

QUALITY OF HIGHER EDUCATION IN BANGLADESH: APPLICATION OF A MODIFIED SERVQUAL MODEL

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Abstract

Progressive importance, swelling investment, and mounting national and global competition necessitate evaluation of the service quality of higher education. Quantifiable indicators such as student teacher ratio, student number, women participation, establishing new departments, and increase in the number of universities are no longer enough unless the student's stand point is considered. This research probed the service quality of higher education in a public university in southern Bangladesh utilizing modified SERVQUAL gap model. The t-test results suggest that there is a significant service gap in all the selected service dimensions such as learning, teaching, recognition, assessment system, internet and library facilities, campus life, and non-academic administration. The results also mirror that little more than half (54.1%) students are satisfied with the service quality of the selected university and almost similar proportion (52.1 %) of the students have future interest in studying in the same university. Regression analysis reveals that learning and recognition are two important determinants of client's overall satisfaction with the service of selected university. Importance Performance Analysis (IPA) advocates that the university should take immediate step in improving internet and library facilities, campus life, and non-academic administration. Factor analysis output confirms that slight modification of the proposed seven set model into six set factors can be employed by the management as off-the-rack service quality measurement tool.

Key words: service quality, higher education, SERVQUAL, Bangladesh.

Introduction

Progressive utilization of advanced information in all the sectors of development portrays that creation and dissemination of knowledge is inevitable for successful existence in the global village. Knowledge has enormous power to control access to opportunity and advancement hence becomes the new engine of overall development. In the United States, human capital is now estimated to be three times more important than physical capital (World Bank, 2000). It is often said that "Companies don't fail due to lack of financial capital. They fail due to a lack of intellectual capital". In fact, survival in the global village is closely allied with the ability of producing and recognizing intellectual capital. At this time, intellectual capital is progressively valued both by individuals and a nation. Higher education, as an essential precursor in producing and nurturing intellectual human capital has become significantly important for producing critical thinkers and innovators, as well as healthy informed, and enthusiastic citizens (Chaudhary et al., 2009, p.1).

Enrolment in tertiary education in Bangladesh has tripled since 2000, which portrays a burgeoning demand of higher education (ICEF Monitor, 2015). Since, the government is mandated with providing higher education opportunities for all the citizens to meet the future challenges (Mamun, 2008), spending on higher education from both public and private sectors is flourishing. For instance, according to the website¹ of University Grants Commission (UGC), at present Bangladesh has 37 public universities and 92 private universities, while in 2013 the figure was 31 and 51 respectively (The Economist Intelligent Unit, 2013). Public universities

overwhelmingly depend on government funding, where government arranges 95% of the total recurrent cost (University Grant Commission, 2006), while the private universities depend predominantly on the charges and fees from the incumbent.

The mere availability of higher education is not enough for producing outstanding intellectual capital. Numerous global and local tensions instigate higher education institutions to compete with each other for students, resources, and prestige (Protnoi & Bagley, 2014). Higher education produces “positional goods” that provide access to prestige and income-earning (Marginson, 2006). Higher education is facing hovering pressure to enhance value in its activities (Heck & Johnsrud, 2000). However, creating such value in education urges expanded effort on continuous improvement to concentrate on stakeholder interest and to enhance student satisfaction (Tan & Kek, 2004).

Present Status of Higher Education in Bangladesh

Higher education has enormous potential to promote prosperity, especially in the developing nations (Monem & Baniamin, 2010; World Bank, 2000; Kruss et al., 2015). As discussed earlier, at present Bangladesh has 37 public universities, 92 private universities, and 3 international universities. Among these 37 public universities, 13 are general, 5 engineering and technology, 8 science and technology universities, 4 agricultural universities, and the rest 7 universities are specialized universities in medical science, animal science, maritime, textile engineering, defense professionals, etc. All the public universities except two are residential i.e. having classroom, residential accommodation, and other physical facilities in their own campus. The rest two universities - National University (NU) and Bangladesh Open University (BOU) are of a special type. The National University is an affiliating university offering graduate and post-graduate courses via affiliated degree colleges/professional institutions. As displayed in national university webpage², presently more than two million students are seeking their higher education through 2154 affiliated colleges/Professional institutions. The Bangladesh Open University (BOU) on the other hand, offers various formal and non-formal educational programs via Open and Distance Learning (ODL) mode for the potential students scattered throughout the country.

Academicians, education thinkers, education researchers, education policy planners, and other stakeholders are in common consensus that the quality of higher education in Bangladesh has been deteriorating steadily, in some areas quite alarmingly, over the last two decades (Salahuddin & Aminuzzaman, 2011). Despite progressive enrollment and commensurate expansion of faculties in the public universities, the improvement of higher education is mostly quantitative rather than qualitative (Monem & Baniamin, 2010). At all levels of education, teachers emphasized cognitive learning rather than facilitating incumbents to use reasoning, understand, communicate, apply knowledge, and solve real-life or workplace problems (Khaled, 2014). As a result, the number of universities, both public and private, is proliferating day by day, but the quality concern of higher education remains as illusion. Lamentably, the top ranked universities in the country failed to discover themselves in Times World University ranking³ list.

Conceptual Framework

Over the past four and half decades, several theories have been employed to describe college and university student's satisfaction. For instance, Wit and Handal (1984) personal environment fit theory, Tino(1975) used Durkheim's theory of suicide and cost-benefit analysis, Okun, Ruehlman, and Karoly (1991) used investment theory, Carvey (1987) and Polcyn (1986) used the marketing theory of importance-performance analysis to explain college student's satisfaction. However, since 1970, the most frequently used student satisfaction instrument was the College Students Satisfaction Questionnaire (CSSQ) developed by Betz, Klingensmith,

and Menne (1970) based on job satisfaction theories of Herzberg, Mausnear, Peterson, and Capwell (1957), Hoppock (1953) and Vroom (1964). Betz et al (1970) assumed that the student of the university possesses the similar motivation to the employees of a university. So, similar to the university employees, the students determine satisfaction based on the value of their input into the educational process (studying) in comparison to their education compensation (Pennington, Zvonkovic, & Wilson, 1989). Actually, the students in the past 'worked' for the grade they achieved, and if the value of the work (studying) did not exceed the value of the grade they remained satisfied with the educational experience. However, by the mid-1990's higher education milieu and the relationship between the academy and the college students has changed (Franklin et al., 1995). Today students are no longer simply another 'employee' in the educational process rather a 'consumer' in the educational process. This shift has strong premises to suggest that the student's satisfaction assessment based on job satisfaction theory is no longer applicable. Actually, satisfaction is a continuous process and reshaped with change of situation and experience (Oliver, 1993). Studying several definitions of satisfaction, a group of authors are in agreement that satisfaction is a response (cognitive and affective) that pertains to a particular focus (i.e. purchase experience and/or the associated products) and occurs at a certain time (i.e. post- purchase, post-consumption) (Giese & Cote, 2002). So, due to dynamic nature, satisfaction researchers (Oliver, 1993; Parasuraman, Zeithaml, & Berry, 1988) argued that the most appropriate method for assessing customer satisfaction is expectancy-disconfirmation process. According to this process, satisfaction is the difference between individual expectations about the outcome of a process before experiencing the process and the actual outcome as perceived by the individual.

The Disconfirmation Paradigm

The foundation of the SERVQUAL model proposed by Parasuraman, Zeithaml, and Berry (1985, 1988) is grounded on disconfirmation paradigm, i.e. customer satisfaction with services or perception of service quality can be viewed as confirmation or disconfirmation of customer expectation of offered service (Churchill & Surprenant, 1982; Parasuraman, Zeithaml, & Berry, 1985). The SERVQUAL instrument is composed of 22 items grouped under five service quality dimensions such as tangibles, reliability, responsiveness, assurance, and empathy. In equation form the operationalization of service quality can be expressed as:

$$SQ_i = \sum_{j=1}^k (P_{ij} - E_{ij})$$

Where:

SQ_i = Perceived service quality of individual "i";

k = Number of service attributes / items;

P = Perception of individual "i" with respect to performance of a service firm attribute "j";

E = Service quality expectation for attribute "j" that is the relevant norm for individual "i".

(Zeithaml, Parasuraman, & Berry, 1988, p. 12-40).

The SERVQUAL is extensively used an off-the-rack instrument in diverse service setting (Tan & Kek, 2004). In higher education context, the model was first applied to measure library service quality by the Association of Research Libraries (ARL) under the name LibQUAL (Awang & Mahmood, 2011). Over the past few years, the SERVQUAL model has been empirically adopted for testing service quality of higher education both in the global and national

milieu. As the five dimensions proposed in the SERVQUAL model are not universal and can vary based on context (Buttle, 1996), so scholars adopted modified SERVQUAL in many cases. Soutar & McNeil (1996) utilized a modified SERVQUAL instrument to appraise the students' views of the academic and administrative service quality offered in an Australian university. Sahney, Banwet, and Karunes (2004) test service quality in selected Indian institutions with the help of SERVQUAL methodology. In studying disconfirmation of expectation and perception of postgraduate students in a selected Malaysian university Shekarchizadeh, Rasli, and Hon-Ta (2011) adopted modified SERVQUAL instrument composed of 35 items under five dimensions professionalism, reliability, hospitality, tangibles, and commitment. Tan & Kek (2004) used enhanced SERVQUAL methodology within 76 different areas for measuring the student's satisfaction in two selected local universities in Singapore. Scholars in many other parts of the world also used either SERVQUAL or modified SERVQUAL for measuring higher education service quality for instance Legcevic (2012) in Croatia, De Olivera and Ferreira (2009) in Brazil, Zafiropolous and Verna (2008) in Greece, Dado et al. (2011) in Serbia, Đonlagić & Fazlić (2015) in Bosnia and Herzegovina, Yousapronpaiboon (2014) in Thailand.

Despite the wide popularity and extensive application in numerous service sectors, SERVQUAL model has both theoretical and practical limitations (Adil et al., 2013). The number of dimensions make up service quality contextual, so the proposed five dimensions in SERVQUAL model is not universal (Buttle, 1996). Cronin and Taylor (1992, 1994) posit that SERVQUAL is paradigmatically flawed for its ill-judged adoption of disconfirmation model. Nonetheless, the gap score in SERVQUAL does not provide any additional information beyond that has already contained in perception aspect in the scale (Babakus & Boller, 1992).

Studies focusing on quality of education in Bangladesh are very limited. Majority of these scarce studies (Ahmed, ND; Barmon, Sharmin, & Dey, 2012; Monem & Beniamin, 2010; Mamun, 2008; Barnamala, 2015) mainly considered student enrolment, income based group access, tuition and other concerned fees, government financing, student intake, faculty recruitment, self-development, teaching methods, library and laboratory facilities, teacher student ratio, class size, percentage of female student, etc., for revealing quality of tertiary education. Sarker, Rana, & Zitu (2013) used degree of perceive satisfaction on different single item scales encompassing teaching quality, learning, library facilities, availability of journals and books in the library, laboratory facilities, research facilities, existing course curricula, timely completion of the syllabus, etc., to compare the quality of higher education of two public universities in Bangladesh. Disappointingly, this research is not aware of any study adopted disconfirmation paradigm to evaluate student's satisfaction, although this method is one of the most appropriate tools for assessing customer satisfaction. Nonetheless, as service quality dimensions are contextual and have spatial variation, this research planned to apply a modified SERVQUAL model to assess the service quality of tertiary education in Bangladesh.

Methodology of Research

Study Locale

This study focused on a science and technology university in Bangladesh that is situated in the southern part of the country. The university is composed of eight faculties, and offers both graduate and postgraduate (Except few faculties) programs in a wide range of subjects such as agricultural science, computer science, business administration, livestock, fisheries, food and nutrition, disaster management, etc. Currently around 2000 students are studying in different faculties in this University and the total number of teaching staffs is around one hundred and ninety.

Population and Sampling

Virtually, all the students from graduate and post graduate level of the selected university constitute the population of this research. At first, two undergraduate classes and two post graduate program offering departments from each faculty were randomly selected. The students of the selected classes and departments constitute the population of the study. Hence, the total number of the population of the study was 1087. It is important to note that few faculties do not introduce post graduate programs yet. However, according to sample size calculator⁴ the required sample size at 90% confidence level and 5% margin of error was 216. Considering 80% rate of return this research randomly selected a sample size equivalent to 270.

Data Collecting Instrument & Statistical Analysis

To obtain relevant information, this research adopts a self-administered survey questionnaire. The questionnaire was finalized in two stages. In the first stage, a set of 80 questions related to seven dimensions, namely learning, teaching, assessment, recognition, library and internet facilities, campus life, and non-academic administration was prepared based on disconfirmation process following Tan & Kek (2004), Awang & Ismail (2010), Franklin et al. (1995) and other relevant literatures. The prepared questions were then mailed to 20 faculty members from different departments to rate importance in measuring service quality based on a 10 point scale (Less important 1.....10 very important). Based on 12 returned questionnaires, the mean importance of each statement was calculated and 54 statements with a high importance score were retained. A five point perception expectation questionnaire regarding these 54 statements was prepared and pre-tested upon 40 students. The pilot test revealed that four statements were confusing to the students, and eventually deleted from the questionnaire. Construct reliability of the instrument was tested based on Cronbach α . The values presented in Table 1 ranged between 0.904 to 0.703 which are more than the value 0.70 suggested by Nunally (1978), hence indicating an accepted level of reliability. Data collected in this research are analyzed and described using descriptive statistics, reliability analysis, t-test, factor analysis (using a principal component method with VARIMAX rotation), and multiple regression analysis. All these analyses were performed using SPSS 16.0 software package.

Table 1. Reliability of the instrument based on α value.

Service quality dimensions	Number of items	Cronbach α
Learning	9	0.888
Teaching	8	0.904
Assessment system	5	0.746
Recognition	6	0.760
Library & internet	10	0.771
Campus life	7	0.703
Non-academic administration	5	0.723

Importance Performance Analysis (IPA)

This research also used Importance Performance Analysis (IPA) which is a convenient approach comparing the performance of the elements of a service with the importance of each of these elements to consumers. The scale items used in SERVQUAL study can possibly be used

in IPA. However, the difference is in the treatment of the score. Apart from deducting perception score from expectation score, IPA analysis calculates performance minus importance score. High performance of a relatively less important service aspect could indicate that the management is over-delivering on that particular aspect of service quality. Similarly, poor performance of on an important aspect indicates priority area for immediate action. IPA analysis facilitates customer ranking of the importance and performance of service attributes to be plotted on a grid, which assist an easy identification of management priorities. The top right hand quadrant indicates priority areas for immediate action, while the bottom right quadrant indicates the areas of service delivery to save money and resources (Palmer, 2007). The following figure demonstrates IPA grid.

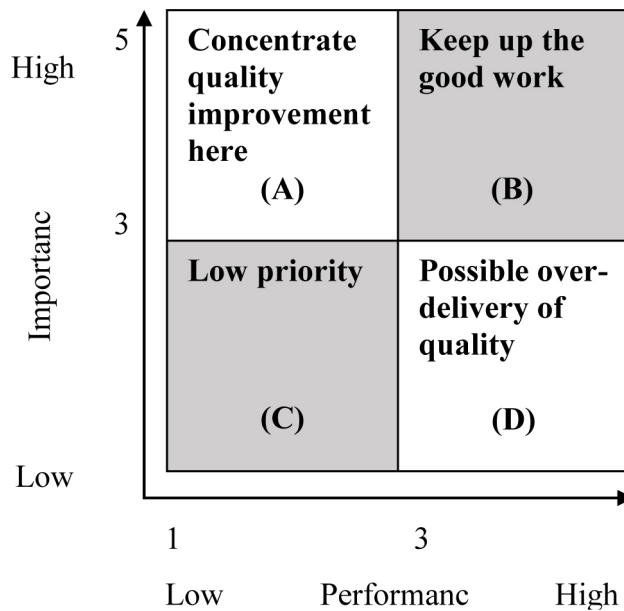


Figure 1: Quadrants in IPA grid.

Background of the Respondents

The mean age of respondent students was about 21 years, and the majority (59.9%) of them were male. Highest (41.5%) proportions of the respondents were from rural area and their average achievement of CGPA (Cumulative Grade Point Average) until the last semester was 3.23 on the scale of 4.0. Except postgraduate students, number of respondents increased with the decrease of level of education, where highest proportions (33.6%) of the students were from level one. Except very few, almost all the students were very regular to regular in their classes, where a major section (54.4%) is placed in the regular category. However, more detailed information regarding general characteristics of the respondents can be obtained from Table 2.

Table 2. General characteristics of the respondents (n= 217).

Variable	Scale	Categories	Frq.	%	Mean	SD	Med.	Min.	Max.
Age	Years				20.90	1.61	21	18	27
Gender	Nominal	Male	130	59.9					
		Female	87	40.1					
Resident	Nominal	Rural	90	41.5					
		Urban	77	35.6					
		Sub-urban	50	23					
CGPA	Score				3.23	0.35	3.25	2.20	4.00
Level of education	Nominal	Level-1	73	33.6					
		Level-2	49	22.6					
		Level-3	31	14.3					
		Level-4	33	15.2					
		Postgraduate	31	14.3					
Regularity in attending classes	Nominal	Irregular	3	1.4					
		Moderate	6	2.8					
		Regular	118	54.4					
		Very regular	90	41.5					

Results of Research

Gap Evaluation between Perception and Expectation

Service gap scores are obtained through subtracting expectation scores from the perception score. The outcome could be either positive gap score or negative gap score. Positive gap score implies satisfaction, while negative gap scores represent dissatisfaction. The results of the survey arranged in Table 3 revealed a predominantly negative service gap in all the selected dimensions of service quality. The university resembled high gap score of -1.86 and -1.76 regarding campus life, and library and internet facilities. However, in case of other aspects of service, large gap according to rank order were non-academic administration (-1.28), recognition (-1.19), learning (-1.08), assessment system (-0.92), and teaching (-0.90).

Table 3. Service gap in selected service quality dimensions (n=217).

Service dimensions	Perceived (P)		Expected (E)		Gap P-E	IPA grid	t	Sig.
	Mean	SD*	Mean	SD*				
Learning	3.22	0.603	4.30	0.594	-1.08	B	-19.48	p<0.0001
Teaching	3.51	0.786	4.41	0.593	-0.90	B	-14.70	p<0.0001
Assessment system	3.32	0.722	4.24	0.708	-0.92	B	-14.48	p<0.0001
Recognition	3.26	0.880	4.45	0.658	-1.19	B	-17.86	p<0.0001
Library & internet	2.60	0.823	4.36	0.656	-1.76	A	-24.04	p<0.0001
Campus life	2.53	0.823	4.40	0.704	-1.86	A	-25.14	p<0.0001
Non-academic administration	3.00	0.903	4.26	0.716	-1.28	AB	-18.23	p<0.0001

Note: *Standard Deviation

T-statistics represents that in all the selected dimensions of service quality, perception significantly ($p > 0.000$) fall short of expectation. Scattered plotting of perceived and expected scores in Figure 2 represents that campus life, and library and internet services fall in the top left quadrant and non-academic administration services fall on the line separating top two quadrant. Remaining service dimensions ensured their position in the top right quadrant of IPA grid.

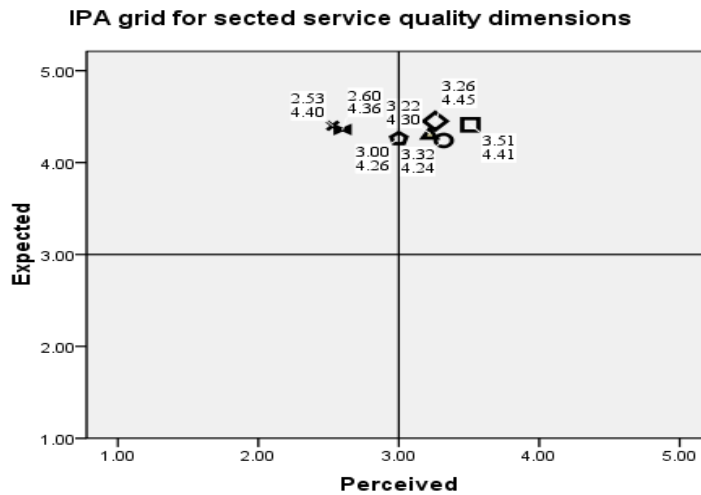


Figure 2: General IPA grid for service quality dimensions.

Overall Satisfaction and Interest in Future Study

Overall satisfaction score presented in Figure 3 showed that More than half (55.1%) of the students are either satisfied or very satisfied with the service quality of the university where 6.9% are very satisfied. Among the rest of the students, major section (34.1%) didn't know whether they are satisfied or dissatisfied and a very small section (3.2%) of the students found to be very dissatisfied with the service quality of the University. In case of interest in future study in the selected university (Figure 4) a little more than half (52.1%) of the students were inclined to continue their further study in the University, while the rest of the students are either confused (27.6%) or not interested (20.3%) in the university for their future study.

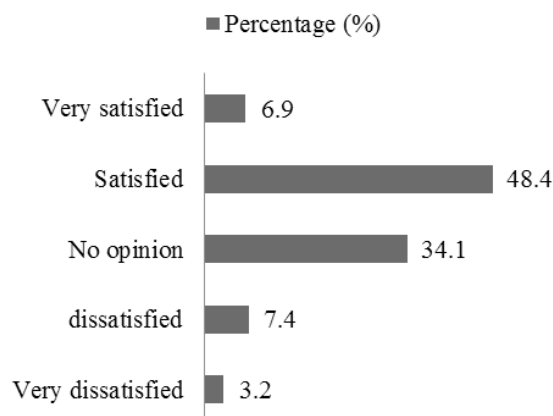


Figure 3: Bar graph showing distribution of the respondents based on overall.

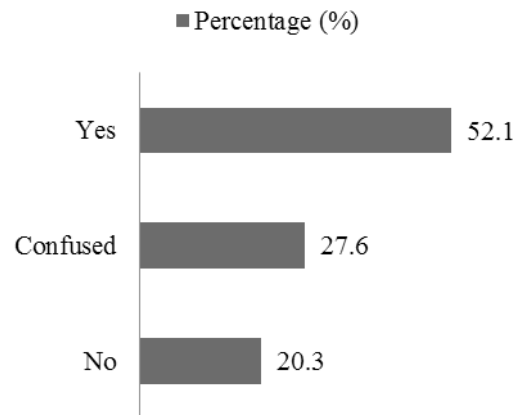


Figure 4: Bar graph showing student's interest in future study in the university university

Item Based Service Gap and IPA Grid

In the case of learning dimension, the largest gap (-1.94) was found in the availability of modern equipment in the classroom. Student's perception was also remarkably behind expectation in terms of comfort class environment (-1.52), sufficiency and attractiveness of course materials (-1.45), development of analytical ability (-1.11), creativity (-1.09), and practical skill (-0.94). However, a detail of service gap in the other aspects of learning dimension can be obtained from Table 4. Position in IPA grip represents that three aspects of the service fall into top left corner of IPA quadrant, and the rest of the aspects found their place in the top right quadrant.

Table 4. Service gap in the aspects related to learning (n=217).

SL.	Aspect of service	Perception (P)		Expectation (E)		Service Gap P-E	Rank	IPA grid
		Mean	SD	Mean	SD			
Learning								
1	The courses have developed my knowledge and intelligence	3.83	0.885	4.34	0.760	-0.51	9	B
2	Education in PSTU has enhanced my creativity	3.21	1.110	4.30	0.850	-1.09	5	B
3	The education has developed my team-working skill	3.61	1.016	4.17	0.888	-0.56	8	B
4	The education has developed my communication skill	3.66	0.972	4.32	0.837	-0.66	7	B
5	The education is helpful in developing practical skill	3.43	1.184	4.37	0.795	-0.94	6	B
6	The education has developed my analytical ability	3.12	1.085	4.23	0.800	-1.11	4	B
7	The course materials are sufficient and attractive	2.82	1.213	4.27	0.951	-1.45	3	A
8	The classroom environment is comfortable and cozy	2.82	1.134	4.34	0.889	-1.52	2	A
9	Classrooms are well equipped with modern facilities (e.g. multimedia, internet connection, speaker, etc.)	2.46	1.205	4.40	0.933	-1.94	1	A

When comes the dimension teaching, the largest gap between perception and expectation was -1.27 and -1.01 regarding teacher's use of modern teaching methods, and teacher's fairness and impartiality. Other aspects of conspicuous service gap were friendliness of the teacher with the students, sufficient preparation of the teacher prior to their class, and communication skill of the teacher. However, gaps related to other aspects of teaching can be observed from Table 5. All the selected aspects of teaching fall into the top right quadrant of IPA grid.

Table 5. Service gap in the aspects related to teaching (n=217).

SL.	Aspect of service	Perception (P)		Expectation (E)		Service Gap	Rank	IPA grid
		Mean	SD	Mean	SD	P-E		
Teaching								
1	Teachers are knowledgeable in their respective subject	3.70	1.096	4.58	0.728	-0.88	6	B
2	Teachers are fair and impartial	3.29	1.157	4.30	0.811	-1.01	2	B
3	Teachers take sufficient preparation prior to their classes	3.49	1.009	4.39	0.798	-0.90	4	B
4	Teachers possess good communication skill	3.50	1.036	4.39	0.793	-0.89	5	B
5	Teachers are willing to help the students	3.77	0.957	4.48	0.758	-0.71	7	B
6	Teachers are easily approachable (friendly and easy to talk)	3.51	1.050	4.42	0.773	-0.91	3	B
7	Teachers use a variety of modern teaching methods	3.08	1.141	4.35	0.816	-1.27	1	B
8	Teachers are punctual and disciplined	3.70	1.046	4.36	0.782	-0.66	8	B

If consider assessment related aspects (Table 6), major gap (-1.02) was found in the failure of the assessment system to consider both inside and outside class performance. The second highest gap (-0.98) was found in the impartiality and transparency of the assessment system. Another two aspects with almost similar gap -0.83 and -0.82 were reasonability of the drop policy, and international standard of the grading system. Similar to teaching aspects, all the selected aspects of assessment fall into the top right quadrant of the IPA grid.

Table 6. Service gap in the aspects related to assessment (n=217).

SL.	Aspect of service	Perception (P)		Expectation (E)		Service Gap	Rank	IPA
		Mean	SD	Mean	SD	P-E		
Assessment								
1	Assessment system is unbiased and transparent	3.23	1.017	4.21	0.939	-0.98	2	B
2	Grading system of this university encompasses international standard	3.53	1.049	4.35	0.804	-0.82	5	B
3	Assessment system consider both class and outside class performances	3.17	1.074	4.19	0.903	-1.02	1	B
4	All drop policies and regulations are reasonable	3.35	0.976	4.18	0.899	-0.83	4	B
5	Assessment system equally considers theoretical and practical skill	3.32	1.154	4.29	0.837	-0.97	3	B

As presented in Table 7, in case of recognition dimension major gaps (-1.46 and -1.39) were found in the dedication of the university authority in achieving recognition, and appreciating creativity and extra-curricular activities of the students. Other aspects based on a hierarchy of gaps were national recognition of the university (-1.21), recognition of the bright students (-1.18), performance scholarship (-1.10) and pride of the students being a part of PSTU (-0.42). All the selected aspects of recognition except dedication of the university in improving accreditation found their position in the top right quadrant of IPA grid.

Table 7. Service gap in the aspects related to recognition (n=217).

SL.	Aspect of service	Perception (P)		Expectation (E)		Service Gap P-E	Rank	IPA grid
		Mean	SD	Mean	SD			
Recognition								
1	I feel proud to be a student of PSTU	3.45	1.133	4.27	0.954	-0.82	6	B
2	My university is nationally well recognized	3.30	1.262	4.51	0.844	-1.21	3	B
3	Students receive scholarship if performed well	3.40	1.251	4.50	0.861	-1.10	5	B
4	Bright students receive proper recognition from PSTU.	3.31	1.160	4.49	0.805	-1.18	4	B
5	University authority is dedicated to improving the accreditation (recognition) of PSTU	3.01	1.170	4.47	0.816	-1.46	1	A
6	PSTU recognize creative students, who perform well in extra-curricular activities	3.07	1.205	4.46	0.769	-1.39	2	B

Gap analysis result presented in Table 8 shows that a major aspect of gap (-1.54) in case of non-academic administration dimension is the staff's interest in solving students' problems. Another aspect represented remarkable gap (-1.42) was in non-academic staff's knowledge and efficiency. However, service gap in other selected aspects of non-academic administration is presented in Table 7. The data presented in the table further demonstrate that two aspects of non-academic administration fall into the top left quadrant of IPA grid, while the rest of the aspects found their place in the top right quadrant of the IPA grid.

Table 8. Service gap in the aspects related to non-academic administration (n=217).

SL.	Aspect of service	Perception (P)		Expectation (E)		Service Gap P-E	Rank	IPA grid
		Mean	SD	Mean	SD			
Non-academic Administration								
1	Non-academic staffs are knowledgeable and efficient	2.76	1.066	4.18	0.890	-1.42	2	A
2	Staffs are available during the office hour	3.19	1.146	4.29	0.809	-1.10	4	B
3	Staffs are easily approachable (friendly and easy to talk)	3.08	1.191	4.32	0.814	-1.24	3	B
4	Staffs are willing to help the students	3.19	1.092	4.28	0.891	-1.09	5	B
5	Staffs provide special attention to student problems	2.78	1.156	4.32	0.880	-1.54	1	A

Aspects related to library and internet facilities in Table 9 represent that, except helpfulness of library staffs, and reading environment of the library, all the other aspects exhibit a remarkable gap in perception and expectation. The library is suffering heavily from the shortage of up-to-date books, journals, and periodicals and has restricted access to online resources. In case of internet facilities, the speed of the internet and free access to the internet during class hours and lab work represents huge negative gap in perception and expectation. Gap in other aspects can be observed from the following Table. It is also observed from the table that except two aspects of library and internet facilities all the other aspects are placed in the top left quadrant of IPA grid.

Table 9. Service gap for the aspects related to library and internet facilities (n=217).

SL.	Aspect of service	Perception (P)		Expectation (E)		Service Gap P-E	Rank	IPA grid
		Mean	SD	Mean	SD			
Library and internet facilities								
1	Library staffs are efficient in handling their affairs	2.85	1.085	4.30	0.881	-1.45	7	A
2	Library staffs are very helpful and coordinated	3.11	1.091	4.35	0.769	-1.24	9	B
3	The library offers a comfortable reading environment	3.10	1.268	4.33	0.800	-1.23	10	B
4	The library has sufficient up-to-date books, journals, and periodicals.	2.20	1.148	4.48	0.752	-2.28	3	A
5	Library opening hours are convenient for the students	2.97	1.278	4.37	0.830	-1.40	8	A
6	The library has access to up-to-date online resources	2.41	1.252	4.36	0.887	-1.95	4	A
7	It is easy to find books/journals in the library	2.51	1.139	4.29	0.883	-1.78	6	A
8	This university has uninterrupted power supply to ensure computer access	2.51	1.155	4.30	0.839	-1.79	5	A
9	I have free access to the internet during my classes and lab works	2.13	1.279	4.43	0.826	-2.30	2	A
10	The speed of PSTU internet is reasonable	2.00	1.194	4.41	0.873	-2.41	1	A

Gap scores (Table 10), in case of campus life, represent that except standard of student's accommodation, all the other selected aspects mirrored a vast gap in the perception and expectation regarding the service. Based on bulk of service gap the aspects according to rank order were sufficiency of physician in health care center (-2.02), optimum transport facilities for the students (-1.96), facilities available in the health care center (-1.95), recreation facilities (-1.83), and facilities of gymnasium and playground (-1.64). Resembling similarity to the aspects of library and internet facilities, almost all the aspects of campus life are located in the top left quadrant of the IPA grid.

Table 10. Service gap for the aspects related to campus life (n=217).

SL.	Aspect of service	Perception (P)		Expectation (E)		Service Gap P-E	Rank	IPA grid
		Mean	SD	Mean	SD			
Campus Life								
1	I have sufficient recreation facilities on this campus	2.58	1.198	4.41	0.778	-1.83	5	A
2	Accommodation facilities for the students are well standard	3.13	1.234	4.46	0.810	-1.33	7	B
3	This campus has well facilitated gymnasium and playground	2.70	1.149	4.34	0.818	-1.64	6	A
4	Canteens/dining in PSTU supplies healthy food	2.09	1.186	4.41	0.884	-2.32	1	A
5	PSTU has sufficient transportation facilities for its students	2.42	1.164	4.38	0.885	-1.96	3	A
6	University health care center is well facilitated	2.42	1.200	4.37	0.945	-1.95	4	A
7	Sufficient number of physicians available in the health care center	2.39	1.239	4.41	0.877	-2.02	2	A

Service Quality Dimensions and Overall Satisfaction

This study adopts a single item direct measure of overall satisfaction with services based on a 5 point Likert scale, where 1 indicates complete dissatisfaction and 5 indicates very high satisfaction. The regression model considered the perceived score of all the selected seven dimensions as the predictor variable while overall satisfaction with service quality was considered as the criterion viable. The regression results presented in Table 11 represent that the seven perceived service quality dimensions can describe 23% of the overall satisfaction with service quality of the university. The model evolved has $F_{7, 216} = 10.24$ and significant at 0.001 level. The results presented in the Table further reveal that perceived learning and perceived recognition have significant ($p < 0.05$) contribution on student's overall satisfaction with the service. However, other dimensions such as perceived teaching, assessment, library and internet facilities, campus life, and non-academic administration do not have significant contribution to client's assessment of overall satisfaction with service quality. Variance Inflation Factors (VIF) ranged from 2.066 to 2.644 indicating that multicollinearity among the predictor variables is not a problem.

Table 11. Effect of perceived service quality dimensions on overall satisfaction (n=216).

Perceived service dimensions	B	SE	β	t	p	VIF
Learning	0.325	0.122	0.238	2.67	0.008	2.232
Teaching	0.078	0.092	0.075	0.084	0.398	2.197
Assessment	-0.079	0.099	-0.069	-0.79	0.427	2.131
Recognition	0.199	0.091	0.213	2.19	0.029	2.644
Library and Internet Facilities	0.042	0.087	0.042	0.48	0.632	2.156
Campus life	0.065	0.086	0.065	0.76	0.446	2.066
Non-academic administration	0.034	0.079	0.037	0.43	0.668	2.132

Factor Analytic Results

For having a more parsimonious explanation of results, 50 items scale was factor analyzed following the principal component method along with VARIMIX rotation. Prior to performing factor analysis, suitability of the data was checked. The correlation matrix mirrored presence of many coefficients equal to or above 0.5. The Kaiser-Meyer with a value of 0.905 exceeds suggested value of 0.60 (Kaiser, 1970, 1974). Bartlett's Test of Sphericity (Bartlett, 1954) showed statistical significance ($p < 0.001$) which supports the suitability of correlation matrix. All the variables having commonalities less than 0.50 were dropped from further analysis following recommendation of Hair et al. (2010). The cross loaded variables were also removed from further analysis. The results of the final analysis exhibit presence of six components those in common can explain 60.67% of the variance. This figure is higher than the suggested 50% level, hence it can be claimed that this six factor solution is capable enough to measure the service quality of a university.

The original survey instrument was composed of 50 statements grouped into seven factors. However, the final solutions retained 30 statements divided into six set of factors. A remarkable number of statements were returned to their original groups except some statements loaded on different components. Teaching, non-academic administration, and assessment returned successfully to their original classification. The students perceived library, internet, and campus life as one component loaded on a new factor called university facilities. Statements related to learning and recognition results evolvment of another factor called learning and recognition. The possible reason might link to this fact is, interest in learning is closely linked with recognition. However, the resulting six factors are recognized as: university facilities, teaching, learning recognition, non-academic administration, learning, and assessment. (Please see Appendix 1 for details of factor analysis results).

Discussion

In the process of analysis, it is explored that student's expectation concerning service quality dimensions (learning, teaching, assessment system, recognition, library and internet facilities, campus life, non-academic administration) of the selected university supersede perception. This negative quality gaps indicate that the university is not providing satisfactory service to the students. In line with our findings, Yousapronpaiboon (2008) in Thailand, Dato et al. (2011) in Serbia, Đonlagić & Fazlić (2015) in Bosnia Herzegovina and Shekarchizadeh et al. (2011) in Malaysia also found significant gaps in all the selected dimensions of service quality in higher education. In fact, higher education in the developing countries is under severe strain. This system is overwhelmingly underfunded, but experiencing escalating demand. Faculty are often under-qualified, lack motivation, and ill paid. Students are poorly taught based on backdated curricula (World Bank, 2000). Higher education quality in Bangladesh is qualitatively anemic and dysfunctional since the colonial period. The governments emphasized quantitative expansion overlooking quality (Ahmed, n. d.). The findings of the study established the fact that things are not significantly changed yet.

Research results indicate that all the items under learning represent negative service gaps in terms of perception and expectation. However, the university needs immediate concentration on supplying sufficient and attractive course materials and establishing well equipped comfortable classrooms with modern teaching-learning facilities as these sectors have a wider service gap compared to other items of learning. The teachers need to use a variety of teaching methods, and treat students impartially. They also require to concentrate on sufficient preparation beforehand classes and improvement of communication skill. Assessment system needs to be more transparent and diversified in counting theoretical and practical skills both inside and outside classroom. The university needs to strive for national and international accreditation as well as recognize and reward creative students. Non-academic staffs should

concentrate in improvising knowledge and efficiency and at the same time provide special attention to students' problems. Among all the dimensions library and internet facilities, and campus life deserves rapid attention as almost all the aspects under these dimensions exhibit wider gaps and fall in the top left quadrant of IPA grid. The university should take immediate steps for increasing number of up-to-date books, journals, and periodicals, enhance student access to online resources, ensure free and first internet access during classes and lab works, and ensure uninterrupted power supply. Recreation facilities, food and lodging, transportation facilities, health care services also deserve immediate action.

Improving service quality is a hectic task. The study findings show that the service quality of the selected university is feeble in all the selected dimensions. A closer review of the gaps established the fact that improvement of such expanded gaps in service quality deserves efforts from personal, community as well as national level. All the stakeholders (students, student organizations, teachers, guardians, non-academic officers and staffs, public and private recruiting organizations, university administrators, government, etc.) should be pro-active in the improvement of the service quality. Of course, the university authority has to play the central role in this endeavor. They should arrange sufficient resources, integrate activities, and keep strong surveillance over the quality improvement initiatives of all the stakeholders.

It is obvious from the findings that all the items under modified SERVQUAL dimensions represent a negative service gap in terms of perception and expectation of the clients. It is assumed that the smaller the gap the better the service. However, this notion needs care as empirical evidences posit that the gaps can't be considered small (Donlagić & Fazlić, 2015).

Study Limitations

It is important to note that this research encompasses several limitations. Student's expectation of service quality depends upon their prior physical or psychological orientation to quality education. As quality tertiary institutions are extremely scarce in the country, so the student's expectation of service might be arbitrary. The faculties of the university differ significantly in terms of establishment age, resources, lab facilities, the number of quality teaching staff, and teaching modalities. So, gap identification may not be generalized for the whole institution. Ex-post-facto evaluation of student's expectations might influence research result, therefore it is suggested that the university should investigate student's expectation results during enrollment. Moreover, service quality is a dynamic component, hence periodic evaluation can reveal a more precise picture.

Results of research, results of research, results of research, results of research, results of research, results of research, results of research.

Conclusions and Implications

The quality debate in higher education gain momentum as Bangladeshi universities, considerably lag behind international quality standard. This study established the fact that the dimensions of a service is contextual, hence modified SERVQUAL can successfully measure the service quality of higher education. A slight modification of the proposed model can be used as off-the-rack instrument for higher education service quality measurement. It was also found that the selected university failed to fulfill the student's expectation in all the selected dimensions of service quality. A significant section of the students were either dissatisfied or undecided about the service quality, and planned to be not with the university in their future study. The IPA grid indicates that the university needs immediate attention on the library and internet facilities, campus life and non-academic administration. The university needs to arrange regular teachers training for improving communication skill & ethical issues, as well as the development and use of attractive teaching materials. Adoption of an assessment system copes with the standard of accredited world class universities is indispensable. Arrangement of

updated books, periodicals, journals, magazines, etc., in the library is vital. Easy and frequent access to rich online resources deserves attention. The university also needs to arrange available internet facilities during classes and lab works. Enhancement of internet speed, and availability of electricity deserves special attention. The university should arrange sufficient transportation and recreation facilities, availability of healthy foods in the canteen & dining, expand services of health center, and recruit a sufficient number of physicians in the health care center. Periodic arrangement of training is essential for non-academic staffs in the areas of office management and public relations. Establishment of well-equipped comfortable classrooms is crucial. The subject matter of education in the university should focus student's creativity, analytical ability, as well practical life oriented skills. The university also needs to strive for national and international recognition by improving service quality, as recognition is one of the most important precursors of satisfaction. In fact, it is necessary to address all the service gaps either wide or small, as the service quality development rests on all out improvement.

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Endnotes

1 <http://www.ugc.gov.bd/en/home/university/public/120> (Retrieved 8 October 2016)

2 http://www.nu.edu.bd/home/index.php?option=com_content&view=article&id=110&Itemid=2096 (Accessed 9 October 2016)

3 https://www.timeshighereducation.com/world-university-rankings/2017/world-ranking#!/page/0/length/25/sort_by/rank_label/sort_order/asc/cols/scores (Accessed 8 October 2016)

4 <https://www.surveymonkey.com/mp/sample-size-calculator/>

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Appendix 1**Table. Factor (Rotated) analytic results of student's perception scale of measuring service quality.**

Factors		Loading	Eigen value	% of variance	C* α
F₁ (University facilities)			10.34	32.32	0.885
L ₁₀	The speed of PSTU internet is reasonable	0.818			
L ₉	I have free access to the internet during my classes and lab works	0.767			
L ₄	The library has sufficient up-to-date books, journals, and periodicals.	0.738			
L ₈	This university has uninterrupted power supply to ensure computer access	0.697			
L ₆	The library has access to up-to-date online resources	0.682			
C ₄	Canteens/dining in PSTU supplies healthy food	0.624			
C ₁	I have sufficient recreation facilities on this campus	0.599			
C ₆	University health care center is well facilitated	0.575			
C ₅	PSTU has sufficient transportation facilities for its students	0.518			
F₂ (Teaching)			3.36	10.50	0.872
T ₃	Teachers take sufficient preparation prior to their classes	0.756			
T ₁	Teachers are knowledgeable in their respective subject	0.751			
T ₂	Teachers are fair and unbiased	0.727			
T ₈	Teachers are punctual and disciplined	0.726			
T ₄	Teachers possess good communication skill	0.665			
T ₅	Teachers are willing to help the students	0.619			
T ₇	Teachers use a variety of modern teaching methods	0.502			
F₃ (Learning and Recognition)			1.68	5.72	0.820
L ₂	Education in PSTU has enhanced my creativity	0.724			
L ₆	The education has developed my analytical ability	0.712			
R ₅	University authority is dedicated to improving the accreditation (recognition) of PSTU	0.612			
R ₂	My university is nationally well recognized	0.593			
R ₆	PSTU recognize creative students, who perform well in extra-curricular activities	0.579			
L ₅	The education is helpful in developing practical skill	0.569			
F₄ (Non-academic administration)			1.44	4.50	0.849
N ₅	Staffs provide special attention to student problems	0.806			
N ₄	Staffs are willing to help the students	0.796			
N ₃	Staffs are easily approachable(friendly and easy to talk)	0.741			
N ₁	Non-academic staffs are knowledgeable and efficient	0.564			
F₅ (Learning)			1.31	4.11	0.601
L ₈	The classroom environment is comfortable and cozy	0.758			
L ₉	Classrooms are well equipped with modern facilities (e.g. multimedia, internet connection, loud speaker, etc.)	0.751			
F₆ (Assessment)			1.27	3.52	0.542
A ₂	Grading system of this university encompasses international standard	0.812			
A ₃	Assessment system consider both class and outside class performances	0.509			

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