

Service quality assessment model for academic libraries

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Abstract

Purpose – The purpose of this paper is to develop a service quality assessment model for academic libraries using SERVQUAL and validate the model surveying teachers, students and researchers.

Design/methodology/approach – A model was developed, including 28 statements of five dimensions using the SERVQUAL instrument. It incorporated three segments, i.e. minimum service expectation, desired service expectation and actual service performance with a seven-point Likert scale. The minimum service expectation and desired service expectation appear at both ends of the tolerance zone, which represents the range of satisfactory service performance. A performance level upper tolerance zone could delight users, or service performance below the tolerance zone would cause dissatisfaction. A survey was conducted among 552 respondents from ten private university libraries of Bangladesh to validate the model.

Findings – Several statistical methods like Cronbach's alpha (0.986), Bartlett's test (0.001), rotation sums of squared loadings (74.26) in factor analysis, item loading (0.671-0.839), commonalities (0.579-0.859), Kaiser–Meyer–Olkin value (0.971), construct reliability (0.862-0.910) and AVE value (0.510-0.660) supported reliability and validity of the model. The actual service performance of all dimensions existed within the tolerance zone of the respective dimensions. Besides, the overall service performance (5.11) resided within the tolerance zone (4.73-5.84), indicating the users were satisfied with the service provided by their libraries.

Originality/value – The model was developed in the current context of university libraries, which produced appropriate results. It will prompt further research on service quality assessment in academic libraries globally.

Keywords SERVQUAL, Development, Bangladesh, Validation, University libraries, Service quality assessment model

Paper type Research paper

Introduction

Academic libraries are service oriented institutions that are set up for the provision of the relevant information resources and quality services to satisfy their users' learning, teaching and research needs. Currently, university libraries become more user-focused for information availability, rising costs, competitive pressures, and increasing awareness of users (Andaleeb and Simmonds, 1998). The effectiveness of university libraries generally refers to library collections, staff performance, services and facilities (Mezbah-ul-Islam, 2003). There are 105 private, 46 public and three international universities in Bangladesh (UGC, 2020). Most of the university libraries in Bangladesh are trying to enhance their tools and techniques to assist learning, teaching, and research as well as adjust the method of sharing and providing information to their users through technology-driven services (Alam, 2017a; Islam and Habiba, 2015). To develop and keep state-of-the-art user-expected library



services, it is essential to identify how well users get library services against their expectations in the changing information environment and evaluate the quality of existing services. Hoffman and Bateson (2011) defined service quality as an attitude formed by a long-term regarding the overall evaluation of a firm's performance. Sahu (2007) defined library service quality as the "difference between users' expectations and perceptions of service performance and the reality of the service". Many researchers have agreed that assessing service quality based on user responses is the most useful and easy approach to evaluating the success of academic libraries (Alam, 2018).

Through the years, diverse research streams have focused on developing tools and techniques for measuring service quality (Roy and Bouchard, 1999). SERVQUAL is an approach to assess the service quality of business sectors, which was developed by marketing researchers Parasuraman *et al.* (1985). Afterward, SERVQUAL has been radically shifted to the quality assessment of all service sectors, including libraries around the world with necessary change (Alam, 2017b; Hossain and Islam, 2012). The Texas A&M University Libraries developed the LibQUAL+ in 2000 based on the SERVQUAL conceptual model, which is being used to assess the service quality of more than 1,300 academic libraries in 33 countries (Libqual.org, 2020). The LibQUAL+ protocol is a rigorously tested Web survey tool with the purpose of helping libraries to assess library service quality, improve library services, market the library and change institutional culture. The Texas A&M research and development team developed and tested an alternative form of the conventional LibQUAL+ survey called "LibQUAL+ Lite" in 2008 (Libqual.org, 2020). Both LibQUAL+ and LibQUAL+ Lite are less suitable in the perspective of academic libraries in Bangladesh being Web-based survey protocols (Ahmed and Shueb, 2009; Libqual.org, 2020). The SERVQUAL has been applied in different types of libraries, including academic, public and special libraries globally. Although the service quality assessment should be a continuous process, only a few studies have been conducted in Bangladesh (Alam, 2017b; Partap, 2019). The main aim of the study is to develop and validate a model using the modified SERVQUAL instrument for assessing the service quality in academic libraries.

Literature review

Assessing service quality is essential to retain users in the current competitive service environment. To assess the service quality of any library, user feedback is considered as a more reliable factor (Parasuraman *et al.*, 1985). SERVQUAL is the most useful service quality assessment tool, which is being significantly used in various library settings, especially university libraries globally (Hossain and Islam, 2012). Initially, Parasuraman *et al.* (1985) identified ten dimensions in SERVQUAL, which are "reliability, responsiveness, competence, creditability, access, courtesy, security, communication, understanding the customer, and tangibles". In a later study, Parasuraman *et al.* (1988) merged the components into five dimensions capturing all facets of the ten initially conceptualized dimensions. These five dimensions are tangibles – "the appearance of physical facilities, equipment, personnel, and communication materials"; reliability – "the ability to perform the promised service dependably and accurately"; responsiveness – "the willingness to help customers and provide prompt service"; assurance – "the knowledge and courtesy of employees and their ability to inspire trust and confidence"; and empathy – "the provision of caring, individualized attention to customers". Many researchers (Afridi *et al.*, 2016; Asogwa *et al.*, 2014; Coleman *et al.*, 1997; Enayati *et al.*, 2013; Hanaysha *et al.*, 2012; Hery Wihardika Griadhi, 2018; Kiran, 2010; Leonnard, 2018; Lestari and Yudoko, 2016; Trivedi and Bhatt, 2019; Wang and Shieh, 2006; and so forth) used the five dimensions, i.e. tangibles, assurance,

responsiveness, reliability and empathy to assess the service quality in academic, public and special libraries around the world with necessary change.

In Bangladesh, [Shoeb and Ahmed \(2009\)](#) conducted a study on “individual differences in service quality assessment of IUB Library”. They modified the SERVQUAL instrument focusing 30 statements of seven dimensions, which are collections and access, assurance, reliability, empathy, library as place, responsiveness and tangibles. They adequately covered the entire services of the university library due to the inclusion of additional two dimensions “collections and access” and “library as place” with the SERVQUAL dimensions of [Parasuraman *et al.* \(1988\)](#). Different authors ([Ahmed and Shoeb, 2009](#); [Shoeb, 2010, 2011](#)) similarly focused on the seven dimensions, i.e. collections and access, assurance, reliability, empathy, library as place, responsiveness and tangibles of [Shoeb and Ahmed \(2009\)](#) to measure the service quality in various university libraries of Bangladesh.

[Andaleeb and Simmonds \(1998\)](#) sufficiently cover the total services of academic libraries due to the inclusion of an extra “resources” dimension with existing SERVQUAL dimensions and combining the former two dimensions “assurance and empathy” into a separate one “demeanor”. The modified SERVQUAL dimensions of Andaleeb and Simmonds are “resources, competence, responsiveness, demeanor, and tangibles”. Various researchers ([Hossain, 2016](#); [Hossain and Ahmed, 2014, 2013](#); [Hossain and Islam, 2012](#); [Shoeb, 2010, 2011](#)) used the five modified SERVQUAL dimensions, i.e. resource, competence, demeanor, responsiveness and tangibles of [Andaleeb and Simmonds \(1998\)](#) in several empirical studies undertaken in different university libraries of Bangladesh.

[Parasuraman *et al.* \(1994\)](#) involved respondents in rating service quality in three formats, which are the minimum expectation, desired expectation and perceived service quality. They proposed a concept that the “minimum and desired service expectations appear at either end, with the area in between known as the zone of tolerance”. The zone of tolerance represents the “range of service performance, which customers consider satisfactory”. [Berry and Parasuraman \(1991\)](#) stated that a service performance below the tolerance zone would create dissatisfaction and decrease customer reliability and loyalty. On the contrary, a performance level above the tolerance zone could pleasantly surprise users and strengthen their reliability and loyalty. Several studies ([Ahmed and Shoeb, 2009](#); [Hossain and Ahmed, 2014, 2013](#); [Hossain and Islam, 2012](#); [Shoeb and Ahmed, 2009](#)) applied the three-column formats, i.e. minimum expectation, desired expectation and perceived service quality of [Parasuraman *et al.* \(1994\)](#) to measure the service quality in different academic libraries. Most of the studies asked respondents to appraise each statement of the SERVQUAL questionnaire from 1 “lowest” to 7 “highest” considering a seven-point scale ([Ahmed and Shoeb, 2009](#); [Hossain, 2016](#); [Hossain and Ahmed, 2014, 2013](#); [Hossain and Islam, 2012](#); [Shoeb, 2010, 2011](#); [Shoeb and Ahmed, 2009](#)).

Based on the available literature, few studies have been undertaken using SERVQUAL in the university libraries of Bangladesh on measuring service quality ([Ahmed and Shoeb, 2009](#)), individual differences in service quality ([Shoeb and Ahmed, 2009](#)), perceptions of library services by gender ([Shoeb, 2010](#)), identifying service superiority, underlying dimensions and zone of tolerance ([Shoeb, 2011](#)), understanding perceived service quality and satisfaction ([Hossain and Islam, 2012](#)), developing a service performance assessment system for university libraries ([Hossain and Ahmed, 2013](#)), developing an alternative scale for measuring service quality ([Hossain and Ahmed, 2014](#)), determining key dimensions for evaluating service quality and satisfaction ([Hossain, 2016](#)), assessing perceived service quality of EU Library ([Alam, 2017b](#)) and measuring the performance of 17 residential hall libraries of DU ([Karim, 2018](#)). However, very few efforts have been made to develop and validate a model for assessing service quality in the academic libraries of Bangladesh. In

recent years, university libraries of Bangladesh are trying to enhance their tools and techniques for meeting the learning, teaching and research needs as well as adjusting the ICT-based systems for sharing and providing information to their users (Alam and Mezbah-ul-Islam, 2019). To develop and keep user-expected library services, it is essential to explore periodically how well users get library services against their expectation in the changing information environment. Thus, it is anticipated to develop and validate a model for assessing the service quality in the academic libraries.

Objectives of the study

Based on the research gaps, the study has made the following specific objectives:

- to develop a model using the SERVQUAL instrument for assessing service quality in the academic libraries; and
- to validate the model by conducting a survey among the users of ten private university libraries of Bangladesh;

Methodology

Research design

The quantitative method was used to assess the service quality in the university libraries of Bangladesh. An attempt was made to collect both primary and secondary data. Initially, some secondary sources were reviewed to know what had already been written about library service quality. A service quality assessment model was developed, including 28 statements of five dimensions using the modified SERVQUAL instrument based on the current perspective of university libraries. The model incorporated three segments, i.e. minimum service expectation, desired service expectation and actual service performance with a seven-point Likert scale. The minimum service expectation and desired service expectation appear at both ends of the zone of tolerance, which represents the range of satisfactory service performance. A performance level upper the zone of tolerance could delight users, or the service performance below the zone of tolerance would cause dissatisfaction. A survey was conducted among 552 respondents, including teachers, students and researchers from ten private university libraries of Bangladesh, to validate the model. Several statistical methods were used to test the reliability and validity of the model.

Questionnaire design

A structured questionnaire was constructed for the study consists of the three segments with a seven-point Likert scale, demographic information and 28 statements of five dimensions of service quality. Among the 28 statements, 21 were taken from the available SERVQUAL literature and 7 were incorporated from the available both LibQUAL+ and LibQUAL+ Lite literature focusing on the five dimensions:

- (1) Resource – all available library resources and its easy access;
- (2) Competence – ability to perform the promised service dependably and accurately;
- (3) Responsiveness – willingness to help users and provide prompt service;
- (4) Demeanor – knowledge, and courtesy of employees and their ability of caring and individual attention to users; and
- (5) Tangibles – the appearance of physical facilities, equipment, personnel and communication materials.

Most of the statements were modified as per the current perspective of the university libraries. A seven-point agreement scale is considered at the numerical 1 with the verbal statement “strongly disagree” and at the numerical 7 with the verbal statement “strongly agree”.

Population, sample and data collection

The population for this study consisted of teachers, students and researchers from ten private universities in Bangladesh whose libraries have four criteria, i.e. availability of automation, institutional repository, website and e-resources. The purposive sampling method was used to collect data from the existing users of the library, be a large population size from the ten university libraries, and make this study more convenient. A total of 712 questionnaires were delivered to the students, teachers and researchers of the selected private universities. Among them, 596 (83.71%) questionnaires were returned. A total of 552 (77.53%) questionnaires of 77 teachers, 436 students and 39 researchers were found completely filled up, which were considered for analysis. As per the rules of thumb of Roscoe (1975), “sample sizes larger than 30 and less than 500 are appropriate for most research”. He also proposed for determining sample size that where “samples are to be broken into subsamples” (teachers/students/researchers), “a minimum sample size of 30 for each category is necessary”. According to Sekaran (2003), if the total population size is 75,000 or more requires a minimum sample size of 384 respondents. So, the sample size (552) is suitable for conducting the study, which is more than the minimum requirement of a large population as per the criteria of Roscoe and Sekaran.

Data assessment methods

The 22nd version of SPSS has been used to calculate descriptive statistics, reliability and validity statistics. The descriptive statistics assessed the overall service quality. Bartlett’s test, construct reliability and Cronbach’s alpha measured reliability. Moreover, the factor analysis with varimax rotation, item loading, commonalities, KMO value, AVE measured the validity of the study.

Findings

Demographic information

The findings of the study demonstrated that among 552 respondents, 77 (13.9%) were teachers, 436 (79 %) were students and 39 (7.1%) were researchers. The majority of the respondents were from International Islamic University Chittagong (124, 22.5%), followed by Daffodil International University (61, 11.1%), Eastern University (55, 10%), Chittagong Independent University (50, 9.1%), Independent University Bangladesh (48, 8.7%), BRAC University (46, 8.3%), University of Liberal Arts Bangladesh (46, 8.3%), East West University (45, 8.2%), United International University (42, 7.6%) and Northern University Bangladesh (35, 6.3%). Among the respondents, 7 (1.3%) were Professors, 15 (2.7%) were Associate Professors, 30 (5.4%) were Assistant Professors, 27 (4.9%) were Lecturers, 38 (6.9%) were MPhil/PhD researchers, 98 (17.8%) were post-graduate students and 337 (61.1%) were undergraduate students. The majority of the respondents were from the age group of 20-29 years (405, 73.4%), followed by 30-39 years (73, 13.2%), under 20 years (34, 6.2%), 40-49 years (19, 3.4%), 50-49 years (16, 2.9%) and 60 and above years (5, 0.9%). Among the respondents, 536 (97.1%) were Bangladeshi users, and 16 (2.9%) were foreign users. Among 552 respondents, 381 (69 %) were male, and 171 (31 %) were female (Table 1). The demographic information of the sample indicated that a broad cross-section of the population responded.

Table 1.
Demographic
information of the
respondents

Category	Name of university	Respondents	Valid (%)
University	International Islamic University Chittagong (IIUC)	124	22.5
	Daffodil International University (DIU)	61	11.1
	Eastern University (EU)	55	10.0
	Chittagong Independent University (CIU)	50	9.1
	Independent University Bangladesh (IUB)	48	8.7
	BRAC University (BU)	46	8.3
	University of Liberal Arts Bangladesh (ULAB)	46	8.3
	East West University (EWU)	45	8.2
	United International University (UIU)	42	7.6
	Northern University Bangladesh (NUB)	35	6.3
User type	Teacher	77	13.9
	Student	436	79.0
	Researcher	39	7.1
Gender	Male	381	69.0
	Female	171	31.0
Status	Professor	7	1.3
	Associate Professor	15	2.7
	Assistant Professor	30	5.4
	Lecturer	27	4.9
	MPhil/PhD Researcher	38	6.9
	Undergraduate Student	98	17.8
	Post Graduate Student	337	61.1
Age	20-29 years	405	73.4
	30-39 years	73	13.2
	Under 20 years	34	6.2
	40-49 years	19	3.4
	50-59 years	16	2.9
Country	60 years and above	5	0.9
	Bangladeshi	536	97.1
	Foreign	16	2.9

Reliability
Cronbach's alpha. Nunnally (1978) suggested that “alpha values should be 0.70 or more”. Reliability analyses indicated that the internal consistency of all items ($\alpha = 0.986$), 28 statements of service quality ($\alpha = 0.987$) and the five variables ($\alpha = 0.943$) of the study were very satisfactory. The Cronbach's alpha values of the five variables are resources ($\alpha = 0.909$), competence ($\alpha = 0.924$), responsiveness ($\alpha = 0.924$), demeanor ($\alpha = 0.929$) and tangibles ($\alpha = 0.897$) indicating good reliability of overall questionnaire items (Table 2).
Bartlett's test of sphericity. The value of Bartlett's Test of sphericity should be 0.05 or less (Schierholz and Laukkanen, 2007). Table 3 shows that Bartlett's test has ($p < 0.001$) for

Table 2.
Cronbach's alpha and
convergent validity

Dimensions	Cronbach's alpha (CA)	Composite reliability (CR)	Average variance extracted (AVE)	Items
Resource	0.909	0.869	0.526	6
Competence	0.924	0.898	0.638	5
Responsiveness	0.924	0.907	0.660	5
Demeanor	0.929	0.910	0.627	6
Tangibles	0.897	0.862	0.510	6

28 statements of service quality, and ($p < 0.001$) for five variables indicating the internal consistency of the data is appropriate.

Composite reliability. Table 2 illustrates that the composite reliability (CR) values of resources (0.869), competence (0.898), responsiveness (0.907), demeanor (0.910) and tangibles (0.862) were higher than the threshold 0.77 (Bagozzi and Yi, 1988) indicated that all the variables are internally consistent and reliable.

Validity

Convergent validity. Table 2 demonstrates that the average variance extracted (AVE) values of resources (0.526), competence (0.638), responsiveness (0.660), demeanor (0.627) and tangibles (0.510) were higher than the limit of 0.50 as recommended by Bagozzi and Yi (1988) which supported the convergent validity among all the variables.

Kaiser–Meyer–Olkin value. The criteria for KMO value is “0.90 s = marvelous, 0.80 s = meritorious, 0.70 s = middling, 0.60 s = mediocre, 0.50 s = miserable and below 0.50 = unacceptable” (Kaiser, 1974). Table 2 shows that the KMO value matrix is 0.971 for 28 statements of service quality, and 0.878 for five dimensions, which means that the 552 samples are statistically significant for the factor analysis.

Factor analysis

Factor analysis was conducted with the varimax rotation where five factors were recovered, which had 74.28% of the variance, and a total of 28 items out of 28 were loading (40.482 – 0.360) on the factors (Table 4). In factor analysis, only factors having latent roots [eigenvalues] greater than one are considered significant (Andaleeb and Simmonds, 1998). However, the five factors had eigenvalues of greater than one (15.91 – 6.21), indicating all the independent variables were significant to conduct the study.

Items loading

The criteria for item loading is “0.32 = poor; 0.45 = fair; 0.55 = good; 0.63 = very goods or 0.71 = excellent” (Comrey and Lee, 1992). The items loading of the extracted from variables were shown to be between 0.671 and 0.761 for six statements of resources, between 0.750 and 0.830 for five statements of competence, between 0.762 and 0.839 for five statements of responsiveness, between 0.768 and 0.809 for five statements of demeanor and between 0.685 and 0.749 for six statements of tangibles suggested that all the items represent the respective dimensions of service quality successfully (Table 4).

Commonalities

Nadiri (1970) recommended that “all commonalities of a perfectly sufficient sample above 0.5 are acceptable”. Table 4 shows that commonalities of the variables extracted between

No. of items	KMO value	Bartlett's test of sphericity
28 Items (ASP)	0.971	0.001
28 Items (MSE)	0.978	0.001
28 Items (DSE)	0.976	0.001
5 Dimensions (ASP)	0.878	0.001
5 Dimensions (MSE)	0.899	0.001
5 Dimensions (DSE)	0.884	0.001

Table 3.
Bartlett's test of
sphericity and KMO
value

Dimensions	Items	Loading factors	Communalities	Eigen value	Variance (%)	Cum (%)
Resource	R1A	0.671	0.658	15.910	23.968	23.968
	R2A	0.738	0.687			
	R3A	0.761	0.783			
	R4A	0.726	0.735			
	R5A	0.747	0.728			
	R6A	0.710	0.716			
Competence	C7A	0.750	0.693	10.443	15.733	39.700
	C8A	0.811	0.739			
	C9A	0.824	0.752			
	C10A	0.778	0.733			
	C11A	0.830	0.742			
	C12A	0.828	0.759			
Responsiveness	RP13A	0.827	0.765	9.628	14.504	54.204
	RP14A	0.839	0.772			
	RP15A	0.762	0.728			
	RP16A	0.805	0.763			
	D17A	0.809	0.730			
	D18A	0.803	0.727			
Demeanor	D19A	0.793	0.767	7.107	10.707	64.911
	D120A	0.795	0.776			
	D21A	0.768	0.725			
	D22A	0.782	0.752			
	T23A	0.703	0.859			
	T24A	0.685	0.847			
Tangibles	T25A	0.705	0.762	6.208	9.352	74.263
	T26A	0.746	0.753			
	T27A	0.749	0.750			
	T28A	0.700	0.579			

Table 4.
Factor analysis with
varimax rotation

0.579 and 0.859 for 28 statements out of 28 recommended that the variance in all of the statements is within a suitable range.

Overall service quality

Table 5 illustrates that the overall mean of minimum service expectation was 4.73, desired service expectation was 5.84, and actual service performance was 5.11 indicated that the users of the selected private university libraries were satisfied with the service provided by their libraries. Among the 28 statements of the five dimensions of service quality, “convenient library hours” occupied the highest perceived mean of 5.45, followed by another top-five perceived services were “library staff are always available in the library to help users” scored 5.34, “the library has the suitable space that encourages study and learning” scored 5.29, “the internal environment is calm, welcoming and conducive to study” scored 5.24 and both “library staff have the ability to guide users properly” and “library staff deal with users in a considerate manner” scored 5.22. On the other hand, the service statement “Library resources adequately cover your field of study” forms the lowest perceived mean of 4.82, followed by another lowest five perceived services were “Digital Institutional Repository is rich” scored 4.85, both “The library is fully automated” and “Library resources are updated” scored 4.93, “Library staff inform users regularly regarding the current progress of the library” scored 4.94, and “Library staff are giving individual attention to meet research

Items	Statements	MSE	SD	DSE	SD	ASP	SD
R1	Library resources adequately cover your field of study	4.41	1.509	5.67	1.319	4.82	1.486
R2	Library resources are updated	4.56	1.542	5.70	1.334	4.93	1.421
R3	Resources are conveniently accessible	4.51	1.570	5.64	1.387	5.04	1.486
R4	Digital Institutional Repository is rich	4.47	1.538	5.67	1.353	4.85	1.506
R5	The online catalog of your library is easy to understand	4.63	1.689	5.78	1.383	5.13	1.634
R6	Easy access to subscribed online resources (e-books and e-journals)	4.59	1.654	5.76	1.390	5.04	1.654
C7	Library staff are knowledgeable to answer your query	4.62	1.658	5.81	1.397	5.12	1.625
C8	Library staff provide services as promised	4.70	1.549	5.84	1.335	5.11	1.537
C9	Services are provided with minimum interruption	4.76	1.553	5.85	1.375	5.11	1.541
C10	Users feel relaxed when interacting with library staff	4.76	1.573	5.83	1.316	5.15	1.616
C11	Library staff have the ability to guide users properly	4.86	1.648	5.99	1.246	5.22	1.642
RP12	Library staff have the willingness to help users	4.70	1.725	5.84	1.401	5.17	1.591
RP13	Giving priority to the user's interest	4.74	1.647	5.87	1.297	5.10	1.595
RP14	Library staff serve promptly to the users	4.77	1.580	5.83	1.320	5.12	1.518
RP15	Library staff inform users regularly regarding current progress of the library	4.66	1.652	5.74	1.343	4.94	1.680
RP16	Library staff are always available in the library to help users	4.94	1.654	5.96	1.272	5.34	1.640
D17	Library staff are always polite showing friendly behavior	4.80	1.692	5.91	1.381	5.15	1.625
D18	Library staff are giving individual attention to meet research needs	4.67	1.608	5.76	1.375	5.03	1.566
D19	Library staff deal with users in a considerate manner	4.81	1.536	5.90	1.223	5.22	1.477
D120	Library staff understand the needs of the users	4.82	1.574	5.87	1.241	5.13	1.514
D21	One can make suggestion or complaint easily about any issue of the library	4.77	1.609	5.84	1.272	5.14	1.542
D22	Readiness for responding to user queries	4.79	1.599	5.79	1.269	5.19	1.501
T23	The library has the suitable space that encourages study and learning	4.84	1.710	5.93	1.383	5.29	1.604
T24	The internal environment is calm, welcoming and conducive to study	4.92	1.599	6.01	1.305	5.24	1.589
T25	The library is fully automated	4.64	1.615	5.78	1.331	4.93	1.614
T26	Sufficient knowledge management tools are available in the library	4.75	1.590	5.87	1.339	5.04	1.533
T27	Library website contains necessary information	4.87	1.541	5.99	1.260	5.21	1.559
T28	Convenient library hours (opening and closing hours)	5.00	1.576	6.07	1.273	5.45	1.523
	<i>Overall Service Quality</i>	4.73	1.308	5.84	1.044	5.11	1.199

Notes: MSE = Minimum Service Expectation, DSE = Desired Service Performance, and SD = Standard Subdivision

Table 5.
Overall service
quality

needs” scored 5.03. The actual service performance of all items existed within the tolerance zone of the respective items indicating the users were satisfied with the service provided by their university libraries.

Dimensional service quality

Among the five dimensions of service quality, the highest overall performance was 5.19 for tangibles, followed by 5.14 for competence, 5.14 for demeanor, 5.13 for responsiveness and, consequently, 4.97 for resources formed the lowest perceived score (Table 6). The actual service performance is 4.97 (MSE = 4.53-DSE = 5.70) for resource, 5.14 (MSE = 4.74-DSE = 5.86) for competence, 5.13 (MSE = 4.76-DSE = 5.85) for responsiveness, 5.14 (MSE = 4.78-DSE = 5.84) for demeanor, and 5.19 (MSE = 4.84-DSE = 5.94) for tangibles. It is found that all dimensions existed within the tolerance zone of the respective dimensions indicating the users were satisfied with the staff’s competence, demeanor and responsiveness, as well as tangible facility and resource of the libraries.

Discussion

The study developed a model using the SERVQUAL instrument for assessing the service quality of academic libraries and validated the model surveying 77 teachers, 436 students and 39 researchers from ten selected private university libraries of Bangladesh. The Cronbach’s alpha values of the five variables are resources ($\alpha = 0.909$), competence ($\alpha = 0.924$), responsiveness ($\alpha = 0.924$), demeanor ($\alpha = 0.929$) and tangibles ($\alpha = 0.897$) indicating good reliability of overall questionnaire items. The Bartlett’s test has ($p < 0.001$) for 28 items, and ($p < 0.001$) for five variables indicating the internal consistency of the data is appropriate. The composite reliability values of resources (0.869), competence (0.898), responsiveness (0.907), demeanor (0.910) and tangibles (0.862) indicated that all the variables are internally consistent and reliable.

The AVE values of resources (0.526), competence (0.638), responsiveness (0.660), demeanor (0.627) and tangibles (0.510) supported the convergent validity among all the variables. The KMO value matrix is 0.971 for 28 items, and 0.878 for five dimensions, which indicated that 552 samples are statistically significant for the factor analysis. Factor analysis was conducted with the varimax rotation where five factors were recovered, which had 74.28% of the variance, and a total of 28 items out of 28 were loading (0.482–0.360) on the factors. The five factors had eigenvalues of greater than one (17.424–6.28), indicating all the independent variables were significant to conduct the study. The items loading of the extracted from variables were shown between 0.671 and 0.761 for six items of resources, between 0.750 and 0.830 for five items of competence, between 0.762 and 0.839 for five items of responsiveness, between 0.768 and 0.809 for six items of demeanor, and between 0.685 and 0.749 for six items of

Table 6.
Dimensional service
quality

Dimensions	MSE	SD	DSE	SD	ASP	SD
Tangibles	4.84	1.34659	5.94	1.14889	5.19	1.27121
Competence	4.74	1.42555	5.86	1.18297	5.14	1.39549
Demeanor	4.78	1.47986	5.84	1.16913	5.14	1.40530
Responsiveness	4.76	1.42599	5.85	1.12486	5.13	1.32055
Resource	4.53	1.37828	5.70	1.11500	4.97	1.27703

tangibles indicating all the items represent the respective dimensions successfully. The commonalities of the variables extracted between 0.579 and 0.859 for 28 items out of 28, indicating the variance in all of the statements is within a suitable range.

The overall service performance (5.11) resided within the zone of tolerance (4.73-5.84), which indicated that the users were satisfied with the service provided by their university libraries. The actual service performance of all items existed within the tolerance zone of the respective items indicating the users were satisfied with the services. Among the 28 services, the top five perceived services were library hours (5.45) availability of library staff to help users (5.34), suitable space (5.29), internal environment (5.24) and ability of library staff to guide users (5.22). On the other hand, the lowest five perceived services were library resources cover field of study (4.82), Digital Institutional Repository (4.85), library automation (4.93), updated library resources (4.93) and informing users regularly the current progress of their library (4.94). Among the five dimensions, the tangible facility got the highest perceived mean (5.19), whereas the resources of the libraries achieved the lowest perceived mean (4.97). The actual service performance of all dimensions existed within the zone of tolerance of the respective dimensions indicating the users were satisfied with the resources of the libraries, competence, responsiveness, demeanor of the library staff and tangible facilities of the libraries. The results and several statistical methods supported the validity of the model, which have several significant implications for both practice and future research. An attempt has been taken to develop and validate the model that will prompt future study to assess the service quality of academic libraries.

Conclusion

Assessing service quality is the most realistic approach to evaluate the success of any libraries, but a few studies have been conducted in the university libraries of Bangladesh. SERVQUAL is now an efficient instrument to measure library service quality around the globe. This study developed and validated a library service quality assessment model using SERVQUAL to promote the service quality assessment in the academic libraries. The model was developed, including 28 statements of five dimensions based on the modified SERVQUAL instrument, incorporating three segments with a seven-point Likert scale. Being Web-based survey protocols, both LibQUAL+ and LibQUAL+ Lite were not included in the model, but seven statements have been incorporated from both instruments related to the five dimensions as per the current perspective of university libraries. It was validated surveying 552 respondents of the ten selected private university libraries in Bangladesh, including teachers, students and researchers. However, staff members and part-time faculty members were not included as they comprise a small proportion of library users. The finding of the study shows that the actual service performance of all items, dimensions and overall (5.11) existed within the zone of tolerance of the respective items, dimensions and overall (4.73–5.84) service quality. The results indicated that the users of the libraries were satisfied with the existing services, and the level of satisfaction was reasonably well. The reliability and validity statistics indicated that the model is valid, which produced an appropriate result. However, the researchers hope that this model will have implications for academic libraries in Bangladesh. Besides, more research would be expected to establish it as a widely accepted model that may produce a realistic picture of the service quality in academic libraries globally.

References

- Afridi, S.A., Khattak, A. and Khan, A. (2016), "Measurement of service quality gap in the selected private universities/institutes of Peshawar using SERVQUAL model", *City University Research Journal*, Vol. 6 No. 1, pp. 61-69.
- Ahmed, S.M.Z. and Shoeb, Z.H. (2009), "Measuring service quality of a public university library in Bangladesh using SERVQUAL", *Performance Measurement and Metrics*, Vol. 10 No. 1, pp. 17-32.
- Alam, M.J. (2017a), "Challenges and remedies for adoption of open source integrated library system in the university libraries of Bangladesh", *International Journal of Ethics in Social Sciences*, Vol. 5 No. 2, pp. 6-30.
- Alam, M.J. (2017b), *Service Quality Assessment of a Private University Library in Bangladesh Using SERVQUAL*, Research Paper, Eastern University, Dhaka.
- Alam, M.J. (2018), "Assessing adoption and satisfaction of open source integrated library systems in the university libraries of Bangladesh", MPhil thesis, Bangladesh University of Professionals, Dhaka.
- Alam, M.J. and Mezbah-Ul-Islam, M. (2019), "Factors for adoption of OSILS in university libraries of Bangladesh", *IFLA Journal*, Vol. 45 No. 2, pp. 127-139.
- Andaleeb, S.S. and Simmonds, P.L. (1998), "Explaining user satisfaction with academic libraries: strategic implications", *College and Research Libraries*, Vol. 59 No. 2, pp. 156-167.
- Asogwa, B.E., Asadu, B.U., Ezema, J.U., Ugwu, C.I. and Ugwuanyi, F.C. (2014), "Use of ServQUAL in the evaluation of service quality of academic libraries in developing countries", *Library Philosophy and Practice (e-Journal)*, Vol. 1146, pp. 1-25.
- Bagozzi, R.P. and Yi, Y. (1988), "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol. 16 No. 1, pp. 74-94.
- Berry, L.L. and Parasuraman, A. (1991), *Marketing Services: Competing through Quality*, The Free Press, New York, NY.
- Coleman, V., Xiao, Y., Bair, L. and Chollett, B. (1997), "Toward a TQM paradigm: using SERVQUAL to measure library service quality", *College and Research Libraries*, Vol. 58 No. 3, pp. 237-249.
- Comrey, A.L. and Lee, H.B. (1992), *A First Course in Factor Analysis*, 2nd ed., Lawrence Erlbaum, Hillsdale, NJ.
- Enayati, T., Modanloo, Y., Behnamfar, R. and Rezaei, A. (2013), "Measuring service quality of Islamic Azad University of Mazandaran using SERVQUAL model", *Iranian Journal of Management Studies (IJMS)*, Vol. 6 No. 1, pp. 99-116.
- Hanaysha, J.R.M., Kumar, D. and Hilman, H. (2012), "Service quality and satisfaction: study on international students in universities of North Malaysia", *International Journal of Research in Management*, Vol. 3 No. 2, pp. 116-133.
- HeryWihardikaGriadhi, M. (2018), "An evaluation on library services using SERVQUAL method", in Abdullah, A.G., Foley, J., Suryaputra, I.G.N.A. and Hellman, A. (Eds), *SHS Web of Conferences*, Vol. 42, pp. 1-7.
- Hoffman, K.D. and Bateson, J.E.G. (2011), *Services Marketing: Concepts, Strategies, and Cases*, 4th ed., Cengage learning, South-Western, Mason, OH.
- Hossain, M.J. (2016), "Determining the key dimensions for evaluating service quality and satisfaction in academic libraries", *International Information and Library Review*, Vol. 48 No. 3, pp. 176-189.
- Hossain, M.J. and Ahmed, S.M.Z. (2013), "Developing a service performance assessment system to improve service quality of academic libraries", *Business Information Review*, Vol. 30 No. 4, pp. 210-221.
- Hossain, M.J. and Ahmed, S.M.Z. (2014), "An investigation of service expectations: developing and validating an alternative scale for service quality assessment in academic libraries", *International Information and Library Review*, Vol. 46 Nos 1/2, pp. 21-30.

- Hossain, M.J. and Islam, A. (2012), "Understanding perceived service quality and satisfaction: a study of Dhaka university library, Bangladesh", *Performance Measurement and Metrics*, Vol. 13 No. 3, pp. 169-182.
- Islam, M. and Habiba, U. (2015), "Using pattern of internet and e-resources by the students and faculty members of a private university in Bangladesh", *American Journal of Educational Research*, Vol. 3 No. 5, pp. 541-546.
- Kaiser, H.F. (1974), "An index of factorial simplicity", *Psychometrika*, Vol. 39 No. 1, pp. 31-36.
- Karim, S. (2018), "Library performance measurement: a study of Dhaka university residential hall libraries, Bangladesh", *Library Philosophy and Practice (e-Journal)*, No. 1831, pp. 1-17.
- Kiran, K. (2010), "Service quality and customer satisfaction in academic libraries: perspectives from a Malaysian university", *Library Review*, Vol. 59 No. 4, pp. 261-273.
- Leonnard, L. (2018), "The performance of SERVQUAL to measure service quality in private university", *Journal on Efficiency and Responsibility in Education and Science*, Vol. 11 No. 1, pp. 16-21.
- Lestari, A.G. and Yudoko, G. (2016), "An analysis of SBM-ITB library service quality: a case study of the undergraduate students' perception and expectation", *Journal of Business and Management*, Vol. 5 No. 2, pp. 247-258.
- Libqual.org (2020), "LibQUAL+®", about LibQUAL+", available at: www.libqual.org/home (accessed 4 June 2020).
- Mezbah-Ul-Islam, M. (2003), "Measuring effectiveness of university libraries: Case study of Bangladesh", Unpublished PhD thesis, North-Eastern Hill University, Shillong.
- Nadiri, M. (1970), "Diagnosing university students zone of tolerance from university library services", *Malaysian Journal of Library and Information Science*, Vol. 15 No. 1, pp. 1-21.
- Nunnally, J.C. (1978), *Psychometric Theory*, 2nd ed., McGraw-Hill, New York, NY.
- Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1985), "A conceptual model of service quality and its implications for future research", *Journal of Marketing*, Vol. 49 No. 4, pp. 41-50.
- Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1988), "Servqual: a multiple-item scale for measuring consumer perceptions of service quality", *Journal of Retailing*, Vol. 64 No. 1, pp. 12-40.
- Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1994), "Alternative scales for measuring service quality: a comparative assessment based on psychometric and diagnostic criteria", *Journal of Retailing*, Vol. 70 No. 3, pp. 201-230.
- Partap, B. (2019), "A review of service quality assessment of library and information centres", *Library Philosophy and Practice (e-Journal)*, Vol. 2333, pp. 1-17.
- Roscoe, J.T. (1975), *Fundamental Research Statistics for the Behavioural Sciences*, 2nd ed., Holt, Rinehart and Winston, New York, NY.
- Roy, M.C. and Bouchard, L. (1999), "Developing and evaluating methods for user satisfaction measurement in practice", *Journal of Information Technology Management*, Vol. 10 Nos 3/4, pp. 49-58.
- Sahu, A.K. (2007), "Measuring service quality in an academic library: an Indian case study", *Library Review*, Vol. 56 No. 3, pp. 234-243.
- Schierholz, R. and Laukkanen, T. (2007), "Internet vs mobile banking: comparing customer value perceptions", *Business Process Management Journal*, Vol. 13 No. 6, pp. 788-797.
- Sekaran, U. (2003), *Research Methods for Business: A Skill-Building Approach*, 4th ed., John Wiley and Sons, New York, NY.
- Shoeb, Z.H. (2010), "Perceptions of library services by gender: a study in Bangladesh", *Libri*, Vol. 60 No. 4, pp. 331-338.
- Shoeb, Z.H. (2011), "Identifying service superiority, zone of tolerance and underlying dimensions: service quality attributes in a private university library in Bangladesh", *Library Review*, Vol. 60 No. 4, pp. 293-311.

- Shoeb, Z.H. and Ahmed, S.M.Z. (2009), "Individual differences in service quality assessment: a study of a private university library system in Bangladesh", *Performance Measurement and Metrics*, Vol. 10 No. 3, pp. 193-211.
- Trivedi, D. and Bhatt, A. (2019), "Quest for quality: assessment of service quality of special academic institution library: case study", *Performance Measurement and Metrics*, Vol. 21 No. 1, pp. 1-17.
- UGC (2020), "University grants commission", available at: www.ugc-universities.gov.bd/home/university/public/120 (accessed 29 March 2020).
- Wang, I.M. and Shieh, C.J. (2006), "The relationship between service quality and customer satisfaction: the example of CJCUI library", *Journal of Information and Optimization Sciences*, Vol. 27 No. 1, pp. 193-209.

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