



Effects of service quality on satisfaction in Eastern University Library, Bangladesh

International Federation of Library Associations and Institutions
2021, Vol. 47(2) 209–222
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DOI: 10.1177/0340035220959099
journals.sagepub.com/home/iff



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Abstract

This study evaluated the effects of SERVQUAL dimensions on user satisfaction at Eastern University Library, Bangladesh. A modified SERVQUAL instrument was adapted to the local arrangements and included 30 statements under five dimensions with a seven-point Likert scale for evaluating the effects of library service quality on user satisfaction. A survey was conducted among 51 teachers and 163 undergraduate and 38 postgraduate students. The effects of five SERVQUAL dimensions were computed through multiple regression analysis, where the five dimensions were used as independent variables and user satisfaction was used as the dependent variable. The regression model was established as significant ($p < 0.001$) and explained the 56.9% variation in user satisfaction. The results recommended that tangible facilities ($p < 0.001$), staff responsiveness ($p < 0.001$) and the resources ($p < 0.004$) of the library significantly influenced user satisfaction. Several statistical methods supported the reliability and validity of the model, which will prompt further research on service quality and its impact on user satisfaction in academic libraries.

Keywords

Effects, service quality, user satisfaction, SERVQUAL, academic library, Bangladesh

Submitted: 24 March 2020; Accepted: 21 August 2020.

Introduction

Academic libraries are service-oriented institutions which are established for the provision of appropriate resources and quality services to meet the academic needs of their user community. The effectiveness of a university library generally refers to the library's collections, staff performance, services and facilities (Mezbah-ul-Islam, 2003). Currently, university libraries are becoming more user-focused due to information availability, rising costs, competitive pressures and increasing awareness of their users (Andaleeb and Simmonds, 1998). Globally, academic libraries are moving from manual to automated systems due to the effect of information and communications technologies (ICTs) and the changing needs of their users (Partap, 2019). Most of the university libraries in Bangladesh are trying to enhance their tools and techniques to assist research, teaching and learning, as well as adjust the methods of sharing and providing information for their users through technology-driven services (Alam, 2017a; Alam and

Mezbah-ul-Islam, 2019; Islam and Habiba, 2015). To develop and maintain state-of-the-art library services, it is essential to assess the quality of the existing services, as well as evaluate what importance is given by users to the dimensions of service quality in the changing information environment. Many researchers have agreed that assessing service quality based on user responses is the easiest and most useful approach to determine the success of academic libraries (Alam, 2018).

Quality is a degree of excellence in the resources and services provided to users where users can get the maximum satisfaction and feel delighted (Partap, 2019). Service quality is an attitude formed over the long term regarding the overall evaluation of the

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performance of a firm (Hoffman and Bateson, 2011). Library service quality is defined for this study as the difference between user expectations and perceptions of the service performance of the library (Sahu, 2007). User satisfaction can be defined as the level of quality service performance that achieves the user's expectations (Afthanorhan et al., 2019; Hoffman and Bateson, 2011). The effect is defined as the significant influence or impact of service quality on user satisfaction in the library (Poll, 2003). Researchers (Choshaly and Mirabolghasemi, 2019; Sumaedi et al., 2011; Wang and Shieh, 2006) have discussed the relationship between service quality and user satisfaction from different perspectives and agree that service quality has a positive effect on user satisfaction.

Over the years, diverse research has focused on developing tools and techniques for the assessment of service quality (Roy and Bouchard, 1999). Developed by Parasuraman et al. in 1985, SERVQUAL was initially an approach for assessing the service quality of various business sectors. It has since been radically shifted to the quality assessment of all service sectors, including libraries. Now, SERVQUAL is the most useful service quality assessment tool, and it is used to measure service quality in various library settings, including public, academic and specialist libraries globally (Alam, 2017b; Hossain and Islam, 2012). Similar tools like LibQUAL+, LibQUAL+ Lite and SERVPERF were considered for the assessment of library service quality, but they emphasize making e-resources accessible from home or on campus, which is not suitable from the perspective of academic libraries in Bangladesh (Ahmed and Shoeb, 2009; Mezbah-ul-Islam, 2003). There are 105 private, 46 public and three international universities in Bangladesh (University Grants Commission, 2020). Established in 2003, Eastern University is one of the fastest growing private universities in Bangladesh. Currently, the number of teachers is about 115 and 3782 students are pursuing their studies in undergraduate and postgraduate programmes within four faculties. Eastern University Library was established in 2003 along with the university and it can seat 164 readers. The library has been automated and digitized using Drupal, KOHA and DSpace software. The library has about 18,450 books, 1682 journals, 568 theses and internship reports, 892 audiovisual materials and 542 institutional publications. Access and download facilities for about 36,500 online journals and 16,000 e-books are available. The library provides remote access to its subscription online journals and e-books through MyAthens. Its opening hours are from 9 a.m. to 9 p.m. throughout the week (Eastern University, 2020). The main aim of this study is to

evaluate the effects of service quality on user satisfaction at Eastern University Library.

Literature review

Assessing service quality is necessary for the progress of university libraries; it helps to retain existing users and attract new ones in the current competitive service environment (Moreira et al., 2009). Library professionals should be aware of users' expectations in the provision of quality services (Shoeb, 2011). User opinions are considered as a reliable factor in evaluating library service quality. SERVQUAL is the most useful service quality assessment tool, and it is being used in various library settings, especially university libraries, globally (Hossain and Islam, 2012). Initially, Parasuraman et al. (1985: 48) outlined 10 dimensions of service quality in SERVQUAL: 'access, communication, competence, courtesy, credibility, reliability, responsiveness, security, tangibles, and understanding/knowing the customer'. They then merged these 10 components into five dimensions (the first three are original components and the last two are combined) capturing all of the facets of the 10 initially conceptualized dimensions. These five dimensions are:

1. Tangibles – 'Physical facilities, equipment, and appearance of personnel';
2. Reliability – 'Ability to perform the promised service dependably and accurately';
3. Responsiveness – 'Willingness to help customers and provide prompt service';
4. Assurance – 'Knowledge and courtesy of employees and their ability to inspire trust and confidence';
5. Empathy – 'Caring, individualized attention the firm provides its customers' (Parasuraman et al., 1988: 23).

Wang and Shieh (2006) conducted a regression analysis to evaluate the relationship between service quality and customer satisfaction at Chang Jung Christian University Library, Taiwan, where tangibles, reliability, responsiveness, assurance and empathy were used as independent variables, and user satisfaction was applied as the dependent variable. Similarly, Suki and Suki (2013) applied tangibles, reliability, responsiveness, assurance and empathy as independent variables, and used user satisfaction as the dependent variable, to assess service quality versus customer satisfaction from the perspectives of visitors to a public university library in Malaysia. Andaleeb and Simmonds (1998) effectively covered the full services of university libraries by combining

the two dimensions of ‘assurance’ and ‘empathy’ into a single dimension, ‘demeanour’, and including an extra ‘resources’ dimension with the original SERVQUAL dimensions. The modified SERVQUAL dimensions of Andaleeb and Simmonds (1998: 163) are: ‘demeanor, competence, resources, responsiveness, and tangibles’. They conducted a multiple regression analysis where user satisfaction was applied as a dependent variable, and the five dimensions of SERVQUAL were applied as the independent variables, to explain user satisfaction at three academic libraries in Erie and Pennsylvania. Simmonds and Andaleeb (2001) applied resources, competence, responsiveness, demeanor, tangibles, familiarity and gender as independent variables, and used user satisfaction as the dependent variable, to assess the role of service quality, resources and user characteristics in three academic libraries in the USA.

In Bangladesh, Shoeb and Ahmed (2009: 197) carried out a study of the individual differences in the service quality of a private university library. They modified the SERVQUAL instrument, focusing on 30 statements in seven dimensions: ‘assurance, collections and access, empathy, library as place, reliability, responsiveness, and tangibles’. They adequately covered the entire services of the university library with the inclusion of an additional two dimensions – ‘collections and access’ and ‘library as place’ – with the SERVQUAL dimensions of Parasuraman et al. (1988). Ahmed and Shoeb (2009) similarly focused on 30 statements in these seven dimensions using a seven-point Likert scale to measure service quality in the central library of the University of Dhaka. Different researchers (Alam, 2017b; Hossain, 2016; Hossain and Ahmed, 2013, 2014; Hossain and Islam, 2012; Karim, 2018; Shoeb, 2010, 2011) have used the five modified SERVQUAL dimensions – that is, resources, responsiveness, competence, demeanor and tangibles – of Andaleeb and Simmonds (1998) in several empirical studies conducted in different university libraries in Bangladesh. Most of the studies in Bangladesh (Alam, 2017b; Hossain, 2016; Hossain and Ahmed, 2013, 2014; Hossain and Islam, 2012; Karim, 2018; Shoeb, 2010, 2011) asked the respondents to appraise each statement of the SERVQUAL questionnaire from ‘1: lowest’ to ‘7: highest’ on a seven-point scale.

Based on the available literature, studies have been undertaken using SERVQUAL in Bangladeshi university libraries on individual differences in service quality (Shoeb and Ahmed, 2009); measuring service quality (Ahmed and Shoeb, 2009); gender perceptions of library service quality (Shoeb, 2010); identifying service superiority, underlying dimensions and tolerance zones (Shoeb, 2011); perceived service quality

and user satisfaction (Hossain and Islam, 2012); developing a service performance assessment system for academic libraries (Hossain and Ahmed, 2013); developing and validating a service quality assessment scale to investigate service expectations (Hossain and Ahmed, 2014); identifying the major dimensions to evaluate service quality and user satisfaction (Hossain, 2016); assessing the perceived service quality of Eastern University Library (Alam, 2017b); and measuring the performance of 17 residential hall libraries at the University of Dhaka (Karim, 2018). However, very few efforts have been made to assess the effects of service quality on user satisfaction in university libraries in Bangladesh. A conceptual framework is suitable for evaluating the effects of service quality on user satisfaction, where the five dimensions of SERVQUAL are the independent variables and overall user satisfaction is the dependent variable. Using such a model, it is anticipated that the effects of library service quality on user satisfaction at Eastern University can be evaluated.

Objective of the study

The application of ICTs in libraries, changing information environment, availability of electronic resources, and increasing awareness of users have left library professionals confused that they can meet their user needs or not. In order to ensure the library services that are expected by users, it is necessary to assess the quality of existing services periodically regarding the available collections, staff performance, services and facilities (Andaleeb and Simmonds, 1998; Mezbah-ul-Islam, 2003). Assessing service quality is the most useful and easiest approach for evaluating the success of the existing services of a university library (Alam, 2017b). SERVQUAL is widely used to assess service quality in various library settings, especially university libraries, around the world. The literature review revealed that there has been a moderate amount of discussion on measuring library service quality using SERVQUAL, but insufficient research on evaluating the effects of service quality on user satisfaction in university libraries in Bangladesh. The objective of this study is to evaluate the effects of service quality on user satisfaction in Eastern University Library from users’ viewpoints.

Hypotheses

The question is raised here as to which dimensions of SERVQUAL have significant effects on user satisfaction in a university library. Based on the objective of the study and this research question, the following five hypotheses have been formulated:

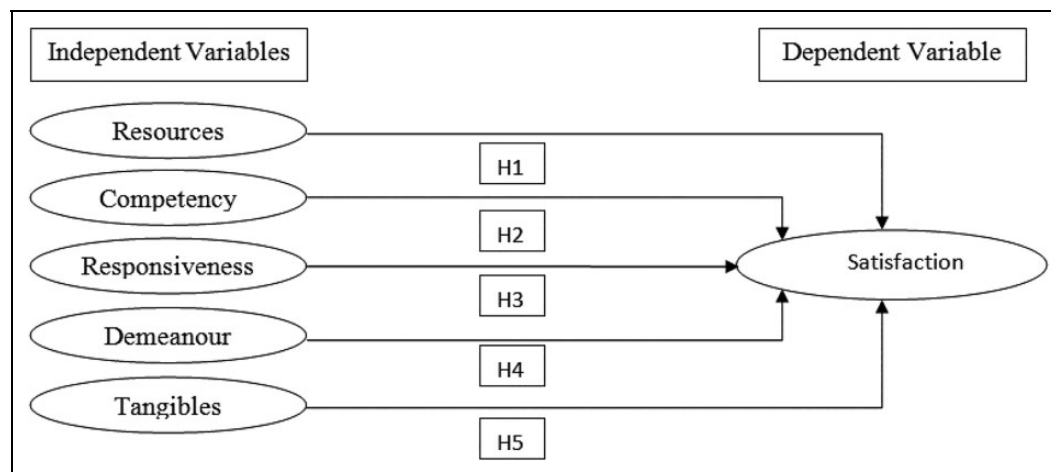


Figure 1. Conceptual framework.

H1. The higher the perceived quality of the resources of a library, the greater the level of user satisfaction;

H2. The greater the perceived competence of library staff, the greater the level of user satisfaction;

H3. The greater the responsiveness of library staff, the greater the level of user satisfaction;

H4. The greater the positive demeanour of library staff, the greater the level of user satisfaction;

H5. The better the perceived tangible facilities of the library, the greater the level of user satisfaction.

Methodology

Research design

A quantitative method was used to evaluate the effects of service quality on user satisfaction at Eastern University Library and to test the five hypotheses. An attempt was made to collect both primary and secondary data. Initially, some secondary sources were reviewed to determine what had already been written about library service quality and its effects. For the primary data, the study conducted a questionnaire-based sample survey. A conceptual framework was developed to conduct multiple regression analysis to evaluate the effects of service quality on user satisfaction, where five dimensions were used as independent variables and user satisfaction was applied as the dependent variable (see Figure 1). Several statistical methods were applied to evaluate the reliability and validity of the study.

Questionnaire design

A structured questionnaire was designed for the study which included three elements: demographic information, 30 statements in five dimensions of service

quality, and four statements of user satisfaction. Andaleeb and Simmonds' (1998) SERVQUAL instrument was modified, focusing on 30 statements in five dimensions:

1. Resources – all of the available library resources and their ease of access;
2. Competency – 'Ability to perform the promised service dependably and accurately';
3. Responsiveness – 'Willingness to help users and provide prompt service';
4. Demeanour – courtesy and knowledge of library staff and their ability to provide individual attention to users;
5. Tangibles – 'The appearance of physical facilities, personnel, equipment, and communication materials' (Andaleeb and Simmonds, 1998: 163).

In addition, four statements were incorporated into the survey to assess the overall user satisfaction. A seven-point agreement scale was used from 1 = 'Strongly disagree' to 7 = 'Strongly agree'. A seven-point satisfaction scale was also used from 1 = 'Highly dissatisfied' to 7 = 'Highly satisfied'.

Population, sample and data collection

The population for this study consisted of teachers, undergraduate students and postgraduate students at Eastern University. A simple random sampling method was applied to collect data from existing users of the library. In order to make the study more representative, approximately 6.47% of the total population was taken as a sample, according to the percent rule-of-thumb of 5% (Burns and Bush, 2007). A total of 330 questionnaires were delivered to 265 students and 65 teachers at the university. From these, 273

Table 1. Reliability statistics.

| Dimensions | Cronbach's alpha | Composite reliability | Bartlett's Test of Sphericity | Number of items |
|----------------|------------------|-----------------------|-------------------------------|-----------------|
| Resources | 0.835 | 0.875 | 0.001 | 7 |
| Competency | 0.891 | 0.920 | 0.001 | 5 |
| Responsiveness | 0.914 | 0.935 | 0.001 | 5 |
| Demeanour | 0.871 | 0.909 | 0.001 | 5 |
| Tangibles | 0.839 | 0.877 | 0.001 | 8 |
| Satisfaction | 0.876 | 0.916 | 0.001 | 4 |

(82.73%) questionnaires were returned. A total of 261 (76.36%) questionnaires were completed fully. After conducting a Mahalanobis distance test, nine responses were deleted based on a Mahalanobis distance from 25.98 to 33.46. Finally, 252 (76.36%) questionnaires from 51 teachers, 163 undergraduate students and 38 postgraduate students were considered for analysis based on a Mahalanobis distance from 0.25 to 21.78. To determine sample size, Roscoe (1975) proposes that where samples are to be broken into subsamples, a minimum sample size of 30 is essential for each subsample. So, a sample size of 252, including 51 teachers, 163 undergraduate students and 38 postgraduate students, is suitable for conducting the study, which has fulfilled the criteria set out by Burns and Bush (2007) as well as Roscoe (1975).

Data assessment methods

The 22nd version of SPSS was applied to compute the descriptive statistics, multiple regression analysis, reliability and validity statistics. The descriptive statistics assessed the overall service quality and user satisfaction. The multiple regression analysis evaluated the effects of service quality on user satisfaction by testing the hypotheses. Bartlett's Test of Sphericity, composite reliability and Cronbach's alpha measured the reliability. Moreover, factor analysis, item loading, commonalities, discriminating validity, average variance extracted (AVE), a histogram, a normal probability plot, a Kaiser-Meyer-Olkin (KMO) test and variance inflation factor (VIF) values measured the validity of the study.

Reliability

Cronbach's alpha. Nunnally (1978: 245) suggests that 'alpha values should be 0.70 or greater'. Table 1 shows that the internal consistency of the 30 statements of service quality ($\alpha = 0.950$), the five variables ($\alpha = 0.901$), all the items ($\alpha = 0.931$), the seven statements of resources ($\alpha = 0.835$), the five statements of competency ($\alpha = 0.891$), the five statements of

responsiveness ($\alpha = 0.914$), the five statements of demeanour ($\alpha = 0.871$), the eight statements of tangibles ($\alpha = 0.839$), and the four statements of satisfaction ($\alpha = 0.876$) of the study was very satisfactory, indicating the good reliability overall of the questionnaire items.

Composite reliability. The composite reliability values of resources (0.875), competency (0.920), responsiveness (0.935), demeanour (0.909), tangibles (0.877) and satisfaction (0.916) were higher than the threshold of 0.77 (Bagozzi and Yi, 1988), indicating that all the variables are internally consistent and reliable (Table 1).

Bartlett's Test of Sphericity. Schierholz and Laukkanen (2007) recommend that the value of Bartlett's Test of Sphericity 'should be 0.05 or less'. Table 1 shows that the Bartlett's Test of Sphericity has $p < 0.001$ for the 30 statements of service quality; $p < 0.001$ for the seven statements of resources; $p < 0.001$ for the five statements of competency; $p < 0.001$ for the five statements of responsiveness; $p < 0.001$ for the five statements of demeanour; $p < 0.001$ for the eight statements of tangibles; $p < 0.001$ for the four statements of satisfaction; and $p < 0.001$ for the six variables – indicating that the internal consistency of the data is appropriate.

Validity

Factor analysis. Factor analysis was conducted with the principal components, where six factors were recovered which had 66% of the variance and all of the items (31.368–0.306) were loading on the factors. In factor analysis, 'only factors having latent roots [eigenvalues] greater than one are considered significant' (Andaleeb and Simmonds, 1998: 162). The six factors (19.279–4.352) had an eigenvalue of greater than one, indicating that the five independent variables were significant to conduct the study (Table 2).

Item loading. The criteria for item loading are '0.32 = poor; 0.45 = fair; 0.55 = good; 0.63 = very good or

Table 2. Validity statistics.

| Dimensions | Items | Loading factors | Communalities | Eigenvalue | Variance (%) | Cumulative (%) | AVE | KMO | VIF |
|----------------|-------|-----------------|---------------|------------|--------------|----------------|-------|-------|-------|
| Resources | R1 | 0.781 | 0.745 | 19.279 | 25.631 | 25.631 | 0.502 | 0.822 | 1.828 |
| | R2 | 0.705 | 0.630 | | | | | | |
| | R3 | 0.772 | 0.781 | | | | | | |
| | R4 | 0.697 | 0.500 | | | | | | |
| | R5 | 0.702 | 0.707 | | | | | | |
| | R6 | 0.681 | 0.511 | | | | | | |
| | R7 | 0.606 | 0.589 | | | | | | |
| Competency | C8 | 0.821 | 0.625 | 8.255 | 10.975 | 36.606 | 0.698 | 0.859 | 3.479 |
| | C9 | 0.845 | 0.632 | | | | | | |
| | C10 | 0.840 | 0.602 | | | | | | |
| | C11 | 0.837 | 0.662 | | | | | | |
| | C12 | 0.835 | 0.688 | | | | | | |
| Responsiveness | RP13 | 0.860 | 0.721 | 6.405 | 8.515 | 45.120 | 0.744 | 0.888 | 3.927 |
| | RP14 | 0.880 | 0.742 | | | | | | |
| | RP15 | 0.894 | 0.707 | | | | | | |
| | RP16 | 0.833 | 0.703 | | | | | | |
| | RP17 | 0.843 | 0.651 | | | | | | |
| Demeanour | D18 | 0.799 | 0.654 | 6.243 | 8.299 | 53.420 | 0.667 | 0.839 | 3.885 |
| | D19 | 0.860 | 0.673 | | | | | | |
| | D20 | 0.861 | 0.747 | | | | | | |
| | D21 | 0.815 | 0.602 | | | | | | |
| | D22 | 0.741 | 0.746 | | | | | | |
| Tangibles | T23 | 0.541 | 0.357 | 5.111 | 6.795 | 60.215 | 0.474 | 0.823 | 1.694 |
| | T24 | 0.669 | 0.687 | | | | | | |
| | T25 | 0.682 | 0.785 | | | | | | |
| | T26 | 0.759 | 0.649 | | | | | | |
| | T27 | 0.678 | 0.580 | | | | | | |
| | T28 | 0.729 | 0.652 | | | | | | |
| | T29 | 0.732 | 0.696 | | | | | | |
| | T30 | 0.697 | 0.572 | | | | | | |
| Satisfaction | S31 | 0.879 | 0.741 | 4.352 | 5.785 | 66.000 | 0.731 | 0.779 | N/A |
| | S32 | 0.851 | 0.693 | | | | | | |
| | S33 | 0.851 | 0.624 | | | | | | |
| | S34 | 0.839 | 0.672 | | | | | | |

0.71 = excellent' (Comrey and Lee, 1992). The item loading of the extracted variables was shown to be between 0.606 and 0.781 for the seven statements of resources; between 0.821 and 0.845 for the five statements of competency; between 0.833 and 0.894 for the five statements of responsiveness; between 0.741 and 0.861 for the five statements of demeanour; between 0.541 and 0.759 for the eight statements of tangibles; and between 0.839 and 0.879 for the four statements of satisfaction – suggesting that all the items represent their respective dimensions of service quality and user satisfaction successfully (Table 2).

Commonalities. Enshassi et al. (2019: 66) suggest that all commonality values of an entirely sufficient sample 'should have equal or more than 0.5'. The commonalities of the variables were between 0.500 and

0.785 for 33 of the 34 statements, indicating the variance in most of the statements is within a suitable range (Table 2).

Discriminating validity. A discriminating validity is achieved if the 'correlation between one scale and another is not as high as each scale's coefficient alpha' (Andaleeb and Simmonds, 1998: 161; see also Fornell and Larcker, 1981). The alpha coefficient of each factor (0.946–0.950) was as high as the correlation between one factor and another (0.306–0.781), which supports the discriminating validity of the model.

Convergent validity. Table 2 shows that the AVE values of resources (0.502), competency (0.698), responsiveness (0.744), demeanour (0.667), tangibles (0.474) and satisfaction (0.731) were greater than the limit of 0.50

Table 3. Demographic information of the respondents.

| Variables | Classification | Frequency | Valid % | Cumulative % |
|-----------|----------------------------|-----------|---------|--------------|
| User type | Undergraduate student | 163 | 64.7 | 64.7 |
| | Teacher | 51 | 20.2 | 84.9 |
| | Postgraduate student | 38 | 15.1 | 100.0 |
| Gender | Male | 156 | 61.9 | 61.9 |
| | Female | 96 | 38.1 | 100.0 |
| Faculty | Business Administration | 93 | 36.9 | 36.9 |
| | Law | 70 | 27.8 | 64.7 |
| | Engineering and Technology | 45 | 17.9 | 82.6 |
| | Arts | 44 | 17.4 | 100.0 |
| Age | < 20 | 21 | 8.3 | 8.3 |
| | 20–29 | 179 | 71.0 | 79.3 |
| | 30–39 | 32 | 12.7 | 92.0 |
| | 40–49 | 12 | 4.8 | 96.8 |
| | 50+ | 8 | 3.2 | 100.0 |

recommended by Bagozzi and Yi (1988), which supports the convergent validity among all the variables.

KMO value. The criteria for the KMO value are ‘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: 34). The KMO value matrix is 0.822 for the seven statements of resources; 0.859 for the five statements of competency; 0.888 for the five statements of responsiveness; 0.839 for the five statements of demeanour; 0.823 for the eight statements of responsiveness; 0.779 for the four statements of satisfaction; and 0.860 for the six dimensions – meaning that the 252 samples are statistically significant for conducting factor analysis (Table 2).

VIF value. It is necessary to test multicollinearity after the normality of the data in a regression model has been established. In a good regression model, there should be no multicollinearity and no correlation between the independent variables. According to SPSS Tests (2020), if the ‘VIF value lies between 1 and 10, then there is no multicollinearity’. The VIF values of the coefficients’ output in the collinearity statistics are 1.828 for resources, 3.479 for competency, 3.927 for responsiveness, 3.885 for demeanour and 1.694 for tangibles, indicating that there are no multicollinearity symptoms (Table 2).

Findings

Demographic information

The findings show that among the 252 respondents, 163 (64.7%) were undergraduate students, 51 (20.2%) were teachers and 38 (15.1%) were postgraduate

students. Among the respondents, 156 (61.9%) were male and 96 (38.1%) were female. The majority of the respondents were from the Faculty of Business Administration (93, 36.9%), followed by the Faculty of Law (70, 27.8%), Faculty of Engineering and Technology (45, 17.9%) and the Faculty of Arts (44, 17.5%). Among the respondents, 21 (8.3%) were aged under 20, 179 (71.0%) were in the 20–29 age group, 32 (12.7%) were in the 30–39 age group, 12 (4.8%) were in the 40–49 age group and 8 (3.2%) were aged 50+ (Table 3). The demographic information indicates that a broad cross section of the population responded.

Overall perceived service quality

Table 4 illustrates that the overall mean of the perceived service quality was 5.22. Among the 30 statements of the five dimensions of service quality, ‘suitable and convenient library hours’ had the highest mean with 5.83, followed by ‘library staff are always available in the library to help users’ with 5.54; ‘library staff provide services as promised’ with 5.52; ‘auto email alert service is interesting’ with 5.50; and ‘online book reservation system saves time’ with 5.50. On the other hand, the service statement ‘existing collections adequately cover your field of study’ had the lowest mean with 4.44, followed by ‘convenient remote access to subscribed e-resources through MyAthens’ with 4.57; ‘digital institutional repository is rich and dynamic’ with 4.68; ‘existing collections adequately fulfil your information need’ with 4.69; and both ‘e-resources are easily accessible from personal computer’ and ‘collections are conveniently accessible’ with 4.94. Among the five dimensions of SERVQUAL, the highest overall performance was 5.41 for tangibles, followed by 5.40 for competency, 5.31 for

Table 4. Overall perceived service quality.

| Dimensions | Statements | Mean | Standard deviation |
|----------------------|---|------|--------------------|
| T23: Tangibles | Suitable and convenient library hours | 5.83 | 1.477 |
| C10: Competency | Library staff are always available in the library to help users | 5.54 | 1.518 |
| C8: Competency | Library staff provide services as promised | 5.52 | 1.404 |
| T27: Tangibles | Auto email alert service is interesting | 5.50 | 1.438 |
| T28: Tangibles | Online book reservation system saves time | 5.50 | 1.468 |
| RP15: Responsiveness | Prompt and timely service to users | 5.42 | 1.517 |
| T30: Tangibles | Library website contains necessary information | 5.41 | 1.441 |
| D18: Demeanour | Library staff are always courteous, showing friendly behaviour | 5.40 | 1.505 |
| T29: Tangibles | Self-renewal service online is easy to use | 5.40 | 1.536 |
| C9: Competency | Library staff are knowledgeable in answering user queries | 5.38 | 1.519 |
| D20: Demeanour | Library staff deal with users in a considerate manner | 5.38 | 1.388 |
| C12: Competency | Users feel relaxed when interacting with library staff | 5.33 | 1.551 |
| RP16: Responsiveness | Readiness to respond to users' questions | 5.33 | 1.438 |
| T26: Tangibles | Library is fully automated and in good condition | 5.32 | 1.498 |
| D21: Demeanour | Library staff understand the needs of users | 5.31 | 1.518 |
| RP14: Responsiveness | Giving priority to users' interests | 5.31 | 1.494 |
| R7: Resources | Online catalogue is easy to understand | 5.27 | 1.460 |
| RP13: Responsiveness | Library staff have willingness to help users | 5.27 | 1.572 |
| C11: Competency | Providing services accurately with minimum interruption | 5.24 | 1.388 |
| RP17: Responsiveness | Having sincerity in handling users' problems | 5.22 | 1.519 |
| D19: Demeanour | Library staff are giving individual attention to users | 5.17 | 1.522 |
| T25: Tangibles | Appropriate study environment | 5.17 | 1.561 |
| T24: Tangibles | Having suitable space that encourages study and research | 5.13 | 1.562 |
| D22: Demeanour | Users can complain and make suggestions easily | 5.06 | 1.659 |
| R2: Resources | Collections are conveniently accessible | 4.94 | 1.490 |
| R5: Resources | E-resources are easily accessible from personal computer | 4.94 | 1.484 |
| R3: Resources | Existing collections adequately fulfil your information needs | 4.69 | 1.611 |
| R4: Resources | Digital institutional repository is rich and dynamic | 4.68 | 1.346 |
| R6: Resources | Convenient remote access to subscribed e-resources through MyAthens | 4.57 | 1.420 |
| R1: Resources | Existing collections adequately cover your field of study | 4.44 | 1.600 |
| Overall | | 5.22 | 0.954 |

responsiveness and 5.27 for demeanour. Consequently, resources, with 4.79, had the lowest overall score.

Overall user satisfaction

The overall satisfaction score was 5.53 on a seven-point scale, indicating that the library users are satisfied with the services provided by the library. Among the four statements of satisfaction, 'I would like to use the library in the future' had the highest mean of 5.85, while the service statement 'Overall, I am satisfied with my library experience' had the lowest with 5.28 (Table 5).

Overall perceived service quality and user satisfaction by user category

Table 6 shows the overall perceived service quality and user satisfaction by user category for the university library. The highest overall mean for perceived service

quality was 5.34 for the teachers, followed by 5.20 for the undergraduate students and 5.17 for the postgraduate students. It was also found that the teachers (5.63) were comparatively most satisfied with the services provided by their university library, followed by the postgraduate students (5.51) and undergraduate students (5.50). An analysis of variance (ANOVA) test showed that there was no significant difference in the overall perceived service quality ($p > 0.591$) and user satisfaction ($p > 0.781$) among the teachers, undergraduate students and postgraduate students, indicating that the respondents were similarly satisfied with the services provided by the library.

Effects of library service quality through multiple regression analysis

To evaluate the effects of library service quality, a multiple regression analysis was carried out with the

Table 5. Overall user satisfaction.

| Dimensions | Statements | Mean | Standard deviation |
|-------------------|---|------|--------------------|
| S31: Satisfaction | Overall, I am satisfied with my library experience | 5.28 | 1.407 |
| S32: Satisfaction | I would like to use the library in the future | 5.85 | 1.300 |
| S33: Satisfaction | I would like to tell others about the services of the library | 5.65 | 1.441 |
| S34: Satisfaction | Considering it is a university library, the quality of service is excellent | 5.32 | 1.454 |
| Overall | | 5.53 | 1.197 |

Table 6. Overall perceived service quality and user satisfaction by user category.

| User category | n | Service quality | | | User satisfaction | | |
|------------------------|-----|-----------------|--------------------|------------------|-------------------|--------------------|------------------|
| | | Mean | Standard deviation | ANOVA | Mean | Standard deviation | ANOVA |
| Teachers | 51 | 5.34 | 0.92 | <i>p</i> > 0.591 | 5.63 | 1.05 | <i>p</i> > 0.781 |
| Undergraduate students | 163 | 5.20 | 0.91 | | 5.50 | 1.18 | |
| Postgraduate students | 38 | 5.17 | 1.19 | | 5.51 | 1.44 | |
| Total | 252 | 5.22 | 0.95 | | 5.53 | 1.20 | |

Table 7. Model summary of library service quality.

| Model | R | R ² | Adjusted R ² | Standard error of the estimate | Change statistics | | | | |
|-------|--------------------|----------------|-------------------------|--------------------------------|-----------------------|----------|-----|-----|----------------------|
| | | | | | R ² change | F change | df1 | df2 | Significant F change |
| 1 | 0.760 ^a | 0.577 | 0.569 | 0.78627 | 0.577 | 67.226 | 5 | 246 | 0.000 |

^aPredictors (constant): tangibles, competency, resources, demeanour, responsiveness.

^bDependent variable: satisfaction.

Table 8. ANOVA of the regression model.

| Model | | Sum of squares | df | Mean square | F | Significance |
|-------|------------|----------------|-----|-------------|--------|--------------------|
| 1 | Regression | 207.801 | 5 | 41.560 | 67.226 | 0.000 ^b |
| | Residual | 152.081 | 246 | 0.618 | | |
| | Total | 359.882 | 251 | | | |

^aDependent variable: satisfaction.

^bPredictors (constant): tangibles, competency, resources, demeanour, responsiveness.

five dimensions of SERVQUAL as the independent variables to test the model and user satisfaction as the dependent variable. The overall *F*-statistic – *F*(5,246 = 67.226, *p* < 0.001) – recommended that the entire model was recognized as significant. The adjusted *R*² value (0.569) indicated that the regression model explained the 56.9% variation in user satisfaction. Many scholars use the criteria of Cohen et al. (2003) – ‘less than .01 = trivial; .01 up to .30 = weak; .30 up to .50 = moderately strong; .50 or greater = strong’ – to identify whether the relationship between independent and dependent variables is weak or strong (Alam and Mezbah-ul-Islam, 2019: 132). The Multiple *R* value (0.760) indicates that the

relationship in this study was recognized as strong when applying Cohen et al.’s (2003) criteria (Table 7).

The residual sum of squares in a regression model effectively explains the variation of modelling errors. Generally, a model with a ‘large regression sum of squares in comparison to the residual sum of squares indicates the model accounts for most of the variation in the dependent variable’ (Pasha, 2009: 46). The model has a large regression sum of squares (207.801) in comparison to the residual sum of squares (152.081), indicating that the model measured most of the variation in the dependent variable (Table 8).

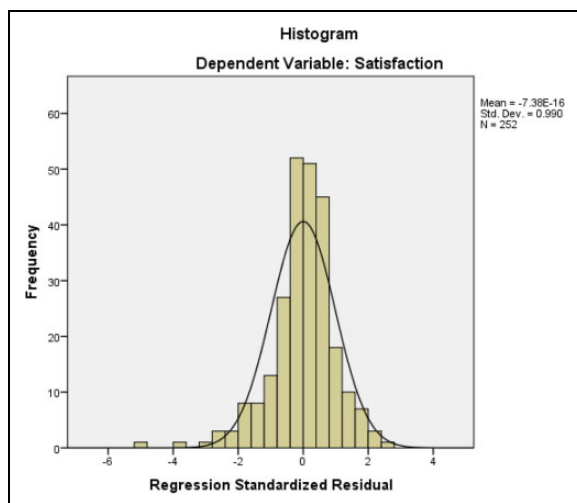


Figure 2. Visual identification of the shape of normal distribution.

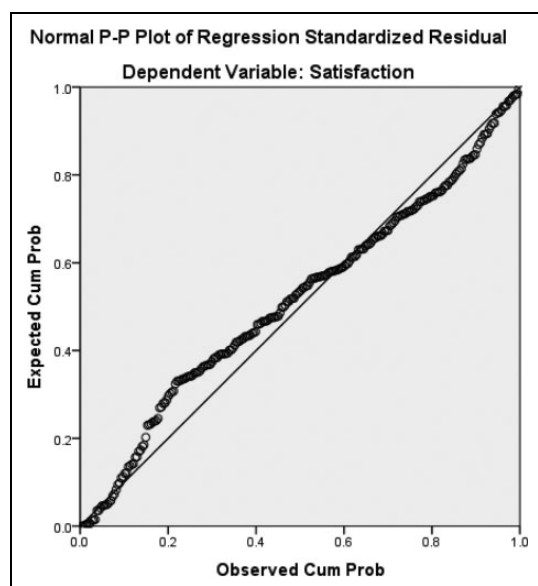


Figure 3. Normal probability plot of the standardized regression residual.

Figure 2 shows a histogram and Figure 3 a normal probability plot, which indicate that the dependent variable is usually distributed and there is no deviation from the assumptions. The residual statistics suggest that the model is rationally confident and that there would be no restrictions in using the model.

Table 9 shows that three of the five dimensions had a significant effect on user satisfaction: responsiveness ($b = 0.303, p < 0.001$), tangibles ($b = 0.448, p < 0.001$) and resources ($b = 0.163, p < 0.004$). The other two factors – competence ($b = -0.078, p > 0.327$) and demeanour (assurance and empathy) ($b = 0.068, p > 0.407$) – were not significant. However, the competence of the library staff had an insignificant negative effect on user satisfaction.

Discussion

This study evaluated the effect of library service quality on user satisfaction in a private university library in Bangladesh. The findings of the survey show that the overall mean of perceived service performance was 5.22, indicating positive acceptance by the users. Among the 30 statements, ‘suitable and convenient library hours’ achieved the highest service performance score, whereas the service statement ‘existing collections adequately cover your field of study’ was the lowest service performance for meeting the needs of users. The library is open seven days a week from 9 a.m. to 9 p.m., which was considered suitable and convenient library hours by the users (Eastern University, 2020). In Bangladesh, a further three studies (Ahmed and Shoeb, 2009; Hossain, 2016; Hossain and Islam, 2012) have revealed that convenient library hours scored the highest perceived mean by users. The library holds about 18,450 books, 1682 journals, 568 theses, 892 audiovisual materials, and 542 institutional publications. It provides access to about 36,500 online journals and 16,000 e-books, which are considered by the library users as the lowest service performance to cover their field of study

Table 9. Regression results of the five factors.

| Model | Unstandardized coefficients | | Standardized coefficients | t | Significance | Collinearity statistics | | Decision ($p < 0.05$) |
|----------------|-----------------------------|----------------|---------------------------|--------|--------------|-------------------------|-------|-------------------------|
| | b | Standard error | b | | | Tolerance | VIF | |
| I (Constant) | 0.426 | 0.289 | | 1.472 | 0.142 | | | |
| Resources | 0.185 | 0.064 | 0.163 | 2.916 | 0.004 | 0.547 | 1.828 | Significant |
| Competency | -0.024 | 0.075 | -0.024 | -0.315 | 0.753 | 0.287 | 3.479 | Not significant |
| Responsiveness | 0.279 | 0.076 | 0.303 | 3.694 | 0.000 | 0.255 | 3.927 | Significant |
| Demeanour | 0.007 | 0.079 | 0.007 | 0.088 | 0.930 | 0.257 | 3.885 | Not significant |
| Tangibles | 0.522 | 0.063 | 0.448 | 8.304 | 0.000 | 0.590 | 1.694 | Significant |

^aDependent variable: satisfaction.

(Eastern University, 2020). Among the five dimensions of SERVQUAL, tangibles achieved the highest service performance score, followed by competency, responsiveness, the demeanour of library staff and resources. Library professionals at the university mentioned that over the last four years comparatively less importance had been given to procuring books for the library, which may be one of the causes for less satisfaction of the users with regard to library resources. The overall satisfaction mean was 5.53, indicating the overall service quality of the Eastern University Library ensured favourable satisfaction of the users.

This study adopted a modified SERVQUAL instrument and included 30 statements in five dimensions of service quality and four statements of user satisfaction, with a seven-point Likert scale used to evaluate the effects of library service quality on user satisfaction. The 30 statements of service quality and four statements of user satisfaction were taken from the available SERVQUAL literature and adapted to local arrangements and in consultation with professional experts. The demographic information of the sample indicated that a broad cross section of the population was surveyed. The Bartlett's Test of Sphericity indicated that the internal consistency of the data is appropriate. The composite reliability values of the six dimensions indicated that all the variables are internally consistent and reliable. The Cronbach's alpha indicated good reliability of the overall questionnaire items. The KMO value matrix suggested that there is no problem with the data, and the sample size (252) is statistically significant for the factor analysis. The factor analysis recommended that all the independent and dependent variables were significant to conduct the study. The items loading suggested that all the items represent the respective dimensions of service quality and user satisfaction successfully. The commonalities of the variables recommended that the variance in most of the statements is within a suitable range. The model has a small residual sum of squares in comparison to the regression sum of squares, indicating that it adequately explained the variation in the dependent variable. The normal probability plot and histogram do not indicate any departure from the assumptions, and the dependent variable is normally distributed, which would not severely limit the use of the model. The VIF values suggested that there are no multicollinearity symptoms. The AVE values of the six dimensions supported the convergent validity among all the variables. The correlation between one factor and another is as small as each factor's alpha coefficient, indicating that discriminant validity exists. From the above discussion, it can be concluded

that all the reliability and validity statistics support the validity of the adapted SERVQUAL instrument.

The multiple regression model was established to be significant ($p < 0.001$) and explained the 56.9% of variation in user satisfaction. The standardized beta values recommended that the tangible facilities of the library had the highest effect ($b = 0.448, p < 0.001$) on user satisfaction, followed by responsiveness ($b = 0.303, p < 0.001$) and the resources ($b = 0.163, p < 0.004$) of the library. The competence of the library staff had an insignificant negative effect ($b = -0.078, p > 0.327$) on user satisfaction. The demeanour (assurance and empathy) of the library staff had no significant effect ($b = 0.068, p > 0.407$) on user satisfaction.

Andaleeb and Simmonds (1998) conducted a multiple regression analysis where resources, competency, responsiveness, demeanour and tangibles were independent variables, and user satisfaction was the dependent variable. They revealed that the model was significant ($p < 0.001$) and the users of three academic libraries in Erie and Pennsylvania placed significant importance on library resources ($p < 0.001$) and the demeanour ($p < 0.001$) of library staff. Simmonds and Andaleeb (2001) carried out a regression analysis where resources, competency, responsiveness, demeanour, tangibles, familiarity and gender were independent variables, and user satisfaction was the dependent variable. The study found that the model was recognized as significant ($p < 0.001$), and library resources ($p < 0.050$), tangibles ($p < 0.050$) and the familiarity of library staff ($p < 0.010$) had significant effects on user satisfaction in three academic libraries in Erie and Pennsylvania. Wang and Shieh (2006) discovered that their regression model was significant ($p < 0.001$) and, except for responsiveness ($p > 0.186$), all dimensions – assurance ($p < 0.001$), reliability ($p < 0.001$), empathy ($p < 0.001$) and tangibles ($p < 0.001$) had significant positive effects on user satisfaction in the Chang Jung Christian University Library, Taiwan. Suki and Suki (2013) found that their model was significant ($p < 0.001$) and all the independent variables – tangibles ($p < 0.065$), reliability ($p < 0.048$), responsiveness ($p < 0.001$), assurance ($p < 0.001$) and empathy ($p < 0.021$) – significantly influenced user satisfaction in a public university library in Malaysia.

This regression model was established as significant ($p < 0.001$), which is similar to the studies by Andaleeb and Simmonds (1998), Simmonds and Andaleeb (2001), Wang and Shieh (2006), and Suki and Suki (2013). Moreover, the resources ($p < 0.004$) of the library had a significant effect on user satisfaction, which produced a similar result to the studies by Andaleeb and Simmonds (1998) and Simmonds and

Andaleeb (2001). The library's tangible facilities ($p < 0.001$) had a significant effect on user satisfaction, which was a similar result to the studies by Simmonds and Andaleeb (2001), Suki and Suki (2013), and Wang and Shieh (2006). The responsiveness ($p < 0.001$) of library staff had a significant effect on user satisfaction, which was a similar result to the study by Suki and Suki (2013). The library staff's competency ($p > 0.327$) had no significant effect on user satisfaction, which produced a similar result to the studies by Andaleeb and Simmonds (1998) and Simmonds and Andaleeb (2001). The demeanour ($p > 0.407$) of the library staff had no significant effect on user satisfaction, which was a similar result to the study by Simmonds and Andaleeb (2001).

H1. The higher the perceived quality of the resources of a library, the greater the level of user satisfaction

The standardized beta values recommended that the resources of the library had the third most significant impact ($b = 0.163$, $p < 0.004$) on user satisfaction. Resource strategy is important because users frequently use their library to obtain answers to their academic problems. In the present dynamic ICT environment, resources do not only mean the physical collections of a library; rather, they include a diversity of e-resources which can be accessed online. Library authorities should be open to users' demands and play a positive role in developing diversified information-access options for users.

H2. The greater the perceived competence of library staff, the greater the level of user satisfaction

The results show that the competency of the library staff had an insignificant negative impact ($b = -0.078$, $p > 0.327$) on user satisfaction. Parasuraman et al. (1991) state that competency is essential to some but not all service sectors. They also mention that being proficient is an expectation of customers with regard to equipment and automobile repairs, but is not as relevant to customer services. The author believes that receiving competent service is essential for users of academic libraries because when sloppy and incompetent services prevail, user satisfaction will be attenuated.

H3. The greater the responsiveness of library staff, the greater the level of user satisfaction

The results indicate that the library users attributed the second-highest level of importance ($b = 0.303$, $p < 0.001$) to the responsiveness of library professionals. Though implementing the qualities of

responsiveness among library professionals can be challenging, library staff should focus on their responsiveness to deliver services that satisfy their users.

H4. The greater the positive demeanour of library staff, the greater the level of user satisfaction

The results recommend that the library users have no insignificant impact ($b = 0.068$, $p > 0.407$) to the demeanour approach of the library staff. Library users look for staff who are approachable and friendly, but not unnecessarily intrusive. A good demeanour among library staff is important to library users. When library staff show a perfect demeanour in providing services, it may not be noticed, but when library staff demonstrate a poor demeanour, users will notice this and their satisfaction level will decrease.

H5. The better the perceived tangible facilities of the library, the greater the level of user satisfaction

The standardized beta values suggested that the tangible facilities of the library had the highest impact ($b = 0.448$, $p < 0.001$) on user satisfaction, indicating that the physical facilities of the library play a vital role in explaining user satisfaction. To satisfy users, library professionals should place an emphasis on keeping the physical facilities up to date and maintaining the library in a good condition.

Conclusion

The aim of this study was to evaluate the effects of SERVQUAL dimensions on user satisfaction in an academic library in Bangladesh. It was conducted among 51 teachers, 163 undergraduate students and 38 postgraduate students at a private university library in Bangladesh; staff members and part-time faculty members were not included as they comprise a small proportion of the library's users. The results indicated that these users of the library were satisfied with the existing services, and the level of satisfaction was reasonably good. The regression model was established as significant ($p < 0.001$) and indicated that the tangible facilities ($p < 0.001$), responsiveness of staff ($p < 0.001$) and resources ($p < 0.004$) of the library had a significant effect on user satisfaction. The validity and reliability statistics indicated that the model is valid, which produced an appropriate result.

Based on the findings, some recommendations are suggested. The library authorities should place emphasis on maintaining state-of-the-art tangible facilities in the library as the users placed the highest importance on the physical facilities. Library professionals should focus on their responsiveness in

delivering services to satisfy users, as this aspect was given the second-highest level of significance. Library management should emphasize the procurement of library resources based on user needs because the users ranked resources as the third most important factor and their level of satisfaction with resources was the lowest among the five dimensions. Although the competency and demeanour of library staff did not have a significant effect on user satisfaction, library professionals should not give these factors less importance because when a poor demeanour and incompetent service prevail, user satisfaction will be attenuated.

The model has several significant implications for practice and future research. The study provided a clear picture of the existing services of the Eastern University Library and built awareness among library professionals and users regarding their library services. The findings of the study would be helpful for the authorities of the university library in planning and implementing the library services that are expected by its users. A first attempt has been made to evaluate the effects of service quality on user satisfaction in a university library in Bangladesh, which has contributed to filling the research gaps regarding library service quality. However, having established this model, more research would be required to assist in developing it as an acceptable model. The researcher hopes that the model will have implications in academic libraries that may help to produce a more effective result on the effects of library service quality.


Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The author received no financial support for the research, authorship and/or publication of this article.

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