Analysing the Effect of Forced Shifting Towards E-Learning during Covid-9 for Student Perceived Satisfaction Variables and Service Quality Dimensions

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ABSTRACT

With the rapid spread of COVID-19 posing indefinite lockdowns globally with easy and cheap access to internet, e-learning tools are gaining popularity as a medium of learning. The area of e learning service quality is getting attention. The spate of conferences and webinars were conducted and many educational institutions have shifted from traditional means of teaching to online virtual classrooms. Many researchers previously suggested that acceptance of e-learning courses is influenced by perceived service quality. However, proper measurement e learning service quality is an issue which remains unaddressed. As far as higher education is concerned, the success, of this program shows varied results. There is a lack of studies especially in the area of student's perception of e learning service quality in higher education context. The study also assesses the technological forced shifting in the area during covid 19. Therefore this study is initiated with a desire to assess e learning quality vis a vis student satisfaction through SERVQUAL model in higher education. In order to accomplish our objectives and in the light of extant literature review and discussion, the study utilizes adapted SERVQUAL scale. This study, Utilized a SERVQUAL Model for measuring e learning among higher education students. The study assesses unidimensionality through (CFA). Analysis was conducted to investigate the reliability and validity of the research scale, and the structural equation model (SEM) to examine the hypothesized model.

Keywords: e-learning, service quality, satisfaction, SERVQUAL, learning content, SEM

INTRODUCTION

There is a lack of literature and research available in the area of service quality especially in higher education sector. After the thorough literature review some research gaps were identified,

Structural equation modeling (SEM) was used to measure the relationships between independent and dependent variables. The findings of data analysis of 374 students reveal that the measures of service quality such as assurance, responsiveness and tangibility plays a significant role as far as e learning quality is concerned.

In the era of global Pandemic the utility of e-learning programs has been expanding, the online infrastructure is demanded specially for higher education, particularly in developing countries, as a result of increased accessibility and transformation in the area of information technology which results in transformation in education sector as well. With these developments in motion especially in the area of information technology, modes of imparting education where learning became possible even without physical presence are being adopted (Marold et al., 2000; McAllister and McAllister, 1996; Zhang & Nunamaker, 2003). Secondly with the advent of covid 19, countries were thrown into indefinite lockdowns resulted into forced shifting of mode of learning from traditional to online based platforms. These

changes posed issues with almost every domain of administration including severe challenges with Human resource of many educational institutions. Therefore it is necessary to assess the service quality dimensions in e learning programmes during Covid 19.

The effectiveness of these online learning programs shows mixed results. We try to understand the reasons behind these irregularities by considering the responses of students who have participated in e- learning courses; it is possible to better understand the reasons why students are often dissatisfied with the e-learning experience. In one of the study by Diaz and Cartnal, 1999) it is observed that presence rates of e learning methods are higher than mode of classroom teaching (Levy, 2007; Lykourentzou et al., 2009; Richards and Ridley, 1997).

Bouhnik and Marcus (2006) identify student characteristics to predict student behavior in e learning systems and stated some factors discourage students to learn. Lack of contact with teachers and peer students are some additional issues identified in another study by Swan (2011).

There is a growing need of evaluating e learning quality and is also beneficial for all the stakeholders (Gress et al., 2010). Moreover, to identify the factors determining the quality of e learning are much more important (Udo et al., 2011). These factors can be utilized during implementation phase and especially for students, if these determinants are considered and carefully implemented, they will lead to a greater satisfaction among students. It has implications in every field as for education institutions; it may lead to more effective learning programmes.

The second very important issue of service quality in the field of e learning is also very important and needs to be thoroughly researched. There should be proper measures to examine the service quality of e learning programmes. Many researchers believe that it is a very complex issue and scarcity of research is making this issue more complex specifically in the area of education. Therefore, through this study, e learning service quality is measured through SERVQUAL scale.

ELECTRONIC LEARNING QUALITY IN HIGHER EDUCATION

As far as meaning of Quality is concerned according to some researchers it is a subjective term. The definition of quality is different from person to person. According to American Society for Quality, it refers to tendency of a product or service to satisfy needs and is free from defects (Yang et al., 2003). According to Joseph Juran (1981), quality means "fitness for use;" according to Philip Crosby (1979), it means "conformance to requirements". Earlier definitions measure quality in terms of goods only and are based on Japanese zero defect principles, according to this philosophy quality is making product with zero defects (Crosby 1979). The definitions of quality are not definite but its importance is undeniable; for both goods and service sectors. This has also been understood that this is because of the peculiar nature of services (Parsuraman et al., 1985).

By keeping these peculiarities into consideration this concept of quality in classroom environments is a main theme in many researches as well. Plethora of studies was found in the area of learning which were built on this model. SERVQUAL tries to measure the difference between the expectations of students/ recipients of service and the satisfaction of the student/ recipients with the services provided. By keeping these peculiarities into consideration, the model was developed as SERVQUAL which was later developed into comprehensive model (Oliver, 1980). Over the period of time its utility increases in many researches as well. Plethora of studies was found in the area of learning which were built on this model. Therefore SERVQUAL was utilized to measure characteristics of students/ recipients of service and the satisfaction of the student/ recipients with the services provided. Initial model was developed with 10 constructs; however, as the model gets refined by the early 1990s, it is briefed to five constructs. The description of each construct is given below

CONSTRUCTS DESCRIPTION

Assurance (AS). This refers to staff/teachers behavior and their competency to inspire trust and confidence.

Tangibles (TA). This refers to the physical appearance of facilities, infrastructure, personnel and learning material

Empathy (EM). This refers to the level of care and customized attention the educational institute provides to its students.

Responsiveness (RS). It refers to administration's willingness and provide service promptly to the students enrolled in an educational institute.

Reliability (RA). It refers to the ability to deliver the promised service accurately and dependably.

These constructs were modified according to e learning environments in higher education sector to measure learning quality vis a vis learners satisfaction. The study was structured on five potential gaps. These are:

- Management perception: the difference between expectations of management and learner.
- Quality specification: It is referred as the variance between perceived student experience and actual student experience.
- Service delivery: It refers to the gap between perceived standards of service and actual service delivery.
- Market communication: It is referred to the difference between what students really experience and what is communicated.
- Perceived service quality: It is the gap between a student's perception of learning experience and expectation.

There are numerous reasons for utilizing SERVQUAL in this study. Firstly, SERVQUAL, as a measuring tool, is very popular in recent researches. Secondly, it can be properly applied in education sector (Jiang et al. 2000; Kang et al. 2002; Kettinger et al. 2005). Finally, it is also identified from the literature that SERVQUAL is a widely accepted and valid instrument for the measurement of service quality, for the last 25 years in the wide range of industries, However surprisingly, the instrument has not been used in an educational context (Petruzzellis, D'Uggento, & Romanazzi, 2006; Stodnick & Rogers, 2008).

In one of the study Rowley (2006) stated that the researches regarding e-services is still in its nascent stages, more effort is required to understand the factors affecting e-service quality in the educational domain. In one of the similar study, Stodnick and Rogers (2008) were among the first to use SERVQUAL scale on traditional students to measure their learning quality. They found that three out of five constructs (assurance, empathy, and reliability) were significant predictors.

OBJECTIVES OF THE STUDY

The study is initiated with a desire to assess e learning quality vis a vis student satisfaction through SERVQUAL model in higher education. In order to accomplish our objectives and in the light of extant literature review and discussion, the study utilizes adapted SERVQUAL model SERVQUAL scale is taken as an independent variable and learning quality as a separate construct as a dependent variable to measure e learning students' perceptions of learning quality and satisfaction, and tries understand which dimensions of SERVQUAL has the biggest influence on the student expectation of quality and satisfaction. The sub-objectives are:

- To review the latest literature in the area of e learning service quality
- To assess which dimension of SERVQUAL scale is most important in the measurement of e learning service quality,
- To develop measures of learning quality vis a vis student satisfaction.
- To assess the unidmensionality, validity and reliability of the above measures.

STUDENT SATISFACTION AND E-LEARNING SERVICE QUALITY

It is believed and many researchers have also stated that classroom settings influence e learning, Online instructors plays a significant role in e learning they are facilitators and motivators of e learning; therefore, in one of the research by Liaw (2008) he stated that e-learners perceive quality and derive satisfaction through online learning . There are many researches on how the service quality can be improved by improving learner and instructor satisfaction and communication. In the light of above literature the hypotheses were formed. They are:

- H1: "Assurance" positively influences e-learning quality and satisfaction.
- H2: "Tangibility" positively influences e-learning quality and satisfaction.
- H3: "Empathy" positively influences e-learning quality and satisfaction.
- H4: "Responsiveness" positively influences e-learning quality and satisfaction.
- H5: "Reliability" positively influences e-learning quality and satisfaction.

DATA COLLECTION AND INSTRUMENT DEVELOPMENT

The questionnaire was developed after thorough literature review and after many rounds of discussion with experts and practitioners. It was divided in 3 sections. In the first section, questions were asked about demographic profile of respondents. In second section items related to adapted SERVQUAL scale were placed and under final section items related to learning quality were structured. A five point Likert scale was used for data collection. The respondents were students, many researchers have successfully used University students when modeling and scale development is appropriate (Yuvas, 1994). Moreover, the use of university students was found in various studies (Udo, Bagchi, & Kirs, 2010; Van Iwaarden, vander Wielaea, Ball & Millen, 2004: Yavas, 1994).

The questionnaire was administered to students in higher education centres in Jeddah, KSA. The students were coming from different streams eg. A total of 374 responses were collected. 52 questionnaires were incomplete and cannot be used in the process of data analysis therefore a total of 321 questionnaires were used in final data analysis.

Original SERVQUAL constructs

The original popular and most commonly used SERVQUAL scale consisted of 20 items (Cao et al, 2005; Stodnick and Rogers, 2008; Olorunniwo et al, 2006). The statements used in this research were adapted from the five research constructs reflected in the study of Olorunniwo et al. (2006) and Stodnick and Rogers (2008). However they were changed in the context of online learning environments. Six items measuring demographics previously used in other related studies were also used in this research. The 10 item scale was used to measure learning quality vis a vis students satisfaction. There are very few studies based on e-learning service quality. On the recommendation of many previous studies, relating to service quality, the scale was modified as researchers suggest that SERVQUAL should be modified to design a comprehensive conceptual model of service quality according to the context in which the research is being carried out (Carman, 1990; Cronin and Taylor, 1992; Parasuraman and Grewal, 2000).

Data analysis and results

The features of Lisrel 8.80 and SPSS statistics 19 were utilized for performing data analysis. For the assessment of descriptive statistics SPSS 19 was used and Lisrel 8.80 was used for the assessment of measurement model and structural model. Results were presented in the final section of this paper. The demographic profile of respondents was given as under. Most of the students were enrolled in public sector universities. The details are given in Table 1.

ASSESSMENT OF MEASUREMENT MODEL

A researcher cannot estimate a structural model before assessing a measurement model. Therefore measurement model was estimated.

Assessment of unidimensionality

Before proceeding with the estimation of measurement model, it is essential that the scale should be unidimensional i.e. each item should measure its respective construct. Therefore unidimensionalty was assessed through a more superior and advanced measure i.e. confirmatory factor analysis (CFA). With the capabilities of Lisrel 8.80 it is possible to assess the CFA for each

Table 1. The results of descriptive statistics

Demographics	Frequency	Percentage (%)
Sector		
Public	307	82.08
Private	67	17.92
Course		
Professional	309	83
Non professional	65	17
Level of education		
Under Grad	20	5.3
Grad	157	41.9
Masters	102	27.27
Above	60	16.04
Gender		
Male	214	57.22
Female	110	43.66
Age		
10-20 yrs	20	5.3
20 – 30 yrs	344	91.97
30-40 yrs	10	2.90

construct in a single model. The acceptable standard loadings were not less than 0.30 (Lingduist, 2001). All the scales were found to be unidimensional except LQ scale. This scale was trimmed and items (LQ1, LQ2 and LQ10) were deleted at each iterative process following the footsteps of experts in the area (Malhotra, 2003). All the factor loadings of the refined scale were in acceptable ranges. Thus the scale was made unidimensional. The results of the CFA were given in Figure 1 and fit indices values are given in Table 3.

Reliability and validity

There are very few relevant tests performed before the estimation of measurement model in structural equation modeling. The very first test is assessment of reliability. Therefore this study performed reliability tests using values of Cronbach Alpha (Cronbach, 1951; Nunnully, 1978). This value is a measure of internal consistency

of scales. The value of 0.70 is acceptable. All the scales were found to be under acceptable range. The values are given in Table 2.

Table 2. Cronbach Alpha values ensuring reliabilies of all study scales

No.	Constructs	Cronbach's Alpha value
1	AS	0.80
2	EM	0.78
3	TA	0.79
4	RS	0.90
5	RA	0.70
6	LQ	0.88

Table 3. Fit indices for the study scales

MODEL	Scale version*	GFI	NFI	NNFI	CFI
CFA	Original	0.68	0.53	0.50	0.58
	Refined	0.90	0.80	0.70	0.80

Chi-Square=359.94, df=237, P-value=0.00000, RMSEA=0.037
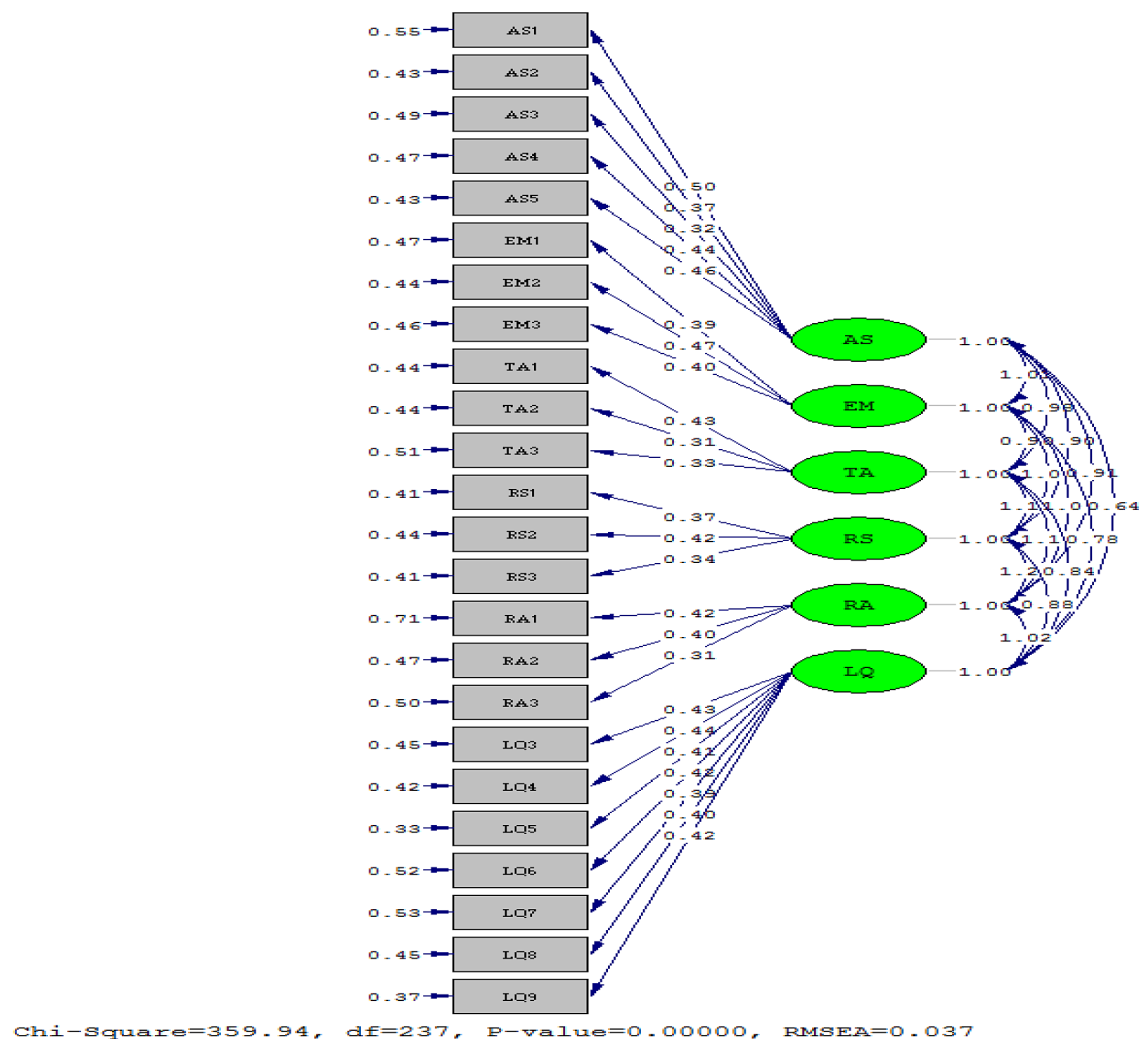
Figure 1. Results of CFA in a full measurement model

Validity

Validities were also assessed were convergent and discriminant validities. After the estimation of scale reliability, this research study assesses all important validities. This problem is common as the indicators were measuring and are based on a single concept. Discriminant validity on the other hand is the degree to which a construct and its items are unrelated from each other. These validities were also ensured through CFA factor loadings, when they lie in acceptable range it indicates strong validities.

STRUCTURAL MODEL

After the assessment of measurement model the data was utilized for the estimation of structural model. The values of all measures of unidimensionality, reliability and validity were in acceptable limits. Once measurement model was estimated the researcher can proceed with the structural model assessment. Therefore single model was estimated for all study variables. As far as demographic/control variables are concerned the model with control variables was performed however, the control variables were not correlated with the study variables, therefore were dropped from further analysis. Structural model was estimated with independent variables as measures of SERVQUAL and dependent variable as learning quality. Both the variables were modified to measure student satisfaction in higher education institutes in Saudi Arabia.

Estimation of the Structural Models

In this study, single structural model for all research constructs was estimated. The structural model with SRVQUAL measures as independent variables and Learning quality as dependent variable was examined. Standardized solutions of the structural model were used to verify the relationships included in the hypotheses. Based on the path coefficients, research hypotheses were tested. The path values are shown in Figure 2.

Results vis a vis Assurance

All the parameters and path values from AS to LQ were statistically significant and model fit is within acceptable range. Hypothesis **H1** was thus, *Accepted.* The result for this hypothesis suggests the presence of strong positive relationship (coefficient = 1.04, p value < 0.05) between AS and LQ (learning quality).
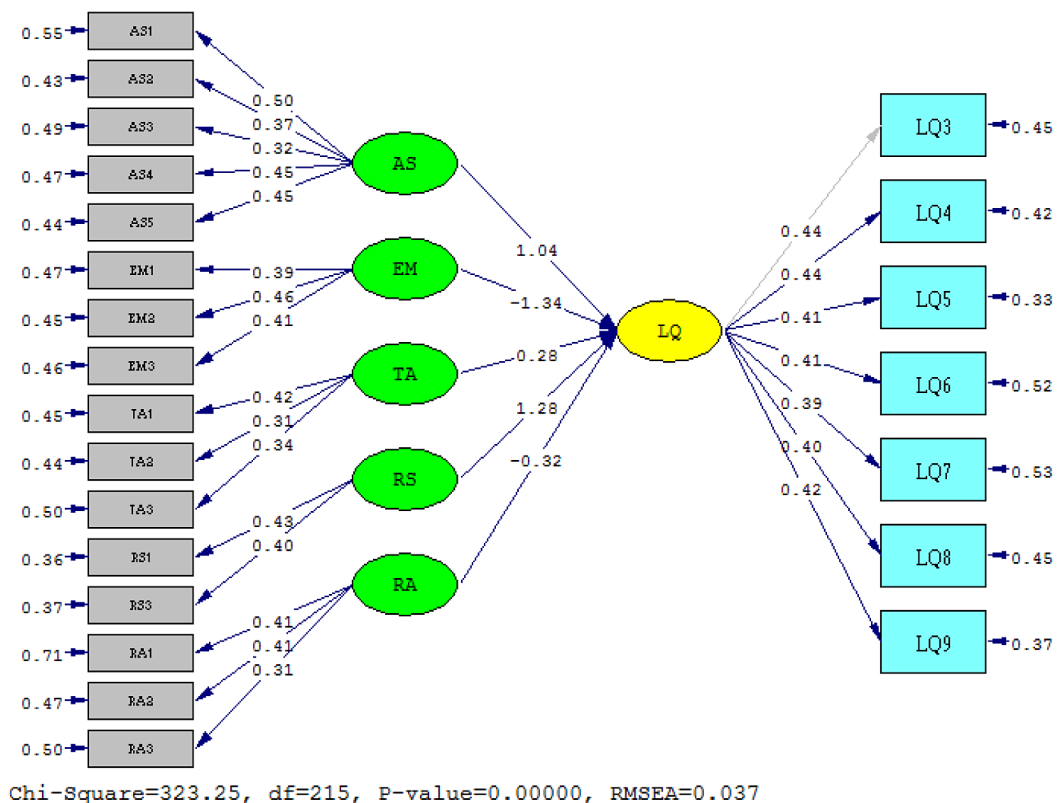

Chi-Square=323.25, df=215, P-value=0.00000, RMSEA=0.037

Figure 2. Results in full structural model

Results vis a vis Empathy

All the parameters and path values from EM to LQ were statistically significant and model fit is within acceptable range. Hypothesis **H2** was thus, *not Accepted.* The result for this hypothesis suggests the absence of intended strong positive relationship (coefficient = -1.34, p value < 0.05) between EM and LQ (learning quality).

Results vis a vis Tangibles

All the parameters and path values from TA to LQ were statistically significant and model fit is within acceptable range. Hypothesis **H3** was thus, *Accepted.* The result for this hypothesis suggests the presence of strong positive relationship (coefficient = 0.28, p value < 0.05) between TA and LQ (learning quality).

Results vis a vis Responsiveness

All the parameters and path values from RS to LQ were statistically significant and model fit is within acceptable range. Hypothesis **H4** was thus, *Accepted.* The result for this hypothesis suggests the presence of strong positive relationship (coefficient = 1.28, p value < 0.05) between AS and LQ (learning quality).

Results vis a vis Reliability

All the parameters and path values from RA to LQ were statistically significant and model fit is within acceptable range. Hypothesis **H5** was thus, not *Accepted.* The result for this hypothesis suggests the presence of strong positive relationship (coefficient = -0.32, p value < 0.05) between RA and LQ (learning quality).

All the fit indices were found to be in acceptable ranges. Chi-square/df ratio is 1.50. The recommended value is 1.00; however in most cases this value cannot be reached. A value near 2.00 is good (Hau 2010). RMSEA is 0.037; a lower RMSEA means a better fit. All the fit indices in our study show good fitness are mentioned in Table 04. Therefore a developed model can be accepted for further research.

Table 4. Showing fit indices of the above model

MODEL	GFI	NFI	NNFI	CFI
Structural	0.89	0.73	0.86	0.88

CONCLUSIONS

The purposed study has two main objectives: (1) to assess which dimension of SERVQUAL scale is most important in the measurement of e learning service quality in higher education institutes, and (2) to develop measures of e learning quality vis a vis student satisfaction. The study develops a modified SERVQUAL instrument for assessing e-learning quality. All the factor loadings of the refined scale after performing CFA were in acceptable ranges. Thus the scale was made unidimensional. The reliabilities were assessed through cronbach's alpha. The value of 0.70 is acceptable. The values are under the range of 0.70-0.90. All the scales were found to be under acceptable range. The validities were also ensured through CFA factor loadings.

Hypotheses H1, H3 and H4 were confirmed in terms of student satisfaction. The findings are in line with the other researches as in one of the study it was stated that measures of SERQUAL are significant. The hypotheses H2 and H5 were found to be non significant, and therefore it has interesting implications in designing e learning programmes. This can be attributed to the structure of e learning programme. Lack of bandwidth and infrastructure is also often found in developing countries may add to these findings. This research also concludes that Assurance, Tangibility and Responsiveness are an integral part of e learning programmes. Therefore this study recommends 'that quality e-learning' programmes must not ignore the physical part of a programme and should be based on needs of the students.

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