Empirical Assesment of Service Quality Dimension in Technology-based Universities

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Abstract

This study aims to verify the dimensionality of service quality within the context of Nigerian technological universities. Data for this study was collected from five public federal universities which are technology-oriented in Nigeria based on an adapted service quality questionnaire (ADSERVQUAL) from the original studies by Parasuraman *et al.* (1985, 1988). Respondents were students drawn from all faculties: engineering, management technology, environmental technology, science education, agricultural technology, pure and applied sciences and postgraduate studies. Factor analysis result gave rise to four dimensions from the 27 items of the ADSERVQUAL questionnaire, instead of the original five dimensions by Parasuraman *et al.* (1985, 1988). For this study, the four dimensions are named: empathy, tangibles, commitment and reliability. Dimensional analysis shows that students' expectations were perceived to be higher than their perceptions of service quality, resulting to negative service quality perception. Therefore technological universities in Nigeria should strive towards reversing the negative perception of service quality by students in order to improve attachment. Managerial implication and suggestions for future research were made accordingly.

Keywords: Technological Universities; Nigeria; attachment

Abstrak

Kajian ini bertujuan untuk mengesahkan dimensi kualiti perkhidmatan dalam konteks universiti yang berasaskan teknologi di Nigeria. Data untuk kajian ini telah diperolehi daripada lima universiti awam yang berasaskan teknologi di Nigeria berdasarkan asal soal selidik kualiti perkhidmatan yang telah diubahsuaikan (ADSERVQUAL) dari kajian asal oleh Parasuraman *et al.* (1985, 1988). Responden terdiri daripada pelajar yang dipilih dari semua fakulti: kejuruteraan, pengurusan teknologi, teknologi alam sekitar, pendidikan, sains teknologi pertanian, sains tulen dan gunaan dan pengajian siswazah. Faktor analisis telah berjaya menghasilkan empat dimensi daripada 27 item soalselidik ADSERVQUAL, bukan lima dimensi asal yang diperolehi oleh Parasuraman *et al.* (1985,1988). Untuk kajian ini, empat dimensi ini dinamakan: empati, tangibel, komitmen dan kebolehpercayaan. Analisis dimensi menunjukkan bahawa jangkaan pelajar dilihat lebih tinggi daripada persepsi mereka terhadap kualiti perkhidmatan, menyebabkan persepsi kualiti perkhidmatan yang negatif. Oleh itu, universiti yang berasaskan teknologi di Nigeria seharusnyaberusaha untuk menukar persepsi negatif oleh pelajar mereka untuk meningkatkan tahap kesetiaan. Implikasi pengurusann dan cadangan untuk kajian lanjutan diberikan.

Kata kunci: Universiti Berasaskan Teknologi; Nigeria; kesetiaan

∎1.0 INTRODUCTION

The debate on service quality in the exisitmg literature has been intensive over the years. Many researchers such as Parasuraman *et al.* (1985); Carman, (1990); Bolton and Drew, (1991a, b) agreed that service quality is an evasive concept. Lewis and Booms (1983:100) defined service quality as a "measure of how well a service level delivered, matches the customers' expectations." This definition explains that service quality is an attitude of overall judgment about service superiority (Fard, 2005). Parasuraman *et al.* (1990) pointed out that service quality is an attribute that is extrinsically perceived based on the customers' experience of the service encounters. However, Jaiswal (2008) noted that service quality is not only involved in the final product or service, but also in the production and delivery process, which requires the measurement of customers' perceptions after consumption. Therefore the purpose of this study is to verify the dimensionality of the service quality within

the context of Nigerian technological universities. To achieve the research objective, a research question was proposed as thus: **Research Question**: **What are the underlying dimensions of service quality in technological universities in Nigeria?**

■2.0 LITERATURE REVIEW

2.1 Service Quality in Higher Education

Service quality issues, over the years, has become an important consumer trend (Parasuraman *et al.* 1985) and has gained ground in service marketing literature in general and the extant literature on higher education in particular (Tan and Kek, 2004; Telford and Masson, 2005; Smith *et al.* 2007). The constructs of quality as conceptualised in the extant literature was based on perceived quality (Fitri *et al.* 2008). Perceived quality, according to Zeithaml *et al.* (1987) and Zammuto *et al.* (1996) is defined as the consumer's judgment about an entity's overall experience or superiority. Similarly Parasuraman *et al.* (1994:43) concluded that "consumer perceptions of service quality result from comparing expectations prior to receiving the service, and their actual experience of the service". Perceived quality is also seen as a form of attitude, related to, but not the same as satisfaction, and resulting from a comparison of expectations with perceptions of performance (Rowley, 1996).

The higher education sector exhibits all the characteristics of service provider: it is intangible and heterogeneous, meets the criterion of inseparability, by being produced and consumed at the same time, satisfies the perishability criterion and assumes the students' participation in the delivery process (Cuthbert, 1996). Therefore, Cuthbert (1996) posits that service quality is directly applicable to higher education. He concluded that higher education institutions are increasingly attracting more attention to service quality initiatives mainly due to the social requirement for quality evaluation in education and the competitiveness in the higher education market place.

2.1. 1 SERVQUAL

The SERVQUAL (or service quality) scale, which is one of the most widely adapted and used service quality instruments, has its theoretical foundation in the Perception (P) less expectation (E) measures called the gaps model. The gaps model defines service quality in terms of the differences between customers' expectations and perceptions of the services received, using 22 dimensions for both expectation and perceptions. Zeithaml *et al.* (2006: 49) said: "customers' expectations are beliefs about service delivery as standards or reference points against which performance is judged", whereas customers' perceptions are "subjective assessments of actual services experienced in the interaction process with service providers". Measuring the difference between expectations and perceptions using the SERVQUAL gap scores is useful for assessing levels of service quality (Shahin, 2005). Parasuraman *et al.* (1988) argue that, with modification, SERVQUAL can be adapted to any service organisation. They further claimed that information on service quality gaps could help managers diagnose where performance improvement can best be targeted. The SERVQUAL instrument is therefore adapted in this study.

Brochado (2009) observed that, in the context of higher education, the dimensions include physical facilities, equipment, teaching staff, non-teaching staff, communication materials such as brochures, booklets, logos, brand name (tangibles); the ability of the university to perform the promised service dependably, professionally and accurately (reliability); the

willingness of the university to give help to students and provide timely service (responsiveness); the expertise, knowledge, qualification and courtesy of the teaching staff (assurance) and the caring, personalized attention given to students by the university (empathy). These dimensions are summarized in Table 1 and are the measures for the questionnaire for this study.

Table 1 SERVQUAL constructs and their dimensions in higher education

CONSTRUCT	HE DIMENSIONS
Tangibles	Physical facilities; equipment; appearance of personnel; communication materials; laboratories; workshops, logos; brand name.
Reliability	The ability of the university to perform promised services dependably and accurately.
Responsiveness	The willingness of the university to help students (e.g. financial aids, scholarships); provision of prompt services.
Assurance	Knowledge, experience and quality of the teaching staff; ability of the teaching and other support staff to convey trust and confidence.
Empathy	Care provided to students by both the university and staff; personalized attention.

Source: Brochado (2009)

■3.0 METHODOLOGY

3.1 Data and Instrumen

Data for this study was collected from five public federal universities of technology in Nigeria. Respondents were students drawn from all faculties; engineering, management technology, environmental technology, science education, agricultural technology, pure and applied sciences and postgraduate studies.

An adapted service quality (ADSERVQUAL) questionnaire was used as the instrument for collecting data for this study. The ADSERVQUAL instrument was based on Parasuraman et al., (1988)'s five service quality dimensions: tangibles, reliability, responsiveness, assurance and empathy. The instrument measured the respondents' expectations and perceptions of service quality based on the aforementioned dimensions using a 5-point Likert scale. Tangibles was measured by eight (8) items, reliability by five (5) items, responsiveness by five (5) items, assurance by four (4) items and empathy by five (5) items. The questionnaire was divided into 2 parts: service quality measures (27 items) and demographic questions (6 items). In all, there are 33 items on the questionnaire.

3.2 Sample and Administration

The instrument was distributed and administered to 750 undergraduate students on proportional basis across the faculties in the five case study universities. The proportional stratification was based on gender and faculty. Faculty of Management Technology had the highest (21%) proportion, while the lowest proportion was from faculty of Agricultural Technology (14%). Details of the proportional distribution is presented in Table 2

Table 2 Proportional distribution of the questionnaire

Faculty/ University	Agric	Envt	Engg	Magt	Sci	Set	Total
ATBU							
M	16	17	19	26	16	13	107
F	4	13	11	14	14	7	63
FUTA							
M	8	17	13	10	6	11	65
F	7	8	7	15	9	9	55
FUTO							
M	14	16	12	11	12	13	78
F	6	9	8	9	8	12	52
FUTM							
M	11	14	13	11	14	11	74
F	9	11	12	14	6	14	66
MAUTECH							
M	17	22	13	22	15	11	100
F	13	18	12	28	10	9	90
TOTAL	105	145	120	160	110	110	**750**
%	14%	19%	16%	21%	15%	15%	**100%**

Agric = Agricultural Technology; Envt = Environmental Technology; Engg = Engineering; Magt = Management Technology; Sci = Sciences; Set = Science Education and Technology

In-class strategy of filling-up the questionnaire was adopted to facilitate quick and high response rate. In this regard, lecturers assisted with the distribution of the questionnaires during class sessions. At least 40 minutes of class periods were allotted by the lecturers for the respondents to fill and return back the questionnaires.

■**3.0 RESULTS**

Out of the 750 questionnaires distributed, 720 were returned, in which 674 (94%) were used for analysis. The balance of 46 (6%) were deemed to be unusable due to extreme cases of missing values and blank responses, as such they were not included in the analysis. Thus, 674 respondents are large enough for a survey study of this nature (Hair et al., 2006).

4.1 Sample Description

Majority of the respondents are male (61%), between the ages of 22-27 years (48%), not working (42%) and are in their final year of study (53%). Almost all the respondents (97%) are enrolled on full-time basis, the only exception being postgraduate students who accounted for the 3% of those on part-time studies. The sample description and characteristics is illustrated in Table 3.

4.2 Factor Analysis Results

Factor analysis was used to identify smallest number of descriptive terms that explains the maximum amount of common variance in a component matrix. Before proceeding with the factor analysis, measure of sampling adequacy was determined. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was computed to identify whether the sample size is adequate or not. As illustrated in Table 4.2, the KMO index of 0.938 (close to 1), means that the dataset is appropriate for factor analysis (Rasli, 2006; Hair *et al.,* 2006).

Table 3 Demographics and characteristics of samples

Demography	Detail	N	% of Respondents
Gender	Male	409	60.7
	Female	265	39.3
Programme	Bachelors	584	86.6
	Masters	73	10.8
	Doctorate	17	2.5
Faculty	Agriculture	52	7.7
	Engineering	72	10.7
	Environment	104	15.4
	Management	191	28.3
	Sciences	86	12.8
	Science Education	79	11.7
	Postgraduate Studies	90	13.4
Mode of Study	Full Time	653	96.9
	Part Time	21	3.1
Level of Study	Second Year	75	11.1
	Third Year	151	22.4
	Final Year	358	53.1
	Postgraduates	90	13.4
Age	17-22 Years	128	19
	22.01-27 Years	325	48.2
	27.01-32 Years	139	20.6
	32.01-37 Years	50	7.4
	37.01-42 Years	19	2.8
	>42 Years	13	1.9
Working Experience	Never Worked Before	296	43.9
	Working in Govt.	161	23.9
	Self-employed	105	15.6
	Working for others	112	16.6
Graduation Period	This Semester (10/11)	329	48.8
	Next Semester (11/12)	97	14.4
	Next 3 Semesters	94	13.9
	>3 Semesters	154	22.8

The result of Bartlett's test of sphericity is significant ($P= 0.000, < 0.05$), indicating that the factor analysis should be continued (Rasli, 2006). To achieve the aim of this study, principal component analysis (PCA) with varimax rotation and Kaiser Normalization was selected to verify the service quality dimensions. All the 27 items on the ADSERVQUAL questionnaire loaded on four factors instead of the original five dimensions (Parasuraman, *et al*., 1988). For this study, the four dimensions are named: empathy, tangibles, commitment and reliability. In addition, Cronbach's alpha coefficient was used to estimate the internal consistency of the ADSERVQUAL instrument. The alpha coefficients for the four factors: empathy, tangibles, commitment and reliability ranged from 0.779 to 0.855, implying high internal consistency. Table 4 presents the factor scores.

4.3 Dimensional Gaps Analysis

In order to find the gaps between expectations and perceptions of the respondents based on the emerged four service quality dimensions, mean analysis of the gaps of each dimension was conducted. The result is presented in Table 5

Table 4 Factor structures matrix

Measurement items	Empathy	Tangibles	Reliability	Commitment
Academic staff are consistently polite with students	.613			
Academic staff have the knowledge to answer students' questions	.723			
Academic staff gives students individual attention	.699			
Academic staff have the students best interest in their hearts	.710			
Academic staff understand the specific needs of their students	.665			
My university's support employees are giving students individual attention	.671			
The university is located in a desirable geographical area		.766		
The university offers necessary facilities towards my program		.609		
The university offers attractive physical facilities		.701		
The university has a well-equipped library		.727		
The university has convenient library operating hours		.638		
The university has well-equipped laboratories and workshops		.705		
The university has convenient laboratories and workshops operating hours		.630		
Teaching faculty always appear neat and well dressed during and after class sessions		.445		
Lecturers in my university are subject-matter experts			.558	
Lecturers in my university keep their promises			.634	
Support employees have the knowledge to answer students' questions			.679	
Support employees offers to students, their best interests at heart			.622	
Support employees understands the specific needs of students			.500	
When academic staff promises to be available during office hours, they are there to see students				.515
Academic staff performs service right, most of the times				.586
Academic staff maintain error-free records				.605
Academic staff informs students exactly how classes will be conducted				.458
Academic staff gives prompt services to students				.689
Cronbach's alpha	0.856	0.823	0.779	0.852
KMO	0.938			
Bartlett's test of sphericity				
Approx. chi-square		0.00076		
Df		351		
Sig.		.000		

Table 5 Dimensional gap

Dimension	Mean Gap
Empathy	-0.10732
Tangibles	-0.1339
Reliability	-0.13561
Commitment	-0.14058
Overall Service Quality Gap	-0.12935

Based on Table 5, negative gap scores are reported for all the four dimensions, implying that service quality in Nigerian technological universities are negatively perceived by the respondents. Comparatively, the empathy dimension has the lowest negative disconfirmation. This negative disconfirmation result is an indication of dissatisfaction with the overall service quality in the case universities (Zeithmanl *et al*., 1988).

■5.0 DISCUSSIONS

Assessing service quality in organizations, and higher education institutions in particular has been a wide subject matter of study. Though numerous studies abound on this subject matter, there is significant dearth of studies on the issue within the Nigerian higher education context. Therefore adapting from the SERVQUAL scale, the current study assessed respondents' expectations and perceptions of service quality, consistent with findings in the literature (Shekarchizadeh, *et al*., 2011; Illias *et al*., 2008; Sahney, 2008; Parasuraman, *et al*., 1988). Reliability analysis of the scale showed high reliability of the ADSERVQUAL used for the present study. The overall Cronbach's alpha value for the items after factor analysis was greater than 0.9. In addition, the Cronbach's alpha values for the dimensional items were all greater than 0.7. As such, all the items on the ADSERVQUAL and the four dimensions that emerged after factor analysis were found to have adequate internal consistency, and hence high reliability. The high internal consistency in this current study is consistent with previous studies in the higher education context (Illias *et al*., 2008; Shekarchizadeh, *et al*., 2011).

Based on dimensional analysis, students' expectations were perceived to be higher than their perceptions of service quality. Thus, it was uncovered that students had negative perceptions about service quality in Nigerian technological universities, as their expectations were not met across all the four dimensions. These indicate that students in universities in Nigerian technological universities often become dissatisfied, especially when they benchmark their institutions against those in Europe, America and Asia. Managers of these institutions need to be proactive towards reversing the negative trend. For instance, managers of these institutions should exert considerable effort at understanding students' expectations for incorporation into the strategic plans of the institutions. According to Zeithmal *et al*., (1990), organizations should know first, the needs of their customers, because it is the most critical step in delivering quality services in order to be competitive. As corroborated by Noor and Dola (2009), global changes affecting universities necessitate the need for higher education managers to cope with changing customer expectations in order to be competitive. Furthermore, this study seems to confirm the theory developed by Boulding *et al*., (1993) which claims that customers' rising

expectations downgrades perception of actual service, and is consistent with a study by Rust *et al*., (1999) who found rising expectations as having diminishing effect on perceptions.

In addition **a**nnual service quality audit should be conducted to assess the students' opinions on all service dimensions. The results of the audit should form the basis for the strategic action needed to improve service delivery. Providing quality higher education is now a distinguishing factor for competition. In view of these, it is imperative for the administrators of Nigerian technological universities to evaluate their service delivery in order to find out areas of improvement, in line with SERVQUAL's diagnostic ability. Diagnosing and improving areas with negative perception could enhance students' satisfaction. In this line, adopting TQM is vital for quality enhancement and competition.

The four factors that emerged accounted for 56% of the variance in the data collected. Even though the variation is less than those reported by previous studies, such as 65% by Tan and Kek (2004), 62.19% by Shekarchizadeh (2011), however, the Kaiser-Meyer-Olkin score of 0.938 indicate adequacy for factor analysis. In the present study, four dimensions, consistent with Owlia and Aspinwall (1998) were found from the assessment of students' expectations and perceptions of service quality from Nigerian perspectives. These variations in quality dimensions further support the earlier argument of cross-cultural contextualization of service quality evaluation based on SERVQUAL.

5.1 Implications of the Study

This study was able to demonstrate that students in federal technological universities in Nigeria have negative perceptions of service quality, as these universities were not able to meet their expectations on the aforementioned quality factors, thereby leading to dissatisfaction. The dissatisfaction could be explained by the gaps theory (Parasuraman, *et al*., 1988). The gaps theory suggests that the difference between consumers' expectations regarding services provided by an organization based on the actual assessment of those services, determine the direction of service quality perception within the organization. In the case of Nigerian technological universities, it could be that students expect superior services compared to conventional universities, both at home and abroad. Given the specialized nature of technological universities, they are often benchmarked against institutions in Europe and Asia, which may result in high expectations from students. The negative perceptions seem to be responsible for switching decisions to conventional universities and other universities abroad, believing that their expectations could even be exceeded. As corroborated by Rasli *et al*., (2011:6549), lack of attachment to technological universities in Nigeria is attributed to low repurchase intent occasioned by low level of satisfaction. Students, especially postgraduate students tend to switch to other conventional and foreign universities where facilities are comparatively better. The net effects are negative service quality perceptions and unfavourable word-of-mouth recommendations to future students. It means service quality across all dimensions should be enhanced to ensure customer satisfaction, consistent with recommendation by Saludin and Kian (2010). This is the Zone of tolerance (ZOT) canvassed by Zeithmal, *et al*., (1996).

Managing and enhancing service quality, especially at higher education institutions, require considerable effort at understanding students' expectations for incorporation into the strategic plans of the institutions. Therefore university administrators should know firsthand, the needs of their student

customers, because it is the most critical step in delivering quality services in order to be competitive.

5.2 Limitations and Suggestions for Further Research

One major limitation of the present study lie in its inability to look at quality perceptions of other key stakeholders in the universities studied: employees and administrators. Also the study did not go beyond dimensional identification of quality in the studied institutions. In essence, the study does not identify the relationship amongst the dimensions with students satisfaction, and the dimensions that best predict satisfaction. In view of these limitations, it is suggested that future studies should look at employees' perceptions of service quality in the context of Nigerian technological universities. Concerted efforts should be made by future researches towards qualitative study that would explore the opinions of the university administrators regarding constraints to effective service delivery, thus affecting service quality. Finally, the current study should be extended to find out what predicts service quality in Nigerian technological universities.

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