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Service Quality Measurement In Higher Education: The Case of Sudan University of Science and Technology

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المستخلص :

الجودة في الخدمات التعليمية معقدة في جميع جوانبها، غير معرفة إلى حد كبير وغير مقاسة. الهدف الرئيسي من هذه الدراسة هو تقييم امكانية تطبيق نموذج قياس جودة الخدمة في قياس جودة التعليم العالي في السودان حيث تم تقييم عناصر و سمات جودة الخدمة في التعليم العالي. استخدمت هذه الدراسة استبياناً ذاتياً مقتبساً من نموذج قياس جودة الخدم كأداة للحصول على إنطباع الطلاب وشملت الدراسة عينة عشوائية من 250 طالباً وكانت النتيجة الرئيسية هي أن جامعة السودان للعلوم والتكنولوجيا حالياً تقدم خدمة تعليمية جيدة ولكنها لا تلي التوقعات العامة لطلابها، الذين بدو غير راضين عن مستوى جودة الخدمة المقدمة لهم. كما سلطت الدراسة الضوء على جوانب القصور واقترحت الورقة إجراء مزيد من الدراسات البحثية في موضوع جودة الخدمة في التعليم العالي مستقبلاً.

ABSTRACT

Quality in education services is complex in its facets, largely undefined and unmeasured. The main aim of this study was to examine and evaluate the applicability of the SERVQUAL instrument in measuring higher education quality in Sudan. An evaluation of Service Quality attributes in higher education was conducted. This study used a self-administered questionnaire adapted from the SERVQUAL model as a tool to get responses from the students. Based on random sampling on 250 students employing a survey instruments that measure five dimensions of quality attributes, the main implication is that Sudan University of Science and Technology is currently providing good higher education service but is not meeting the overall expectations of its students, who are dissatisfied with the level of service quality offered to them. Implication and limitation of the study are highlighted and further research discussions are suggested.

Keywords: SERVQUAL instrument; higher education; service quality.

INTRODUCTION

The increased demand in higher education quality service in Sudan is observed since the past few years. the advent of distance education, international educational institutes ready to enter the country, the huge growth in student numbers, internationalization of education, the need to reduce dependence on government funding and increasing competitive pressures have prompted a need to focus on quality and customer service and the rise of a consumer culture.

In Sudan, both private and public institutions of higher learning strive to provide quality services to its students in order to develop and maintain their reputation. Over the last decade; numerous assessments were conducted to measure the service quality in higher education. However, the dimension of quality and the measurement approach to the service quality are still been debated and unsettled with little agreement on what it is or how to measure it (Ramsden, 1991). Though the research assumes that there is a gap between what the students expect and what they actually perceived, this difference is known as disconfirmation .The study measures this gap and its determinants using and instrument called SERVQUAL which is suitable for measurement of service quality.

The research provides an increased body of knowledge surrounding the service quality, with specific focus on the higher education sector. Furthermore, the adaptation of the SERVQUAL model adds further insight to the measurement of service quality in Sudanese higher education universities

Background and literature review

Does service quality differ from product quality? Or they are the same. Until 1985 when Berry, Parasuraman and Zeithaml, published their article "Quality Counts in Services, Too, on the" Business Horizons, most of the published literature is about product quality, Garvin(1984) discusses Five approaches to define it: (1) the transcendent approach of philosophy (Relative Quality), Quality is universally recognizable; it is related to a comparison of features and characteristics of products; (2) the product-based approach of economics, Quality is a precise and measurable variable. Differences in quality reflect differences in quantity of some product attribute; (3) the user-based approach of economics, marketing, and operations management, Quality is 'fitness for intended use.'; (4) the manufacturing-based, Quality is 'conformance to specifications.' and (5) value-based approaches of operations management, Quality is defined in terms of costs and prices. A quality product is one that provides performance at an acceptable price or conformance at an acceptable cost. Juan defines it as 'Fitness for purpose or use.' Crosby defines it as 'Conformance to requirements.' Deming defines it as 'Aimed at the needs of the consumer.' Increasingly today the move is towards a customer driven quality concept, with the idea being of meeting or exceeding customers' expectations. This is often expressed as 'delighting the customer'. Knowledge about product quality, however, is insufficient to understand service quality. Parasuraman et al. (1985) discusses three characteristics of services intangibility, heterogeneity, and inseparability—must be acknowledged for a full understanding of service quality, "Service quality is a measure of how well the service level delivered matches customer expectations. Delivering quality service means conforming to customer expectations on a consistent

basis, Lewis and Booms (1983). Parasuraman et al. (1985) defines service Quality as the result of discrepancy between consumer expectations and actual service performance.

Service Quality dimensions

A variety of approaches has been applied to explain the multidimensional nature of service quality: Stevenson and others (1999) are simply applied Garvin's 8 dimensions of product quality to services (Performance, Features, Reliability, Conformance, Durability, Durability, Serviceability, Aesthetics, and Perceived Quality) No empirical basis has been provided for these dimensions also question whether the 8 product dimensions capture all the important aspects of service transactions.

Evans & Lindsay (1999) provide a list of 8 service dimensions namely: Time, Timeliness, Completeness, Courtesy, Consistency, Accessibility, Accuracy and Responsiveness. While intuitively appealing, there is little empirical evidence to support these service quality dimensions.

Parasuraman, et al (1988) provides a list of 5 service dimensions that are empirically derived and are called the SERVQUAL Dimensions namely:

- (1) Tangibles: Physical facilities, equipment, and appearance of personnel
- (2) Reliability: Ability to perform the promised service dependably and accurately
- (3) Responsiveness: Willingness to help customers and provide prompt service
- (4) Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence
- (5) Empathy: Caring, individualized attention the firm provides its customers

While empirically derived, these dimensions were developed and tested in just 4 types of service industries and may not be universally applicable.

However, Mowen (1995) is of the view that neither the five dimensions of Parasuraman's research team nor Garvin's eight dimensions of product quality are adequate and proposes the eight dimensions as being more appropriate and capable of taking care of both service quality and goods quality namely, Performance, Number of attributes, Courtesy, Reliability, Durability, Timeliness, Aesthetics and Brand Equity.

Empirical analysis of the JCAHO hospital industry quality dimensions indicates that there are really 8 dominant dimensions referred to as the KQCAH Scale which proposed by Sower, V., et al (1998)

Service Quality attributes in higher education:

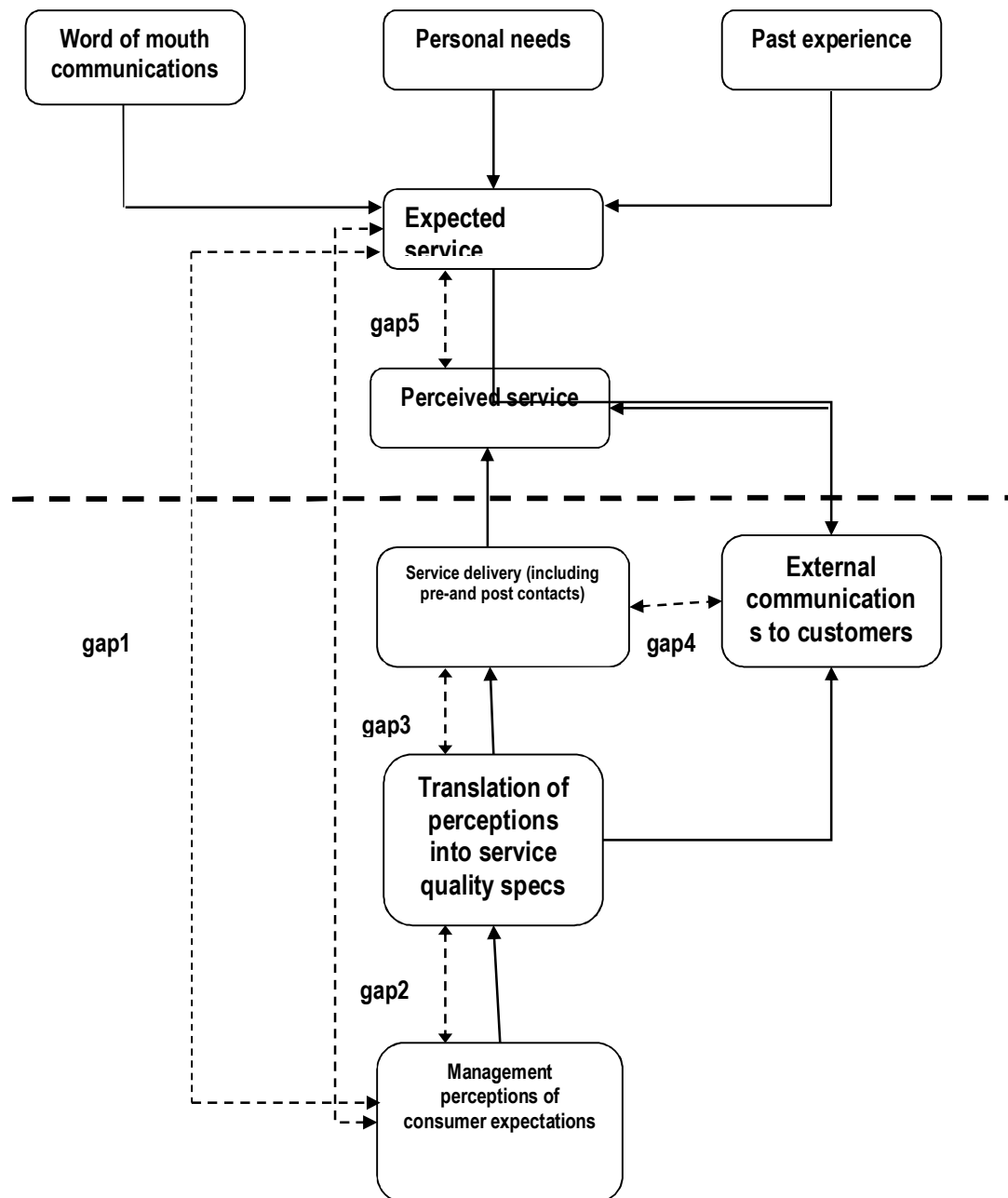
Carney (1994) Proposed comprehensive nineteen variables/attributes in studying a college's image i.e. student qualification (academic), student qualities (personal), faculty-student interaction, quality instruction (faculty), variety of courses, academic reputation, class size, career preparation, athletic programs, student activities (social life), community service, facilities and equipment, location, physical appearance (campus), oncampus residence, friendly, caring atmosphere, religious atmosphere, safe campus, cost/financial aid. Although the variables were developed under the context of college image, most of the variables noted are highly relevant to the measurement of service quality. Athiyaman (1997) Used eight characteristics to examine university education services namely, teaching students well, availability of staff for student consultation, library services, computing facilities, recreational

facilities, class sizes, level and difficulty of subject content and student workload. The author further noted that “consumer satisfaction is similar to attitude, but it is short-term and results from an evaluation of a specific consumption experience.” (Athiyaman 1997, p.532). Lee et al (2000): Explained that the two of the total quality experience variables ‘overall impression of the school’ and ‘overall impression of the education quality’ are the determinant variables in predicting the overall satisfaction. Brooks (2005) Stated that the measurement of quality should encompass more university activities. The author recommends 7 criteria to assess a quality of a university namely, Reputation, Faculty Research Productivity, Student Educational Experiences and Outcomes, Program Characteristics, Program Effectiveness, Student Satisfaction and Student Outcome. Sangeeta et al (2004) Noted that it is necessary to identify customers’ requirements and the design characteristics that make up an educational system. The authors also have highlighted the importance to compare the perceptions of the customers relating to those requirements and characteristics with their expectations and thus, determine the service quality. As far as customer requirements were concerned, the tests for validity and reliability identified a total of 26 items, which were grouped under five factors/constructs (Competence, Attitude, Content, Delivery and Reliability) Hadikoemoro (2002) Captured thirty five items of service quality after two focus group interviews conducted at private and public universities. A total of twenty eight items were identified through factor analysis using varimax rotation. Based on a second factor analysis, those items were categorized into five dimensions (Academic services, Readiness and attentiveness, Fair and impartial, Tangible and General attitudes) Owlia and Aspinwall (1996) Developed 30 attributes called “quality characteristics” after conducting thorough literature reviews on service quality research papers. Based on the similarities, the service quality attributes were grouped into six dimensions (Tangibles, Competence, Attitude, Content, Delivery and Reliability)

The SERVQUAL instrument:

Parasuraman et al. published a conceptual paper in 1985(A Conceptual Model of Service Quality and Its Implications for Future Research,") identifying five service quality gaps (see Figure 1).

FIGURE 1: SERVQUAL (Service Quality Model)



Gap 1: measure the Difference between consumer expectations and management perceptions of consumer expectations. It emerges as a result of the lack of a marketing research orientation, inadequate upward communication and too many layers of management.

Gap 2: measure the Difference between management perceptions of consumer expectations and service quality specifications. It emerges as a result of inadequate

commitment to service quality, a perception of unfeasibility, inadequate task standardization and an absence of goal setting.

Gap 3: measure the Difference between service quality specifications and the service actually delivered. It emerges as a result of role ambiguity and conflict, poor employee-job fit and poor technology-job fit, inappropriate supervisory control systems, lack of perceived control and lack of teamwork.

Gap 4: measure the Difference between service delivery and what is communicated about the service to consumers. It emerges as a result of inadequate horizontal communications and propensity to over-promise.

Gap5: measure the discrepancy between customer expectations and their perceptions of the service delivered, it emerges as a result of the influences exerted from the customer side and the shortfalls (gaps) on the part of the service provider. In this case, customer expectations are influenced by the extent of personal needs, word of mouth recommendation and past service experiences.

According to Brown and Bond (1995), "the gap model is one of the best received and most heuristically valuable contributions to the services literature". The model identifies five key discrepancies or gaps relating to managerial perceptions of service quality, and tasks associated with service delivery to customers. The first four gaps (Gap 1, Gap 2, Gap 3, Gap 4,) are identified as functions of the way in which service is delivered, whereas Gap 5 pertains to the customer and as such is considered to be the true measure of service quality. The Gap on which the SERVQUAL methodology has influence is Gap 5. In the following, the SERVQUAL approach is demonstrated.

SERVQUAL methodology:

Clearly, from a Best Value perspective the measurement of service quality in the service sector should take into account customer expectations of service as well as perceptions of service. However, as Robinson (1999) concludes: "It is apparent that there is little consensus of opinion and much disagreement about how to measure service quality". One service quality measurement model that has been extensively applied is the SERVQUAL model developed by Parasuraman et al. (1985, 1988, 1991, 1993, 1994; Zeithaml et al., 1990). SERVQUAL as the most often used approach for measuring service quality has been to compare customers' expectations before a service encounter and their perceptions of the actual service delivered (Gronroos, 1982; Lewis and Booms, 1983; Parasuraman et al., 1985). The SERVQUAL instrument has been the predominant method used to measure consumers' perceptions of service quality

Parasuraman, et al (1988) provides a list of 5 service dimensions that are empirically derived and are called the SERVQUAL Dimensions.

- (1) Tangibles: Physical facilities, equipment, and appearance of personnel
- (2) Reliability: Ability to perform the promised service dependably and accurately
- (3) Responsiveness: Willingness to help customers and provide prompt service
- (4) Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence
- (5) Empathy: Caring, individualized attention the firm provides its customers.

In the SERVQUAL instrument, 22 statements (figure 1) measure the performance across these five dimensions, using a seven point likert scale measuring both customer

expectations and perceptions (Gabbie and O'neill, 1996). It is important to note that without adequate information on both the quality of services expected and perceptions of services received then feedback from customer surveys can be highly misleading from both a policy and an operational perspective.

Research Methodology and Data Collection

The methodology developed in this study is largely driven by the research objective which is to measure the service quality in higher education in Sudan with a null hypothesis that, There will be no statistically significant difference between students' expectations of the service and one that would be delivered by university, and to answers the following research questions: Do students perceive the service they actually expect? And how can students provided with reliable, responsive, assured and friendly service in an enjoyable environment? What is the expected level of educational service quality? What is the perceived level of educational service quality? What is the level of each the service quality dimensions?

In order to answer the research questions and to obtain data for the determination of service quality attributes and perceived service quality in higher education, this study used a self-administered (structured) questionnaire adapted from the SERVQUAL model (Parasuraman et al, 1994) as a tool to get responses from the subjects.

The study employed a stratified random sampling technique that consisted of two types of strata. The first stratum is according to the year of study, the second stratum is according to the College. the questionnaires were distributed to diverse participants, for the application of the measurement tool; the present study involved students (250 students) from different colleges of Sudan University of science and technology (College of Medical Laboratory Science, College of Engineering, College of Education, College of business studies and College of Veterinary Medicine) which is a leading higher education university in our country. The sampling applied in a way that its results can be generalized according to the universe.

The survey instrument consisted of two parts. In part (A) of the questionnaire, survey respondents were asked to state their level of agreement of each statement for five dimensions of service quality in education on a Seven point Likert ordinal scale (1 represent "strongly disagree" to 7 represent "strongly agree"; 4 denotes average). Cooper (2000) argued that this type of scale is considered to be an interval scale. Therefore, measurement of central tendency and its dispersion can be made. Demographic backgrounds of respondents were asked in part (B) of the questionnaire. Some were assigned to certain categories and it is mutually exclusive and collectively exhaustive. Thus it possessed a property of a nominal scale.

The data from the questionnaire was collected during the summer of 2014. All completed questionnaires were reviewed for completeness, accuracy and quality of data. The useable questionnaires were coded and entered into a preset SPSS (Statistical Package for the Social Sciences) (16) software program.

The analyses of the research data include descriptive statistics such as the calculation of frequency, percentage, mean and standard deviation as a method of data examination.

Servqual Results:

A total of 22 questions related to five dimensions (Table 1) were asked. The level of satisfaction was measured by a 7-point Likert scale, with 7 – indicating the highest satisfaction level against their desired service level, and 1 – indicating the lowest satisfaction level against their desired service level.

Following this, the Gap Score for each dimension is calculated by subtracting the Expectation score from the Perception score. A negative Gap score indicates that the actual service (the Perceived score) was less than what was expected (the Expectation score). In the present study, all the Gap Scores calculated are negative (Table 4) indicating that for each service quality attribute of the University of Sudan University Of Science and Technology student's expectations are not being met. The 'paired samples t-test' was also used to calculate the gap scores for each dimension (Table 2). The mean scores are presented in columns five in Table 5.8. All the t-values are well above the critical value of '2' and the significance level is below 1 % ($p < .01$) level. Unfortunately all the dimensions exhibit a negative Mean Gap score ranging from '-1.54' to '-1.96'. The general Mean Gap figure for all the 22 attributes is -1.80. The assurance Dimension has the smallest negative mean gap score (-1.45), while the Reliability Dimension has the largest negative mean gap score (-1.96).

Table 1: SERVQUAL Importance Weights

Features	100%
1. The appearance of the University's physical facilities, equipment, personnel and communication materials.	23.5
2. The University's ability to perform the promised service dependably and accurately	18.2
3. The University's willingness to help customers and provide prompt service.	19.1
4. The knowledge and courtesy of the University's employees and their ability to convey trust and confidence.	18.8
5. The caring individual attention the University provides its customers.	20.4
Total:	100.0

Table 2: The Gap Score for all dimensions

	Dimensions	Expectation score	Perceived score	Gap Score	t-test
a	Tangibles	5.69	3.76	-1.93	5.40
b	Reliability	5.57	3.61	-1.96	15.16
c	Responsiveness	5.62	3.88	-1.74	13.89
d	Assurance	5.91	4.37	-1.54	6.85
e	Empathy	5.39	3.52	-1.87	7.44
	Average	5.63	3.83	-1.8	29.15

Table 3: The servqual Score for all students

Average Servqual Expectation Score	Average Servqual perception Score	SERVQUALGap Score	t-test
5.63	3.83	-1.8	15.29

The Overall Quality Gap score refers to the Total Mean Perceptions Score minus the Total Mean Expectations Score. In consequence, it gives an idea on the Overall Service Quality gap at Sudan University of Science and Technology.

Students Mean Total Perceptions score is 3.83 and the students Mean Total Expectations score is 5.63. Thus, the students overall quality gap score is -1.8 (3.83-5.63). A diagrammatic summary is provided in (tables 1, 2, 3, 4, and 5). The main implication is that the Sudan University of Science and Technology is not currently meeting the overall expectations of its students, who are highly dissatisfied with the level service quality offered to them.

Table 4: Calculation of SERVQUAL Scores

Dimension	Statement	Expectation Score	Perception Score	Gap Score	Average Servqual Score For the dimension	Average for Dimension
Tangibles	1	5.81	3.43	-2.38	3.7675	-1.925
	2	5.74	3.27	-2.47		
	3	6.05	4.63	-1.42		
	4	5.17	3.74	-1.43		
Reliability	5	5.61	3.70	-1.91	3.618	-1.954
	6	5.46	3.65	-1.81		
	7	5.50	3.38	-2.12		
	8	5.45	3.53	-1.92		
	9	5.84	3.83	-2.01		
Responsiveness	10	5.76	4.13	-1.63	3.8825	-1.74
	11	5.56	3.68	-1.88		
	12	5.66	4.04	-1.62		
	13	5.51	3.68	-1.83		
Assurance	14	5.75	4.36	-1.39	4.375	-1.5375
	15	5.98	4.34	-1.64		
	16	5.78	3.90	-1.88		
	17	6.14	4.90	-1.24		
Empathy	18	4.80	3.19	-1.61	3.524	-1.872
	19	6.10	3.67	-2.43		
	20	5.03	3.43	-1.60		
	21	5.37	3.57	-1.80		
	22	5.68	3.76	-1.92		
Unweighted Average SERVQUAL score:						-1.8057

Based on the t-test, it can be concluded that there is statistically significant difference between students' expectations of the service and one that delivered by Sudan University of Science and Technology.

In terms of the relative importance of the service dimensions, the utmost important area, as highlighted by the respondents, was the tangibles dimension (23.5%) (Table 6). The other service dimensions in the relative importance sequence were empathy, responsiveness, assurance, and reliability.

Table 5: Calculation of Weighted SERVQUAL Scores

SERVQUAL Dimension	Score from Table 2	Weighting from Table 1	Weighted Score
Tangibility	-1.925	23	-45.237
Reliability	-1.954	18.2	-35.562
Responsiveness	-1.74	19.1	-33.234
Assurance	-1.5375	18.8	-28.905
Empathy	-1.872	20.4	-38.1888
Average Weighted score:			-36.22536

Discussion

This study showed that there are significant differences on the student's expectation of service and one that delivered by Sudan University of Science and Technology. SERVQUAL Gap Score (Gap 5) is -1.8, comparing this score to the Average Servqual Expectation Score (5.63) showed that the difference is (31.9 %) which means the services quality offered by Sudan University of Science and Technology is 69.1% and that is good result according to the traditional measure but according to SERVQUAL instrument this result is not up to expectations of students.

The main implication is that Sudan University of Science and Technology is currently providing good higher education service but is not meeting the overall expectations of its students, who are dissatisfied with the level of service quality offered to them. Therefore, we rejected our null hypothesis; there will be no statistically significant difference between students' expectations of the service and one that would be delivered by the university.

While the administration of the SERVQUAL instrument and the subsequent analysis of the results have revealed that the overall students evaluation of the higher education service quality provided by Sudan University of Science and Technology is acceptable (69.1%), also it revealed that its less than what they are expected (mean Gap score -1.8), specially the Reliability Dimension where the students expected a university staff who act according to promises, sincerity in problem solving, performing the service right at the first time, providing service at the promised time and insistence on error free records, but they actually provided with 64.8 % reliable service. (5.57 expected, 3.61 perceived). Also analysis of the difference between the

expectation of service quality and perceived service quality revealed room for improvement in all areas except Reliability (mean gap score – 1.96).

Overall, this study has shown that the service quality at Sudan University of Science and Technology was moderate from students' perspective. This means that there is room for continuous improvement. Therefore the management and staff of the university, academic and administration staff must put more effort and commitment to improve the level of service to produce good graduates.

This study has focused on the student's evaluation of higher education service quality. Future research should focus on the evaluation of service quality from other stakeholders (such as the university staff, government, industries, society etc.). A comprehensive study would help the university to review and improve its overall higher education service quality.

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Part 1:

This survey deals with your expectations and perceptions of your college. All responses are anonymous so you do NOT need to record your name on the survey. Please complete the student profile below and then complete the questionnaire.

PLEASE COMPLETE ALL THE QUESTIONS.

The following items are for statistical information only

1- college:2- course:
.....

3-Gender: Male

4-Age:

Female

--

5-Year of study

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Thanks for your participation

Part 2: THE SERVQUAL INSTRUMENT

EXPECTATIONS This survey deals with your opinions of your college. Please show the extent to which you think colleges should possess the following features. What we are interested in here is a number that best shows your expectations about your college.	E	PERCEPTIONS The following statements relate to your feelings about your college. Please show the extent to which you believe your college has the feature described in the statement. Here, we are interested in a number that shows your perceptions your college	P
You should rank each statement as follows:			
Strongly Agree Disagree	1	2	3
7	4	5	6 Strongly
Statement	Score	Statement	Score
Excellent college will have modern looking equipment.		The college has modern looking equipment.	
The physical facilities at excellent colleges will be visually appealing.		The college's physical features are visually appealing.	
Employees at excellent colleges will be neat in their appearance.		The college's employees are neat appearing.	
Materials associated with the service (pamphlets or statements) will be visually appealing at an excellent college.		Materials associated with the service (such as pamphlets or statements) are visually appealing at the college.	
When excellent colleges promise to do something by a certain time, they do.		When the college promises to do something by a certain time, it does so.	
When a student has a problem, excellent colleges will show a sincere interest in solving it.		When you have a problem, the college shows a sincere interest in solving it.	
Excellent colleges will perform the service right the first time.		The college performs the service right the first time.	
Excellent colleges will provide the service at the time they promise to do so.		The college provides its service at the time it promises to do so.	
Excellent colleges will insist on error free records.		The college insists on error free records.	
Employees of excellent colleges will tell students exactly when services will be performed.		Employees in the college tell you exactly when the services will be performed.	
Employees of excellent colleges will give prompt service to students.		Employees in the college give you prompt service.	

Employees of excellent colleges will always be willing to help students.		Employees in the college are always willing to help you.	
Employees of excellent colleges will never be too busy to respond to students' requests.		Employees in the college are never too busy to respond to your request.	
The behavior of employees in excellent colleges will instill confidence in students		The behavior of employees in the college instills confidence in you.	
Students of excellent colleges will feel safe in transactions.		You feel safe in your transactions with the college.	
Employees of excellent colleges will be consistently courteous with students.		Employees in the college are consistently courteous with you.	
Academic staff of excellent colleges will have the appropriate knowledge and qualification.		17. The college has a knowledgeable and highly qualified academic staff (lecturer).	
Excellent colleges will give students individual attention.		18. The college gives you individual attention.	
Excellent colleges will have operating hours convenient to all their students.		19. The college has operating hours convenient to all its students.	
Excellent colleges will have employees who give students personal service.		20. The college has employees who give you personal attention.	
Excellent colleges will have their students' best interest at heart.		21. The college has your best interests at heart.	
The employees of excellent colleges will understand the specific needs of their students.		22. The employees of the college understand your specific needs.	

SERVQUAL
Importance Weights

Listed below are the five sets of features pertaining to University and the services they offer. We would like to know how much each of these sets of features is important to the customer. Please allocate 100 points among the five sets of features according to how important it is to you. Make sure the points add up to 100.

Features	Points
The appearance of the University's physical facilities, equipment, personnel and communication materials.	
The University's ability to perform the promised service dependably and accurately	
The University's willingness to help customers and provide prompt service.	
The knowledge and courtesy of the University's employees and their ability to convey trust and confidence.	
The caring individual attention the University provides its customers.	
Total:	100