

E-Service Quality, Students' Satisfaction And Synchronous Online Learning Retention In The Era Of Sudden Educational Paradigm Shifts.

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Abstract:

Background: The purpose of this paper is to examine the relationship between E-service quality (E-S-QUAL), students' satisfaction and synchronous online learning retention during COVID-19 pandemic in Malaysia.

Materials and Methods: A quantitative methodology was employed and data were collected through online structured questionnaire. Responses were gathered from students (n=464) who are studying in higher education institutions in Malaysia. Exploratory and confirmatory factor analyses were used to validate the instruments. Structural equation modeling (SEM) was used to examine the associations between the constructs.

Results: The study confirmed that e-service quality dimensions impact students' satisfaction in synchronous online learning. Students' satisfaction level impacted student synchronous online learning's retention. The implications of the findings in relate to the E-service quality, students' satisfaction and synchronous online learning retention are discussed.

Conclusion: These findings can help policymakers to develop strategies to improve e-service quality, satisfaction level, and synchronous online learning retention. Further research suggests focusing on other student groups such as primary and secondary school learners as well as working adult learners. The study proposes a framework of the higher education e-service quality based on the experiences of students that can be used by institutions policymaker to continue improving synchronous and asynchronous online education quality and student satisfaction. More importantly, no previous research has tapped into the measurement of synchronous online learning retention.

Key Word: E-S-QUAL; Satisfaction; Retention; Synchronous online learning.

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I. Introduction

In 2020, the World Health Organisation (WHO) declared Covid-19 as a pandemic and governments ordered movement restrictions and physical distancing to reduce transmission of the Covid-19 (Sohrabi *et al.*, 2020). It impacted 94% of the world's student population; with approximately 1.6 billion learners (United Nations Education, 2020). The temporarily closed physical institutions (Daniel, 2020) impact the educational landscape to the modern approach of teaching and learning (Mishra *et al.*, 2020). In sudden online education, educators are forced to deliver courses online (Hussein *et al.*, 2020) by using synchronous learning that conducts at a specific time via a specific learning platform (Crawford *et al.*, 2020). However, some institutions allowed students to learn at their own pace as classes are offered in an asynchronous where recorded lectures upload to a specific platform (Hodges *et al.*, 2020).

Oyedotun (2020) stated the benefits of sudden online education allow students and lecturers to search for information and materials via the online platform as well as explore different learning options using technology for instruction and learning. However, Rashid and Yadav (2020) argued that sudden online education led to overwork, stress among lecturers. Bao (2020) continues to argue that most faculty members lack online teaching experience and Adedoyin and Soykan (2020) also pointed out, students often have issues such as no internet access, low digital competence, and lack of self-discipline.

Leonard (2019) specified institutions shifted from traditional service quality to e-service quality due to the rapid transformation of existing teaching to online delivery (Dwivedi *et al.*, 2020). As students are the ultimate beneficiary of the education system, a study from student's perspective of e-service quality (E-S-QUAL) and student retention along with student satisfaction is important because it affects students' career and the cost to change institutions and courses very high; thus, dissatisfied students have no choice but to continue with the current online learning platform with current institution despite the quality provided (Mansori *et al.*, 2014).

Given this backdrop, this study aims to advance the body of knowledge by proposing the intervening role of student satisfaction in the relationships between E-S-QUAL factors and student synchronous online

learning retention in sudden online education. To add on, this study aims to explore the relationship between efficiency, fulfilment, privacy, and system availability factors which are known as E-S-QUAL factors with the level of student satisfaction and student retention. These objectives would be achieved by addressing the following research questions (RQs):

RQ1: Does e-service quality impact student satisfaction, especially in the era of sudden online education?

RQ2: Does students' satisfaction impact synchronous online learning retention, especially in the era of sudden online education?

The paper proceeds as follows. In the next section, the theoretical foundation of service quality, E-S-QUAL factors, student satisfaction, and synchronous online learning retention followed by research model and hypothesis formulation, research methodology, findings, and discussion. Finally, the paper concludes with future research directions.

II. Literature Review

Service Quality

Quality is defined as something being “fit for use” (Juran,1981) and being in “conformance to requirements” (Crosby, 1979). Lewis and Booms (1983, p.100) stated service quality as a “measure of how well the service level delivered matches the customer expectations”. There are several service quality models and the first service quality model was developed by Grönroos (1984). It measured the perceived service quality based on the test of qualitative methods from the dimensions of technical quality, functional quality, and corporate image. Next, Parasuraman *et al.* (1985) proposed the gap analysis model also known as SERVQUAL to measures the differences between customer expectation and customer experience. Initially, SERVQUAL had 10 dimensions and it had scale down to 5 dimensions via the scale purification through the iterative sequence such as computation of coefficient alpha and item-to-total correlations of each dimension; deletion of items whose item-to-total corrections were low and whose removal increased coefficient alpha; factor analysis to verify the dimensionality of the overall scale and reassignment of items and restructuring of dimensions where necessary. The final items making up each of SERVQUAL's dimensions are reliability, assurance, tangibles, empathy, and responsiveness, which also refer to as “RATER” (Parasuraman *et al.*, 1988).

Philip and Hazlett (1997) introduced a hierarchical structure model named P-C-P model. It measures service quality based on pivotal, core, and peripheral attributes in service organizations. Pivotal attributes are the most important attributes as it affects service quality in finish product or output whereas core and peripheral attributes are inputs and processes. These attributes are shown in a triangle and the degree of importance decreases from top to bottom of the triangle. Pivotal attributes are at the top, core attributes are at the second stage, and peripheral attributes are at the bottom side of the triangle. Frost and Kumar (2000) introduced INTSERVQUAL, the internal adaption of the GAP model in a large service organisation and concluded that perceptions and expectations of internal customers and internal suppliers play a major role in recognizing the level of internal service quality perceived. Also, INTSERVQUAL was not the only model derived from SERVQUAL; SERVPERF (Cronin & Taylor, 1992) like SERVQUAL but with performance-only statements.

E-service quality

Tim Bernes-Lee developed and launched the World Wide Web and made it widely available to the public due to developments in Personal Computers and supporting technology in 1995 led to the rise of internet-based services has changed the way that firms and consumers interact (Ande *et al.*, 2020). Loiacono (2000) proposed a new model to study overall website effectiveness and the impact of consumer's intention to purchase, which is known as WebQual by measuring the 12 dimensions. However, Barnes and Vidgen (2002) argue that the WebQual model developed based on the communication theory, thus, proposed WebQual 4.0 to assess the perceived service quality in the dimensions of usability, information quality, and service interaction. Yoo and Donthu (2001) developed the SITEQUAL model to measure e-service quality and the dimensions included ease of use of the website and ability for information search; aesthetic design refers to the creativity of website in terms of excellent multimedia and color graphics; processing speed refers to online processing promptness and interactive responsiveness to consumers' requests; security refers to the safety of financial and personal information. Efficiency, reliability, fulfilment, privacy, responsiveness, compensation, and contact are the dimensions of the E-SERVQUAL model proposed by Zeithaml *et al.* (2000). It is drawn up through the three-stage process involving exploratory focus groups and two phases of empirical data collection and analysis.

In 2002, Loiacono *et al.* measured Business to Consumer website quality via WebQual™ and focus on the buying and revisiting intentions of consumers and the value of the website. However, Zeithaml *et al.* (2002) argued that WebQual™ more suitable for website designers to design better websites for users rather than measuring service quality. Wolfinbarger and Gilly (2003) suggested eTAilQ for the measurement of service quality delivery through websites and it found that reliability/fulfilment is the strongest factor that affecting

customer satisfaction, website functionality is a strong factor that affecting loyalty, and customer service is a strong predictive of loyalty and customer satisfaction. Santos (2003) defined e-service quality as the degree to which customers' expectations are fulfilled by the online service provider and proposed the E-ServQual model. In 2005 Parasuraman *et al.* proposed E-S-QUAL scales for measuring e-service quality. E-S-QUAL is a core service quality scale for measuring core service attributes of websites and it has 22 items and four dimensions such as efficiency, fulfilment, system availability, and privacy. E-S-QUAL scale is a leading model for the measurement of e-service quality just as SERVQUAL in service quality. However, Bauer *et al.* (2006) draw attention to concerns related to the scale of E-S-QUAL. As it lacks items aiming to measure the hedonic elements of service quality which are crucial determinants of service quality; thus, proposed eTransQual by measuring the dimensions of Functionality/Design, Reliability, Process, Responsiveness, Enjoyment. Annamdevula & Bellamkonda (2012) develop HiEdQUAL measuring instrument of service quality through qualitative and quantitative studies that explore five dimensions: teaching and course content, administrative services, academic facilities, campus infrastructure, and support services of service quality within the higher education sector. Academic Quality, Administrative Services Quality, Library Services Quality, Supportive Services Quality, Quality of providing Career Opportunities were the dimensions of the HEDQUAL model developed by Icli and Anil in 2014. The majority of researchers are appeal to the E-S-QUAL model as it consists of a holistic assessment of internet service quality which able to detain before and after aspects of e-service quality (San *et al.*, 2020). There are many studies been conducted using the E-S-QUAL model such as the online library (Dalbehera, 2020), online car handling (Jin & Chen, 2020), online banking (Ahmed *et al.*, 2020), online shopping (Al-Khayyal *et al.*, 2020), online food delivery (Annaraud & Berezina, 2020) and tourism industry (Rahahleh *et al.*, 2020). This shows that the E-S-QUAL is suitable to measure in various online services and different industries.

Students' satisfaction

According to Oliver (1980), customer satisfaction measures the difference between customers' expectations before purchasing a service/product and their evaluation after consumption of the service/product. Bates *et al.* (2019) supported satisfaction as a subjective evaluation of features of products and services regarding a pleasurable level of fulfilment or consumption. However, if it fails to meet the customer's expectations, the quality of the actual services provided can cause dissatisfaction.

Thomson and Antony (2020) stated that students are the consumers of educational institutions thus, student satisfaction is important because it affects students' careers (Mansori *et al.*, 2014) and it might lead to dropout (Masserini & Bini, 2020). Student perception of service quality has gained significant popularity in recent times as it impacts student loyalty and student satisfaction (Osman and Saputra, 2019).

Students' retention

Barnacle (2005) highlighted that attrition (dropping out) is seen as a problem in higher education as it potentially reduces economic outcomes. To improve retention rates Singell and Waddell (2010) recommend interventions to identify and "rescue" failing students, which is also supported by Rickinson and Rutherford (1995) by providing counselling to advise students on how to complete at institutions.

The purpose is to form a sense of care and support for students (Sharp *et al.*, 2020) and to engage them as fully as possible in university life (Tight, 2019). As satisfied students are more likely to spread favourable comments and recommend the institution to others (Vaz & Mansori, 2013).

E-service quality, Student satisfaction, Student retention, and Hypothesis

Parasuraman *et al.* (2005) developed a parsimonious scale via an iterative process: examination coefficient alpha and item-to-total correlations by dimension, deletion of items, the examination of dimensionality through exploratory factor analysis and the reassignment of items and restricting of dimensions, as necessary and it resulted in 4 dimensional of E-S-QUAL scale. Chaudhary and Dey (2020) found that student-perceived service quality had a direct effect on student satisfaction. In short, this study defines students' satisfaction based on experiences of students and perceived performance in an era of sudden online education. Efficiency (Parasuraman *et al.*, 2005, p.220) define as "the ease and speed of accessing and using the site". In other words, it means the ability of students to get to the online learning platforms, find their desired resources and information associated with them, and check out with minimal effort (San *et al.* 2020). Thus, this study developed the following hypothesis:

H1: There is a significant relationship between efficiency and student satisfaction in sudden online education.

Fulfilment refers to "the extent to which the site's promise about order delivery and item availability are fulfilled" (Parasuraman *et al.* 2005, p.220). The accuracy of service promises is important as it might impact students' satisfaction. Such as having relevant resources and delivering the services in the promised time is important (Dalbehera 2020). Thus, this study developed the following hypothesis:

H2: There is a significant relationship between fulfilment and student satisfaction in sudden online education.

Parasuraman *et al.* (2005, p.220) define system availability as “the correct technical functioning of the site”. The technical function of the site, particularly the extent to which it is available and properly functioning (Leonnard 2019). Thus, this study developed the following hypothesis:

H3: There is a significant relationship between system availability and student satisfaction in sudden online education.

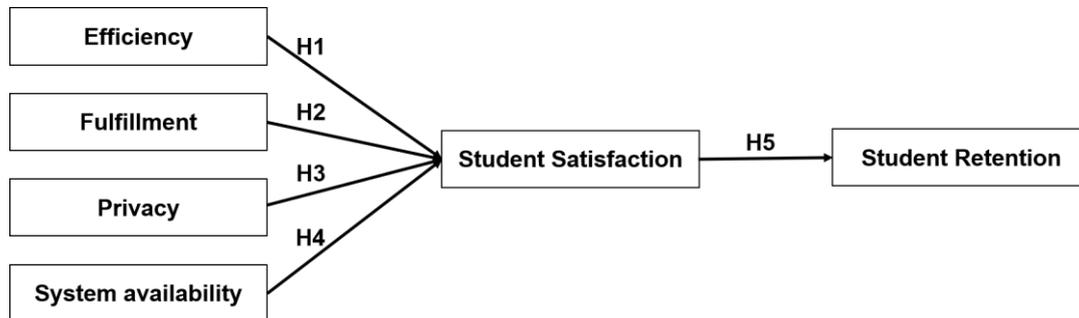
Privacy (Parasuraman *et al.* 2005, p.220) is “the degree to which the site is safe and protects customer information”. Privacy can indeed directly affect the satisfaction and trust of students; thus, assurance learning behaviour data and personal information are secured is important (Demir *et al.* 2020). Thus, this study developed the following hypothesis:

H4: There is a significant relationship between privacy and student satisfaction in sudden online education.

From an online education perspective, Cochran *et al.* (2014, p.42) concluded that the “strongest factor in determining the potential of withdrawal from an online class is the academic experience in that seniors are less likely to withdraw from online courses”. As also supported by Boddy (2020) best retention efforts are those that attempt to give students the feeling that they have a relationship with the institution. Thus, this study developed the following hypothesis:

H5: There is a significant relationship between student satisfaction and retention in sudden online education.

The following is the framework of this study:



III. Methodology

To test the hypotheses, this study used an online questionnaire to conduct data collection due to face-to-face contact is avoided during the Covid-19 pandemic. The sampling method was convenience sampling because convenience sampling allows the researcher to conduct sampling by approaching people that are conveniently available (Zikmund *et al.*, 2019). Malhotra (2015) stated that students were one of the common examples of convenience sampling. Hence, the sample consists of students from different higher education institutions in Malaysia.

In addition, students experienced sudden online education in Malaysia due to conventional classroom teaching and learning practices are shifted to online learning to ensure not even one student is left behind in education despite the Covid-19 pandemic. Therefore, students participating in this study perceived physical (face to face) education and sudden online education. Students completed the online questionnaire that was sent to them via an online link. A total of 464 valid questionnaires were obtained and applied structural equation modeling (SEM) techniques by using the IBM SPSS AMOS version 26 to analyse collected data.

The questionnaire consisted of 24 questions. The items were adapted from previous literature from the studies of Boyd *et al.* (2020); Demir *et al.* (2020), and Leonnard (2019). The questionnaire has three parts. The first part using the E-service quality measurements measures the level of perception toward e-service quality. In the second part, students' overall satisfaction is measured by three questions and three questions on students' retention. Section three of the questionnaire is designed to collect demographic information about the students. All the measured items using five-point Likert scales in which 1 indicates “strongly disagree”, 2 indicated “disagree”, 3 indicated “neutral”, 4 indicated “agree”, and 5 indicates “strongly agree”. After going through all the collected questionnaires, 18 questionnaires were excluded from the analysis due to missing data and/or showing some trend in the responses, for example, rating all responses as either 1 or 5.

IV. Results and Discussion

A total of 464 data is analysed and the demographic background of the respondents is presented in Table 2.

Table 2: Demographic factors

	Frequency	Percent		Frequency	Percent
Gender			Age		
Male	171	36.9	18-20	304	65.5
Female	293	63.1	21-23	138	29.7
			24-26	13	2.8
			27 and above	9	1.9
Education level			Platform		
Foundation	2	0.5	Blackboard	20	4.3
Professional	3	0.6	CISCO Webex	8	1.7
Certificate	19	4.1	Google Classroom	74	15.9
Diploma	304	65.5	Microsoft Teams	198	42.7
Bachelor Degree	121	26.1	Pre-Recordings	2	0.4
Post. Diploma	7	1.5	Zoom	162	34.9
Master	5	1.1			
PhD	3	0.6			

Most of the respondents were female (63.1 percentage) and the majority of the respondents are from the age group ranging from 18 to 20 (65.5 percentage). In terms of education level, the majority of the respondents were pursuing diplomas (65.5 percentage) and bachelor’s degrees (26.1 percentage). Microsoft Teams (42.7 percentage) and Zoom (34.9 percentage) were the online learning platform used by the majority of the respondents.

Table 3: Validity and reliability

Variable	KMO/Sig	Cronbach Alphas	AVE	CR
Efficiency	.80/.001	.86	0.51	0.84
Fulfilment	.90/.001	.85	0.45	0.77
System availability	.77/.001	.73	0.58	0.73
Privacy	.78/.001	.75	0.59	0.74
Satisfaction	.89/.001	.86	0.43	0.70
Retention	.80/.001	.88	0.63	0.84

The validity test is done to test the validity of the employed measurement. Table 3 shows the results of the validity test which indicates that the current instrument is valid and all variables meet the minimum thresholds (p-value<.001 and KMO>.70). All the Cronbach’s alpha in this study were all within the range of 0.65 to 0.95, the constructs were deemed to have satisfied the reliability test according to Chua (2013, p.147).

The average variance expected (AVE > .4) and the composite reliability (CR>.7) of variables have met the minimum requirement (Okazaki, 2011). The evaluation of the goodness of fit statistics indicates that the overall model was not rejected (Chi-square = 268.602, degree of freedom (df) = 137 (p-value = 0.000), Goodness of Fit Index (GFI) = .943, Adjusted Goodness of Fit Index (AGFI) = .921, Comparative Fit Index (CFI) = .975, Tucker-Lewis index (TLI) = 0.968, Incremental Fit Index (IFI) = .938 and Root Mean Square Error of Approximation (RMSEA) = .046.

Table 4: Estimates of regression weights

	Estimate	S.E.	C.R.	P
Satisfaction ← Efficiency	.885	.072	12.234	.001
Satisfaction ← Fulfilment	.890	.064	13.932	.001
Satisfaction ← System availability	.819	.074	10.997	.001
Satisfaction ← Privacy	.854	.076	11.302	.001
Retention ← Satisfaction	.833	.052	15.894	.001

The results in Table 4 show that all hypotheses were accepted. As p-value of H1 (p-value= .001 β=0.885), H2 (p-value= .001 β=0.890), H3 (p-value= .001 β=0.819), and H4 (p-value= .001 β=0.854) are less than .05. With the above findings, Hypothesis 1 (There is a significant relationship between efficiency and student satisfaction in sudden online education), Hypothesis 2 (There is a significant relationship between fulfilment and student

satisfaction in sudden online education.), Hypothesis 3 (There is a significant relationship between system availability and student satisfaction in sudden online education.), and Hypothesis 4 (There is a significant relationship between privacy and student satisfaction in sudden online education.) are accepted.

In addition, H5 (p-value= .001 $\beta=0.833$) shows that student satisfaction has a positive relationship with retention to continue their studies with the current same online learning platforms. The result from Table 4 also reveals that there should be another type of relationship between the variables in the model rather than only a direct relationship. Therefore, to test the mediation effect of student satisfaction on the relationship between E-service quality dimensions and retention, the model was run without the presence of the intervening variable (satisfaction).

Table 5: Direct relationship between E-service quality and retention without the presence of intervening variable (satisfaction)

	Estimate	S.E.	C.R.	P
Retention ← Efficiency	.869	.077	11.226	.001
Retention ← Fulfilment	.886	.069	12.911	.001
Retention ← System availability	.770	.078	9.889	.001
Retention ← Privacy	.841	.080	10.519	.001

The result in Table 5 shows that the E-service quality dimensions are directly related to retention. In addition to that, the result shows a significant relationship between efficiency and retention, fulfilment and retention, system availability and retention, and privacy and retention as the p-value is less than 0.05. With the finding, Hypothesis 5 (There is a significant relationship between student satisfaction and retention in sudden online education.) is accepted.

V. Conclusion

The results of this study indicate a strong direct linkage between E-service quality (E-S-Qual) and student satisfaction as well as student synchronous online learning retention especially in an era of sudden online education. There are three primary results of this study. First, this study established the effect of e-service quality on customer satisfaction especially from students' perspective, which is consistent with the literature (Parasuraman *et al.*, 2005). The results of the study also confirm that E-service quality (E-S-Qual) and student satisfaction are important in the measurement of student retention. Second, all dimensions of E-service quality (E-S-Qual) are equally important, which is consistent with the results of Atabaru *et al.* (2017) and San *et al.* (2020). Third, retention and student satisfaction are closely related (Mansori *et al.*, 2014).

According on the findings, students' satisfaction and synchronous online learning retention confide in E-S-QUAL. Author recommends the higher education institutions to provide online learning related workshop to familiarise them with synchronous online learning platforms. A guidance video and/or online learning platform's manual could be beneficial for students to improve easy to use, find resources, access the online learning platforms and protect of personal information. This will enhance students' satisfaction level and enhance online learning retention. In the other word, if we accept the argument that E-S-QUAL is a decisive factor in students' satisfaction and synchronous online learning retention, then there is a need for consideration of applying the measurement of E-S-QUAL in students learning especially in this educational paradigm shift.

The study has several limitations. First, the study was conducted purely in Malaysia, the findings may not accurately reflect the situation in other countries given the diverse differences. Moreover, the cross-section nature of this study does not allow for the analysis of differences over a period. Thus, future studies should carry out a longitudinal study given that online education is still a novel phenomenon. In addition, further research suggests focusing on other student groups such as primary and secondary school learners as well as working adult learners.

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