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The Influence of Electronic Learning Service Quality on Student Satisfaction. Evidence From Zimbabwean Public Universities

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Abstract

With the emergence of the Covid-19 pandemic and rapid technological growth, electronic learning has become a ubiquitous lever on service delivery in higher education. The purpose of the study was to determine the impact of perceived e-learning service quality on student satisfaction in Zimbabwean public universities. The study adopted the causal research design embedded in the positivism research philosophy. Four e-learning public universities were selected for data collection using a stratified sampling method. Findings from 321 valid responses through multiple regression analysis revealed positive relationships between e-learning quality factors (system quality, information quality and support service quality) and student satisfaction ($p<0.05$). The study validated the DeLone and McLean (2003) model to emphasise the significance of system quality, information quality and support service quality as the key antecedents of student satisfaction. Universities were urged to ensure robustness in their e-learning systems as well as regularly assessing student perceptions of their services as a way to facilitate the design of a customer centric service.

Keywords: E-learning, student satisfaction, system quality, information quality, support service quality

1.0 Introduction

Rapid technological advancement coupled by the eruption of the Covid-19 pandemic has provided a serendipitous avenue for universities to deliver their services through electronic learning. According to Lee and Jeon (2020), e-learning has now been popularized than anticipated as efforts to contain the pandemic meant closure of brick-and-mortar facilities in Higher Education. Universities have since intensified their investment in refurbishment and installation of advanced e-learning systems to support the smooth delivery of education of students (Obododike and Okekeokosisi, 2020; Siriteerawasu, 2021). Technological advancements have also enabled education services to be seamless and ubiquitous as providers are slowly finding a panacea to eliminate face to face learning (Okeke and Unachukwu, 2022; Pham and Tran, 2020).

According to the Zimbabwe Council for Higher Education (ZIMCHE) (2020), the Covid-19 pandemic motivated Higher Education Institutions (HEIs) to revamp their electronic learning systems. Timed face to face learning sessions have been formalised as universities transformed from full scale brick-and-mortar learning to blended e-learning (ZIMCHE, 2020). E-learning adoption has grown rapidly as universities, colleges and schools responded to the Covid-19 pandemic (Badea, 2022; Siriteerawasu, 2021). It is noteworthy to note that student perceptions of educational services have been found important for universities (Lukic & Lukic, 2018; Tabin, Khomisah, Sutiyono and Abdullah, 2022). As such, it remains imperative to evaluate student perceptions of electronic learning, thus new avenues for research have been presented (Eom & Ashill, 2018; Opstad, 2022). This paper sought to examine the students' perceptions of e-learning service quality and their influence on student satisfaction.

2.0 Theory and literature review

Early conceptions of service quality were based on the SERVQUAL and SERVPERF models from the work of Parasuraman, Zeithmal and Berry (1988) and Cronin and Taylor (1992), respectively. Internet service quality has been examined by adopting the E-SERVQUAL scale developed and operationalized by Parasuraman, Zeithmal and Malhotra (2005). Furthermore, scholars who have assessed e-learning service quality have adopted the DeLone and McLean (1992; 2003) models as well as the technology adoption models (TAM) (Davies, 1989; Marandu et al., 2019) with more findings being reported in empirical studies.

In this study, electronic learning service quality was measured based on three constructs adopted from DeLone and McLean (2003; 2016). These are system quality, information quality and support service quality. User satisfaction, also adopted from the same model was conceptualized as student satisfaction. The model has been adopted in more than 8000 studies as researchers sought to assess the success of information systems in different contexts (Jeyaraj, 2020).

2.1 System quality

System quality is defined as the extent to which an electronic platform performs in the manner in which it is designed and the extent to which users anticipate it to operate (Tandon et al., 2017). System quality encompasses factors such as excellent user interface, enhanced privacy and high degree of security (Meskaran et al., 2013). A good e-learning system ensures clean displays, quick presentations, simple search pathways, and interactive features (Ayambaa & Chang, 2012).

System quality is also a function of conspicuous web graphics designs. According Tandon and Kiran (2019) website graphics are visual representations which augment representation of content material. E-learning platform graphics are essential in directing users to content material online and could have positive experience on users through a parallax technique (Tabiin et al., 2022). Vijay, Prashar and Sahay (2019) indicate that an online platform that allows users to navigate easily would enhance system quality and users would prefer it over conventional brick-and-mortar methods. Khare and Rakesh (2011) show that if e-learning platforms are simple to navigate and utilise, user satisfaction is boosted as perception of systems quality is also improved. Students are more likely to return to an online learning site that has a well-designed navigation system which makes it easy to return to previously displayed pages (Tandon & Kiran, 2019).

In this study, system quality was defined as the functional capabilities of the information system in terms of access, availability, log in, security of users, flexibility, appeal and design, ease of navigation, downloading speed and availability (DeLone & McLean, 2016). System quality was modelled as a determinant of user satisfaction.

2.2 Information quality

Information quality relates to the extent to which students are provided with information relevant to their needs (Rehman et al., 2012). When information supply is erratic, students perceive the quality of learning as poor and that distorts their levels of satisfaction (Hanjaya et al., 2019). The format of the e-learning platform or website is another critical dimension of information quality and it relates to how the information is presented on the website (Guo et al., 2012). To lessen the degree of difficulty and time it takes to access information, it is vital to arrange lecture material in a format that makes it as searchable as possible (Cheung & Lee, 2005).

Information quality also emanates from giving learners a variety of levels of richness, from text to multimedia to 3D visual images. Leaners can find information more appealing and beneficial if it is presented in multimedia and 3D visuals so as to see the concepts and models from different angles in an interactive manner rather than a text format (Singh & Srivastava, 2018). The use of images, text, sound, and video may make lecture content appealing as well as informative (Singh & Srivastava, 2018). According to Wang and Le (2016) adding a click and balloon plug-in on the website helps students to get more information about the subject that they are learning. A click function presents more specific information about the specific unit or topic which the students may be learning (Wang & Le, 2016). Higher degrees of interaction can improve the e-learning platform's efficacy and efficiency in delivering relevant information, and hence improve user satisfaction (Guo et al., 2012).

In this study, information quality was defined in terms of usability, format (text, audio and video), understandability, relevance and compatibility of the content that users access from the information system (DeLone & McLean, 2003). It was also conceptualised in terms of readability, adequacy and transferability. It was also determined to be one of the drivers for user satisfaction and information systems use.

2.3 Service quality

Service quality relates to the degree to which an e-learning platform facilitates efficient and successful learning in an accurate and reliable manner through the provision of IT technical support systems and structures (Barutcu,

2010). Responsiveness is a major attribute of service quality that requires e-learning platforms to be fast in enquiry response and prompt in offering useful academic and support assistance (Lionello, Slongo & Matos, 2020). Service quality in learning is also used to refer to the prompt reaction to learner and instructor queries and availability of assistance online (Pearson et al., 2012). Responsiveness can also relate to whether the e-learning platform can give timely service, useful assistance, and reliable information which is needed by the users. Suleiman, Mat, Adesiyan, Mohammed and Aekam (2012) state that service quality ensures that users receive quick services. Thus, it can be described as willingness to assist users and delivering of a swift service.

DeLone and McLean added service quality as a new construct to their model in 2003. They conceptualized service quality as the support that students or users get from IT staff when rectifying problems on portals (DeLone & McLean, 2016). They also defined service quality as the ability of the e-learning system to troubleshoot user challenges online. In this study, service quality focused on responsiveness, accuracy, reliability, technical competence, and empathy of the IT support staff. Service quality also includes for the ability of the e-learning system to convey clear steps and instructions to users (Yosep, 2015).

2.4 Student satisfaction

Online satisfaction has been defined as the contentment of the user with respect to his or her prior experience with a given electronic platform (Tabiin et al., 2022; Vijay et al., 2019). Student satisfaction has been conceptualized as the subjective emotional feeling that students develop after using the electronic learning services (Pham et al., 2010). When a delivery meets or surpasses a student's expectations, they are satisfied (Makudza, 2021). Lin and Lekhawipat (2014) reveal that satisfaction is a very important concept in the context of online environments, as it contributes to student retention and the long-term growth of online learning. Khan et al. (2015) highlight that a satisfied student has a greater intention to reuse e-learning products and services. Makudza, Muchongwe and Dangaiso (2020) also added that demographic diversification also contributes to satisfaction and productivity.

Student satisfaction significantly enables universities to achieve long-term growth and gain competitive advantage (Khan et al., 2015). Rita, Oliveira and Farisa (2019) add that, satisfaction is a critical component in deciding whether or not to learn using online means ever again. On one hand, satisfied students are likely to increase the usage of e-learning and spread positive information about it to others. In this way, student satisfaction helps to attract and retain students (Deyalage & Kulathunga, 2020). On the other side, when students are not satisfied with e-learning, they are likely to stop using it, and they spread negative information to other potential students (Deyalage & Kulathunga, 2020).

In their information systems success model, DeLone and McLean (2003) conceptualized it as user satisfaction. It resonates with customer satisfaction, which Oliver (1980) defined as the positive or negative feelings as a result of service or product use. Satisfaction has been cited as an antecedent of customer loyalty hence it is very important to examine its predictors. Student satisfaction acts as a lever on long-term loyalty and growth of the university (Martinez-Arguelles & Batalla-Busquets, 2016).

2.5 Development of Hypotheses

2.5.1The relationship between system quality and student satisfaction

The relationship between system quality and student satisfaction has been examined by a number of researchers who used the DeLone and McLean model (Al-Fraihat et al., 2020; Chang, 2013; Pang et al., 2020; Yosep, 2015;). Alzahrani et al. (2019) affirmed that e-learning quality mainly depends on system quality. In their research in Malaysia, they mentioned resource utilization, response time, human factors, aggregation of details, reliability, system trust and accuracy as key attributes of good system quality. From their findings, they concluded that system quality positively influences user satisfaction with e-learning. Their findings were supported by those of DeLone and McLean (2003; 2016), Yosep (2015) and Al-Fraihat et al. (2020).

In a study sought to determine the determinants of online learning continuance usage intentions amongst Chinese consumers in Korea, Pang et al. (2020) adopted the DeLone and McLean model (2003) and the expectation confirmation model (Bhattacherjee, 2001). Their results reflected that system quality positively affects online user satisfaction. Their claims were consistent with the results of Chang (2013) who also examined the predictors of students' continuance intentions with a digital library system in Taiwan. The results also supported the findings of Alzahrani et al. (2019).

Li et al (2021) assessed the relationship between system quality and student satisfaction. Their study adopted the DeLone and McLean (2003)'s model, e-learning quality model (Attwell, 2006) and Ozkan and Koseler's (2009) user satisfaction model. Li et al (2021) pinpointed that their model was key in developing a

robust e-learning model through adoption of a number of models that were developed to assess the success of information systems. Their results affirmed that a positive relationship exists between system quality and user satisfaction.

Based on the foregoing discussion, the study hypothesized that;

H1: System quality positively influences student satisfaction with e-learning.

2.5.2The relationship between information quality and student satisfaction.

According to Al- Muhem (2020), information quality positively influences user's satisfaction. The study identified stickiness of the e-learning website which stimulates students to continue navigating and browsing for extended periods (Pham et al., 2019). Al Muhem (2020) adopted the DeLone and McLean model to examine the influence of information quality on students' satisfaction. The study also incorporated organizational factors (change management and top management support), which were modelled to also predict e-learning quality. The findings were that information quality positively influences students' satisfaction. This concurs with Alotaibi (2020), who also reported the positive effect of content quality on student satisfaction in Saudi Arabian universities. The results also corroborate the claims by Yosep (2015) and DeLone and McLean (2016).

Lee and Jeon (2020) also investigated the antecedents of user satisfaction, use and net benefits to learners using a Mobile Learning Management System (MLMS) at a cyber university in Korea. The model was validated through Structural Equation Modelling (SEM) and their results confirmed that information quality positively affected the user's satisfaction with the MLMS. They affirmed results by DeLone and McLean (2016) and Pang et al. (2020).

Furthermore, Alzahrani et al. (2019) assessed the relationship between information quality and student satisfaction at four e-learning universities in Malaysia. They proposed that perceived e-learning quality hinges on information quality. Determinants such as format, understandability, readability, relevancy and detail were included in their model as attributes of content quality. Results reflected a positive relationship between information quality and student satisfaction. Their results were cognisant to those of Cheng (2013) and DeLone and McLean (2016). Pang et al. (2020) also reported similar findings.

Against this background, it was also hypothesised that;

H2: Information quality positively affects student satisfaction with e-learning.

2.5.3The relationship between support service quality and student satisfaction

Lukic and Lukic (2018) examined the relationship between service quality, student satisfaction and future behavioural intentions. Their results reflected positive and significant path coefficients on the link between service quality and student's satisfaction. Their findings confirmed earlier results by Dehgran et al. (2014), from their enquiries in Michigan, USA. However, Pham et al. (2019) argued that their model included none information systems (IS) service quality factors hence, their claims warrant further empirical examination.

Pham et al. (2019) developed and validated their online learning success model in Vietnam. They modelled instructor and course materials quality, system quality, administrative and support service quality as antecedents of overall e-learning service quality. Their model also validated e-learning service quality as a second order construct, a key distinct finding from other studies. Their results reflected a positive relationship between e-learning service quality and student satisfaction, consistent with Yosep (2015), Lukic and Lukic (2018) and Al-Fraihat et al. (2020), despite this difference.

Al Muhem (2020) also validated the DeLone and McLean (2003) model by modelling the effect of e-learning quality factors on students' satisfaction. The model was also extended with organizational factors, which were predicted to influence e-learning quality. The study reported that service quality positively affected students' satisfaction. These findings confirmed prior results by Yosep (2015), DeLone and McLean (2016) and Pang et al. (2020).

In light of the foregoing background, the study hypothesised that;

H3: Support service quality positively influences student satisfaction with e-learning.

2.6 Research model

Based on the hypothesised relationships above, the conceptual framework for the study was drawn. Three predictors of student's satisfaction with electronic learning were identified as system quality, information quality and support service quality. The proposed model was adopted from the DeLone and McLean (2003) model of information systems success. The model resulted in derivation of two equations sought in this study as shown below.

$$ESQ = \sum(SQ + IQ + SSQ) \quad (1)$$

$$SS = a + \beta 1SQ + \beta 2IQ + \beta 3SSQ \quad (2)$$

Where ESQ is e-learning service quality, SQ is system quality, IQ is information quality, SSQ is support service quality, SS is student satisfaction, a is the intercept and β is the regression coefficient. Figure 1 presents the research model.

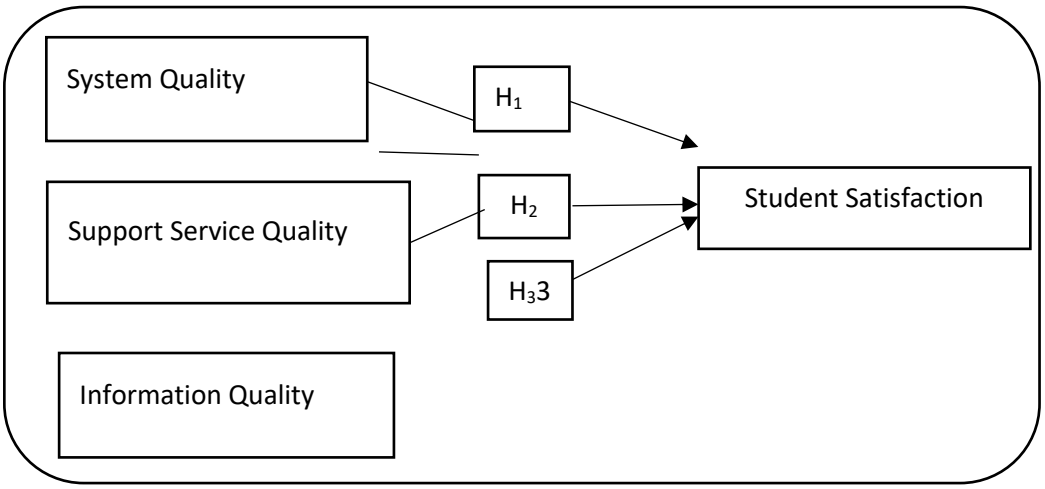

Figure 1: The Conceptual Framework
Source: Adapted and modified from DeLone and McLean (2003)

3.0 Methodology

A cross sectional study was employed to collect and analyse data from four public universities in Zimbabwe. The measurement scales for the study were adopted and adapted from Al-Fraihat et al. (2020). The study's variables were conceptualized as system quality, information quality, support service quality and student satisfaction. A stratified sample of 420 students who were using e-learning was selected to participate in the study. This resulted in 321 valid responses which were retained for conclusive analysis. The data was analysed using Exploratory Factor Analysis (EFA), correlation analysis and multiple regression analysis in SPSS Version 20 package.

4.0 Findings

4.1 Sample Profile

Out of the 420 distributed questionnaires, 321 were returned, giving rise to a response rate of 76.4%. The demographic profile indicated that 38.3% were males and 61.7% were females. More so, there were more participants from Universities A (33.3%) and B (35.5%) than there were from Universities C (15.3%) and D (15.9%) due to the stratified sampling technique based on the proportionate sampling method by Bowley (2016). The results also reflected that young participants aged between 17-21 years and 22-26 years had greater sample composition, with high incidences of 27.4% and 32.4% respectively.

4.2 Exploratory Factor Analysis (EFA)

The purpose of EFA was to reduce quantitative data into a simple structure (Hair et al., 2019). It began with a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test which examines the suitability of data for EFA. A KMO value of 0.933 (>0.6) indicated that there were sufficient correlations in the sample data to proceed to factor analysis (Hair et al., 2019). Secondly, a Bartlett's Test of Sphericity was also checked. A Chi-square of 4264.52, with 120 degrees of freedom and a significant p value of 0.000 indicated that the data was suitable for factor analysis (Hair et al., 2016).

Using the Principal Components Analysis (PCA) and maximum likelihood estimation, all 19 items were loaded. During the first round of PCA, all items loaded significantly (greater than 0.5) except IQ5, SSQ5 which had loadings of 0.30 and 0.37. SS4 had a significant cross-loading on Component 1 and 3. Hair et al. (2016) recommend deletion as the items cause discriminant validity problems. Resultantly, these three items were removed from further

analysis.

A second PCA using maximum likelihood estimation was run. Using a varimax rotation and the Kaiser-Guttman criterion (Kaizer, 1974) of eigenvalue greater than 1, four factors were identified. The four points before the scree plot levelled off were also observed to identify the four factors which explained 78.54% of the total variance. The extracted components were identified as posteriori constructs (Bollen, 2002) cited in Mukucha et al. (2020). According to Bollen, posteriori constructs are variables that are retained from analysed data. These variables were subsequently named system quality, information quality, support service quality and student satisfaction. Table 1 shows the final rotated component matrix.

Table 1. Final Rotated Component Matrix

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
SQ1	.829			
SQ2	.780			
SQ3	.754			
SQ4	.834			
SQ5	.769			
IQ1			.729	
IQ2			.802	
IQ3			.601	
IQ4			.782	
SSQ1		.821		
SSQ2		.818		
SSQ3		.817		
SSQ4		.793		
SS1				.800
SS2				.790
SS3				.754
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 6 iterations.				

4.3 Validity and Reliability of Measurement Scales

The Cronbach alpha was used to examine scale internal consistency. According to Pallant (2011) the accepted threshold is 0.7. All the four constructs had scores of at least 0.7; system quality (0.905), information quality (0.904), support service quality (0.929) and student satisfaction (0.872). Convergent validity was confirmed by having standardised loadings greater than 0.5 and Average Variance Explained (AVE) per latent construct of 0.5 or better (Hair et al., 2016). The AVE for system quality was 0.630, information quality had an AVE of 0.536, support service quality recorded an AVE of 0.659 whilst the AVE for student satisfaction was 0.610. Accordingly, the requirements of convergent validity were satisfied. Discriminant validity was examined by checking items which were cross loading (Pallant, 2011). Item SS4 was deleted after the first round of PCA for cross loading on Components 1 and 2, hence there were no further discriminant validity issues.

4.4 Correlation Analysis

Correlation (r) measures the association and direction of relationships between variables (Pallant, 2011; Hair et al., 2016). Correlation analysis was used to examine the linear relationship between variables in the model. The highest correlation was between information quality and support service quality (0.746) whilst the lowest correlation was observed between system quality and support service quality (0.494). All correlations were positive and statistically significant ($p<0.05$), denoting positive relationships between all variables in the model. Table 2 illustrates the results of correlation analysis.

Table 2. Correlation Analysis

Correlations					
		System Quality	Information Quality	Support Service Quality	Student Satisfaction
System Quality	Pearson Correlation	1	.537**	.494**	.664**
	Sig. (2-tailed)		.000	.000	.000
	N	321	321	321	321
Information Quality	Pearson Correlation	.537**	1	.746**	.735**
	Sig. (2-tailed)	.000		.000	.000
	N	321	321	321	321
Support Service Quality	Pearson Correlation	.494**	.746**	1	.654**
	Sig. (2-tailed)	.000	.000		.000
	N	321	321	321	321
Student Satisfaction	Pearson Correlation	.664**	.735**	.654**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	321	321	321	321
**. Correlation is significant at the 0.01 level (2-tailed).					

4.5 Multiple regression analysis

In order to test hypothesized relationships, data was subjected to parametric examination using multiple regression analysis (Hair et al., 2016). As shown in Table 3, the model R Square was 0.654. This means that the model (system quality, information quality and support service quality) explained 65.4% of the variability in student satisfaction. An adjusted R Square of 0.651 was also observed, denoting a 65.1% variability in student satisfaction. However, the adjusted R Square is only used where smaller than recommended sample sizes are used (Pallant, 2011). The results reflect that the e-learning quality predictors managed to account for a significant amount of variance.

Table 3. Model R Square

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.809[a]	.654	.651	.67523
a. Predictors: (Constant), Support Service Quality, System Quality, Information Quality				
b. Dependent Variable: Student Satisfaction				

Table 4: Model Fit

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	273.340	3	91.113	199.839	.000[b]
	Residual	144.531	317	.456		
	Total	417.872	320			
a. Dependent Variable: Student Satisfaction						
b. Predictors: (Constant), Support Service Quality, System Quality, Information Quality						

Table 4 illustrates the results of the F test through ANOVA that was used to estimate the model's overall statistical significance. The results of the examination indicated that the model was statistically significant as evidenced by a positive F statistic and a significant p value, F (3, 317) =199.839, p =0.000. This reflects that the model was statistically valid. However, the F test only accounts for the statistical significance of the whole model. The regression coefficients were also determined as shown in Table 5. According to the results in Table 5, all the predictor variables were statistically significant in influencing student satisfaction with e-learning. System quality had the most significant influence on student satisfaction, with a beta estimate of 0.422, a T-statistic of 8.985 and a P-value of 0.000. Information quality also influenced student satisfaction by a beta estimate of 0.413, a T-value

of 8.144 and P = 0.000. Support service quality had the least influence on student satisfaction with a beta estimate of 0.140, a T-statistic of 3.241 and a P-value of 0.001. At 95% confidence interval, all coefficients and T-values were positive and statistically significant (p<0.05). The regression equation for the model was expressed as;

$$Student\ satisfaction = 0.281\ (constant) + 0.422\ (system\ quality) + 0.413\ (information\ quality) + 0.140\ (support\ service\ quality).$$

Table 5. Regression Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.281	.216		1.299	.195
	System Quality	.422	.047	.357	8.985	.000
	Information Quality	.413	.051	.422	8.144	.000
	Support Service Quality	.140	.043	.163	3.241	.001
a. Dependent Variable: Student Satisfaction						

4.6 Hypotheses outcomes

Table 6 shows the results of hypotheses testing. Based on the results explained in section 4.5, all the three hypotheses gained empirical support.

Table 6: Hypothesis Testing

Hypothesis	Result
H_1: System quality positively influences student satisfaction with e-learning	Supported
H_2: Information quality positively influences student satisfaction with e-learning	Supported
H_3: Support service quality positively influences student satisfaction with e-learning	Supported

Discussion

H1 was accepted and the relationship between system quality and student satisfaction was confirmed. That therefore follows that there is empirical evidence that in Zimbabwe students value the robustness of an e-learning system that gives them unlimited access, navigation, availability, user interface, flexibility, customization and speed. These attributes are key to cultivating student satisfaction with online learning as they enable learners to successfully execute their sessions. The results resonate with earlier studies by DeLone and Mc Lean (2016), Al-Fraihat et al. (2020) and Lee and Jeon (2020). System quality has been found a key determinant of e-learning success and DeLone and McLean (2013; 2016) emphasized the importance of a sound system quality in enhancing user satisfaction in virtual environments.

Confirmation of H2 supported the relationship between information quality and learner satisfaction. The results reflect that apart from a good e-learning system quality, students also place importance on the quality of content which they access or download on e-learning portals. The completeness, relevance, format, compatibility, understandability, timeliness and vividness of content delivered by instructors was determined to be important. The findings are not a new phenomenon in e-learning studies as Alzahrani et al. (2019) and Pang et al. (2020) confirmed similar results from their studies in Malaysia and Korea, respectively. However, Mamoodi et al. (2019) found the path between information quality and user satisfaction insignificant from their study in Alborz, Iran.

Hypothesis H3 had hypothesised a relationship between support service quality and student satisfaction. It can be drawn that e-learning satisfaction also hinges upon the ability of the IT support staff to solve students' challenges during e-learning sessions promptly. This includes empathy, responsiveness, speed and courtesy; as key support staff attributes are necessary in service delivery. More so, support service quality accounts from the ability of the e-learning system itself to convey clear and simple steps and instructions to students on how to use the system. The results resonate with the findings of Lukic and Lukic (2018), Al-Fraihat et al. (2020), Lee and Jeon

(2020) and Bardea (2022). This also concurs with the findings in Zambia and Saudi Arabia by Mwiya et al. (2019) and Al Muhem (2020), respectively. Lukic and Lukic (2018) pinpointed that most service failures are attributed to the inability of the final users to understand how to consume the service. Thus, good support service quality is an important antecedent of student satisfaction with e-learning in Zimbabwean public universities.

Conclusion and further research

The study validated the DeLone and McLean (2003) model from a Zimbabwean context. Perceived e-learning service quality factors were confirmed as antecedents of student satisfaction with electronic learning. System quality had the most significant influence (β = 0. 422), followed information quality (β = 0.413) and support service quality had the least impact (β = 0.140).

The study has theoretical and practical connotations in the light of these findings. The study validated the updated Information Systems Success Model (ISSM) by DeLone and McLean (1992; 2003) which has been the most cited information systems success model (Jeyaraj, 2020). The perceived e-learning service quality determinants accounted for 65.4% of the variability in student satisfaction with e-learning. This is a reflection of the importance of system quality, information quality and support service quality in e-learning environments.

The study also implies to Higher Education Institutions, especially in Zimbabwe where e-learning success studies are still sparse. Higher education institutions should prioritise system quality, information quality and lastly service quality in their e-learning system capabilities. Universities should consider measuring the student perceptions of e-learning so that they can design a customer centric service that brings user satisfaction. Thus, the study gives an imperative for Higher Education Institutions to continuously evaluate their service quality both in online and face-to-face environments.

However, the study was subject to a few limitations. The study only employed a quantitative approach to understand student perceptions of e-learning service quality. To enhance the quality of findings, future studies may consider triangulation with qualitative methods to garner deeper insights on the student perceptions of e-learning success. Furthermore, the population were students using e-learning, however, to have a holistic evaluation of e-learning success, future studies may incorporate instructors, IT support service staff and faculty administrators. The research model managed to explain 65.4% of the variability in student satisfaction. Future studies may integrate other determinants of student satisfaction using extended models to improve its predictive power.

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