

Assessing Service Quality of Healthcare libraries in Bangladesh: A LibQUAL Study

By

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Thesis submitted to the University of Dhaka, Bangladesh in partial
fulfilment of the requirements for the Degree of Master of Philosophy

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Assessing Service Quality of Healthcare Libraries in Bangladesh: A LibQUAL Study

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DECLARATION

I hereby declare that the thesis entitled "**Assessing Service Quality of Healthcare Libraries in Bangladesh: A LibQUAL Study**" is my own work. This entire research work was conducted by me under the supervision and guidance of Dr. S. M. Zayed Ahmad, Professor, Department of Information Science and Library Management, University of Dhaka.

I also declare that the thesis has not been previously submitted in part or in full to any university or institution for the award of any degree or diploma.

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CERTIFICATE

I hereby certify that the research entitled "**Assessing Service Quality of Healthcare Libraries in Bangladesh: A LibQUAL Study**" submitted as a requirement for the degree of Master of Philosophy (MPhil) in Information Science and Library Management is conducted by Muhammad Burhun Uddin (Reg. No. 213) under my supervision and that this study in whole or in part has not been previously submitted for any award, including a higher degree, to any other university or institution.

Dr. S.M. Zabed Ahmed
(Supervisor)

ABSTRACT

This research is an attempt to measure service quality of healthcare libraries in Bangladesh through a standard tool named LibQUAL. It assists the librarians and information professionals to investigate the level of services provided to users in respect of three dimensions i.e. Affect of Service, Information Control, and Library as a Place. LibQUAL was used to measure the service performance at four major healthcare libraries in Bangladesh. These are: Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM), International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) and National Health Library and Documentation Centre (NHLDOC). In this research, responses to a questionnaire, consisted of 22 core questions, 5 information literacy questions, 5 local questions, 3 satisfactory questions and 3 library use questions, were collected from the faculty members, postgraduate students, researchers, and other users groups.

This analysis revealed the minimum, desired and perceived services expected by library users. It also determined adequacy gap, superiority gap, zone of tolerance, etc. It was found from this research that the healthcare libraries in Bangladesh are not meeting most of the minimum expectations of users. As a result, a huge gap emerged between perceived and desired service levels. Healthcare libraries of Bangladesh should come forward to improving their existing services as well as to introduce new services based on user demands.

Dedicated to

My Beloved Parents

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List of Abbreviations/ Acronyms

AG	Adequacy Gap
AGORA	Access to Global Online Research in Agriculture
ARL	Association of Resource Libraries
AS	Affect of Service
BADAS	Diabetic Association of Bangladesh
BANSDOC	Bangladesh National Scientific and Technical Documentation Centre
BIRDEM	Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders
BIRDEML	Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders Library
BSMMU	Bangabandhu Sheikh Mujib Medical University
BSMMUL	Bangabandhu Sheikh Mujib Medical University Library
CD	Compact Disk
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CRL	Cholera Research Laboratory
DS	Desired Service
DVD	Digital Versatile Disc
EFA	Exploratory Factor Analysis
HINARI	Health Inter Network Access to Research Initiative
IC	Information Control
Icddr,b	International Centre for Diarrhoeal Disease Research, Bangladesh
Icddr,bl	International Centre for Diarrhoeal Disease Research, Bangladesh Library
ICT	Information and Communication Technology
IPGMR	Institute of Postgraduate Medical Research
LibQUAL	Library Quality
LP	Library as a Place
MS	Minimum Service
NFI	Normed Fit Index
NHLDOC	National Health Library and Documentation Centre
ORS	Oral Rehydration Solution
PERI	Programme for Enhancement of Research Information
PS	Perceived Service
RSMEA	Root Mean Square Error of Approximation

SD	Standard Deviation
SDI	Selective Dissemination of Information
SEATO	South-East Asia Treaty Organization
SERVQUAL	Service Quality
SG	Superiority Gap
SPCM	Service Performance Control Matrix
WHO	World Health Organization
Wi-Fi	Wireless Fidelity
ZoT	Zone of Tolerance

CHAPTER- 1

Introduction

1.1 Background:

Bangladesh became an independent nation on 16 December 1971 after a nine-month long bloody war against Pakistan, and since then it has been working hard to ensure good health for its citizen “Health for All.” Maintaining good health is the basic need for every individual. It is also fundamental to national progress. In terms of resources for economic development, nothing can be considered of higher importance than the health of the people (Srinivasulu, 2010). Hence, an efficient healthcare system is a must. To ensure the healthcare services, health libraries are playing a vital role by disseminating health-related information to the healthcare professionals and individuals in the country. Most of the healthcare libraries in Bangladesh are under the administrative control of the ministry of health and family planning (MOHFW, 2009). The main purpose of healthcare libraries is to support medical education, including teaching, research and patient care. A well-knit healthcare library is an asset for the promotion and advancement of health sciences in a medical or health institution (Srinivasulu, 2010).

Healthcare library is one of the most effective ways of disseminating health-related information to the people. It plays a vital role for improving living condition and quality of life. Like other basic human needs, information is often considered as a basic requirement (Islam, 2006). The healthcare library aims to assist medical professionals in enhancing and updating their knowledge and skills, and to provide them with health-related theories, ideas, treatment, opinions, invention, etc.

At present, there are nearly 150 hospitals and more than 50 health science libraries in Dhaka city (Raju, 2014). In recent years, various kinds of electronic information services have been developed into many of the healthcare libraries. In these libraries, latest technologies are increasingly being used to collect, store, retrieve, and disseminate a great variety of information to help medical professionals in their day-to-day education, research and clinical practices. Additionally, medical websites and databases developed by medical institutions, associations, agencies, and publishers provide latest health-related information. In a developing country like Bangladesh, medical professionals are quite aware of the new technologies used by their counterparts in the developed countries (Srinivasulu, 2010).

This research is a report to assess the quality of services of healthcare libraries of Bangladesh, particularly in Dhaka city, through a standard tool named LibQUAL+® instrument. The scores that measure the standard of quality service, were collected from four healthcare libraries in Dhaka city. In this Chapter, the objectives of the research, specific research questions, a brief history of LibQUAL+® tool and a short description of four healthcare institutions are discussed.

1.2 Statement of Problem:

In the historical perspective, at the time of independence of Pakistan in 1947, the then East Pakistan (now Bangladesh) inherited only a few healthcare institutions. However, the condition of the libraries in these institutions was deplorable. Only a very few of them were bearing libraries for their institutional purposes, and most of these libraries were run by semi-professional and non-professional library staff. These libraries had:

- Inadequate collection in respect of scope, coverage, up-to-datedness and multiplicity. Back volumes of periodicals and their current subscriptions including indexing and abstracting tools are almost non-existent;
- Lack of trained human manpower;

- Limited funds for the development of collection and manpower resources;
- Photocopying, scanning and printing facilities were absent in many of the libraries;
- Lack of proper understanding of ICT among health professionals and healthcare libraries;
- Limited ICT access in information infrastructure; and
- Lack of national strategic plan for health information.

During the past three decades, however, healthcare libraries have experienced rapid changes mostly due to the development of ICT. The recent emphasis on formal assessment in higher education has also prompted decision makers to reconsider the role of libraries and to develop more meaningful assessment methods and measures for libraries (Shoeb, 2014).

The quality of a library has traditionally been measured by its collection size and various counts of its uses (Ahmed and Shoeb, 2009). In recent years, many libraries in the developed world move towards LibQUAL+® survey, an assessment tool consisting of questions of three dimensions: Affect of Service (AS), Information Control (IC) and Library as Place (LP).

1.3 Process of Exploration:

The quality of information services should aim to improve services to meet or even surpass customers' expectations. For Hernon and Altman (1995, p.6) "it does not matter what information professionals think about the quality level of their services and as much as some of them may consider that their customers are not capable of evaluating the information services properly, and consider very poorly their opinions, if customers say there is quality service, then there is".

For this reason, a tool that can listen to the customer needs in order to improve the quality of information services is necessary. This is where the evaluation comes to hand. For Lancaster (1996), there are several reasons for a library manager wanting to evaluate the services provided:

- a) To know the level of performance of current service;
- b) Simply to justify its existence;
- c) To identify possible causes of failures or inefficiency of the service; and
- d) To compare the performance of various libraries or services.

In the same direction, Lubisco (2011) states that, as the object of evaluation, organizational performances are measured both objectively (by data collected from management reports) as well as in a subjective way (from data on customer satisfaction). According to Lubisco, these two dimensions are complementary.

The development of LibQUAL+® tool, an initiative of the Association of Research Libraries (ARL), has demonstrated to be quite suitable for the evaluation of academic libraries. However, even though it is more than twelve years old in its implementation in academic libraries of various countries, there is no record of its use in healthcare libraries in Bangladesh. This research aims to contribute to the importance of evaluation for healthcare libraries in Bangladesh by bringing the LibQUAL methodology and its possible contribution to quality evaluation purposes in developing country perspective.

1.4 LibQUAL+®

The specific evaluation tool for use in libraries, called LibQUAL+® - Lib (library) and QUAL (quality) - has its history closely linked to the evaluations experiences developed by Texas A&M University (TAMU) using the SERVQUAL instrument- a popular tool for assessing service quality in the private sector.

However, the distinctive aspect of LibQUAL+® is the set of 22 core questions for which the respondent provides three answers on a 1–9 scale: the minimum level, the desired level, and the perceived level of the service actually provided by the library. It allows the analyst to compare desired level and minimum level with the perceived level of service for each of the 22 items, and for each category of respondent. It provides context for each set of scores.

This core questions are also divided into three dimensions. The dimensions are: Affect of Service (AS), Information Control (IC) and Library as a Place (LP). Among three dimensions, AS consists of nine questions, IC and LP have eight and five questions respectively. *AS questions explores how quality services are provided by the staff.* Similarly, IC oriented questions measure information quality as well as how easily and quickly user get their expected information and LP questions come into focus the physical information of library.

The survey also contains additional five locally selected questions, five questions related to information literacy, three questions for satisfaction in general and three more questions about the use of Libraries and search portals.

There are two services gap scores on LibQUAL+®. A quality service must have the perception score somewhere between the minimum level of service at the lowest end of the scale and the desired level of service at the higher end. The gap between the minimum level and the desired level defines what the methodology establishes as *Zone of Tolerance* (Cook, 2001).

LibQUAL+® was developed to satisfy the need to perform research within libraries to compare and evaluate their services for benchmarking and identifying the best practices (Cook, 2005).

1.5 Objective of the study:

This research aims to evaluate the service quality of healthcare libraries in Bangladesh, particularly in Dhaka City, in respect of information resources, service delivery and strategic enhancement. The objectives inherent to it are to:

- Evaluate the quality of service of healthcare libraries through worldwide recognized tool named LibQUAL+®;
- Measure service quality of healthcare libraries from different kinds of user perceptions;
- Analyze library user feedback systematically for better services; and
- Assess information of peer institutions for determining the service gaps; and

1.6 Research Questions:

This research attempts to find out the answers to the following questions:

1. Which components are fulfilling the minimum expectations of users in getting quality service?

The gap difference among Minimum Service and Perceived Service for each user group was calculated and ranked respectively.

2. Which components are fulfilling the desired expectation of users in getting quality service?

Here, the gap difference between Desired Service (DS) and Perceived Service (PS) was calculated and ranked.

3. Is there any significant difference in overall service quality in terms of individual group or service dimension?

Here, nonparametric statistical analysis like, Mann-Whitney and Kruskal-Wallis tests were calculated.

4. *Is there any significant difference in overall service quality in terms of age or service dimensions?*

In order to find out the variation among gender in respect of male and female, a tabular chart as well as Mann-Whitney tests were carried out.

5. *Is there any significant difference in overall service quality with regard to age or service dimensions?*

Here, nonparametric statistical analysis like, Kruskal-Wallis test was conducted.

6. *What are the services expected by users in healthcare libraries?*

With a view to identify excellent service at all healthcare libraries, the means of desired service expectations was ranked and compared.

7. *Which things should the library in-charge consider for providing excellent service?*

For this, Zone of Tolerance (ZoT) was calculated.

8. *What are the factors that evaluate user's service quality?*

In this case, exploratory and confirmatory factor analyses were used respectively.

9. *What are the impact of local questions?*

In this stage, mean value, standard deviation of the three levels (MS, DS and PS) of service were calculated and adequacy as well as superiority gap were measured respectively.

10. *What are the outcome of Information Literacy?*

To explore the information literacy outcome, a tabular chart and a comparison by mean value were presented.

11. *What is the level of user satisfaction in using the library?*

A tabular chart was used to measure the users' satisfaction level.

1.7 Importance of this research:

LibQUAL+® is the most widely used tool around the world to assess library service quality. This is the first LibQUAL+® is being used for the evaluation of healthcare libraries in Bangladesh. This tool provides more reliable and valid score of response in terms of its development, maturity and precision. This current research tried to assess the service quality of healthcare libraries in Bangladesh.

The study was carried out not to measure any library as good or bad. The purpose of this analysis is to find out the services that are needed to improve. The analysis may support library management to identify the strengths and weaknesses of the services provided by the library and to help in future planning and decision-making process. LibQUAL+® helps in the development of library services. In case of changes in the services, it can, when consistently used, monitor the effect of those changes.

Moreover, exploring the user expectation scenario, aggregate data and reports will allow the library authority to compare their own library's performance with other surveyed libraries. In addition, this research tried to reveal whether there are any significant differences of service quality by different demographic groups.

The implementation of the recommendations of this research may bring the library closer to the customers, creating the opportunity to enhance and improve the status of the library in the community it serves and also helping it in obtaining more economic resources for the library. The findings of this research may also assist the librarian or information officer to develop an effective public relation policy. Libraries will also be able to make their achievements transparent to their customers.

Finally, at this time of Internet, where Google and other online information providers have been considered competitors for libraries, more than ever have the latter to justify their existence, presenting a positive cost-benefit ratio to their customers, developing links and helping them achieving their goals so that they can realize libraries' value when compared to their competitors. In short, the use of LibQUAL+® will assist the evaluation of library services effectively and efficiently.

1.8 Research Areas:

At present, there are nearly 150 hospitals and more than 50 health science libraries in Dhaka city (Raju, 2014). The research includes four major healthcare libraries. Among them two are owned by government i.e. Bangabandhu Sheikh Mujib Medical University (BSMMU) and National Health Library and Documentation Centre (NHLDOC). Besides, one is private i.e. Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) and another is international healthcare library i.e. International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b). The details about these institutions are as follows:

1.8.1 Bangabandhu Sheikh Mujib Medical University (BSMMU)

BSMMU is the premier postgraduate medical institution in Bangladesh. It bears the legacy of the Institute of Postgraduate Medical Research (IPGMR), which was established in December 1965. With a view to expanding medical research in Bangladesh, government changed IPGMR into a medical university in 1998. The university has strong link with other professional bodies both at home and abroad. At present, the university is expanding rapidly, and it has many departments equipped with modern technology for service, teaching and research.

BSMMU complex has five main multistoried buildings that are named as Block-A, Block-B, Block-C, Block-D and Cabin block. The causality department, out-patient departments for medicine, surgery, neurosurgery, neurology, gastroenterology, hematology, psychiatry, pediatric surgery and hospital dispensary are located in a separate complex.

The university runs its administration and finance with rules and regulations set forth by the University Grant Commission of Bangladesh and Ministry of Health and Family Welfare, Government of the People's Republic of Bangladesh.

1.8.1.1 BSMMU Library

BSMMU has a well-equipped modern academic library known as BSMMU Central Library with approximately 22,800 sq. ft. floor space. The library can accommodate over 750 users at a time in its well-furnished reading area. On an average, more than 1000 doctors/members/teachers use this library every day. It is generally providing services to students, doctors, teachers and researchers. It has General Reading Area, Archival Section, multimedia corner, Group Discussion Area, Muktijuddha Corner, Audio-Visual & Reference Section, etc. for its user.

At present, seven officers, 18 supporting staff and two security personnel are working in the library. BSMMU Central Library remains open every day from 8.00 am-10.00 pm excluding weekly and government declared holidays.

BSMMU Library holds a good collection i.e. 26,551 copies of books covering various subject areas of health, research, the practice of medicine, related biomedical and allied healthcare disciplines and nursing to meet clinical and educational needs of its clients. The library books and monographs are housed in the 4th and 5th floor arranged according to the National Medical Classification Number,

The journal collection consists of 4630 volumes of bound journals. The number of currently subscribed/donated local journals and foreign journals are 57 and 106 respectively. All journals are arranged alphabetically on the shelves. The Library also receives a large number publication every year as gift. These are in the form of bulletins, research papers, reviews, magazines, etc.

BSMMU's Digital Library has 13 computers with internet browsing facilities. It also supports access to more than 10,000 electronic journals using HINARI, AGORA and PERI web sites. All departments have access to the Central Library's contents through university Local Area Network (LAN).

The reference collection can only be used within the Library. It consists mainly of encyclopedias, dictionaries, handbooks, world almanacs, manual, WHO and other organizational reports, etc., housed in the 5th floor west side of the library.

BSMMU publications such as research reports, thesis/dissertations are also shelved separately in the 4th floor Book Stack Area. This library has 1583 copies of WHO publications. Other resources include maps, atlases, CDs/DVDs, floppies, tapes and audio-visual materials, etc. are kept in the Journal and Reference Section in the 5th floor.

The main task of the BSMMU Library is to satisfy its readers by rendering them need-based services. The Library provides various types of services such as: reading, lending, reference, news clipping, Selection Dissemination of Information service (SDI), Bibliographic and Abstracting Service, Current Awareness Service, reader's guidance, referral services, audio-visual and Internet facilities, etc. to users.

1.8.2 Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM)

BIRDEM is a well-recognized institution of the Diabetic Association of Bangladesh (BADAS) for serving a large number of diabetic patients throughout the country. The Institute has about 700 bed In-Patient hospital with all modern disciplines of medicine. BIRDEM conducts the largest number of postgraduate medical courses in the private sector. World Health Organization (WHO) declared BIRDEM as a Collaborating Centre for Research on Prevention and Control of Diabetes.

BIRDEM's General Hospital, the only specialized hospital for the treatment of innumerable diabetic patients of the country, was officially established in 1989 as a result of an entirely private initiative. This specialized hospital is located at the East of Bangabondhu Sheikh Mujib Medical University (BSMMU), to the west of Dhaka Club and at the east-north corner of Shahbag circle; it stands alongside to the south of the National Broadcasting Authority building. This hospital is comprised of three multi-storied buildings. There are a 5-storied building in the middle, a 16-storied building on the north side and an 8-storied building on the south side. There are a number of west-facing entrances including the main gate to enter into the building. Each building also has adequate number of lifts.

This hospital has internal and outer patients' treatment systems. For primary detection of diabetes, first, patients have to collect tickets at a fixed price from the available counters situated on the south side of the middle building; simultaneously they have to collect test tubes and boxes and fill them up with the sample of their stool and urine going inside any one of the toilets standing in a row; then they have to submit these samples to a certain room and receive the reports on the due date; the next procedure is to collect 'History book' and 'ID card' from the hospital authority and take the next steps for proper treatment accordingly.

A patient can get admitted into the hospital after considering the situation of his/her disease based upon the concerned doctor's advice. Besides, this hospital has a wide reputation as a very reliable centre for the treatments of patients who have diabetes, heart disease or eye-related diseases. There is an Information Centre in the hospital for any kind of inquiries. Patients can also collect necessary information through telephone. The hospital provides surgical operation facilities for complicated diseases like open heart surgery, bypass surgery, kidney transplantation, valve replacement, oratory lithotomy, gastrostomy, hematology, general surgery, urology, laparoscopy, etc.

1.8.2.1 BIRDEM Library

BIRDEM Library is a well-established computerized library and information centre. Its journey started in 1975 at Segun Bagicha and then shifted to Shahbagh in 1982 and then again resifted to present premises in 1985 to meet the needs of the medical professionals, scientists, paraprofessional, health personnel, BIRDEM Library provides services to postgraduate students and staff of the Diabetic Association of Bangladesh and other organizations working in the fields of diabetics, endocrine and metabolic diseases, nutritional and related disorders.

BIRDEML has a rich collection of 7571 books, 21 international journals and 52 national and complementary journals. The library can accommodate approximately 80 users at a time. Computerized library management system was introduced both for books and journals. Library cooperation has been established with icddr,b, BANSDOC, BSMMU, NHLDOC and other major medical and health libraries. Wi-Fi facility is also available for its library users.

1.8.3 International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)

icddr,b, was established in Dhaka in 1960s as a Cholera Research Laboratory (CRL) of South-East Asia Treaty Organization (SEATO). CRL was internationally recognized for its diarrheal disease research. Among its notable early achievements was a key role in the development, testing and implementation of oral rehydration solution (ORS), a treatment estimated to have saved millions of lives worldwide.

In 1962, CRL established the Dhaka Hospital, still run by icddr,b, to meet the urgent need to treat patients, particularly young children, with severe diarrheal disease. The Dhaka Hospital has developed into a nationally important treatment centre and provides an infrastructure for an extensive programme of clinical research. Later, clinical services were introduced at Matlab, a rural area of Bangladesh some 50 km south of Dhaka.

In 1978, CRL received fresh impetus and a new name, the International Centre for Diarrhoeal Disease Research, Bangladesh. In recent years, it has been known simply as icddr,b. Its research continued to expand to address some of the major public health threats such as malnutrition, respiratory disease, vaccine testing, maternal, neonatal and child health, and health systems. The institute maintained a strong and productive relationship with the Government of Bangladesh and played an influential role in informing and evaluating national health policies and practice.

icddr,b is recognized as a national asset, and has contributed to the significant improvements in health sector achieved by Bangladesh in recent decades, despite the challenges posed by limited resources. In 2001, it received the first Gates Award for Global Health in recognition of development of ORS. In 2005, the centre received the Independence Day Award, Bangladesh's most prestigious national award.

The contributions of icddr,b's researchers and clinicians in the field of infectious diseases are mentionable. Over the past 30 years, its staff have supported multiple relief efforts across Asia, the Middle East, the Caribbean and sub-Saharan Africa. icddr,b's mission is to continue generating the evidence to underpin further improvements in public healthcare in Bangladesh, while also ensuring that its research benefits those living in other countries of the global South.

1.8.3.1 icddr,b Library

icddr,b's Library and Information Services Section is the preeminent medical and public health library in the region. Its mission is to make available findings and results of global health research from icddr,b scientists and the international research community.

Established in 1962, icddr,b's Library and Information Services Section maintains a modern library and information centre equipped with the most advanced tools and information technology for collecting, processing, and storing information. It currently houses a collection of over 45,500 volumes of bound journals and books and it subscribes to INASP resources and over 176 journals (another 115 journals free or under exchange) and 80 newsletters. The Library Information and Services Section offers reference and bibliographic services, inter-library loan, training programmes, internship programme, guided library tours, photocopying and scanning, reprints, internet and wi-fi access, etc.

The library maintains the databases of monographs, documents/reprints, icddr,b publications, icddr,b research projects, bound journals, loose journals and CDs using library management software.

1.8.4 National Health Library and Documentation Centre (NHLDOC)

National Health Library and Documentation Centre is the national reference library situated at Mohakhali, Dhaka, an easily and readily accessible part of the city. Established in 1974, the centre is headed by a Chief Librarian under the control of the Director General of Health Service, Ministry of Health and Family Welfare, Government of the People's Republic of Bangladesh. The stack room provides open access facilities for browsing and selecting books. It saves the valuable time of the readers which accelerates maximum utilization of books.

The reading area of the library can accommodate 100 readers at a time. The main objective of this library is to make available health science related books and journals to its users. In this connection, the library has a Book Selection Committee comprising of 10 members nominated by Government among the heads of the health sciences institutes in Bangladesh. At present, 34 staff members are working in the library, and among them 12 are professional employees. It remains open on all government working days from 10:00 am - 5:00 pm.

The library has over 14,100 copies of health and medical books to meet its user's thrust of knowledge. Its journal collection consists of 14,000 subscribed foreign journals and 80 local journals. It also provides full-text access to HINARI. Besides, it has over 200 health and medical-related CDs.

Different types of services like lending, reference, news clipping, Current Awareness Service (CAS), Selection Dissemination of Information service (SDI), bibliographic and abstracting service, audio-visual and Internet facilities, etc. are available at NHLDOC for its users.

1.9 Thesis Outline:

This thesis is arranged into five major chapters excluding preliminaries and appendices. These are:

- **Chapter-1** introduced the general background about why this research was undertaken including objectives, methodology and scope and importance of the research.
- **Chapter-2** focuses on the literature related to the research. It aims at identifying and reviewing literature relevant to healthcare libraries with a particular emphasis on research relevant to Bangladesh.
- **Chapter-3** describes the methodology of the research, where the population and sampling, questionnaire for collecting data, data collection and analysis, etc. are discussed.
- **Chapter-4** presents data analysis and findings of this research study.
- **Chapter-5** provides summary, recommendations and conclusion of this research. It recommends possible solutions to overcome the existing problems inherent to healthcare libraries in Bangladesh.

1.10 Conclusion:

This Chapter introduced background and objective of the research, described conceptual framework, specified statement of the problem and research questions, revealed the importance of the research. The next Chapter will review the literature pertinent to this research area.

CHAPTER- 2

Literature Review

2.1 Introduction:

This Chapter reviews the literature on quality, service quality and service quality of libraries in Bangladesh and worldwide. Besides, relevant LibQUAL+® studies and studies conducted on healthcare libraries are also presented in this Chapter

2.2 Concept of Quality:

The term 'quality' is a measurement of how excellent something or someone is. In another sense, quality can be defined as degree of customer satisfaction. Pariseau and McDaniel (1997) defined quality is one of the competitive priorities which have migrated from the literature of manufacturing strategy to the service arena. Juran (1989) identified quality as fitness of use, need satisfying product features and free from deficiencies. Here, a product or service is considered to be of good quality if it is fit enough for intended use, i.e. it can be used satisfactorily. A product or service need not to be perfect. In spite of other drawbacks, if the product or service satisfies the end use conditions, it is said to be good quality. Deming (1986) expressed quality as to meet consumer needs by focusing on regular improvement in consistency and lessening in variation. ISO 11620 (2008) Performance Indicators for Libraries stated: "Quality is the totality of features and characteristics of a product or services that bear on the library's ability to satisfy stated or implied needs".

Harvin (2010) considered quality as thing that go through into the following four steps:

- s1) inspection - Supervision of produced quantity to maintain standard level
- s2) partial - a single sample can represent the whole quantity of a product. So, assessment of a single unit of a product explores how well or bad the product is.
- s3) "quality guaranteed" - quality based products are represented by its assurance i.e. guarantee from the producer in respect of legibility, reliability, usability etc. Besides, efficiency and flexibility in repairing of guaranteed product also represent the overall quality.
- s4) strategic quality management – for ensuring quality of any product and for achieving success in market, integration of three things (inspection, sample test, quality guarantee) should be managed strategically.

According to Garvin (1987), eight dimensions are inherent to quality. An organization must have all of the below mentioned factors when building quality into their service.

Dimension 1: Performance

A quality product should be such so that expectation of users as well as instructions from manufacturer can be fulfilled. If the products are not as per customers' expectation or of low quality, then it leads the products to negative reviews and bad reputation.

Dimension 2: Features

In a quality-based product, all the features, whether tangible or intangible benefits should be clarified. One of the most important features of a product is to provide guarantee in respect of legibility and speciality.

Dimension 3: Reliability

Reliability is an important factor for quality product. It includes customers' trust on a product. Many branded products achieved reliability from customers through their quality products.

Dimension 4: Durability

A quality product should last a certain duration of time i.e. how long will the product be well after production, how long will it be well from the date of using, etc.

Dimension 5: Conformance

One of the most crucial features of a product is that the product should be produced following all national guidelines and instructions provided by the government.

Dimension 6: Service ability

Quality inherent to a product also includes availability of service against a product. Service availability refers to after sales service support, flexibility to do servicing, enough service support, etc. In a quality product, these are mentioned clearly.

Dimension 7: Aesthetics

A quality product is featured by its reflection on art, culture and nature. So, a quality product should be attractive in respect of colour, packets, size, etc.

Dimension 8: Perceived Quality

Existing quality inherent to product, fixation of product price, brand name, etc. need to consider while making a quality product.

2.3 Concept of Service Quality:

Service quality is an assessment of how well a delivered service conforms to the client's expectations.

Calvert (2001), configured service quality into two dimensions. Such as the customer (customers' past experiences, customers' personal needs, customers' national culture) and the service provider (Direct and Indirect communication about what customer expect, provided service acts as a benchmark).

Hernon and Altman (1998) stressed that for libraries, service quality applies to resources (information content); organization (service environment and resource delivery) and service delivered by staff. Evaluation of library service quality is always indicating the assessment of library service quality. The SERVQUAL Instrument measures the five dimensions of service quality. These five dimensions are: tangibility, reliability, responsiveness, assurance and empathy.

Parasuraman *et al.* (1988) defined service quality as an overall judgment similar to attitude towards the service and generally accepted as an antecedent of overall customer satisfaction.

So, service quality is an assessment of how well the delivered services meet the expectation of consumers as well as to improve service by identifying problems

2.4 Service Quality Study [Bangladesh Perspectives]:

Hossain and Ahmed (2013) developed a Service Performance Control Matrix (SPCM) with a view to assess, evaluate and improve services of the academic libraries, which provides necessary guidelines for further modification of services, was utilized into five public university libraries in Bangladesh. The study suggested that in case of practical solution to assess library services, SPCM can be applied.

Hossain and Islam (2012) attempted to understand the perceived service quality of Dhaka University Library. For this, expectations and needs of users, user's opinion regarding perceived services were identified. The findings showed that users got optimum satisfaction in library hours though other items meet more or less users' demands.

Shoeb and Ahmed (2010) was taken to measure the service quality of Independent university, Bangladesh library from user point of view. It was found that minimum expectation of users i.e. faculty, graduate, under-graduate students were fulfilled in IUBL where desired expectation was unsatisfactory. In rating the services by gender, significant differences were found and made clear that female were more much satisfied than male users.

Shoeb and Ahmed (2009) investigated individual differences i.e. gender, status, in assessing service quality in Independent University, Bangladesh library. It was explored by this study that minimum expectation of IUB library users in respect of gender and status was met. Significant differences in gap scores, overall and dimension-wise superiority and adequacy gap were found in gender and status.

2.5 Service Quality Study [Worldwide Perspectives]:

Khaola and Mabilikoane (2015) assessed the students' perceived levels regarding library service quality, satisfaction, frequency of use of library resources and also their relationships. The survey research method used to collect data from the National University of Lesotho (NUL). They found that LibQUAL+™ had gained acceptable applicability in Lesotho, and further recommends, prospects were discussed.

Abili and Afarinandehbin (2012) assessed service quality of Amirkabir University through SERVQUAL questionnaire, where gap between students' perceptions and expectations in assurance, responsiveness, empathy, reliability and tangibility dimensions were determined. In this research, the dimension 'responsiveness' was identified as most important dimension among five dimensions in spite of having the highest gap. Necessary development and more concentration from authority to meet the users' requirement were suggested here.

Rehman (2012) studied to measure the service quality of university libraries of Pakistan from user point of view. The study explored that minimum, desired and perceived services provided by most of the universities are not satisfying users. The study also made it clear that there was a wide difference between perceived service and expected services.

Bala *et al.*, (2011) studied the services of life insurance sector. By testing reliability and dimensionality prevailing in this sector, specific drawbacks those were necessary to improve on an emergency basis were found.

Cook and Heath (2001) analyzed that in a research university library users' thought about library service quality at every level. The LibQUAL+ diagnostic tool showed that a single factor influenced user's perception on library service quality. Then the hierarchical model is demonstrated.

Nitecki (1996) tried to measure the service quality of academic library. The article discusses implications for library management and future explorations of a tool applicable to academic libraries. The result explores that library budget and information control have a nice strong relationship.

2.6 LibQUAL Study [Bangladesh Perspectives]:

Shoeb (2014) investigated the quality of services provided by the top ranked university libraries in Bangladesh to their users through LibQual+ attributes. This study explored the overall service picture by determining adequacy gap, superiority gap, *Zone of Tolerance*, exploratory factor analysis, confirmatory factor analysis. Finally, it was observed that there were huge gaps between desired expectation of service and perceived level of service though the gap between minimum expectation of service and perceived level services were lower. It also made clear the academic libraries were not fulfilling the minimum and desired expectation of users. There was a huge gap between perceived service and minimum/desired service.

2.7 LibQUAL Study [Worldwide Perspectives]:

Natesan and Aerts (2016) tried to identify whether users of library can differentiate among minimum, desired and perceived services. The study used multi trait multi method (MTMM) to measure users' evaluation in these three levels of services. It was found that users were capable to differentiate among them. So, it was proved by this study that the gap theory is valid in measuring services of library.

Pourahmad, Neshat and Hasani (2016) used LibQUAL model to improve satisfaction level of student of four different university libraries of Iran. In this study, mean values were found negative that refers to the unsatisfactory services of libraries to its users. Furthermore, libraries were very far away in fulfilling the desired expectations of students.

Juventus and Jeje (2016) analyzed the influence of library use of Tanzania. It was found that libraries are providing better services to their users than the public university libraries. Multiple regression analysis was also applied here to show dimension-wise impact. Here, positive and significant values were found in five dimensions i.e. security, library as a place, collection and access, information control and service affect, which indicates that users are satisfied.

Rehman (2014), for the first time, in South Asia perspective, implemented the locally modified LibQUAL+® survey in Pakistan; its Urdu translation experience, and the reliability and validity analysis of the data collected in Urdu. The data was collected using two separate studies conducted on graduate and undergraduate students and faculty members of 29 universities in Pakistan. This study focused the psychometric properties of LibQUAL+® in South Asia- the largest continent of the world.

Kieftenbeld and Natesan (2013) used multi-group confirmatory factor analysis to examining the invariances in respect of measurement and structure of LibQUAL+®. Here, measurement invariance was tested across undergraduates, graduates and researchers and then structural invariance was tested. This study made clear that factor variances were equal though covariances and means were not equal across groups.

Lane (2012) proved that LibQUAL+® have some factorial invariance to measure library service quality over time. The study focused that no confirmatory analysis in supporting three factor structures of LibQUAL+® were found in any peer reviewed journals. The study suggested two dimensions rather than three dimensions in case of measuring service quality.

Lewis (2011) studied in case of higher education two- and four-year institutions have standards for distance learning. Standards showed that distance learners had access enough regarding library resources. For evaluating library resources and services, the LibQUAL+® survey developed.

Ladhari (2008) attempted to test empirically the relationship between perceived service quality and perceived value. In this study, he explained perceived value through affect of service (AS), library as place (LP) and information control (IC). The results also supported the validity of the LibQUAL+™ measure in context of public library service.

Thompson, Kyrillidou and Cook (2008) measured the desired service quality of a library through 22 core questions of LibQUAL+ protocol. They explored similarities and dissimilarities of desired service level in respect of user groups (undergraduate, graduate, faculty), geographical place and time.

Thompson, Kyrillidou and Cook (2007), in a paper presentation explored what services were expected by library users and how much tolerant the users of library in respect of library services presented in core 22 questions of LibQUAL+®. The study also determined whether users' tolerance level in getting any library services become stable or became change over year.

Saunders (2006) worked with drilling the LibQUAL+® Data. The result made enable to drill data into sub-groups just to observe differences and variation by library.

Begay (2004) used the LibQUAL+™ comments to identify necessary guidelines for the organizational and individual level. With the help of quantitative LibQUAL+ (™) data and other sources of data, they organized comments. In order to meet and address library customer needs they provided a focused method.

Cook, Heath and Thompson (2002) developed a norms tables from the LibQUAL+ data collected from the respondents of 43 universities. Norms were developed by subtracting perceived service from minimum service level. It was proved that norms were helpful for librarians to find out the areas where improvements are needed.

Thompson, Cook and Thompson (2002) carried out a study to measure perceived service quality. The structure and reliability of LibQUAL+ scores were utilized in this study.

Cook and Heath (2001) considered users as most important part in assessing library service quality under the study "Users' perceptions of library service quality: LibQUAL+™ quality study". In this study, the gap between expected service and perceived service in each dimension was identified. Besides, the dimensions of library service quality were also tested here.

2.8 Healthcare Libraries [Bangladesh Perspectives]:

Hossain and Mostofa (2015) attempted to explore the current state of private health libraries in Dhaka city, to find out the challenges and provide some suggestions for improvement of HLs in Bangladesh. The study identified some challenges like; lack of library infrastructure, adequate trained manpower, managerial skills among the existing manpower, be short of goodwill within the institutions that the libraries serve and financial constraints and many others. Finally, the study provides a model for improvement of health library in Bangladesh.

Raju (2014) tried to explore the existing problems of health science libraries in Dhaka city. Finally, the study provides necessary indication on how the prospect of such libraries would be better.

Aldana, Piechulek and Ahmed (2001) assessed the user expectations, quality of healthcare provided in rural Bangladesh. The article presents a picture to assess and degree of client satisfaction and quality of healthcare provided in rural Bangladesh, where 75% clients were satisfied, in that case, cultural background plays an important role. They suggested that further research is needed to determine users' satisfactions clearly.

Ahmed (1991) explained the user need of HELLIS network in Bangladesh under the title *User need identification: a device for development of collection and information services for HELLIS network in Bangladesh*. The aim of this study is to assess the opinion of users to identify their needs of resources and services which would enable NHLDC to adopt necessary measures for overall improvement of the facilities and services.

Khan, Ahmed and Akhter (1990) worked with health science libraries under the title *Health sciences libraries and information services in Bangladesh*. The study explores the Basic problems relating to the status of health sciences libraries and information centers in Bangladesh are highlighted and discussed; strategies for improving the country's health sciences information services are suggested. A survey of libraries is reported, the country's national science and technology information policy is defined, and recommendations for action are proposed.

2.9 Healthcare Libraries [Worldwide Perspectives]:

Maden-Jenkins (2010) conducted a study on Healthcare librarians and the delivery of critical appraisal training: attitudes, level of involvement and support. This study aims to examine the attitudes of healthcare librarians towards delivering critical appraisal training and their level of involvement.

Srinivasulu (2010) conducted a survey on medical college libraries in Andhra Pradesh to find out the role of health libraries in the development of medical education. It was found from the survey that health science libraries are supporting medical professional to enhance and update their knowledge, skills. Moreover, health libraries are essential to provide medical professionals regarding new innovations.

Thompson, Kyrillidou and Cook (2008) attempted to measure the expected library service of users through LibQUAL+® to identify whether medical library users want well library services in order to avail required information promptly. Anticipated differences in expectations for health as other library settings did not emerge. The expectations and perceptions are similar across different types of health science library settings, hospital and academic, and across other general research libraries. Khudair (2005) studied on healthcare libraries in Saudi Arabia to gain a detailed understanding of the current health library/information environment, to identify

problems, issues, and areas for improvement, to make recommendations for improvement, and to instantiate these in models and prototypes.

Urquhart, Durbin and Spink (2004) presented a paper for 'South Yorkshire Workforce Development Confederation' under the title Training needs analysis of healthcare library staff. The aims and objectives of the training needs analysis were to inform the planning and implementation of training strategies for healthcare library staff in the South Yorkshire Workforce Development Confederation by identifying the training and development needs of staff, using a matrix of technical/specialist, interpersonal skills and underpinning knowledge, identifying future training needs, developing an options appraisal, taking into account comparative costs of various delivery methods.

Alpi and Bible (2004) carried out a study to explore the role of librarians especially public and academic in meeting the health information needs of diverse population groups in respect of language, age, geography, ethnicity, sexual orientation, faith and other.

Crespo (2004) in Training the health information seeker: quality issues in health information web sites explores the issues related to the need for teaching users analytical evaluation skills in the context of online consumer health information.

Kellerman (1997) in Introduction to health Sciences librarianship: A Management Handbook attempted to give the reader a complete picture of health sciences librarianship from collection development, acquisitions, and cataloguing to the computerization of biomedical information.

Buchanan (1993) focused the library's role and progress in providing necessary information for administrative decision-making, how that role has been communicated to administrators, and the partnerships between healthcare

librarians and administrators. They suggested future research on some selected topics.

Coghlan, Khan and Akter (1993) conducted a study under the title Health information exchange in developing countries: a major player in the growing role of document provision in the third world. The study illustrates the role of health information exchange on overall document provision in the third world.

Holly (1993) in *Library Services and Healthcare Administration* focused the library's role in providing information for administrative decision making, how that role has been communicated to administrators, and the partnerships between healthcare librarians and administrators.

Stevens (1990) reported an article from a survey, which entitled with Impact of changing healthcare economics on Michigan hospital libraries. The survey points to the need for regular collection of comprehensive hospital library statistics to assist hospital librarians in effective direction of their profession's course.

2.10 Summary:

In this Chapter, studies relevant to quality, service quality and service quality of libraries from Bangladesh and worldwide perspective are reviewed. Besides, LibQUAL+ studies, healthcare library assessment studies are also covered.

CHAPTER- 3

Research Design and Methodology

3.1 Introduction:

This Chapter explores the population and sampling, data collection method, the questionnaire used for collecting data, data processing and analysis methods, tables and charts, which were used in this research.

3.2 Sampling:

According to Pickard (2007), sampling is the process of selecting a few from the many in order to carry out empirical research. This current research investigated LIBQUAL⁺® scores for library service quality assessment at four healthcare libraries selected based on purposive sampling method. The sample population for the study consisted of faculty members, researchers, postgraduate students and others. In case of BIRDEM and BSMMU, the sample population consisted of faculty member, researchers, postgraduate students and others (employees of concerned institution as well as external users). On the other hand, sample size of icddr,b consisted of only researchers (hospital researchers, training researchers, clinical science researchers, project researchers, etc.) and others (employees and external users). Besides, in case of NHLDOC, sample population consisted of researchers (external) and others (a small portion of its staff). The present research presented a mirror model of LibQUAL⁺® protocol.

A printed copy of LibQUAL⁺® survey questionnaire was used for the survey. The survey questionnaires were sent to faculty members, researchers and postgraduate students and other categories of users. A group of volunteers, recruited from various departments of University of Dhaka was recruited for collecting data.

They were given instruction on how to collect data from respondents before the actual survey. They were assigned to collect data from the faculty members, researchers, postgraduates and others. In this study, as library user, the terms ‘faculty member’ and ‘faculty’ are used synonymously words.

3.3 Sample Size and Response Rate:

In any research, involvement of respondents is very important as they are required to fill-in the questionnaire voluntarily. The following table (Table: 3.1) presents a brief summary about four healthcare institutions where the total population of four healthcare institutions were as BIRDEM (1,465), icddr,b (4,550), NHLDOC ((2,445) and BSMMU (1965).

Table 3.1 Brief Summary: Sample of healthcare libraries

S/N	Institute Name	Category	Year of Est.	Total Population
01	Bangabandhu Sheikh Mujib Medical University (BSMMU)	Public	1965	2,080
02	Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM)	Private	1975	1,465
03	International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)	International	1960	4,550
04	National Health Library and Documentation Centre (NHLDOC)	Public	1974	2,445

Source: Yearbooks and information collected from concerned institutions

In any survey, it is necessary to know how many responses are really needed for statistically sound results. This is why, a standard survey sample size was utilized in this research (Table: 3.2). According to Sample Size Calculator 2013, 90 percent confidence level with ± 5 standard deviation was observed in determining the sample size.

Table 3.2 Expected Respondents among Total Respondents

S/N	Institute Name	Total Respondents	Expected Sample Size
01	Bangabandhu Sheikh Mujib Medical University (BSMMU)	2,080	240
02	Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM)	1,465	229
03	International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)	4,550	256
04	National Health Library and Documentation Centre (NHLDOC)	2,445	244

Table: 3.3 explores the sample populations in respect of total responses by all categories of users at four healthcare institutions. It demonstrates the number of LibQUAL⁺® printed questionnaires that were distributed and then returned.

Table: 3.3 Summary of Sample

S/N	Institute Name	Questionnaire Distributed	Questionnaire Returned	% Returned
01	Bangabandhu Sheikh Mujib Medical University (BSMMU)	296	163	55.06
02	Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM)	255	105	41.17
03	International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)	279	112	40.14
04	National Health Library and Documentation Centre (NHLDOC)	262	93	35.49

3.4 Methods of Data Collection:

In this research, a set of questions according to original LibQUAL+® scale was used. Here, data were collected from faculty members, researchers, postgraduate students and other users where everyone was requested to fill-in the questionnaire with three levels of services: Minimum Service Level (*the Level of service that are enough/sufficient to users*), Desired Service Level (*the level of service that are expected by the user*) and Perceived Service (*the level of service that the user actually get*). Each level was consisted of a 9-point scale from lowest to highest scores to get an exact opinion from users.

3.5 Questionnaire:

The questionnaires of this research were organized into demographic questions (4 items), core questions (22 items), local questions (5 questions), information literacy questions (5 items), general satisfactory questions (3 questions), and library use question (3 items).

3.5.1 Demographic Questions

The demographic questions included age, gender, discipline, and position of the respondent. Demographic items differ according to institution type.

3.5.2 Core Questions

It consisted of 22-items of the original LibQUAL⁺® instrument. The items were grouped under three dimensions, these are: (a) Affect of Service (9 items); (b) Information Control (8 items) and (c) Library as Place (5 items). The 22 core items are:

Core Question: Affect of Service

- AS-1 Employees who instill confidence in users
- AS -2 Giving users individual attention
- AS -3 Employees who are consistently courteous
- AS -4 Readiness to respond to users' questions
- AS -5 Employees who have the knowledge to answer user questions
- AS -6 Employees who deal with users in a caring fashion
- AS -7 Employees who understand the needs of their users
- AS -8 Willingness to help users
- AS -9 Dependability in handling users' service problems

Core Question: Information Control

- IC-1 Making electronic resources accessible from my home or office
- IC-2 A library Web site enabling me to locate information on my own
- IC-3 The printed library materials I need for my work
- IC-4 The electronic information resources I need
- IC-5 Modern equipment that lets me easily access needed information
- IC-6 Easy-to-use access tools that allow me to find things on my own
- IC-7 Making information easily accessible for independent use
- IC-8 Print and/or electronic journal collections I require for my work

Core Question: Library as a Place

- LP-1 Library space that inspires study and learning
- LP-2 Quiet space for individual activities
- LP-3 A comfortable and inviting location
- LP-4 A getaway for study, learning, or research
- LP-5 Community space for group learning and group study

3.5.3 Information Literacy Questions

Five information literacy-related questions were included here. These are:

Information Literacy Questions

- IL-1 The library helps me stay abreast of developments in my field(s) of interest
- IL-2 The library aids my advancement in my academic discipline
- IL-3 The library enables me to be more efficient in my academic pursuits
- IL-4 The library helps me distinguish between trustworthy and untrustworthy information
- IL-5 The library provides me with the information skills I need in my work or study

3.5.4 Satisfaction Questions

Three questions were added to measure the satisfaction level of users. These are:

General Satisfactory Questions

- S-1 In general, I am satisfied with the way in which I am treated at the library
- S-2 In general, I am satisfied with library support for my learning, research, and/or teaching needs
- S-3 How would you rate the overall quality of the service provided by the library?

3.5.5 Local Questions

The survey may choose to add five local questions from a list of more than 100 optional questions provided by the LibQUAL+® team. For this research, five local questions were included in the context of healthcare libraries of Bangladesh. The local questions are:

Local Questions

- LQ-1** Library keeping me informed about resources and services
- LQ-2** Librarians teaching me how to effectively use the electronically available databases, Journals and books
- LQ-3** Adequate hours of service
- LQ-4** Library orientations or instruction sessions
- LQ-5** providing services as promised

3.5.6 Library Use Questions

Three questions were added under this category to measure how frequently users use the library facilities. These are:

Library Use Questions

- Q-1** How often do you use resources on library premises?
- Q-2** How often do you access library resources through a library Webpage?
- Q-3** How often do you use Yahoo!, Google, or non-library gateways for Information?

3.6 Method of Data Processing:

The collected data were entered into IBM SPSS. Data were treated for analysis in the following ways:

Firstly, inputted data were checked with the print copy of questionnaire and then checked for wrong and inconsistent data.

Secondly, the collected data were checked carefully and cautiously to avoid missing data.

Thirdly, some users selected “N/A” for all or most of the items. In this case, it was decided that questionnaires containing more than 11 “N/A” responses would not be accepted.

3.7 Analysis of Data:

Various type of tables and charts that were used for analyzing data include:

3.7.1 Radar Charts

Radar charts (also known as spider charts, polar charts, web charts, or star plots) are a way to visualize multivariate data. These charts are used to plot one or more groups of values over multiple common variables. They do this by giving an axis for each variable, and these axes are arranged radially around a central point and spaced equally.

In this study, radar charts were used to illustrate the summary of core 22 questions within three dimensions (Affect of Service, Information Control and Library as a Place).

3.7.2 Means

The term mean refers to '*average*' that is used to derive the central tendency of the data in question. It is determined by adding all the data points in a population and then dividing the total by the number of points. The resulting number is known as the mean or the average. In this research, the mean values were used to measure minimum, desired, perceived service quality. Besides, mean values were computed for measuring users' satisfaction and information literacy outcome questions.

3.7.3 Standard Deviation

Standard deviation is a number used to tell how measurements for a group are spread out from the average (mean) or expected value. A low standard deviation means that most of the numbers are very close to the average. A high standard deviation means that the numbers are spread out. In this research, SD was calculated to assess how far the values are spread above and below the mean.

3.7.4 Service Adequacy

The service adequacy (SA) gap score is the result of subtraction of the minimum service expected by users from perceived service. In this study, service adequacy gap (Perceived Service- Minimum Service) was calculated in case of core questions as well as locally selected questions. In general, it works as an indicator to measure how much minimum expectation of users are fulfilled. A positive SA gap in case of any service refers to fulfillment of minimum expectation of users and the existing services provided by the library are good, whereas negative SA gap indicates that existing services are not meeting users' minimum expectation.

3.7.5 Service Superiority

Service superiority is the result that is found by subtracting desired service expected by users from perceived service that the library currently provides. In a simple equation, Service Superiority = Perceived Service - Desired Service. Here, superiority gap was calculated in case of core questions as well as locally selected questions. In general, it works as an indicator to measure how much desired expectation of users are fulfilled. A positive SS gap in case of any service refers to fulfillment of desired expectation of users and the existing services provided by the library are very good, whereas negative SA gap indicates that existing services are not meeting users' desired expectations.

3.7.6 Exploratory Factor Analysis (EFA)

EFA is also called 'unrestricted' factor analysis. It finds factors which reproduce correlations between observed variables (n of factors = n of observed variables). Basically, it is a statistical technique that is used to reduce data to a smaller set of summary variables and to explore the underlining theoretical structure of the phenomena. EFA was used to identify the structure of the relationship between the variables and the respondents.

3.7.7 Confirmatory Factor Analysis (CFA)

CFA is also called 'restricted' factor model. It specifies the measurement model before looking at data i.e. test of theory against data. It is a multivariate statistical procedure that is used to test how well the measured variables represent the number of constructs. In confirmatory factor analysis (CFA), researchers can specify the number of factors required in the data and which measured variable is related to which latent variable. Here, CFA was used to confirm or reject the original LibQUAL+® measurement theory.

3.8 Data Analysis Techniques:

The ways through which data were analyzed are as follows:

- To find out the difference between male and female respondents, a tabular chart was presented.
- Three levels (MS, DS and PS) of service performances and gaps were calculated and ranked respectively to find out the impact of local questions.
- With a view to identify excellent service of all healthcare libraries, the means of desired service expectations was ranked and compared.

- To explore the components that are fulfilling the minimum expectation of users in getting quality service, the gap difference among Minimum Service and Perceived Service for each user group was calculated and ranked respectively.
- To explore the components that are fulfilling the desired expectation of group user in getting quality service, the gap difference between Desired Service and Perceived Service performance was calculated and ranked.
- *Zone of Tolerance* (the range between Desired Service Level and Minimum Service Level) were calculated to identify the things that the library should consider for providing excellent service.
- To explore the factors that evaluate user's service quality, exploratory factor analysis and confirmatory factor analysis method were used respectively.
- To identify the variation in overall service quality in respect of gender and age, nonparametric statistical analysis like, Mann-Whitney and Kruskal-Wallis tests were conducted.

3.9 Summary:

This Chapter described how the research was carried out, survey population and sample size, techniques used for data collection and analysis, etc. The next Chapter will present the data analysis and findings of this research.

CHAPTER- 4

Data Interpretation and Findings

4.1 Preface:

Analysis of data is the most crucial part of any research. It helps to explore the key findings and to identify areas where further improvements are required. This Chapter elucidates the results of this research study.

4.2 Methodological Approach:

The research questions adopted for this research were analyzed under three broad headings. The first part included a demographic summary (number of respondents, respondents by gender, age, user groups, etc.); and secondly, service quality of four healthcare libraries were measured separately i.e. institution-wise, and then finally analyses of key findings were presented.

4.3 Demographic summary of four healthcare libraries:

In this research, assessment of library service quality was measured through LibQUAL+® scores at four healthcare libraries, e.g. BSMMU, BIRDEM, icddr,b and NHLDOC. The respondents included faculty member, researchers, postgraduate students and others (employees of concerned institutions, external users, etc.).

4.3.1 Respondents' Ratio

Table 4.1 below shows that BSMMU had the highest number of respondents i.e. 7.84%, compared to its total population. BIRDEM, icddr,b and NHLDOC had 7.58%, 2.30% and 3.80% respondents respectively in comparison to their total population.

Table 4.1 Respondents' ratio with the total population

Institution	Population	Respondents(n)	Respondents
BSMMU	2080	163	7.84%
BIRDEM	1465	111	7.58%
icddr,b	4550	105	2.30%
NHLDOC	2445	93	3.80%
Total	10,540	472	4.48%

4.3.2. Gender-wise Respondents

Respondents at four healthcare libraries as per gender (male and female) are presented in Table 4.2. Among 163 respondents at BSMMU, 63.19% were male and 36.81% were female. At BIRDEM, among 111 respondents, 64.86% were male and 35.14% were female. In case of icddr,b, with 105 respondents, male and female percentages were 65.71% and 34.29% respectively. At NHLDOC, among 95 respondents, male and female response rates were 74.19% and 25.81%, consecutively.

Table 4.2 Gender-wise Respondents

Institution	Gender	Frequency	Percent (%)
BSMMU	Male	103	63.19
	Female	60	36.81
	Total	163	100.00
BIRDEM	Male	72	64.86
	Female	39	35.14
	Total	111	100.00
icddr,b	Male	69	65.71
	Female	36	34.29
	Total	105	100.00
NHLDOC	Male	69	74.19
	Female	24	25.81
	Total	93	100.00

4.3.3. Group-wise Respondents

Respondents at four healthcare libraries as per user groups (faculty, postgraduate, researcher and others) are presented in Table 4.3. Among 163 respondents at BSMMU, the highest respondents were postgraduates (37.42%), followed by faculty (30.06%) and researchers (25.77%), whereas 6.75% respondents belong to other categories. At BIRDEM, among 111 respondents, the responses were faculty (24.32%), postgraduates (36.94%) and researchers (32.43%), whereas 6.31% respondents were other users. In case of icddr,b with 105 respondents, 75.24% were researchers and the remaining 24.76% belong to other users. At NHLDOC, among 95 respondents, researchers and other users were 81.73 % and 19.27% successively.

Table 4.3 User Group-wise Respondents

Institution	Gender	Frequency	Percent (%)
BSMMU	Faculty	49	30.06
	Postgraduate Student	61	37.42
	Researcher	42	25.77
	Other	11	6.75
	Total	163	100.00
BIRDEM	Faculty	27	24.32
	Postgraduate Student	41	36.94
	Researcher	36	32.43
	Other	7	6.31
	Total	111	100.00
icddr,b	Researchers	79	75.24
	Other	26	24.76
	Total	105	100
NHLDOC	Researcher	76	81.73
	Other	17	18.27
	Total	93	100.00

4.3.4. Age-wise Respondents

Responses of users of four healthcare libraries as per age are presented below in tabular form (Table 4.4 - 4.7).

At BSMMU, the highest 38.04% respondents fell into 34-39 years and then 26.38% in 28-33 years age categories. The age groups 22-27 years and above 40 years had 16.56% and 19.02% respondents respectively (Table 4.4).

Table 4.4 Respondents' Age at BSMMU

Age (Year)	Frequency	Percent
22-27 Years	27	16.56
28-33 Years	43	26.38
34-39 Years	62	38.04
40-Above Years	31	19.02
Total	163	100.00

For BIRDEM, the highest number of 42.34% came from 28-33 years age category. Then, 30.63%, 14.42% and 12.61% respondents were from 34-39 years, above 40 years and 22-27 years age groups successively (Table 4.6).

Table 4.5 Respondents' Age at BIRDEM

Age (Year)	Frequency	Percent
22-27 Years	14	12.61
28-33 Years	47	42.34
34-39 Years	34	30.63
40-Above Years	16	14.42
Total	111	100.00

In case of icddr,b, the highest respondents 48.57% were from 28-33 years age group and the lowest responses 11.43% were from above 40 years age group. Besides, 12.38% and 27.62% responses came from 22-27 years and 34-39 years age groups respectively (Table 4.5).

Table 4.6 Respondents' Age at icddr,b

Age (Year)	Frequency	Percent
22-27 Years	13	12.38
28-33 Years	51	48.57
34-39 Years	29	27.62
40-Above Years	12	11.43
Total	105	100.00

At NHLDOC, the highest (45.16%) and the lowest (11.83%) responses came from 34-39 years and 22-27 years age groups respectively. Besides, 27.96% responses were from 28-33 years and 15.06% were from above 40 years age groups (Table 4.7).

Table 4.7 Respondents' Age at NHLDOC

Age (Year)	Frequency	Percent
22-27 Years	11	11.83
28-33 Years	26	27.96
34-39 Years	42	45.16
40-Above Years	14	15.05
Total	93	100.00

4.4 Service Quality of four healthcare libraries:

Here, the service quality scores of each healthcare libraries (BSMMUL, BIRDEML, icddr,b and NHLDOC) are presented separately according to research questions.

4.4.1 Bangabandhu Sheikh Mujib Medical University Library (BSMMUL)

4.4.1.1 Summary: Core Questions of LibQUAL+® (BSMMUL)

The answers to LibQUAL+® core 22 question from BSMMU are analyzed below.

4.4.1.1.1 Responses of Users in respect of Minimum, Desired and Perceived Services: BSMMUL

Table 4.8 presents responses of BSMMU Library users to LibQUAL+® core questions on three levels of services (MS, DS & PS). The analysis was done to observe the distribution of mean values and standard deviations.

Table -4.8 BSMMUL: Core questions (Mean & SD) by participating Users (N=163)

Order	ID	MS		DS		PS	
		Mean	SD	Mean	SD	Mean	SD
1	AS-1	6.25	0.94	7.74	0.99	5.29	1.29
2	IC-1	6.43	1.02	7.69	1.02	5.68	1.28
3	LP-1	6.86	1.09	7.87	1.02	5.97	1.18
4	AS-2	6.02	1.14	7.50	1.33	5.21	1.34
5	IC-2	6.15	1.05	7.71	1.02	5.57	1.37
6	AS-3	5.69	1.22	7.47	0.94	4.44	0.98
7	IC-3	6.45	1.07	7.82	1.01	5.70	1.25
8	LP-2	6.19	0.91	7.60	0.98	5.53	1.25
9	AS-4	5.89	1.08	7.60	0.93	4.99	1.21
10	IC-4	6.75	1.19	7.98	0.97	5.64	1.20
11	AS-5	6.03	1.05	7.79	0.93	5.38	1.33
12	LP-3	6.18	1.29	7.96	0.98	5.25	1.33
13	AS-6	6.55	1.08	7.91	0.93	5.43	1.24
14	IC-5	6.48	1.17	7.96	1.02	5.52	1.23
15	AS-7	5.96	1.10	7.84	0.96	5.02	1.24
16	IC-6	6.12	0.95	7.63	1.02	5.28	1.24
17	LP-4	6.20	1.10	7.62	1.13	5.55	1.32
18	AS-8	6.15	0.90	7.78	0.96	5.56	1.21
19	IC-7	5.87	1.21	7.62	1.04	4.89	1.37
20	IC-8	6.50	1.15	7.98	1.01	5.64	1.28
21	LP-4	6.08	1.04	7.55	1.02	5.36	1.32
22	AS-9	6.07	0.93	7.68	0.79	5.54	1.37

The tables below (Table 4.9 – 4.13) represent the means and standard deviations of BSMMU scores ranked by mean values for all three level of services. The scores given by each type of users (faculty, researcher, postgraduate students and others) are shown individually. In general, all BSMMU’s DS scores are higher than PS ratings.

Table 4.9 BSMMUL: Core questions (Mean & SD) ranked by mean value by participating Users (N=163)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	6.86	1.09	IC-8	7.98	1.01	LP-1	6.97	1.18
2	IC-4	6.75	1.19	IC-4	7.98	0.97	IC-3	6.70	1.25
3	AS-6	6.55	1.08	IC-5	7.96	1.02	IC-1	6.68	1.28
4	IC-8	6.50	1.15	LP-3	7.96	0.98	IC-4	6.64	1.20
5	IC-5	6.48	1.17	AS-6	7.91	0.93	IC-8	6.64	1.28
6	IC-3	6.45	1.07	LP-1	7.87	1.02	IC-2	6.57	1.37
7	IC-1	6.43	1.02	AS-7	7.84	0.96	AS-8	6.56	1.21
8	AS-1	6.25	0.94	IC-3	7.82	1.01	LP-4	6.55	1.32
9	LP-4	6.20	1.10	AS-5	7.79	0.93	AS-9	6.54	1.37
10	LP-2	6.19	0.91	AS-8	7.78	0.96	LP-2	6.53	1.25
11	LP-3	6.18	1.29	AS-1	7.74	0.99	IC-5	6.52	1.23
12	IC-2	6.15	1.05	IC-2	7.71	1.02	AS-6	6.43	1.24
13	AS-8	6.15	0.90	IC-1	7.69	1.02	AS-5	6.38	1.33
14	IC-6	6.12	0.95	AS-9	7.68	0.79	LP-5	6.36	1.32
15	LP-5	6.08	1.04	IC-6	7.63	1.02	AS-1	6.29	1.29
16	AS-9	6.07	0.93	LP-4	7.62	1.13	IC-6	6.28	1.24
17	AS-5	6.03	1.05	IC-7	7.62	1.04	LP-3	6.25	1.33
18	AS-2	6.02	1.14	LP-2	7.60	0.98	AS-2	6.21	1.34
19	AS-7	5.96	1.10	AS-4	7.60	0.93	AS-7	6.02	1.24
20	AS-4	5.89	1.08	LP-5	7.55	1.02	AS-4	5.99	1.21
21	IC-7	5.87	1.21	AS-2	7.50	1.33	IC-7	5.89	1.37
22	AS-3	5.69	1.22	AS-3	7.47	0.94	AS-3	5.44	0.98

Table 4.10 BSMMUL: Core questions (Mean & SD) ranked by mean value by Faculty (n=49)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	IC-4	7.16	0.75	LP-3	8.41	0.70	LP-1	7.49	0.74
2	AS-6	7.16	0.92	AS-6	8.41	0.70	IC-3	7.33	0.85
3	LP-1	7.10	0.65	IC-8	8.39	0.73	IC-1	7.31	0.87
4	IC-8	6.94	0.88	AS-7	8.35	0.75	IC-8	7.29	0.91
5	IC-1	6.92	0.76	AS-1	8.31	0.77	AS-9	7.29	1.08
6	IC-3	6.92	0.67	IC-1	8.24	0.75	IC-2	7.27	0.88
7	IC-5	6.88	0.67	IC-4	8.22	0.59	LP-4	7.24	0.92
8	LP-4	6.69	0.62	IC-5	8.20	0.58	AS-8	7.22	0.96
9	LP-3	6.67	0.75	LP-4	8.20	0.76	AS-1	7.14	1.02
10	IC-2	6.65	0.56	LP-1	8.12	0.53	AS-5	7.08	1.02
11	LP-2	6.65	0.56	IC-2	8.12	0.63	AS-6	7.08	1.02
12	AS-1	6.59	0.64	LP-2	8.12	0.67	IC-4	7.06	0.92
13	LP-5	6.57	0.71	IC-3	8.10	0.62	IC-5	7.06	0.97
14	AS-2	6.55	0.65	AS-5	8.10	0.62	LP-2	7.02	0.92
15	AS-8	6.53	0.65	IC-7	8.10	0.65	LP-5	7.00	1.06
16	AS-9	6.53	0.65	AS-8	8.02	0.52	AS-7	6.80	1.17
17	IC-7	6.51	0.79	IC-6	7.98	0.59	AS-4	6.71	1.15
18	AS-5	6.49	0.65	LP-5	7.96	0.58	IC-6	6.71	1.15
19	AS-7	6.49	0.82	AS-9	7.94	0.52	AS-2	6.47	0.89
20	IC-6	6.49	0.79	AS-4	7.92	0.57	LP-3	6.47	0.89
21	AS-4	6.39	0.84	AS-3	7.88	0.63	IC-7	6.47	1.08
22	AS-3	6.29	0.87	AS-2	7.67	0.80	AS-3	5.86	0.58

Table 4.11 BSMMUL: Core questions (Mean & SD) ranked by mean value by Postgraduates (n=61)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	6.23	1.36	LP-3	7.52	1.18	LP-1	6.20	1.39
2	AS-6	6.21	1.17	AS-7	7.48	1.13	IC-3	6.08	1.39
3	IC-8	6.02	1.34	AS-6	7.46	1.07	IC-4	6.08	1.39
4	IC-3	5.98	1.30	IC-8	7.46	1.18	IC-8	6.00	1.46
5	IC-4	5.97	1.40	IC-4	7.43	1.22	IC-1	5.98	1.50
6	IC-1	5.90	1.14	IC-5	7.41	1.31	IC-5	5.93	1.34
7	IC-5	5.89	1.44	AS-1	7.39	1.05	AS-6	5.92	1.33
8	AS-1	5.75	1.11	AS-9	7.34	0.96	AS-8	5.92	1.31
9	AS-8	5.67	1.06	IC-3	7.28	1.25	AS-9	5.90	1.40
10	LP-2	5.64	1.05	LP-1	7.23	1.27	LP-2	5.85	1.42
11	IC-6	5.61	1.04	AS-5	7.20	1.05	IC-6	5.79	1.27
12	LP-4	5.59	1.37	AS-8	7.20	1.17	LP-4	5.79	1.51
13	AS-9	5.59	1.02	IC-2	7.16	1.25	IC-2	5.75	1.61
14	IC-2	5.52	1.31	IC-1	7.15	1.19	LP-5	5.70	1.45
15	AS-7	5.52	1.25	AS-4	7.10	1.14	AS-1	5.62	1.37
16	LP-5	5.49	1.19	LP-2	7.07	1.18	LP-3	5.59	1.65
17	AS-4	5.48	1.21	IC-7	7.07	1.30	AS-5	5.56	1.43
18	LP-3	5.39	1.54	IC-6	7.05	1.30	AS-7	5.54	1.26
19	AS-5	5.36	1.24	AS-3	7.00	1.17	AS-2	5.51	1.61
20	AS-2	5.28	1.38	LP-4	7.00	1.39	AS-4	5.51	1.23
21	IC-7	5.26	1.39	LP-5	6.92	1.19	IC-7	5.31	1.57
22	AS-3	5.03	1.39	AS-2	6.69	1.61	AS-3	4.93	1.22

**Table 4.12 BSMMUL: Core questions (Mean & SD) ranked by mean value by
Researchers (n=42)**

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.31	0.68	IC-5	8.36	0.58	LP-1	7.33	0.72
2	IC-4	7.24	0.73	IC-4	8.33	0.57	IC-1	6.76	0.93
3	IC-5	6.67	0.90	LP-1	8.31	0.60	IC-2	6.76	0.93
4	IC-8	6.50	0.94	AS-2	8.26	0.70	IC-3	6.76	1.10
5	IC-3	6.48	0.89	AS-8	8.24	0.62	IC-4	6.76	0.93
6	IC-1	6.43	0.77	AS-5	8.21	0.65	LP-3	6.71	0.92
7	LP-3	6.43	0.83	IC-3	8.14	0.68	AS-2	6.69	0.95
8	AS-1	6.40	0.73	IC-8	8.07	0.75	LP-2	6.69	0.95
9	LP-4	6.33	0.69	LP-3	7.93	0.71	LP-4	6.67	0.90
10	IC-2	6.31	0.64	AS-6	7.93	0.64	AS-8	6.62	0.91
11	AS-2	6.29	0.67	LP-5	7.90	0.79	IC-8	6.62	0.96
12	LP-2	6.29	0.67	IC-2	7.88	0.71	AS-5	6.60	0.94
13	AS-5	6.29	0.67	AS-4	7.88	0.74	IC-5	6.52	1.02
14	AS-8	6.29	0.64	IC-6	7.86	0.61	LP-5	6.48	1.06
15	IC-6	6.26	0.70	AS-9	7.81	0.67	IC-6	6.38	1.15
16	AS-6	6.19	0.86	AS-7	7.69	0.64	AS-9	6.31	1.18
17	LP-5	6.19	0.80	IC-7	7.69	0.64	AS-1	6.17	0.82
18	AS-9	6.07	0.78	IC-1	7.67	0.61	AS-6	6.14	0.95
19	AS-7	5.79	0.95	LP-4	7.67	0.61	IC-7	5.79	1.05
20	AS-4	5.76	0.93	LP-2	7.64	0.62	AS-4	5.74	0.86
21	IC-7	5.76	0.96	AS-3	7.62	0.58	AS-7	5.69	0.87
22	AS-3	5.74	0.94	AS-1	7.50	0.92	AS-3	5.55	0.71

Table 4.13 BSMMUL: Core questions (Mean & SD) ranked by mean value by Others (n=11)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.55	0.52	IC-8	8.73	0.47	AS-9	7.64	0.67
2	IC-4	7.36	0.67	LP-1	8.55	0.52	LP-1	7.55	0.69
3	LP-3	7.36	0.50	IC-4	8.55	0.52	IC-1	7.45	0.69
4	IC-5	7.36	0.67	LP-3	8.45	0.52	LP-2	7.45	0.69
5	IC-8	7.27	0.65	IC-5	8.45	0.69	IC-4	7.45	0.69
6	IC-1	7.18	0.60	AS-2	8.36	0.81	AS-6	7.45	0.69
7	AS-6	7.00	0.63	IC-3	8.36	0.67	IC-8	7.45	0.69
8	IC-3	6.91	0.54	IC-6	8.36	0.50	IC-2	7.27	0.79
9	LP-4	6.91	0.54	IC-1	8.27	0.47	IC-5	7.27	1.01
10	AS-1	6.82	0.40	LP-4	8.27	0.65	LP-4	7.18	0.87
11	AS-2	6.82	0.40	IC-7	8.27	0.47	AS-2	7.09	0.83
12	IC-2	6.82	0.40	IC-2	8.18	0.60	IC-3	7.09	0.83
13	LP-2	6.82	0.40	AS-6	8.18	0.75	LP-3	7.09	0.83
14	IC-6	6.82	0.40	AS-7	8.18	0.60	AS-5	7.00	0.89
15	AS-5	6.73	0.47	AS-8	8.18	0.75	AS-8	6.91	0.94
16	AS-7	6.73	0.47	LP-2	8.09	0.54	IC-7	6.91	0.94
17	IC-7	6.73	0.47	AS-1	8.00	0.63	AS-1	6.73	1.10
18	LP-5	6.73	0.47	AS-5	8.00	0.77	IC-6	6.73	0.90
19	AS-9	6.73	0.47	LP-5	7.91	0.54	LP-5	6.73	0.90
20	AS-8	6.55	0.69	AS-9	7.91	0.54	AS-7	6.55	0.82
21	AS-3	6.45	0.69	AS-4	7.82	0.40	AS-4	6.36	0.92
22	AS-4	6.45	0.69	AS-3	7.73	0.79	AS-3	5.91	0.30

4.4.1.1.2 Service Adequacy of BSMMUL: Core Questions

The subtraction of minimum service from perceived service (Service Adequacy) was measured to observe whether user's expectations of minimum service quality are met or not. In case of BSMMU Library, Table 4.14 shows combined and individual group-wise adequacy gap.

Table 4.14 BSMMUL: Service Adequacy of all (N=163) and Particular Groups

Order	ID	ALL		Faculty		Postgraduate Student		Researcher		Others	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	AS-1	0.05	0.76	0.55	0.68	-0.13	0.64	-0.24	0.69	-0.09	0.94
2	IC-1	0.25	0.70	0.39	0.67	0.08	0.74	0.33	0.61	0.27	0.79
3	LP-1	0.11	0.74	0.39	0.79	-0.03	0.66	0.02	0.72	0.00	0.77
4	AS-2	0.18	0.69	-0.08	0.84	0.23	0.53	0.40	0.59	0.27	0.79
5	IC-2	0.42	0.60	0.61	0.61	0.23	0.56	0.45	0.55	0.45	0.69
6	AS-3	-0.25	0.55	-0.43	0.65	-0.10	0.44	-0.19	0.51	-0.55	0.52
7	IC-3	0.25	0.73	0.41	0.79	0.10	0.60	0.29	0.81	0.18	0.75
8	LP-2	0.34	0.66	0.37	0.78	0.21	0.61	0.40	0.59	0.64	0.50
9	AS-4	0.10	0.65	0.33	0.75	0.03	0.48	-0.02	0.64	-0.09	0.83
10	IC-4	-0.10	0.81	-0.10	0.87	0.11	0.75	-0.48	0.71	0.09	0.70
11	AS-5	0.35	0.62	0.59	0.61	0.20	0.57	0.31	0.60	0.27	0.79
12	LP-3	0.07	0.74	-0.20	0.87	0.20	0.60	0.29	0.64	-0.27	0.79
13	AS-6	-0.12	0.73	-0.08	0.67	-0.30	0.78	-0.05	0.70	0.45	0.52
14	IC-5	0.03	0.92	0.18	1.11	0.05	0.80	-0.14	0.75	-0.09	1.14
15	AS-7	0.06	0.64	0.31	0.77	0.02	0.50	-0.10	0.58	-0.18	0.75
16	IC-6	0.16	0.72	0.22	0.85	0.18	0.53	0.12	0.77	-0.09	0.83
17	LP-4	0.34	0.64	0.55	0.74	0.20	0.54	0.33	0.61	0.27	0.65
18	AS-8	0.41	0.61	0.69	0.55	0.25	0.54	0.33	0.61	0.36	0.81
19	IC-7	0.02	0.70	-0.04	0.87	0.05	0.56	0.02	0.60	0.18	0.98
20	IC-8	0.14	0.77	0.35	0.80	-0.02	0.72	0.12	0.74	0.18	0.87
21	LP-5	0.28	0.61	0.43	0.74	0.21	0.45	0.29	0.60	0.00	0.77
22	AS-9	0.47	0.59	0.76	0.56	0.31	0.50	0.24	0.62	0.91	0.30

Table 4.15 focuses on combined and individual group-wise adequacy gap ranked by mean value at BSMMU Library. It is important to note here that positive scores are better. For example, AG score of +1.00 is better than a score of +0.80 and in the same way an AG score of -40 is better than a score of -60.

Among 22 core items, for all users, AS-3 (-0.25), AS-6 (-0.12), IC-4 (0.01), IC-7 (0.02) and IC-5 (0.03) had lowest AG gaps which indicate that BSMMU Library provides comparatively more satisfactory services to its users in respect of handling user politely, dealing users very smartly, providing necessary information, providing necessary print/electronic journals and providing modern equipment to access needed information. The highest negative AG gap was concerned with AS-9 (0.47), which refers that BSMMU Library employees are not handling user's service-related problems properly.

In case of faculty, the top five AG scores are AS-3 (-0.43), LP-3 (-0.2), IC-4 (-0.1), AS-2 (-0.08) and AS-6 (-0.08). For postgraduate students, the highest negative gap was found in AS-6 (-0.3), which indicate that library staff are not dealing users smartly. For the researchers, the biggest two negative AG scores were IC-4 (-0.48), IC-1 (-24). For others, the highest negative AG score was AS-3 (-0.55).

Table 4.15 BSMMUL: Service Adequacy of all (N=163) and Particular Groups (Ranked by Mean)

Order	ID	ALL		ID	Faculty		ID	Postgraduate Student		ID	Researcher		ID	Others	
		Mean	SD		Mean	SD		Mean	SD		Mean	SD		Mean	SD
1	AS-3	-0.25	0.55	AS-3	-0.43	0.65	AS-6	-0.3	0.78	IC-4	-0.48	0.71	AS-3	-0.55	0.52
2	AS-6	-0.12	0.73	LP-3	-0.2	0.87	AS-1	-0.13	0.64	AS-1	-0.24	0.69	LP-3	-0.27	0.79
3	IC-4	-0.1	0.81	IC-4	-0.1	0.87	AS-3	-0.1	0.44	AS-3	-0.19	0.51	AS-7	-0.18	0.75
4	IC-7	0.02	0.7	AS-2	-0.08	0.84	LP-1	-0.03	0.66	IC-5	-0.14	0.75	AS-1	-0.09	0.94
5	IC-5	0.03	0.92	AS-6	-0.08	0.67	IC-8	-0.02	0.72	AS-7	-0.1	0.58	AS-4	-0.09	0.83
6	AS-1	0.05	0.76	IC-7	-0.04	0.87	AS-7	0.02	0.5	AS-6	-0.05	0.7	IC-5	-0.09	1.14
7	AS-7	0.06	0.64	IC-5	0.18	1.11	AS-4	0.03	0.48	AS-4	-0.02	0.64	IC-6	-0.09	0.83
8	LP-3	0.07	0.74	IC-6	0.22	0.85	IC-5	0.05	0.8	LP-1	0.02	0.72	LP-1	0	0.77
9	AS-4	0.1	0.65	AS-7	0.31	0.77	IC-7	0.05	0.56	IC-7	0.02	0.6	LP-5	0	0.77
10	LP-1	0.11	0.74	AS-4	0.33	0.75	IC-1	0.08	0.74	IC-6	0.12	0.77	IC-4	0.09	0.7
11	IC-8	0.14	0.77	IC-8	0.35	0.8	IC-3	0.1	0.6	IC-8	0.12	0.74	IC-3	0.18	0.75
12	IC-6	0.16	0.72	LP-2	0.37	0.78	IC-4	0.11	0.75	AS-9	0.24	0.62	IC-7	0.18	0.98
13	AS-2	0.18	0.69	IC-1	0.39	0.67	IC-6	0.18	0.53	IC-3	0.29	0.81	IC-8	0.18	0.87
14	IC-1	0.25	0.7	LP-1	0.39	0.79	AS-5	0.2	0.57	LP-3	0.29	0.64	IC-1	0.27	0.79
15	IC-3	0.25	0.73	IC-3	0.41	0.79	LP-3	0.2	0.6	LP-5	0.29	0.6	AS-2	0.27	0.79
16	LP-5	0.28	0.61	LP-5	0.43	0.74	LP-4	0.2	0.54	AS-5	0.31	0.6	AS-5	0.27	0.79
17	LP-2	0.34	0.66	AS-1	0.55	0.68	LP-2	0.21	0.61	IC-1	0.33	0.61	LP-4	0.27	0.65
18	LP-4	0.34	0.64	LP-4	0.55	0.74	LP-5	0.21	0.45	LP-4	0.33	0.61	AS-8	0.36	0.81
19	AS-5	0.35	0.62	AS-5	0.59	0.61	AS-2	0.23	0.53	AS-8	0.33	0.61	IC-2	0.45	0.69
20	AS-8	0.41	0.61	IC-2	0.61	0.61	IC-2	0.23	0.56	AS-2	0.4	0.59	AS-6	0.45	0.52
21	IC-2	0.42	0.6	AS-8	0.69	0.55	AS-8	0.25	0.54	LP-2	0.4	0.59	LP-2	0.64	0.5
22	AS-9	0.47	0.59	AS-9	0.76	0.56	AS-9	0.31	0.5	IC-2	0.45	0.55	AS-9	0.91	0.3

4.4.1.1.3 Service Superiority of BSMMUL: Core Questions

When desired service is subtracted from perceived service, then the output is called Service Superiority (SS) gap. Basically, it is an indicator of those services that are meeting desired expectation of users. Table 4.16 shows combined and individual group-wise superiority gap scores at BSMMUL.

Table 4.16 BSMMUL: Service Superiority of all (N=163) and Particular Groups

Order	ID	ALL		Faculty		Postgraduate Student		Researcher		Others	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	AS-1	-1.44	0.79	-1.16	0.69	-1.77	0.74	-1.33	0.85	-1.27	0.79
2	IC-1	-1.01	0.61	-0.94	0.47	-1.16	0.66	-0.90	0.62	-0.82	0.75
3	LP-1	-0.90	0.60	-0.63	0.70	-1.03	0.52	-0.98	0.52	-1.00	0.63
4	AS-2	-1.29	0.62	-1.20	0.64	-1.18	0.53	-1.57	0.67	-1.27	0.47
5	IC-2	-1.13	0.74	-0.86	0.76	-1.41	0.69	-1.12	0.63	-0.91	0.83
6	AS-3	-2.04	0.52	-2.02	0.43	-2.07	0.54	-2.07	0.46	-1.82	0.87
7	IC-3	-1.12	0.80	-0.78	0.77	-1.20	0.65	-1.38	0.91	-1.27	0.79
8	LP-2	-1.07	0.67	-1.10	0.68	-1.21	0.66	-0.95	0.66	-0.64	0.50
9	AS-4	-1.61	0.95	-1.20	1.00	-1.59	0.76	-2.14	0.93	-1.45	0.82
10	IC-4	-1.33	0.73	-1.16	0.83	-1.34	0.63	-1.57	0.70	-1.09	0.70
11	AS-5	-1.40	0.77	-1.02	0.83	-1.64	0.61	-1.62	0.73	-1.00	0.63
12	LP-3	-1.71	1.02	-1.94	1.14	-1.93	1.00	-1.21	0.68	-1.36	1.03
13	AS-6	-1.48	0.77	-1.33	0.69	-1.54	0.67	-1.79	0.90	-0.73	0.47
14	IC-5	-1.45	0.93	-1.14	1.08	-1.48	0.79	-1.83	0.76	-1.18	1.08
15	AS-7	-1.82	0.63	-1.55	0.68	-1.93	0.51	-2.00	0.62	-1.64	0.67
16	IC-6	-1.34	0.83	-1.27	0.91	-1.26	0.63	-1.48	0.94	-1.64	1.03
17	LP-4	-1.07	0.67	-0.96	0.73	-1.21	0.61	-1.00	0.62	-1.09	0.83
18	AS-8	-1.22	0.75	-0.80	0.79	-1.28	0.58	-1.62	0.73	-1.27	0.65
19	IC-7	-1.73	0.69	-1.63	0.73	-1.75	0.65	-1.90	0.69	-1.36	0.67
20	IC-8	-1.34	0.70	-1.10	0.71	-1.46	0.67	-1.45	0.74	-1.27	0.47
21	LP-5	-1.19	0.74	-0.96	0.76	-1.21	0.66	-1.43	0.74	-1.18	0.87
22	AS-9	-1.14	1.03	-0.65	0.95	-1.44	0.87	-1.50	1.06	-0.27	0.79

Table 4.17 explores the superiority gap ranked by mean value. Here, it was found that researchers' gap scores were comparatively higher than other groups. For all users, the five highest negative SG scores were AS-3 (-2.04), AS-7 (-1.82), IC-7 (-1.73), LP-3 (-1.71) and AS-4 (-1.61). These gaps indicate that desired expectation of users at BSMMUL in receiving these services were not met.

For faculty, the top five gap sizes were AS-3 (-2.02), LP-3 (-1.94), IC-7 (-1.63), AS-7 (-1.55) and AS-6 (-1.33). For the postgraduate group, the top five problematic attributes were AS-3 (-2.07), AS-7 (-1.93), LP-3 (-1.93), AS-1 (-1.77) and IC-7 (-1.75).

In case of researchers, the top SG items were AS-4 (-2.14), AS-3 (-2.07), AS-7 (-2.00), IC-7 (-1.9) and IC-5 (-1.83). For others, the highest five gap scores were AS-3 (-1.82), IC-6 (-1.64), AS-7 (-1.64), AS-4 (-1.45) and IC-7 (-1.36).

Table 4.17 BSMMUL: Service Superiority of all (N=163) and Particular Groups (Ranked by Mean)

Order	ID	ALL		ID	Faculty		ID	Postgraduate Student		ID	Researcher		ID	Others	
		Mean	SD		Mean	SD		Mean	SD		Mean	SD		Mean	SD
1	LP-1	-0.9	0.6	LP-1	-0.63	0.7	LP-1	-1.03	0.52	IC-1	-0.9	0.62	AS-9	-0.27	0.79
2	IC-1	-1.01	0.61	AS-9	-0.65	0.95	IC-1	-1.16	0.66	LP-2	-0.95	0.66	LP-2	-0.64	0.5
3	LP-2	-1.07	0.67	IC-3	-0.78	0.77	AS-2	-1.18	0.53	LP-1	-0.98	0.52	AS-6	-0.73	0.47
4	LP-4	-1.07	0.67	AS-8	-0.8	0.79	IC-3	-1.2	0.65	LP-4	-1	0.62	IC-1	-0.82	0.75
5	IC-3	-1.12	0.8	IC-2	-0.86	0.76	LP-2	-1.21	0.66	IC-2	-1.12	0.63	IC-2	-0.91	0.83
6	IC-2	-1.13	0.74	IC-1	-0.94	0.47	LP-4	-1.21	0.61	LP-3	-1.21	0.68	LP-1	-1	0.63
7	AS-9	-1.14	1.03	LP-4	-0.96	0.73	LP-5	-1.21	0.66	AS-1	-1.33	0.85	AS-5	-1	0.63
8	LP-5	-1.19	0.74	LP-5	-0.96	0.76	IC-6	-1.26	0.63	IC-3	-1.38	0.91	IC-4	-1.09	0.7
9	AS-8	-1.22	0.75	AS-5	-1.02	0.83	AS-8	-1.28	0.58	LP-5	-1.43	0.74	LP-4	-1.09	0.83
10	AS-2	-1.29	0.62	IC-8	-1.1	0.71	IC-4	-1.34	0.63	IC-8	-1.45	0.74	IC-5	-1.18	1.08
11	IC-4	-1.33	0.73	LP-2	-1.1	0.68	IC-2	-1.41	0.69	IC-6	-1.48	0.94	LP-5	-1.18	0.87
12	IC-6	-1.34	0.83	IC-5	-1.14	1.08	AS-9	-1.44	0.87	AS-9	-1.5	1.06	AS-1	-1.27	0.79
13	IC-8	-1.34	0.7	AS-1	-1.16	0.69	IC-8	-1.46	0.67	AS-2	-1.57	0.67	AS-2	-1.27	0.47
14	AS-5	-1.4	0.77	IC-4	-1.16	0.83	IC-5	-1.48	0.79	IC-4	-1.57	0.7	IC-3	-1.27	0.79
15	AS-1	-1.44	0.79	AS-2	-1.2	0.64	AS-6	-1.54	0.67	AS-5	-1.62	0.73	AS-8	-1.27	0.65
16	IC-5	-1.45	0.93	AS-4	-1.2	1	AS-4	-1.59	0.76	AS-8	-1.62	0.73	IC-8	-1.27	0.47
17	AS-6	-1.48	0.77	IC-6	-1.27	0.91	AS-5	-1.64	0.61	AS-6	-1.79	0.9	LP-3	-1.36	1.03
18	AS-4	-1.61	0.95	AS-6	-1.33	0.69	IC-7	-1.75	0.65	IC-5	-1.83	0.76	IC-7	-1.36	0.67
19	LP-3	-1.71	1.02	AS-7	-1.55	0.68	AS-1	-1.77	0.74	IC-7	-1.9	0.69	AS-4	-1.45	0.82
20	IC-7	-1.73	0.69	IC-7	-1.63	0.73	LP-3	-1.93	1	AS-7	-2	0.62	AS-7	-1.64	0.67
21	AS-7	-1.82	0.63	LP-3	-1.94	1.14	AS-7	-1.93	0.51	AS-3	-2.07	0.46	IC-6	-1.64	1.03
22	AS-3	-2.04	0.52	AS-3	-2.02	0.43	AS-3	-2.07	0.54	AS-4	-2.14	0.93	AS-3	-1.82	0.87

4.4.1.1.4 Top Common Desired Services: BSMMUL

Here, the top ten desired services of BSMMU Library users (combined and group-wise) were explored. At BSMMU, by all users, the highest ten DS scores were IC-8, IC-4, IC-5, LP-3, AS-6, LP-1, AS-7, IC-3, AS-5 and AS-8. For faculty, the top ten DSs were IC-8, IC-4, IC-5, LP-3, AS-6, LP-1 and AS-7. For postgraduate students, the top ten DSs were IC-8, IC-4, IC-5, LP-3, AS-6, LP-1, AS-7 and IC-3. For researcher, the top ten DSs are IC-8, IC-4, IC-5, LP-3, AS-6, LP-1, IC-3, AS-5 and AS-8. For others user, the top ten DSs were IC-8, IC-4, IC-5, LP-3, LP-1 and IC-3. This finding indicates that all user groups had almost similar desired service expectations. Although faculty and others differ in few attributes, but most of their DS scores match with other groups. Here, the top DS scores were related to library journal collection, electronic resources, modern equipment, library location, library space and library printed materials (see Table 4.18).

Table 4.18 BSSMUL: Top Common Desired Service by All and Individual Users (N=163)

Order	ID	Items	All	Faculty	Postgraduate	Researcher	Others
1	IC-8	Print and/or electronic journal collections I require for my work	×	×	×	×	×
2	IC-4	The electronic information resources I need	×	×	×	×	×
3	IC-5	Modern equipment that lets me easily access needed information	×	×	×	×	×
4	LP-3	A comfortable and inviting location	×	×	×	×	×
5	AS-6	Employees who deal with users in a caring fashion	×	×	×	×	
6	LP-1	Library space that inspires study and learning	×	×	×	×	×
7	AS-7	Employees who understand the needs of their users	×	×	×		
8	IC-3	The printed library materials I need for my work	×		×	×	×
9	AS-5	Employees who have the knowledge to answer user questions	×			×	
10	AS-8	Willingness to help users	×			×	

4.4.1.1.5 LibQUAL+® Core Questions of BSMMU: *Zone of Tolerance*

The *Zone of Tolerance* (ZoT) was utilized to measure service satisfaction of BSMMU Library user. In order to measure ZoT, mean values of minimum, desired and perceived services are presented in radar charts. Services only inside of Desired and Minimum level are considered satisfactory. Out of such range is not acceptable.

At BSMMU Library (Figure: 4.1-4.5), for all users, all attributes were inside of *Zone of Tolerance* except AS-3 and AS-6. For faculty members, only LP-3, IC-4, AS-3 and AS-6 were outside of ZoT. Unsatisfactory items identified by postgraduates were AS-6, AS-1 and AS-3. For researchers, eighteen items were inside ZoT, excluding AS-3, AS-4, IC-4 and AS-7. Other users identified AS-1, AS-3, AS-4 and LP-3 as unsatisfactory.

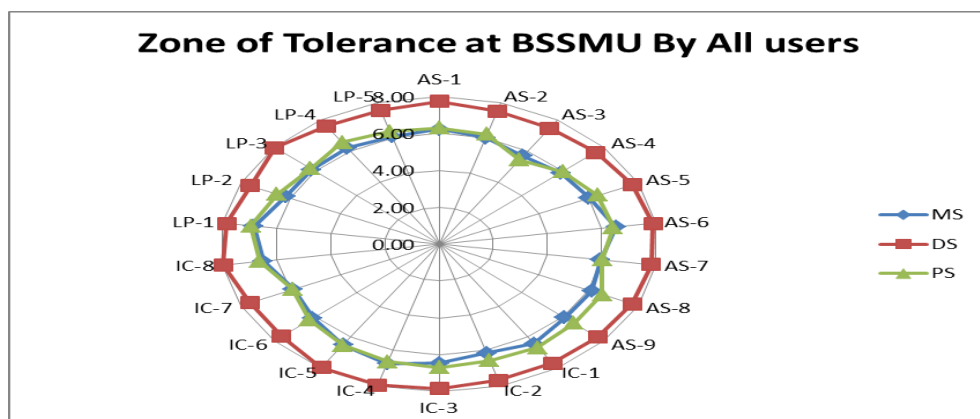


Figure 4.1 *Zone of Tolerance* of BSSMUL: All users

Zone of Tolerance at BSSMU By Faculty

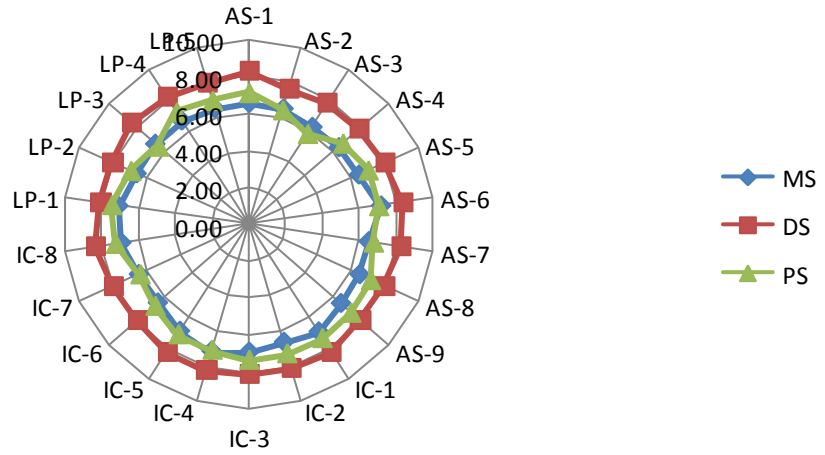


Figure 4.2 Zone of Tolerance of BSSMUL: Faculty

Zone of Tolerance at BSSMU By *Post-graduate Student*

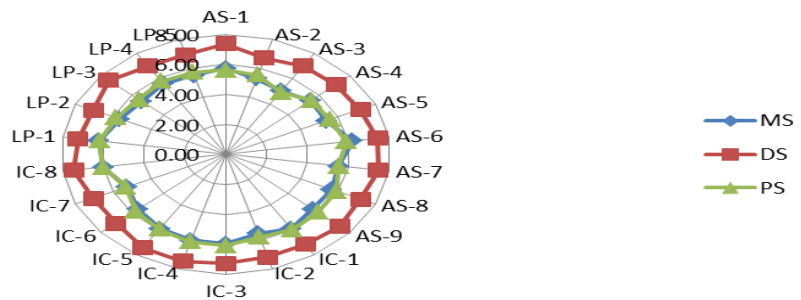


Figure 4.3 Zone of Tolerance of BSSMUL: Postgraduate Student

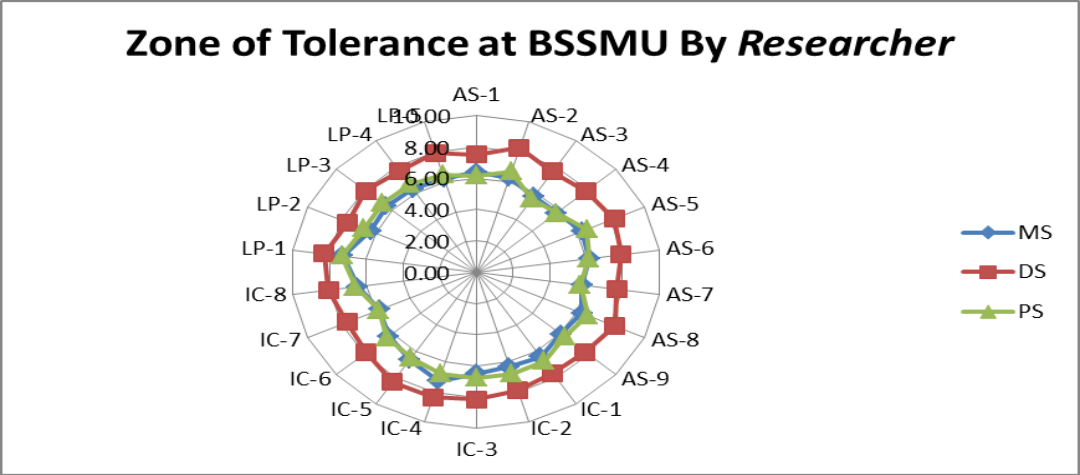


Figure 4.4 Zone of Tolerance of BSSMUL: Researcher

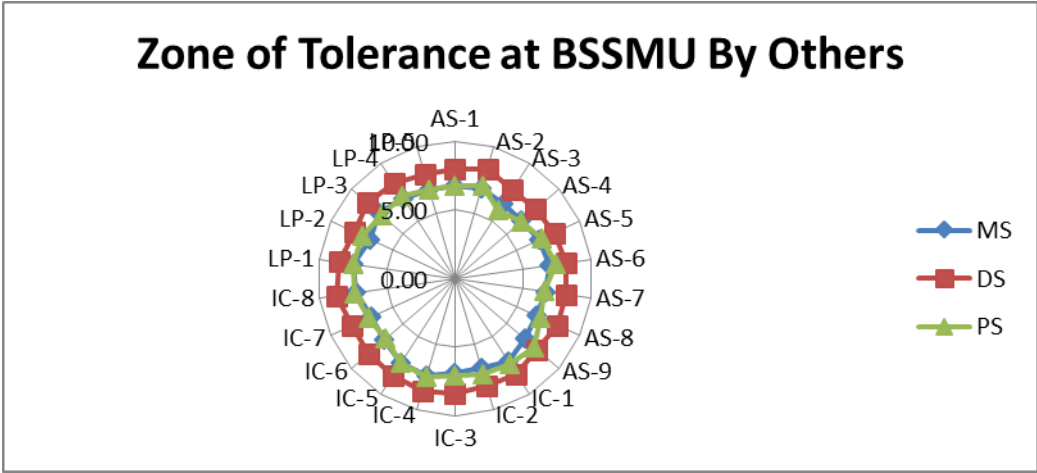


Figure 4.5 Zone of Tolerance of BSSMUL: Others

4.4.1.2. Dimension Summary: Core Questions of LibQUAL+® (BSMMUL)

With a view to evaluate user assumption of library service quality, factor analysis was conducted to investigate dimensionalities of LibQUAL+® core questions.

4.4.1.2.1 Exploratory Factor Analysis: BSMMUL

EFA Pattern Matrix and Factor Correlation Matrix of Desired Services are presented (Table 4.19). This study condensed three dimensions i.e. Affect of Service (AS), Information Control (IC) and Library as Place (LP) through Principal Component Analysis extraction method and Oblimin with Kaiser Normalization rotation method. Factor loading are classified based on their magnitude. Greater than +.30 is minimum consideration level, +.40 is more important and +.50 is practically significant. However, negative value reduces correlation.

At BSMMU (Table: 4.19), EFA determined three factors. Factor 1 included eighteen items LP-2, IC-2, AS-3, AS-4, IC-3, IC-1, AS-6, LP-5, IC-4, AS-5, AS-9, IC-7, AS-1, LP-3, IC-5, IC-8, LP-1 and AS-2). Besides, two items i.e. AS-8 and AS-7 were included in Factor 2 and lastly, in Factor 3, two items i.e. LP-4 and IC-6 were included.

Table 4.19 EFA for Service Quality (Desired Service): BSMMUL (Pattern Matrix & Factor Correlation Matrix)

Items with corresponding dimensions	1	2	3
LP-2 Quiet space for individual activities	0.974	0.1	-0.073
IC-2 A library Web site enabling me to locate information on my own	0.967	-0.045	0.051
AS-3 Employees who are consistently courteous	0.955	0.019	-0.063
AS-4 Readiness to respond to users' questions	0.955	-0.11	0.022
IC-3 The printed library materials I need for my work	0.93	-0.034	0.022
IC-1 Making electronic resources accessible from my home or office	0.924	0.219	-0.01
AS-6 Employees who deal with users in a caring fashion	0.915	0.235	0.055
LP-5 Community space for group learning and group study	0.915	-0.217	0.005
IC-4 The electronic information resources I need	0.899	-0.055	0.044
AS-5 Employees who have the knowledge to answer user questions	0.898	-0.312	0.086
AS-9 Dependability in handling users' service problems	0.889	-0.041	0.04
IC-7 Making information easily accessible for independent use	0.88	0.052	0.125
AS-1 Employees who instill confidence in users	0.849	0.404	0.095
LP-3 A comfortable and inviting location	0.843	0.326	0.11
IC-5 Modern equipment that lets me easily access needed information	0.801	-0.164	0.224
IC-8 Print and/or electronic journal collections I require for my work	0.791	0.135	0.171
LP-1 Library space that inspires study and learning	0.787	-0.295	0.265
AS-2 Giving users individual attention	0.686	-0.438	0.149
AS-8 Willingness to help users	0.225	-0.56	0.305
AS-7 Employees who understand the needs of their users	0.214	0.795	0.299
LP-4 A getaway for study, learning, or research	0.111	0.5	0.695
IC-6 Easy-to-use access tools that allow me to find things on my own	-0.048	-0.072	0.922

Factor Correlation Matrix			
Factor	1	2	3
1	1	0	0.434
2	0	1	0.008
3	0.434	0.008	1

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 25 iterations.

4.4.1.2.2 Confirmatory Factor Analysis: BSMMUL

The correlation matrix (Table: 4.20) showed higher and moderate correlations among indicators. So, the relationship of three-factor model was potential. Besides, scores available in structure of factor coefficients were also good i.e. there were a strong relationship among the items. (Figure 4.6).

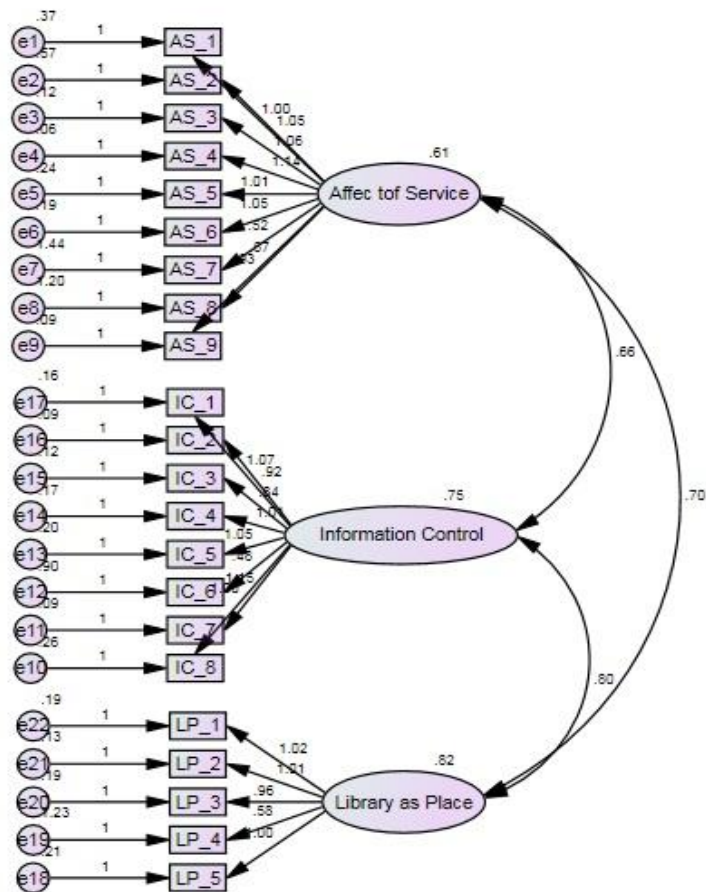


Figure 4.6 Structural Model of LibQUAL+®: BSSMUL Score

Table 4.20 Item Correlation Matrix: BSSMUL

Items	AS-1	IC-1	LP-1	AS-2	IC-2	AS-3	IC-3	LP-2	AS-4	IC-4	AS-5	LP-3	AS-6	IC-5	AS-7	IC-6	LP-4	AS-8	IC-7	IC-8	LP-5	AS-9	
AS-1	-																						
IC-1	0.818	-																					
LP-1	0.567	0.756	-																				
AS-2	0.332	0.597	0.887	-																			
IC-2	0.690	0.847	0.853	0.766	-																		
AS-3	0.735	0.856	0.800	0.678	0.928	-																	
IC-3	0.688	0.806	0.839	0.761	0.892	0.849	-																
LP-2	0.782	0.905	0.805	0.665	0.899	0.870	0.834	-															
AS-4	0.736	0.816	0.868	0.739	0.906	0.891	0.851	0.884	-														
IC-4	0.732	0.833	0.845	0.668	0.850	0.817	0.809	0.844	0.870	-													
AS-5	0.604	0.709	0.836	0.730	0.777	0.748	0.807	0.758	0.826	0.799	-												
LP-3	0.809	0.901	0.730	0.503	0.818	0.819	0.815	0.880	0.799	0.834	0.625	-											
AS-6	0.882	0.858	0.694	0.467	0.785	0.822	0.782	0.837	0.832	0.818	0.758	0.870	-										
IC-5	0.650	0.759	0.939	0.780	0.838	0.797	0.831	0.768	0.848	0.889	0.796	0.774	0.764	-									
AS-7	0.561	0.448	0.151	0.058	0.273	0.309	0.259	0.357	0.230	0.304	0.090	0.568	0.498	0.265	-								
IC-6	0.210	0.294	0.499	0.359	0.328	0.320	0.322	0.301	0.358	0.359	0.235	0.400	0.284	0.469	0.242	-							
LP-4	0.449	0.507	0.389	0.245	0.338	0.346	0.375	0.388	0.315	0.329	0.161	0.561	0.422	0.388	0.665	0.507	-						
AS-8	0.186	0.223	0.495	0.321	0.253	0.281	0.224	0.235	0.385	0.428	0.542	0.168	0.307	0.434	0.140	0.293	0.019	-					
IC-7	0.725	0.901	0.872	0.740	0.886	0.858	0.862	0.933	0.854	0.840	0.720	0.886	0.772	0.835	0.343	0.454	0.458	0.227	-				
IC-8	0.765	0.820	0.800	0.618	0.777	0.761	0.787	0.819	0.739	0.789	0.709	0.782	0.746	0.793	0.432	0.348	0.556	0.299	0.855	-			
LP-5	0.621	0.818	0.896	0.779	0.892	0.850	0.833	0.848	0.885	0.808	0.864	0.737	0.739	0.847	0.159	0.298	0.324	0.458	0.849	0.760	-		
AS-9	0.741	0.789	0.809	0.678	0.846	0.844	0.847	0.834	0.910	0.787	0.808	0.789	0.825	0.775	0.292	0.381	0.376	0.389	0.809	0.735	0.801	-	

4.4.1.2. LibQUAL+® Data of BSMMUL: Model Fit Statistics

Model Fit Statistics (Confirmatory Factor Analysis) for LibQUAL+® data for BSMMU Library was examined using Chi-square (χ^2), Relative/Normed chi-square (χ^2/df), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA).

Table 4.21 LIBQUAL+® Data of BSMMUL: Model Fit Statistics

Fit Indices	Value	Acceptable Range
χ^2	809.94*	
Df	206	
P	0	
χ^2 /df	3.932	Not less than 2.0 to not higher than 5.0 are adequate (Tabachnick & Fidell, 2007)
RMSEA	0.047	Less than .05 indicates to good fit (Schumacker & Lomax, 2004). values between .05 and .08 are acceptable (Kline, 2005)
CFI	0.994	should be greater than .95 (Hu & Bentler, 2006)
NFI	0.973	should be greater than .95 (Hu & Bentler, 2006)

4.4.1.2.4 BSMMUL: Significant Differences (Mann-Whitney Test)

To test gender-wise Desired Service (DS) level and dimension-wise gap score, Mann-Whitney test was carried out. The test (Table: 4.22) made it clear that in BSMMU, there were significant differences. Difference were observed for the items LP-3 (A comfortable and inviting location) and LP-4 (A getaway for study, learning and research). Besides, the (Table: 4.23) explored the dimension-wise gap scores by gender. Here, significant differences were found in the dimension of LP i.e. “Library as a Place” of AG and overall AG.

Table 4.22 BSMMUL: Mann-Whitney Test for Gender-wise DS level

SQ ID	Mann-Whitney U	Wilcoxon W	Z-value	Asymp. Sig. (2-tailed)
AS-1	2853.5	8209.5	-0.865	0.387
IC-1	2937	4767	-0.577	0.564
LP-1	2970	4800	-0.454	0.650
AS-2	2900	4730	-0.742	0.458
IC-2	3032.5	4862.5	-0.248	0.804
AS-3	2943	8299	-0.598	0.550
IC-3	3052.5	8408.5	-0.171	0.864
LP-2	3017	4847	-0.285	0.776
AS-4	3038.5	4868.5	-0.204	0.839
IC-4	2829.5	4659.5	-0.977	0.328
AS-5	2735	8091	-1.326	0.185
LP-3	2606	4436	-1.782	0.054*
AS-6	2883	8239	-0.761	0.447
IC-5	2956.5	4786.5	-0.494	0.621
AS-7	2739	4569	-1.325	0.185
IC-6	2769.5	4599.5	-1.464	0.143
LP-4	2541	4371	-2.167	0.03*
AS-8	3083.5	8439.5	-0.027	0.979
IC-7	2833	4663	-0.995	0.320
IC-8	2885.5	8241.5	-0.749	0.454
LP-5	2927.5	4757.5	-0.616	0.538
AS-9	2894.5	4724.5	-0.792	0.428

Table 4.23 BSMMU: Mann-Whitney Test for Dimension-wise Gap Scores by Gender

Gap	Dimension	Mann-Whitney U	Wilcoxon W	Z- value	Asymp. Sig. (2-tailed)
	AS	2940.5	4770.5	-0.54905	0.583
AG	IC	2615.5	7971.5	-1.69998	0.089
	LP	2391	7747	-2.89435	0.004*
	AS	2848	4678	-0.84074	0.400
SG	IC	2588	4418	-1.77937	0.075
	LP	2707	8063	-1.34424	0.179
AG	Over all	2266.5	7622.5	-2.8478	0.004*
SG	Over all	2842.5	4672.5	-0.85233	0.394

Note: * Significant at $p < 0.05$

4.4.1.3 LibQUAL+® Local Question Summary: BSMMUL

In this research, considering social and educational perspective of Bangladesh, five local questions, from a large number of questions, were selected for the healthcare libraries. The selected questions were related to resources, teaching of using electronic knowledge resources, library service hours, library orientation and library services.

Table 4.24 Selected Local Questions of LibQUAL+®: BSMMUL

ID	LibQUAL+® Local Questions
LQ-1	Library keeping me informed about resources and services
LQ-2	Librarians teaching me how to effectively use the electronically available databases, journals, and books
LQ-3	Adequate hours of service
LQ-4	Library orientations or instruction sessions
LQ-5	Providing services as promised

The mean and SD scores for the local questions in respect of MS, DS, PS, AG, and SG are presented in the following table (Table 4.25). In all cases, MS and DS means were higher, and PS means were lower. Therefore, negative values emerged in Adequacy Gap and Superiority Gap.

Regarding AG and SG, all gaps were negative, which mean minimum and desired expectations of users in locally selected questions were not fulfilled. Though all AG were negative, yet the lowest AG and SG scores were concerned with LQ-5 indicated that BSMMU Library providing promised services to its users. In contrast, highest AG and SG were related to LQ-2, which made it clear that BSMMU Library were not teaching its users how to effectively use electronic databases, journals, books, etc.

Table 4.25 Local Questions (Mean & SD): BSMMUL

	ID	Minimum Mean (SD)	Desired Mean (SD)	Perceived Mean (SD)	Adequacy Mean (SD)	Superiority Mean (SD)
BSMMU	LQ-1	6.12 (0.93)	7.69 (1.04)	5.36 (1.22)	-0.77 (0.63)	-2.36 (0.85)
	LQ-2	5.91 (1.15)	7.58 (1.01)	4.81 (1.25)	-1.1 (0.62)	-2.8 (0.67)
	LQ-3	6.51 (1.13)	7.95 (0.99)	5.61 (1.25)	-0.94 (0.78)	-2.42 (0.7)
	LQ-4	6.17 (0.97)	7.59 (0.96)	5.39 (1.21)	-0.82 (0.63)	-2.22 (0.72)
	LQ-5	6.15 (0.79)	7.72 (0.72)	5.62 (1.23)	-0.56 (0.53)	-2.14 (0.88)

4.4.1.4 General Satisfaction Responses: BSMMUL

Table 4.26 displayed the mean and SD scores for the general satisfaction questions, e.g. satisfaction with treatment, satisfaction with support and need and satisfaction with overall service quality. The questions were in a 9-point scale from lowest to highest, where 1 mean strongly disagree and 9 mean strongly agree. The table showed that among three satisfactory questions, S-1 (6.02) had the lowest and S-3 had the highest (6.21) level of satisfaction. So, it is proved that most of the users were generally satisfied with the services provided by BSMMU Library.

Table 4.26 General Satisfactory questions (Mean & SD): BSMMUL

ID	Name of Question	Mean (SD)
S-1	In general, I am satisfied with the way in which I am treated at the library	6.02 (0.87)
S-2	In general, I am satisfied with library support for my learning, research, and/or teaching needs	6.07 (1.00)
S-3	How would you rate the overall quality of the service provided by the library?	6.21 (0.92)

4.4.1.5 Information Literacy Outcomes Responses: BSMMUL

The below mentioned Table-4.27 shows the outcomes of information literacy (IL) questions through mean score. The IL questions were concerned with user interest, progress, efficiency, evaluation and competency. The questions were in a 9-point scale from lowest to highest, where 1 mean strongly disagree and 9 mean strongly agree. The table showed that IL-4 had the highest score (6.36) and IL-3 (5.8) had the lowest score. It is found from the information literacy questions that the library helped users to differentiate between trusted and untrusted information. On the other hand, it is also proved that library was unable to meet user's academic pursuits.

Table 4.27 Information Literacy questions (Mean): BSMMUL

IL ID	Name of Question	Mean
IL1	The library helps me stay abreast of developments in my field(s) of interest	6.04
IL2	The library aids my advancement in my academic discipline	6.31
IL3	The library enables me to be more efficient in my academic pursuits	5.8
IL4	The library helps me distinguish between trustworthy and untrustworthy information	6.36
IL5	The library provides me with the information skills I need in my work or study	6.02

4.4.1.6 Library Use Summary: BSMMUL

This section (Table 4.28 and Figure 4.7) showed the use of BSMMU Library by users in terms of daily, weekly, monthly and quarterly basis.

At BSMMU (Table 4.28), in answer to first question, it was found that the largest number of users (37.42%) utilize resources on library premises daily, whereas the frequencies of weekly, monthly and quarterly usages were in order of 32.52%, 4.91% and 25.15%.

In case of second question, the highest number (62.58%) of regular users' access resources through webpage. On the other hand, the lowest number i.e. 0.61% users access resources quarterly through webpage. Besides, the rates of monthly and weekly users accessing through webpage were 3.68% and 33.13% respectively.

For third question, it is showed that 58.28% daily users used non-library gateways for accessing information. Besides, percentages of users using non-library gateways were: weekly (36.81%), monthly (3.68%) and quarterly (1.23%). The graphical representation is shown in Figure 4.1.

Table 4.28 BSMMU: Summary of library use

Library Use Questions	Daily	Weekly	Monthly	Quarterly	Total
How often do you use resources on library premises?	61 37.42	53 32.52	8 4.91	41 25.15	163 100.00
How often do you access library resources through a library Webpage?	102 62.58	54 33.13	6 3.68	1 0.61	163 100.00
How often do you use Yahoo!, Google, or non-library gateways for information	95 58.28	60 36.81	6 3.68	2 1.23	163 100.00

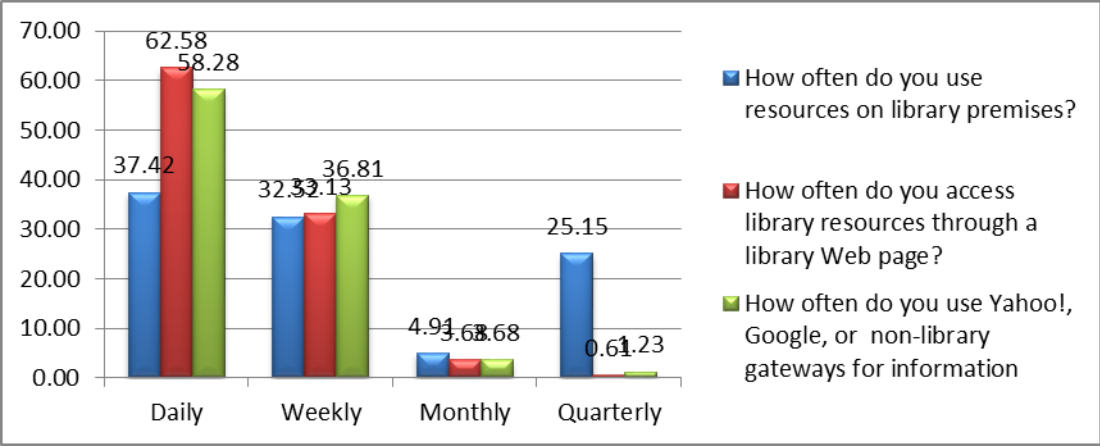


Figure 4.7: BSMMU: Summary of library use in Graph

4.4.2 BIRDEM (Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders) Library:

4.4.2.1 Summary: Core Questions of LibQUAL+® (BIRDEML)

Here, the answers to core 22 questions (Concerning Affect of Service, Information Control and Library as a Place oriented questions) of LibQUAL+® collected from users of BIRDEM Library are analyzed.

4.4.2.1.1 Responses of Users in respect of Minimum, Desired and Perceived Service: BIRDEML

Table 4.29 presents responses of BIRDEML users to LibQUAL+® core questions for three levels of services (MS, DS & PS).

Table 4.29 BIRDEML: Core questions (Mean & SD) by participating Users (N=111)

Order	ID	MS		DS		PS	
		Mean	SD	Mean	SD	Mean	SD
1	AS-1	6.66	0.60	7.88	0.76	5.57	0.64
2	IC-1	6.85	0.58	7.77	0.66	5.86	0.57
3	LP-1	7.13	0.66	8.14	0.72	6.31	0.63
4	AS-2	6.45	0.66	7.91	0.94	5.55	0.70
5	IC-2	6.69	0.52	7.88	0.70	5.77	0.59
6	AS-3	5.83	0.50	7.59	0.69	4.89	0.53
7	IC-3	6.88	0.61	8.01	0.81	5.90	0.62
8	LP-2	6.70	0.53	7.70	0.65	5.78	0.59
9	AS-4	6.14	0.67	7.72	0.70	5.28	0.73
10	IC-4	7.05	0.69	8.23	0.69	5.88	0.57
11	AS-5	6.50	0.63	8.04	0.71	5.61	0.69
12	LP-3	6.55	0.77	8.05	0.78	5.59	0.69
13	AS-6	6.82	0.79	8.01	0.69	5.67	0.69
14	IC-5	6.93	0.71	8.21	0.71	5.73	0.63
15	AS-7	6.26	0.71	7.90	0.73	5.32	0.75
16	IC-6	6.58	0.65	7.73	0.70	5.51	0.75
17	LP-4	6.72	0.57	7.71	0.76	5.78	0.59
18	AS-8	6.62	0.57	8.05	0.75	5.77	0.57
19	IC-7	6.13	0.66	7.70	0.68	5.31	0.94
20	IC-8	6.95	0.69	8.17	0.74	5.85	0.65
21	LP-4	6.55	0.63	7.69	0.70	5.61	0.65
22	AS-9	6.60	0.66	7.86	0.81	5.77	0.91

Table 4.30-4.34 represent the mean and SD values ranked by mean values for all three level of services.

Table 4.30 BIRDEML: Core questions (Mean & SD) ranked by mean value by participating Users (N=111)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.13	0.66	IC-4	8.23	0.69	LP-1	6.31	0.63
2	IC-4	7.05	0.69	IC-5	8.21	0.71	IC-3	5.90	0.62
3	IC-8	6.95	0.69	IC-8	8.17	0.74	IC-4	5.88	0.57
4	IC-5	6.93	0.71	LP-1	8.14	0.72	IC-1	5.86	0.57
5	IC-3	6.88	0.61	LP-3	8.05	0.78	IC-8	5.85	0.65
6	IC-1	6.85	0.58	AS-8	8.05	0.75	LP-2	5.78	0.59
7	AS-6	6.82	0.79	AS-5	8.04	0.71	LP-4	5.78	0.59
8	LP-4	6.72	0.57	IC-3	8.01	0.81	AS-8	5.77	0.57
9	LP-2	6.70	0.53	AS-6	8.01	0.69	AS-9	5.77	0.91
10	IC-2	6.69	0.52	AS-2	7.91	0.94	IC-2	5.77	0.59
11	AS-1	6.66	0.60	AS-7	7.90	0.73	IC-5	5.73	0.63
12	AS-8	6.62	0.57	AS-1	7.88	0.76	AS-6	5.67	0.69
13	AS-9	6.60	0.66	IC-2	7.88	0.70	AS-5	5.61	0.69
14	IC-6	6.58	0.65	AS-9	7.86	0.81	LP-5	5.61	0.65
15	LP-3	6.55	0.77	IC-1	7.77	0.66	LP-3	5.59	0.69
16	LP-5	6.55	0.63	IC-6	7.73	0.70	AS-1	5.57	0.64
17	AS-5	6.50	0.63	AS-4	7.72	0.70	AS-2	5.55	0.70
18	AS-2	6.45	0.66	LP-4	7.71	0.76	IC-6	5.51	0.75
19	AS-7	6.26	0.71	LP-2	7.70	0.65	AS-7	5.32	0.75
20	AS-4	6.14	0.67	IC-7	7.70	0.68	IC-7	5.31	0.94
21	IC-7	6.13	0.66	LP-5	7.69	0.70	AS-4	5.28	0.73
22	AS-3	5.83	0.50	AS-3	7.59	0.69	AS-3	4.89	0.53

Table 4.31 BIRDEML: Core questions (Mean & SD) ranked by mean value by Faculty (n=27)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	IC-8	7.07	0.62	LP-3	8.15	0.72	LP-1	6.11	0.85
2	AS-6	6.96	0.65	IC-8	8.15	0.72	IC-8	6.00	0.78
3	LP-1	6.89	0.75	AS-7	8.04	0.71	IC-1	5.96	0.76
4	IC-4	6.89	0.80	AS-6	8.00	0.62	IC-3	5.96	0.76
5	IC-3	6.85	0.66	LP-4	7.96	0.81	AS-9	5.96	1.09
6	IC-5	6.85	0.66	IC-4	7.93	0.78	LP-4	5.93	0.73
7	IC-1	6.81	0.68	IC-5	7.93	0.87	IC-2	5.89	0.80
8	LP-4	6.81	0.62	AS-1	7.89	0.70	IC-4	5.85	0.86
9	IC-2	6.70	0.61	IC-1	7.85	0.66	AS-6	5.85	0.77
10	AS-1	6.63	0.69	IC-2	7.85	0.86	LP-2	5.81	0.83
11	LP-2	6.59	0.69	LP-1	7.81	0.88	AS-8	5.81	0.79
12	LP-5	6.59	0.75	IC-3	7.81	0.92	IC-5	5.78	0.85
13	AS-9	6.59	0.80	IC-7	7.74	0.76	LP-5	5.74	0.86
14	AS-7	6.56	0.64	LP-2	7.67	0.62	AS-1	5.67	0.83
15	AS-8	6.56	0.70	AS-5	7.67	0.78	AS-5	5.67	1.00
16	AS-5	6.44	0.85	IC-6	7.67	0.83	AS-7	5.67	0.78
17	IC-6	6.44	0.89	AS-8	7.67	0.83	IC-7	5.63	1.01
18	AS-4	6.37	0.69	LP-5	7.59	0.75	AS-4	5.56	0.80
19	LP-3	6.33	1.04	AS-9	7.59	0.84	IC-6	5.56	1.01
20	IC-7	6.26	0.66	AS-3	7.52	0.75	AS-2	5.37	1.01
21	AS-2	6.19	0.88	AS-2	7.48	1.16	LP-3	5.37	1.01
22	AS-3	5.81	0.68	AS-4	7.48	0.70	AS-3	4.96	0.76

Table 4.32 BIRDEML: Core questions (Mean & SD) ranked by mean value by Postgraduate (n=41)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.15	0.57	IC-4	8.37	0.58	LP-1	6.12	0.46
2	IC-4	7.05	0.59	IC-8	8.29	0.68	IC-3	5.95	0.50
3	AS-6	7.02	0.82	LP-3	8.27	0.74	IC-4	5.95	0.38
4	IC-8	6.95	0.67	IC-5	8.22	0.69	AS-9	5.93	0.79
5	IC-1	6.93	0.57	LP-1	8.17	0.63	IC-8	5.88	0.68
6	IC-5	6.93	0.69	AS-6	8.12	0.75	IC-1	5.83	0.54
7	IC-3	6.88	0.46	AS-7	8.12	0.68	LP-2	5.80	0.51
8	LP-2	6.73	0.45	AS-9	8.12	0.81	IC-5	5.80	0.51
9	AS-9	6.68	0.52	AS-8	8.10	0.74	AS-6	5.78	0.61
10	AS-1	6.66	0.53	AS-1	8.05	0.74	AS-8	5.76	0.54
11	IC-2	6.63	0.49	AS-5	8.05	0.67	LP-4	5.73	0.59
12	IC-6	6.63	0.54	IC-3	8.02	0.69	IC-2	5.66	0.53
13	LP-4	6.63	0.54	IC-1	7.93	0.61	AS-1	5.59	0.55
14	AS-8	6.59	0.59	IC-2	7.93	0.61	LP-3	5.56	0.59
15	LP-5	6.51	0.60	LP-2	7.90	0.62	IC-6	5.56	0.63
16	LP-3	6.49	0.64	AS-2	7.83	0.89	LP-5	5.56	0.55
17	AS-7	6.41	0.67	AS-4	7.83	0.67	AS-2	5.49	0.60
18	AS-2	6.39	0.54	IC-6	7.83	0.59	AS-7	5.49	0.71
19	AS-5	6.34	0.57	IC-7	7.83	0.59	AS-5	5.46	0.64
20	AS-4	6.27	0.67	LP-5	7.73	0.78	IC-7	5.41	0.95
21	IC-7	6.27	0.63	AS-3	7.71	0.68	AS-4	5.37	0.70
22	AS-3	5.88	0.40	LP-4	7.61	0.59	AS-3	4.93	0.41

**Table 4.33 BIRDEML: Core questions (Mean & SD) ranked by mean value by
*Researcher (n=36)***

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.25	0.65	IC-5	8.36	0.59	LP-1	6.67	0.48
2	IC-4	7.19	0.67	LP-1	8.28	0.66	IC-3	5.81	0.62
3	IC-3	6.92	0.65	IC-4	8.28	0.70	IC-4	5.81	0.47
4	IC-5	6.92	0.73	AS-5	8.28	0.66	IC-1	5.78	0.42
5	IC-8	6.81	0.71	AS-8	8.28	0.66	IC-2	5.78	0.42
6	IC-1	6.75	0.44	AS-2	8.25	0.69	AS-8	5.78	0.42
7	IC-2	6.75	0.44	IC-3	8.06	0.86	LP-3	5.72	0.45
8	AS-8	6.75	0.44	IC-8	7.97	0.81	LP-4	5.72	0.45
9	LP-2	6.72	0.45	AS-6	7.86	0.68	AS-2	5.69	0.47
10	AS-1	6.69	0.62	IC-2	7.83	0.65	LP-2	5.69	0.47
11	LP-4	6.69	0.47	LP-4	7.81	0.79	AS-5	5.69	0.47
12	AS-2	6.67	0.48	AS-4	7.75	0.73	IC-8	5.67	0.48
13	AS-5	6.67	0.48	AS-9	7.75	0.73	IC-5	5.58	0.55
14	LP-3	6.67	0.48	LP-3	7.69	0.75	LP-5	5.58	0.55
15	IC-6	6.58	0.55	AS-1	7.67	0.79	AS-1	5.50	0.61
16	LP-5	6.58	0.55	IC-6	7.58	0.69	IC-6	5.42	0.65
17	AS-9	6.53	0.61	AS-7	7.53	0.65	AS-9	5.39	0.69
18	AS-6	6.47	0.70	IC-1	7.50	0.61	AS-6	5.36	0.64
19	AS-4	5.86	0.54	AS-3	7.44	0.61	AS-4	4.97	0.65
20	AS-7	5.86	0.54	LP-2	7.44	0.61	AS-7	4.86	0.54
21	IC-7	5.83	0.51	LP-5	7.44	0.61	IC-7	4.83	0.51
22	AS-3	5.78	0.42	IC-7	7.44	0.61	AS-3	4.78	0.42

Table 4.34 BIRDEML: Core questions (Mean & SD) ranked by mean value by Others (n=07)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.29	0.76	IC-8	8.57	0.53	LP-1	6.29	0.49
2	IC-5	7.29	0.95	LP-1	8.43	0.53	AS-9	6.14	1.35
3	IC-8	7.29	0.95	IC-3	8.43	0.79	IC-1	6.00	0.58
4	LP-3	7.14	1.21	IC-4	8.43	0.53	LP-2	6.00	0.58
5	IC-1	7.00	0.82	IC-5	8.43	0.53	IC-4	6.00	0.58
6	IC-4	7.00	0.82	AS-2	8.29	0.76	IC-8	6.00	0.58
7	LP-4	7.00	1.00	LP-3	8.29	0.95	AS-2	5.86	0.69
8	IC-3	6.86	1.07	AS-5	8.14	0.38	IC-2	5.86	0.69
9	LP-2	6.86	0.69	AS-6	8.14	0.69	IC-3	5.86	0.69
10	AS-6	6.86	1.07	IC-6	8.14	0.69	AS-5	5.86	0.38
11	AS-2	6.71	0.76	AS-8	8.14	0.38	LP-3	5.86	0.69
12	IC-2	6.71	0.76	IC-7	8.14	0.90	AS-6	5.86	0.69
13	AS-5	6.71	0.49	AS-1	8.00	0.82	IC-5	5.86	0.69
14	IC-6	6.71	0.76	IC-1	8.00	0.82	LP-4	5.86	0.69
15	AS-1	6.57	0.53	IC-2	8.00	0.82	IC-7	5.86	1.46
16	AS-9	6.57	1.13	LP-2	8.00	0.82	AS-8	5.71	0.49
17	AS-8	6.43	0.53	AS-7	8.00	0.82	IC-6	5.57	0.79
18	LP-5	6.43	0.79	LP-4	8.00	0.82	LP-5	5.57	0.79
19	AS-7	6.29	1.11	LP-5	8.00	0.58	AS-1	5.43	0.53
20	IC-7	6.29	1.11	AS-9	8.00	0.82	AS-4	5.29	0.49
21	AS-4	6.00	0.82	AS-3	7.86	0.90	AS-7	5.29	0.76
22	AS-3	5.86	0.69	AS-4	7.86	0.69	AS-3	5.00	0.58

4.4.2.1.2 Service Adequacy of BIRDEML: Core Questions

With a view to measuring whether user's expectations of minimum service of BIRDEM Library were fulfilled or not, service adequacy gap, which is determined by subtracting minimum service from perceived service, was used here. Table 4.35 shows combined and individual group-wise adequacy gap.

Table 4.35 BIRDEML: Service Adequacy of all (N=111) and Particular Groups

Order	ID	ALL		Faculty		Postgraduate Student		Researcher		Others	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	AS-1	-1.09	0.48	-0.96	0.59	-1.07	0.41	-1.19	0.4	-1.14	0.69
2	IC-1	-0.99	0.5	-0.85	0.53	-1.1	0.62	-0.97	0.17	-1	0.58
3	LP-1	-0.82	0.59	-0.78	0.51	-1.02	0.61	-0.58	0.5	-1	0.82
4	AS-2	-0.9	0.3	-0.81	0.4	-0.9	0.3	-0.97	0.17	-0.86	0.38
5	IC-2	-0.93	0.4	-0.81	0.48	-0.98	0.47	-0.97	0.17	-0.86	0.38
6	AS-3	-0.94	0.24	-0.85	0.36	-0.95	0.22	-1	0	-0.86	0.38
7	IC-3	-0.98	0.43	-0.89	0.51	-0.93	0.35	-1.11	0.4	-1	0.58
8	LP-2	-0.92	0.38	-0.78	0.42	-0.93	0.41	-1.03	0.29	-0.86	0.38
9	AS-4	-0.86	0.34	-0.81	0.4	-0.9	0.3	-0.89	0.32	-0.71	0.49
10	IC-4	-1.17	0.63	-1.04	0.65	-1.1	0.62	-1.39	0.55	-1	0.82
11	AS-5	-0.88	0.32	-0.78	0.42	-0.88	0.33	-0.97	0.17	-0.86	0.38
12	LP-3	-0.96	0.42	-0.96	0.44	-0.93	0.47	-0.94	0.23	-1.29	0.76
13	AS-6	-1.15	0.58	-1.11	0.7	-1.24	0.62	-1.11	0.4	-1	0.58
14	IC-5	-1.2	0.67	-1.07	0.73	-1.12	0.64	-1.33	0.59	-1.43	0.98
15	AS-7	-0.95	0.33	-0.89	0.42	-0.93	0.35	-1	0	-1	0.58
16	IC-6	-1.06	0.41	-0.89	0.42	-1.07	0.41	-1.17	0.38	-1.14	0.38
17	LP-4	-0.94	0.36	-0.89	0.42	-0.9	0.37	-0.97	0.17	-1.14	0.69
18	AS-8	-0.85	0.36	-0.74	0.45	-0.83	0.38	-0.97	0.17	-0.71	0.49
19	IC-7	-0.82	0.54	-0.63	0.63	-0.85	0.65	-1	0	-0.43	0.53
20	IC-8	-1.11	0.56	-1.07	0.68	-1.07	0.57	-1.14	0.42	-1.29	0.76
21	LP-5	-0.94	0.24	-0.85	0.36	-0.95	0.22	-1	0	-0.86	0.38
22	AS-9	-0.83	0.57	-0.63	0.63	-0.76	0.58	-1.14	0.35	-0.43	0.53

Table 4.36 shows the combined and individual group-wise adequacy gap ranked by mean values of BIRDEM Library. For all users, the five lowest negative AG scores were LP-1 (-0.82) "Library space that inspires study and learning", IC-7 (-0.82) "Making information easily accessible for independent use", AS-9 (-0.83) "Dependability in handling users' service problems", AS-8 (-0.85) "Willingness to help users", and AS-4 (-0.86) "Readiness to respond to users' questions". On the other hand, the highest negative AG gap was IC-5 (-1.20) "Modern equipment that lets me easily access needed information".

In case of faculty, the lowest five negative AG scores were IC-7 (-0.63), AS-9 (-0.63), AS-8 (-0.74), LP-1 (-0.78) and LP-2 (-0.78). The highest negative AG score was AS-6 (-1.11) "Employees who deal with users in a caring fashion". For postgraduate students, AS-9 (-0.76), AS-8 (-0.83), IC-7 (-0.85), AS-5 (-0.88) and AS-2 (-0.90) had the lower negative AG scores.

For Researcher, lowest negative AG scores was LP-1 (-0.58) "Library space that inspires study and learning". The highest negative AG gap is IC-4 (-1.39) "The electronic information resources I need".

For others, the top five lowest negative AG scores were IC-7 (-0.43), AS-9 (-0.43), AS-4 (-0.71), AS-8 (-0.71) and AS-2 (-0.86) respectively.

**Table 4.36 BIRDEML: Service Adequacy of all (N=111) and Particular Groups
(Ranked by Mean)**

Order	ID	ALL		ID	Faculty		ID	Postgraduate Student		ID	Researcher		ID	Others	
		Mean	SD		Mean	SD		Mean	SD		Mean	SD		Mean	SD
1	LP-1	-0.82	0.59	IC-7	-0.63	0.63	AS-9	-0.76	0.58	LP-1	0.58	0.50	IC-7	-0.43	0.53
2	IC-7	-0.82	0.54	AS-9	-0.63	0.63	AS-8	-0.83	0.38	AS-4	0.89	0.32	AS-9	-0.43	0.53
3	AS-9	-0.83	0.57	AS-8	-0.74	0.45	IC-7	-0.85	0.65	LP-3	0.94	0.23	AS-4	-0.71	0.49
4	AS-8	-0.85	0.36	LP-1	-0.78	0.51	AS-5	-0.88	0.33	IC-1	0.97	0.17	AS-8	-0.71	0.49
5	AS-4	-0.86	0.34	LP-2	-0.78	0.42	AS-2	-0.90	0.30	AS-2	0.97	0.17	AS-2	-0.86	0.38
6	AS-5	-0.88	0.32	AS-5	-0.78	0.42	AS-4	-0.90	0.30	IC-2	0.97	0.17	IC-2	-0.86	0.38
7	AS-2	-0.90	0.30	AS-2	-0.81	0.40	LP-4	-0.90	0.37	AS-5	0.97	0.17	AS-3	-0.86	0.38
8	LP-2	-0.92	0.38	IC-2	-0.81	0.48	IC-3	-0.93	0.35	LP-4	0.97	0.17	LP-2	-0.86	0.38
9	IC-2	-0.93	0.40	AS-4	-0.81	0.40	LP-2	-0.93	0.41	AS-8	0.97	0.17	AS-5	-0.86	0.38
10	AS-3	-0.94	0.24	IC-1	-0.85	0.53	LP-3	-0.93	0.47	AS-3	1.00	0.00	LP-4	-0.86	0.38
11	LP-4	-0.94	0.36	AS-3	-0.85	0.36	AS-7	-0.93	0.35	AS-7	1.00	0.00	IC-1	-1.00	0.58
12	LP-5	-0.94	0.24	LP-4	-0.85	0.36	AS-3	-0.95	0.22	IC-7	1.00	0.00	LP-1	-1.00	0.82
13	AS-7	-0.95	0.33	IC-3	-0.89	0.51	LP-5	-0.95	0.22	LP-5	1.00	0.00	IC-3	-1.00	0.58
14	LP-3	-0.96	0.42	AS-7	-0.89	0.42	IC-2	-0.98	0.47	LP-2	1.03	0.29	IC-4	-1.00	0.82
15	IC-3	-0.98	0.43	IC-6	-0.89	0.42	LP-1	-1.02	0.61	IC-3	1.11	0.40	AS-6	-1.00	0.58
16	IC-1	-0.99	0.50	LP-5	-0.89	0.42	AS-1	-1.07	0.41	AS-6	1.11	0.40	AS-7	-1.00	0.58
17	IC-6	-1.06	0.41	AS-1	-0.96	0.59	IC-6	-1.07	0.41	IC-8	1.14	0.42	AS-1	-1.14	0.69
18	AS-1	-1.09	0.48	LP-3	-0.96	0.44	IC-8	-1.07	0.57	AS-9	1.14	0.35	IC-6	-1.14	0.38
19	IC-8	-1.11	0.56	IC-4	-1.04	0.65	IC-1	-1.10	0.62	IC-6	1.17	0.38	LP-5	-1.14	0.69
20	AS-6	-1.15	0.58	IC-5	-1.07	0.73	IC-4	-1.10	0.62	AS-1	1.19	0.40	LP-3	-1.29	0.76
21	IC-4	-1.17	0.63	IC-8	-1.07	0.68	IC-5	-1.12	0.64	IC-5	1.33	0.59	IC-8	-1.29	0.76
22	IC-5	-1.20	0.67	AS-6	-1.11	0.70	AS-6	-1.24	0.62	IC-4	1.39	0.55	IC-5	-1.43	0.98

4.4.2.1.3 Service Superiority of BIRDEML: Core Questions

Table 4.37 shows combined and individual group-wise Service Superiority gap (subtraction of Desired Service from the Perceived Service). All scores across groups were negative, which indicate that desired expectations of users in getting quality services were not met by BIRDEM Library.

Table 4.37 BIRDEML: Service Superiority of all (N=111) and Particular Groups

Order	ID	ALL		Faculty		Postgraduate Student		Researcher		Others	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	AS-1	-2.32	0.73	-2.22	0.80	-2.46	0.60	-2.17	0.74	-2.57	0.98
2	IC-1	-1.92	0.61	-1.89	0.58	-2.10	0.62	-1.72	0.57	-2.00	0.58
3	LP-1	-1.83	0.64	-1.70	0.67	-2.05	0.63	-1.61	0.55	-2.14	0.69
4	AS-2	-2.36	0.57	-2.11	0.58	-2.34	0.53	-2.56	0.56	-2.43	0.53
5	IC-2	-2.12	0.68	-1.96	0.76	-2.27	0.71	-2.06	0.58	-2.14	0.69
6	AS-3	-2.69	0.63	-2.56	0.64	-2.78	0.65	-2.67	0.59	-2.86	0.69
7	IC-3	-2.11	0.77	-1.85	0.77	-2.07	0.65	-2.25	0.87	-2.57	0.53
8	LP-2	-1.92	0.61	-1.85	0.53	-2.10	0.62	-1.75	0.60	-2.00	0.58
9	AS-4	-2.44	0.85	-1.93	0.68	-2.46	0.81	-2.78	0.90	-2.57	0.53
10	IC-4	-2.35	0.70	-2.07	0.78	-2.41	0.63	-2.47	0.70	-2.43	0.53
11	AS-5	-2.42	0.68	-2.00	0.83	-2.59	0.59	-2.58	0.55	-2.29	0.49
12	LP-3	-2.47	0.96	-2.78	1.01	-2.71	0.96	-1.97	0.74	-2.43	0.98
13	AS-6	-2.34	0.76	-2.15	0.72	-2.34	0.79	-2.50	0.77	-2.29	0.49
14	IC-5	-2.48	0.85	-2.15	1.03	-2.41	0.84	-2.78	0.64	-2.57	0.79
15	AS-7	-2.59	0.62	-2.37	0.79	-2.63	0.54	-2.67	0.59	-2.71	0.49
16	IC-6	-2.22	0.72	-2.11	0.75	-2.27	0.71	-2.17	0.74	-2.57	0.53
17	LP-4	-1.93	0.66	-2.04	0.76	-2.00	0.63	-1.72	0.57	-2.14	0.69
18	AS-8	-2.28	0.72	-1.85	0.72	-2.34	0.69	-2.50	0.65	-2.43	0.53
19	IC-7	-2.40	0.72	-2.11	0.64	-2.41	0.74	-2.61	0.69	-2.29	0.76
20	IC-8	-2.32	0.72	-2.15	0.77	-2.41	0.63	-2.31	0.79	-2.57	0.53
21	LP-5	-2.08	0.57	-1.85	0.60	-2.05	0.50	-2.22	0.59	-2.43	0.53
22	AS-9	-2.09	1.06	-1.63	1.01	-2.20	1.10	-2.36	0.96	-1.86	1.07

Table 4.38 showed that all Service Superiority gap scores at BIRDEM Library were negative. The highest and lowest SG gaps were -2.86 and -1.61 respectively.

For all users, the top five higher negative SG scores were AS-3 (-2.69) “Employees who are consistently courteous”, AS-7 (-2.59) “Employees who understand the needs of their users”, IC-5 (-2.48) “Modern equipment that lets me easily access needed information”, LP-3 (-2.47) “A comfortable and inviting location”, and AS-4 (-2.44) “Readiness to respond to users’ questions”. For faculty, the highest five negative items were LP-3 (-2.78), AS-3 (-2.56), AS-7 (-2.37), AS-1 (-2.22), and IC-8 (-2.15). In case of postgraduate group, the top five negative SGs were AS-3 (-2.78), LP-3 (-2.71), AS-7 (-2.63), AS-5 (-2.59) and AS-4 (-2.46). The highest negative scores in case of researchers were IC-5 (-2.78), AS-4 (-2.78), AS-7 (-2.67), AS-3 (-2.67) and IC-6 (-2.61). In case of others, all the negative gaps were comparatively higher in comparison with other groups. The top five negative SGs were AS-3 (-2.86), AS-7 (-2.71), IC-8 (-2.57), IC-6 (-2.57) and IC-5 (-2.57)

Table 4.38 BIRDEML: Service Superiority of all (N=111) and Particular Groups (Ranked by Mean)

Order	ID	ALL		ID	Faculty		ID	Postgraduate Student		ID	Researcher		ID	Others	
		Mean	SD		Mean	SD		Mean	SD		Mean	SD		Mean	SD
1	LP-1	-1.83	0.64	AS-9	-1.63	1.01	LP-4	-2.00	0.63	LP-1	-1.61	0.55	AS-9	-1.86	1.07
2	IC-1	-1.92	0.61	LP-1	-1.70	0.67	LP-1	-2.05	0.63	IC-1	-1.72	0.57	IC-1	-2.00	0.58
3	LP-2	-1.92	0.61	IC-3	-1.85	0.77	LP-4	-2.05	0.50	LP-4	-1.72	0.57	LP-2	-2.00	0.58
4	LP-4	-1.93	0.66	LP-2	-1.85	0.53	IC-3	-2.07	0.65	LP-2	-1.75	0.60	LP-1	-2.14	0.69
5	LP-4	-2.08	0.57	AS-8	-1.85	0.72	IC-1	-2.10	0.62	LP-3	-1.97	0.74	IC-2	-2.14	0.69
6	AS-9	-2.09	1.06	LP-4	-1.85	0.60	LP-2	-2.10	0.62	IC-2	-2.06	0.58	LP-4	-2.14	0.69
7	IC-3	-2.11	0.77	IC-1	-1.89	0.58	AS-9	-2.20	1.10	AS-1	-2.17	0.74	AS-5	-2.29	0.49
8	IC-2	-2.12	0.68	AS-4	-1.93	0.68	IC-2	-2.27	0.71	IC-6	-2.17	0.74	AS-6	-2.29	0.49
9	IC-6	-2.22	0.72	IC-2	-1.96	0.76	IC-6	-2.27	0.71	LP-4	-2.22	0.59	IC-7	-2.29	0.76
10	AS-8	-2.28	0.72	AS-5	-2.00	0.83	AS-2	-2.34	0.53	IC-3	-2.25	0.87	AS-2	-2.43	0.53
11	AS-1	-2.32	0.73	LP-4	-2.04	0.76	AS-6	-2.34	0.79	IC-8	-2.31	0.79	IC-4	-2.43	0.53
12	IC-8	-2.32	0.72	IC-4	-2.07	0.78	AS-8	-2.34	0.69	AS-9	-2.36	0.96	LP-3	-2.43	0.98
13	AS-6	-2.34	0.76	AS-2	-2.11	0.58	IC-4	-2.41	0.63	IC-4	-2.47	0.70	AS-8	-2.43	0.53
14	IC-4	-2.35	0.70	IC-6	-2.11	0.75	IC-5	-2.41	0.84	AS-6	-2.50	0.77	LP-4	-2.43	0.53
15	AS-2	-2.36	0.57	IC-7	-2.11	0.64	IC-7	-2.41	0.74	AS-8	-2.50	0.65	AS-1	-2.57	0.98
16	IC-7	-2.40	0.72	AS-6	-2.15	0.72	IC-8	-2.41	0.63	AS-2	-2.56	0.56	IC-3	-2.57	0.53
17	AS-5	-2.42	0.68	IC-5	-2.15	1.03	AS-1	-2.46	0.60	AS-5	-2.58	0.55	AS-4	-2.57	0.53
18	AS-4	-2.44	0.85	IC-8	-2.15	0.77	AS-4	-2.46	0.81	IC-7	-2.61	0.69	IC-5	-2.57	0.79
19	LP-3	-2.47	0.96	AS-1	-2.22	0.80	AS-5	-2.59	0.59	AS-3	-2.67	0.59	IC-6	-2.57	0.53
20	IC-5	-2.48	0.85	AS-7	-2.37	0.79	AS-7	-2.63	0.54	AS-7	-2.67	0.59	IC-8	-2.57	0.53
21	AS-7	-2.59	0.62	AS-3	-2.56	0.64	LP-3	-2.71	0.96	AS-4	-2.78	0.90	AS-7	-2.71	0.49
22	AS-3	-2.69	0.63	LP-3	-2.78	1.01	AS-3	-2.78	0.65	IC-5	-2.78	0.64	AS-3	-2.86	0.69

4.4.2.1.4 Top Common Desired Services: BIRDEML

In Table 4.39, the mean value of the top ten common DSs were ranked and compared collectively and by individual group of users. In case of all users, the highest ten DSs were IC-4, IC-5, IC-8, LP-1, LP-3, AS-8, AS-5, IC-3, AS-6 and AS-2. For faculty, the top ten DSs were IC-4, IC-5, IC-8, LP-3 and AS-6. For postgraduate students, the highest ten DSs were IC-4, IC-5, IC-8, LP-1, LP-3, AS-8 and AS-6. For researchers, the top ten DSs are IC-4, IC-5, IC-8, LP-1, AS-8, AS-5, IC-3, AS-6 and AS-2. For others user, the top ten DSs were IC-4, IC-5, IC-8, LP-1, LP-3, AS-5, IC-3, AS-6 and AS-2. Here, the top DS are related to library's electronic resources, modern equipment, journal collection, and user care.

Table-4.39 BIRDEML: Top Common Desired Service by All and Individual Users (N=111)

Order	ID	Items	All	Faculty	Postgraduate Student	Researcher	Others
1	IC-4	The electronic information resources I need	x	x	x	x	x
2	IC-5	Modern equipment that lets me easily access needed information	x	x	x	x	x
3	IC-8	Print and/or electronic journal collections I require for my work	x	x	x	x	x
4	LP-1	Library space that inspires study and learning	x		x	x	x
5	LP-3	A comfortable and inviting location	x	x	x		x
6	AS-8	Willingness to help users	x		x	x	x
7	AS-5	Employees who have the knowledge to answer user questions	x			x	x
8	IC-3	The printed library materials I need for my work	x			x	x
9	AS-6	Employees who deal with users in a caring fashion	x	x	x	x	x
10	AS-2	Giving users individual attention	x			x	x

4.4.2.1.5 LibQUAL+® Core Questions of BIRDEML: *Zone of Tolerance*

At BIRDEM (Figure: 4.8-4.12), the service level was frustrating as all attributes are outside of *Zone of Tolerance*.

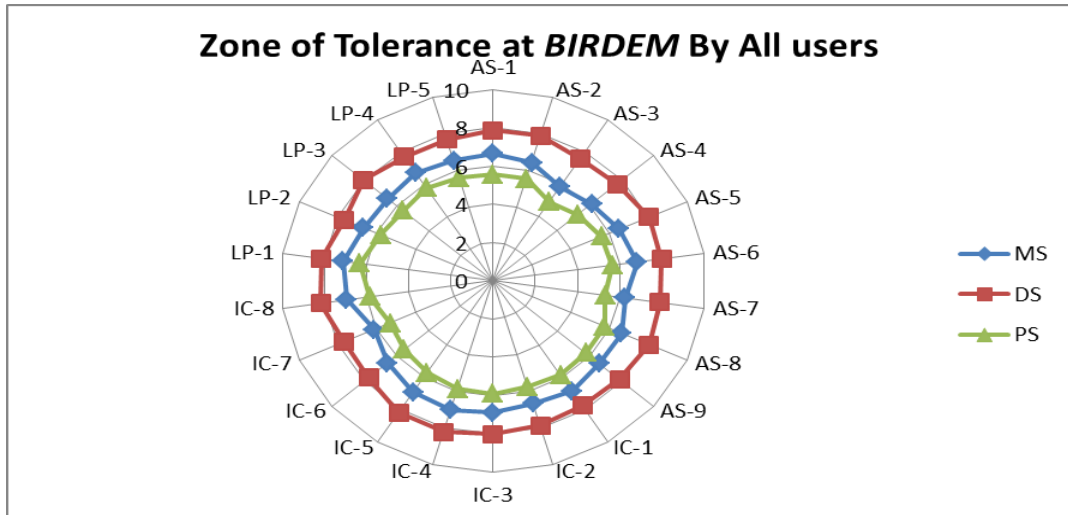


Figure 4.8 *Zone of Tolerance* of BIRDEML: All users

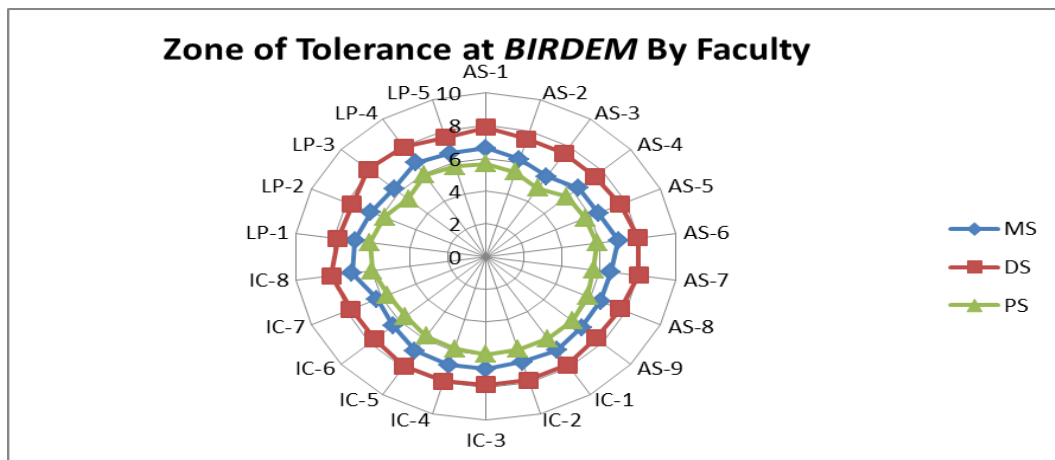


Figure 4.9 *Zone of Tolerance* of BIRDEML: Faculty

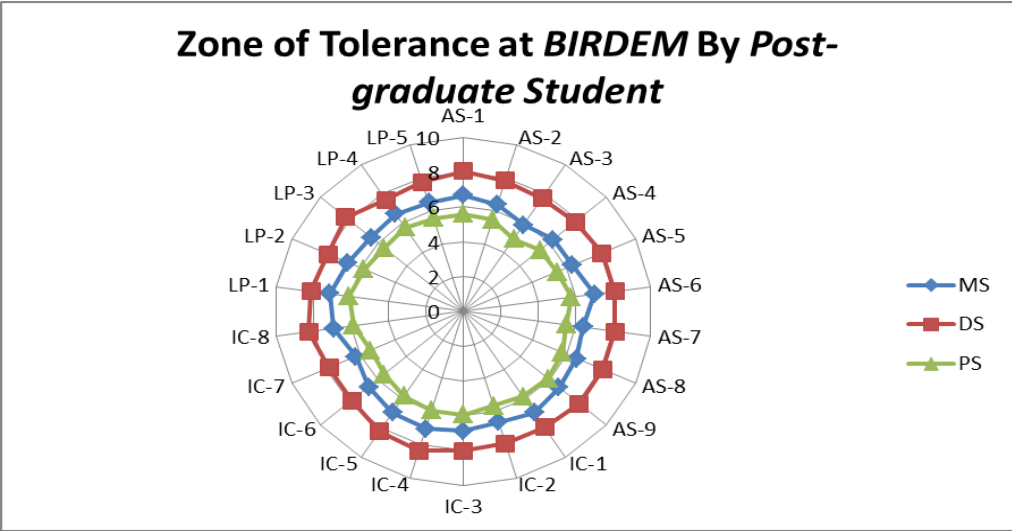


Figure 4.10 Zone of Tolerance of BIRDEML: Postgraduate Student

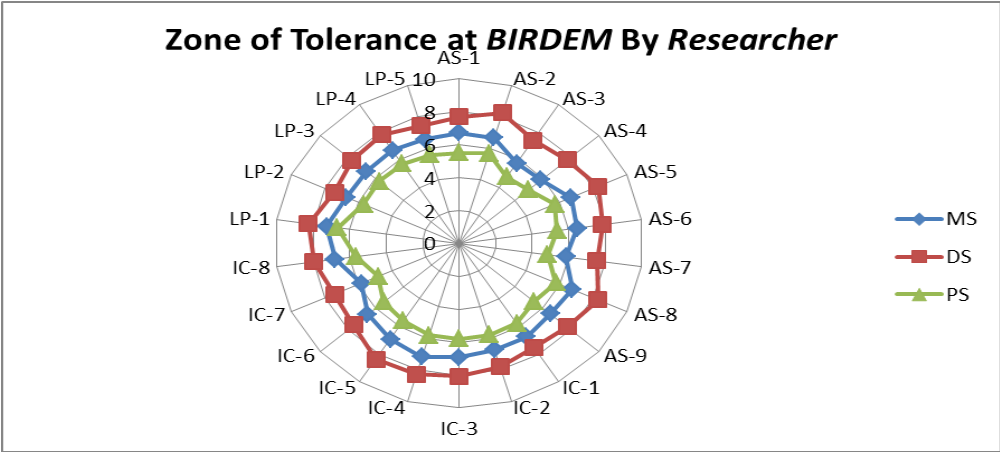


Figure 4.11 Zone of Tolerance of BIRDEML: Researcher

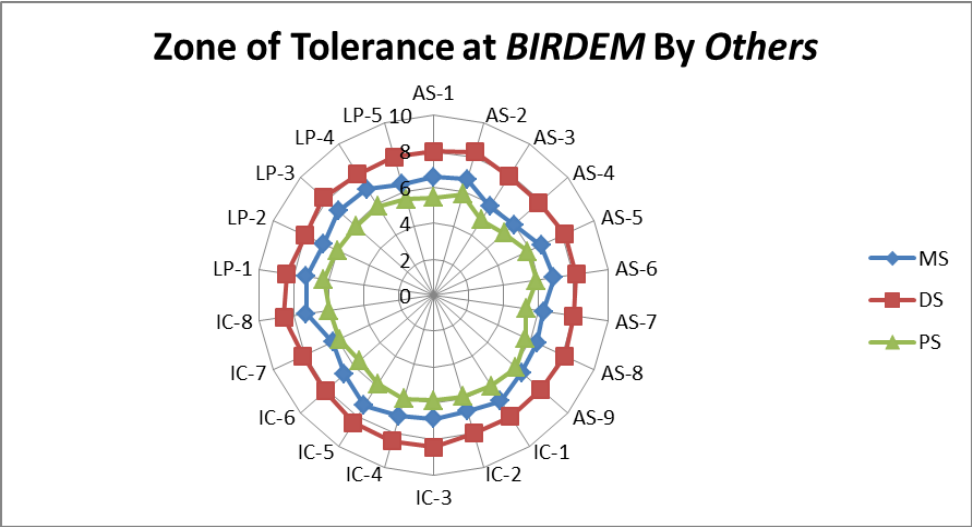


Figure 4.12 Zone of Tolerance of BIRDEML: Others

4.4.2.2. Dimension Summary: Core Questions of LibQUAL+® (BIRDEML)

With a view to evaluate user perceptions of library service quality, dimension-wise investigation of LibQUAL+® Core Questions were done.

4.4.2.2.1 Exploratory Factor Analysis: BIRDEML

EFA Pattern Matrix and Factor Correlation Matrix of Desired Services for BIRDEM are presented in Table 4.39. Three dimensions were extracted through Principal Component Analysis extraction method and Oblimin with Kaiser Normalization rotation method. The factors were Factor 1 (IC-7, AS-7, LP-2, IC-1, LP-3, IC-6, LP-4, AS-3 and IC-8), Factor 2 (IC-2, IC-3, AS-9, AS-4, LP-5, IC-4, LP-1, IC-5, AS-8, AS-5 and AS-2) and Factor 3 AS-1 and AS-6).

Table 4.40 EFA for Service Quality (Desired Service): BIRDEML (Pattern Matrix & Factor Correlation Matrix)

Items with corresponding dimensions	1	2	3
IC-7 Making information easily accessible for independent use	0.955	0.124	-0.202
AS-7 Employees who understand the needs of their users	0.918	-0.24	0.259
LP-2 Quiet space for individual activities	0.887	0.043	0.011
IC-1 Making electronic resources accessible from my home or office	0.881	-0.055	0.104
LP-3 A comfortable and inviting location	0.876	-0.144	0.174
IC-6 Easy-to-use access tools that allow me to find things on my own	0.86	0.229	-0.19
LP-4 A getaway for study, learning, or research	0.753	0.119	0.167
AS-3 Employees who are consistently courteous	0.602	0.292	0.205
IC-8 Print and/or electronic journal collections I require for my work	0.371	0.305	0.075
IC-2 A library Web site enabling me to locate information on my own	0.409	0.553	-0.12
IC-3 The printed library materials I need for my work	0.325	0.563	0.12
AS-9 Dependability in handling users' service problems	0.28	0.473	0.436
AS-4 Readiness to respond to users' questions	0.271	0.585	0.275
LP-5 Community space for group learning and group study	0.235	0.729	-0.067
IC-4 The electronic information resources I need	0.207	0.511	0.265
LP-1 Library space that inspires study and learning	0.192	0.867	-0.303
IC-5 Modern equipment that lets me easily access needed information	-	0.88	0.077
AS-8 Willingness to help users	-	1.00	0.135
AS-5 Employees who have the knowledge to answer user questions	-	0.982	0.164
AS-2 Giving users individual attention	0.097	0.809	-0.424
AS-1 Employees who instill confidence in users	0.329	0.06	0.762
AS-6 Employees who deal with users in a caring fashion	0.264	0.168	0.707

Factor Correlation Matrix			
Factor	1	2	3
1	1	0.487	0.381
2	0.487	1	0.112
3	0.381	0.112	1

Extraction Method: Principal Component Analysis.
 Rotation Method: Oblimin with Kaiser Normalization.
 a. Rotation converged in 25 iterations.

4.4.2.2.2 Confirmatory Factor Analysis: BIRDEML

Table: 4.41 shows higher and moderate correlations among indicators. So, the relationship of three-factor model was potential. Besides, scores available in structure of factor coefficients were also good i.e. there were a strong relationship among the items. (Figure 4.13).

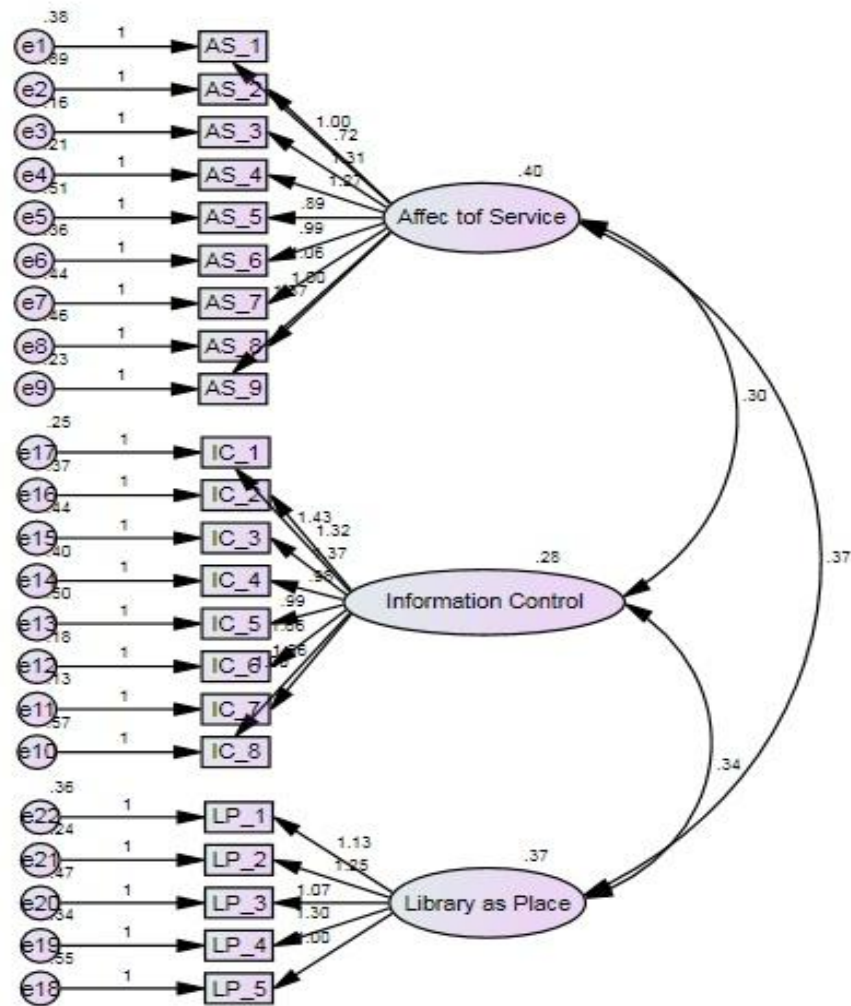


Figure: 4.13 Structural Model of LibQUAL+®: BIRDEML Scores

Table 4.41 Item Correlation Matrix: BIRDEML

Items	AS-1	IC-1	LP-1	AS-2	IC-2	AS-3	IC-3	LP-2	AS-4	IC-4	AS-5	LP-3	AS-6	IC-5	AS-7	IC-6	LP-4	AS-8	IC-7	IC-8	LP-5	AS-9	
AS-1	-																						
IC-1	.644	-																					
LP-1	.135	.377	-																				
AS-2	-.019	.211	.875	-																			
IC-2	.291	.454	.668	.541	-																		
AS-3	.625	.708	.492	.320	.697	-																	
IC-3	.543	.490	.667	.535	.610	.620	-																
LP-2	.589	.827	.468	.317	.603	.814	.563	-															
AS-4	.579	.552	.612	.460	.688	.805	.601	.701	-														
IC-4	.530	.521	.563	.430	.422	.529	.535	.545	.641	-													
AS-5	.284	.298	.767	.627	.563	.487	.614	.372	.616	.509	-												
LP-3	.679	.764	.291	.149	.500	.629	.571	.731	.457	.561	.173	-											
AS-6	.821	.612	.211	.066	.378	.621	.445	.564	.572	.444	.375	.632	-										
IC-5	.334	.292	.801	.687	.616	.464	.667	.289	.572	.613	.703	.343	.406	-									
AS-7	.759	.813	.215	.064	.440	.674	.482	.763	.490	.489	.117	.920	.705	.273	-								
IC-6	.441	.765	.689	.523	.608	.781	.653	.803	.668	.530	.445	.679	.501	.532	.698	-							
LP-4	.674	.772	.444	.263	.622	.755	.645	.700	.617	.447	.327	.755	.650	.507	.797	.779	-						
AS-8	.305	.383	.840	.684	.640	.549	.625	.382	.673	.595	.879	.213	.393	.779	.160	.523	.474	-					
IC-7	.488	.817	.629	.459	.607	.759	.654	.876	.645	.517	.411	.731	.466	.467	.749	.927	.780	.440	-				
IC-8	.454	.466	.512	.362	.316	.362	.512	.440	.412	.500	.403	.399	.318	.462	.514	.499	.576	.439	.550	-			
LP-5	.290	.499	.729	.611	.792	.655	.586	.551	.691	.518	.734	.415	.396	.695	.349	.595	.565	.786	.592	.339	-		
AS-9	.673	.603	.526	.355	.556	.792	.686	.679	.788	.537	.600	.537	.656	.479	.580	.647	.661	.661	.627	.465	.502	-	

4.4.2.2.3 LibQUAL+® Data of BIRDEM: Model Fit Statistics

Model Fit Statistics (Confirmatory Factor Analysis) for LibQUAL+® Data for BSMMU Library was examined using Chi-square (χ^2), Relative/Normed chi-square (χ^2/df), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA).

Table 4.42 LibQUAL+® Data of BIRDEML: Model Fit Statistics

Fit Indices	Value	Acceptable Range
χ^2	907.24*	
Df	206	
P	0	
χ^2/df	4.404	Not less than 2.0 to not higher than 5.0 are adequate (Tabachnick & Fidell, 2007)
RMSEA	0.104	Less than .05 indicates to good fit (Schumacker & Lomax, 2004).
CFI	0.812	Should be greater than .95 (Hu & Bentler, 2006)
NFI	0.787	Should be greater than .95 (Hu & Bentler, 2006)

4.4.2.2.4 BIRDEML: Significant Differences (Mann-Whitney Test)

To identify significant difference of Desired Service (DS) level by Gender and Dimension-wise gap score by Gender, Mann-Whitney test was carried out. The test results (Table: 4.43) indicate that there were significant differences at BSMMU. Difference were observed for the items IC-1, IC-2, LP-2, IC-4, LP-3, AS-7, LP-4 and IC-7. Besides, the (Table: 4.44) explored the Dimension-wise gap scores by Gender. Significant differences were found in case of dimension IC i.e. "Information Control" in SG.

Table 4.43 BIRDEML: Mann-Whitney Test for Gender-wise DS level

SQ ID	Mann-Whitney U	Wilcoxon W	Z-value	Asymp. Sig. (2-tailed)
AS-1	1267	2047	-0.893	0.372
IC-1	983	1763	-2.737	0.006*
LP-1	1249	2029	-1.009	0.313
AS-2	1401.5	2181.5	-0.016	0.987
IC-2	1094	1874	-2.009	0.045*
AS-3	1212	1992	-1.249	0.212
IC-3	1135.5	1915.5	-1.727	0.084
LP-2	1052	1832	-2.289	0.022*
AS-4	1289	2069	-0.745	0.456
IC-4	1020.5	1800.5	-2.528	0.011*
AS-5	1332	3960	-0.468	0.640
LP-3	864.5	1644.5	-3.486	0.000*
AS-6	1327	2107	-0.504	0.614
IC-5	1333.5	2113.5	-0.461	0.645
AS-7	978.5	1758.5	-2.751	0.006*
IC-6	1177.5	1957.5	-1.461	0.144
LP-4	1110	1890	-1.897	0.05*
AS-8	1362.5	2142.5	-0.269	0.788
IC-7	1074	1854	-2.136	0.033*
IC-8	1353.5	2133.5	-0.328	0.743
LP-5	1246.5	2026.5	-1.016	0.309
AS-9	1204.5	1984.5	-1.282	0.200

Note: * Significant at p < 0.05

Table 4.44 BIRDEML: Mann-Whitney Test for Dimension-wise Gap Scores by Gender

Gap	Dimension	Mann-Whitney U	Wilcoxon W	Z-value	Asymp. Sig. (2-tailed)
AG	AS	1367.5	3995.5	-0.24178	0.809
	IC	1285	3913	-0.7739	0.439
	LP	1329.5	3957.5	-0.56449	0.572
SG	AS	1204	1984	-1.24757	0.212
	IC	1030.5	1810.5	-2.3812	0.017*
	LP	1183.5	3811.5	-1.39864	0.162
AG	Over all	1149	3777	-1.58761	0.112
SG	Over all	1223	2003	-1.11888	0.263

Note: * Significant at $p < 0.05$

4.4.2.3 LibQUAL+® Local Question Summary: BIRDEML

The local questions were in the following table.

Table 4.45 LibQUAL+® Model: Local Questions of BIRDEM

ID	LibQUAL+® Local Questions
LQ-1	Library keeping me informed about resources and services
LQ-2	Librarians teaching me how to effectively use the electronically available databases, journals, and books
LQ-3	Adequate hours of service
LQ-4	Library orientations or instruction sessions
LQ-5	Providing services as promised

In the following table (Table 4.46), mean and SD scores of the local questions in respect of MS, DS, PS, AG, and SG were presented. In all cases, MS and DS mean scores were higher and PS mean scores were lower. Therefore, negative values emerged in Adequacy Gap and Superiority Gap.

At BIRDEM, the highest DS are concerned with LQ-3 which explored that user demand more opening hours from the library. Regarding AG and SG, all gaps were negative, which mean minimum and desired expectation of users in locally selected questions were not fulfilled. Although all AG scores are negative, yet the lowest AG was concerned with LQ-3. In contrast, highest SG scores were related to LQ-2, which made it clear that BIRDEM Library are not teaching its users to use effectively the electronic databases, journals, books, etc.

Table 4.46 Selected Local Questions of LibQUAL+®: BIRDEML

	ID	Minimum Mean (SD)	Desired Mean (SD)	Perceived Mean (SD)	Adequacy Mean (SD)	Superiority Mean (SD)
BIRDEM	LQ-1	6.59 (0.61)	7.87 (0.78)	5.55 (0.72)	-1.05 (0.53)	-2.32 (0.84)
	LQ-2	6.14 (0.67)	7.65 (0.68)	5.19 (0.8)	-0.95 (0.44)	-2.46 (0.7)
	LQ-3	6.89 (0.74)	8.1 (0.77)	5.78 (0.68)	-0.87 (0.53)	-2.32 (0.7)
	LQ-4	6.58 (0.61)	7.69 (0.71)	5.58 (0.63)	-1 (0.33)	-2.12 (0.58)
	LQ-5	6.59 (0.65)	7.86 (0.86)	5.63 (0.76)	-0.95 (0.39)	-2.23 (0.95)

4.4.2.4. General Satisfaction Responses: BIRDEML

Table 4.47 displayed the mean and SD scores for each of the general satisfaction questions, e.g. satisfaction with treatment, satisfaction with support and need and satisfaction with overall service quality. The table showed that among three satisfactory questions, S-3 (5.45) had the lowest and S-2 had the highest (5.76) level of satisfaction. So, it is proved that most of the users were dissatisfied with overall services provided by the library. Besides, among three questions, most of the users were satisfied with the support provide by BIRDEM Library regarding learning, research and teaching needs.

Table 4.47 General Satisfactory questions (Mean &SD): BIRDEML

ID	Name of Question	Mean (SD)
S-1	In general, I am satisfied with the way in which I am treated at the library	5.54 (0.78)
S-2	In general, I am satisfied with library support for my learning, research, and/or teaching needs	5.76 (0.86)
S-3	How would you rate the overall quality of the service provided by the library?	5.45 (0.81)

4.4.2.5 Information Literacy Outcomes Responses: BIRDEML

Table-4.48 shows the outcomes of information literacy (IL) questions through mean score. It was found that IL-4 had the highest score (6.23) and IL-1 (5.65) had the lowest score. It is found from the information literacy questions that the largest number of users believe “library helps them to differentiate between trusted and untrusted information”. On the other hand, a large number of user think that library is not informing them about the latest development in their field of interest.

Table 4.48 Information Literacy questions (Mean): BIRDEML

IL ID	Name of Question	Mean
IL1	The library helps me stay abreast of developments in my field(s) of interest	5.65
IL2	The library aids my advancement in my academic discipline	6.10
IL3	The library enables me to be more efficient in my academic pursuits	6.00
IL4	The library helps me distinguish between trustworthy and untrustworthy information	6.23
IL5	The library provides me with the information skills I need in my work or study	5.85

4.4.2.6 Library Use Summary: BIRDEML

Table 4.49 and Figure 4.14 showed the usage statistics of BIRDEM Library users in daily, weekly, monthly and quarterly basis.

At BIRDEM (Table 4.28), in answer to first question, it was found that maximum number of users (44.14%) utilize resources on library premises daily, whereas the rates of weekly, monthly and quarterly usage were 35.14%, 7.21% and 13.51% respectively.

In case of second question, the highest number (63.96%) of daily users were accessing library resources through webpage. On the other hand, the lowest number i.e. 6.31% monthly users were accessing resources through webpage. Besides, weekly user’s access rate through webpage was 29.73% and there were no quarterly users here.

It is showed that 56.76% daily users used non-library gateways for information. Besides, weekly (37.84%) and monthly (5.41%) users also used non-library gateways for information. The graphical representation is shown in the Figure 4.1.4.

For question, “How often do you use Yahoo!, Google, or non-library gateways for information?”, there were no quarterly users. They had 56.76%, 37.84% and 5.41% daily, weekly and monthly users respectively.

Table 4.49 BIRDEM: Summary of library use

Library Use Questions	Daily	Weekly	Monthly	Quarterly	Total
How often do you use resources on library premises?	49 44.14	39 35.14	8 7.21	15 13.51	111 100.00
How often do you access library resources through a library Webpage?	71 63.96	33 29.73	7 6.31	- -	111 100.00
How often do you use Yahoo!, Google, or non-library gateways for information	63 56.76	42 37.84	6 5.41	- -	111 100.00

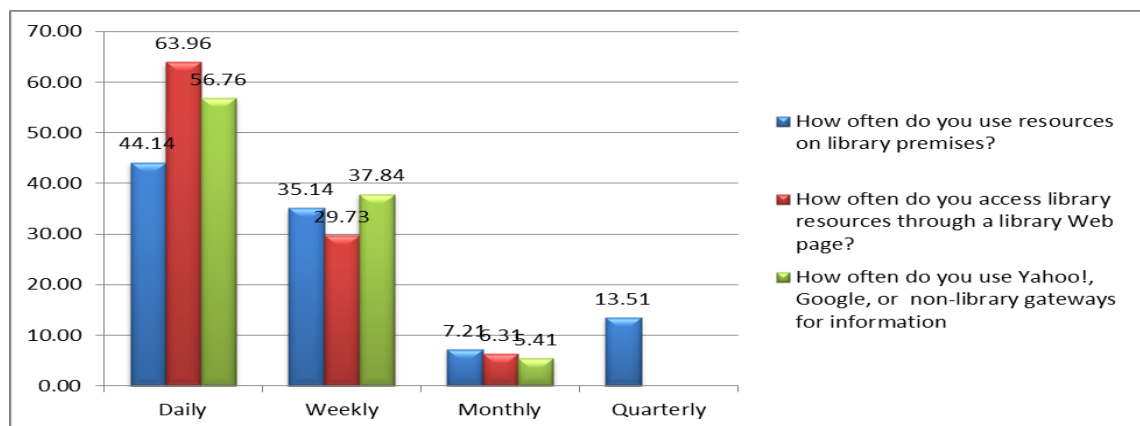


Figure: 4.14 BIRDEM: Summary of library use in Graph

4.4.3 International Centre for Diarrheal Disease Research, Bangladesh (icddr,b) Library:

4.4.3.1 Summary: Core Questions of LibQUAL+® (icddr,bL)

Like BSMMU and BIRDEM, here, the responses to LibQUAL+® 22 core questions collected from icddr,bL users were explained.

4.4.3.1.1 Responses of Users in respect of Minimum, Desired and Perceived Service: icddr,bL

Table 4.50 presents responses of users of icddr,b library to LibQUAL+® core questions for three levels of services (MS, DS & PS). Mean scores presented here are arranged as per survey instrument.

Table- 4.50 icddr,bL: Core questions (Mean & SD) by participating Users (N=105)

Order	ID	MS		DS		PS	
		Mean	SD	Mean	SD	Mean	SD
1	AS-1	6	0.68	7.32	0.94	5.64	0.81
2	IC-1	6.21	0.74	7.26	1.04	5.92	0.72
3	LP-1	6.58	0.92	7.5	1.04	6.18	0.71
4	AS-2	5.78	0.69	7.23	1.2	5.6	0.9
5	IC-2	6.02	0.59	7.25	1.03	5.86	0.76
6	AS-3	5.44	0.71	6.98	0.95	5	0.77
7	IC-3	6.15	0.69	7.41	0.95	6.45	0.77
8	LP-2	5.97	0.64	7.15	1.04	5.84	0.85
9	AS-4	5.71	0.73	7.1	0.94	5.42	0.9
10	IC-4	6.5	0.93	7.63	0.94	5.95	0.76
11	AS-5	5.86	0.66	7.37	1.02	5.69	0.87
12	LP-3	5.94	0.9	7.55	0.97	5.63	0.88
13	AS-6	6.22	0.89	7.46	0.93	6.27	0.87
14	IC-5	6.3	0.9	7.55	0.96	5.81	0.84
15	AS-7	5.82	0.73	7.38	0.95	5.46	0.88
16	IC-6	5.94	0.65	7.17	1.01	5.61	0.85
17	LP-4	6.03	0.58	7.17	0.99	5.84	0.74
18	AS-8	5.95	0.61	7.35	0.97	5.85	0.77
19	IC-7	5.65	0.72	7.17	1.06	5.4	0.97
20	IC-8	6.31	0.78	7.68	0.95	5.9	0.75
21	LP-4	5.91	0.67	7.1	1.03	5.68	0.82
22	AS-9	5.98	0.65	7.21	0.83	5.83	0.87

The tables below (Table 4.51 – 4.53), the mean and SD scores are ranked by mean values for all three level of services. At icddr,bL, researchers had lowest DSs while others user had the highest level of DS.

Table 4.51 icddr,bL: Core questions (Mean & SD) ranked by mean value by participating Users (N=105)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	6.58	0.92	IC-8	7.68	0.95	LP-1	6.18	0.71
2	IC-4	6.5	0.93	IC-4	7.63	0.94	IC-4	5.95	0.77
3	IC-8	6.31	0.78	LP-3	7.55	0.97	IC-3	5.95	0.76
4	IC-5	6.3	0.9	IC-5	7.55	0.96	IC-1	5.92	0.72
5	AS-6	6.22	0.89	LP-1	7.5	1.04	IC-8	6.4	0.75
6	IC-1	6.21	0.74	AS-6	7.46	0.93	IC-2	5.86	0.76
7	IC-3	6.15	0.69	IC-3	7.41	0.95	AS-8	6.35	0.77
8	LP-4	6.03	0.58	AS-7	7.38	0.95	LP-2	5.84	0.85
9	IC-2	6.02	0.59	AS-5	7.37	1.02	LP-4	5.84	0.74
10	AS-1	6	0.68	AS-8	7.35	0.97	AS-9	5.83	0.87
11	AS-9	5.98	0.65	AS-1	7.32	0.94	IC-5	5.81	0.84
12	LP-2	5.97	0.64	IC-1	7.26	1.04	AS-6	5.77	0.87
13	AS-8	5.95	0.61	IC-2	7.25	1.03	AS-5	5.69	0.87
14	LP-3	5.94	0.9	AS-2	7.23	1.2	LP-5	5.68	0.82
15	IC-6	5.94	0.65	AS-9	7.21	0.83	AS-1	5.64	0.81
16	LP-5	5.91	0.67	IC-6	7.17	1.01	LP-3	5.63	0.88
17	AS-5	5.86	0.66	LP-4	7.17	0.99	IC-6	5.61	0.85
18	AS-7	5.82	0.73	IC-7	7.17	1.06	AS-2	5.6	0.9
19	AS-2	5.78	0.69	LP-2	7.15	1.04	AS-7	5.46	0.88
20	AS-4	5.71	0.73	AS-4	7.1	0.94	AS-4	5.42	0.9
21	IC-7	5.65	0.72	LP-5	7.1	1.03	IC-7	5.4	0.97
22	AS-3	5.44	0.71	AS-3	6.98	0.95	AS-3	5	0.77

Table 4.52 icddr,bL: Core questions (Mean & SD) ranked by mean value by Researcher (n=79)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	6.44	0.84	IC-4	7.57	0.84	LP-1	6.12	0.72
2	IC-4	6.43	0.9	IC-8	7.56	0.87	IC-3	5.85	0.79
3	IC-8	6.28	0.78	IC-5	7.46	0.89	IC-4	5.83	0.76
4	AS-6	6.2	0.97	LP-3	7.44	0.96	IC-1	5.79	0.7
5	IC-1	6.18	0.76	AS-6	7.38	0.9	IC-2	5.78	0.73
6	IC-5	6.18	0.81	LP-1	7.35	0.97	AS-8	5.77	0.78
7	IC-3	6.1	0.67	IC-3	7.33	0.87	IC-8	6.25	0.76
8	IC-2	6.03	0.62	AS-5	7.27	0.97	LP-4	5.73	0.7
9	LP-4	6.01	0.57	AS-7	7.27	0.96	LP-2	5.7	0.84
10	AS-1	5.95	0.71	AS-8	7.27	0.92	AS-9	5.7	0.87
11	AS-8	5.95	0.66	AS-1	7.23	0.93	IC-5	5.69	0.83
12	AS-9	5.95	0.7	IC-2	7.18	0.98	AS-6	5.61	0.88
13	LP-2	5.94	0.69	AS-9	7.14	0.81	LP-5	5.61	0.86
14	IC-6	5.9	0.69	IC-1	7.11	1.03	AS-1	5.58	0.84
15	LP-5	5.89	0.73	AS-2	7.06	1.11	AS-5	6.05	0.81
16	LP-3	5.85	0.85	LP-4	7.05	0.96	IC-6	5.53	0.88
17	AS-5	5.82	0.66	AS-4	7	0.92	LP-3	5.49	0.84
18	AS-7	5.76	0.77	IC-6	7	0.96	AS-2	5.44	0.87
19	AS-2	5.73	0.71	LP-2	6.99	0.99	AS-7	5.37	0.91
20	AS-4	5.66	0.78	IC-7	6.99	1.01	AS-4	5.85	0.93
21	IC-7	5.56	0.76	LP-5	6.95	1	IC-7	5.26	0.96
22	AS-3	5.34	0.71	AS-3	6.87	0.91	AS-3	4.89	0.77

**Table 4.53 icddr,bL: Core questions (Mean & SD) ranked by mean value by Others
(n=26)**

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7	1.02	IC-8	8.04	1.08	LP-1	6.35	0.67
2	IC-3	6.73	1	LP-1	7.92	1.13	IC-8	6.35	0.54
3	IC-5	6.65	1.06	LP-3	7.88	0.95	IC-1	6.31	0.63
4	IC-8	6.42	0.76	IC-5	7.85	1.12	IC-3	6.31	0.63
5	IC-1	6.31	0.68	IC-3	7.81	1.2	LP-2	6.27	0.76
6	IC-4	6.31	0.74	AS-2	7.73	1.34	IC-4	6.23	0.67
7	AS-5	6.27	0.6	AS-7	7.73	0.87	AS-5	6.23	0.67
8	LP-3	6.23	0.99	IC-7	7.73	1.04	AS-9	6.23	0.78
9	AS-1	6.15	0.54	IC-1	7.69	0.97	IC-5	6.19	0.74
10	LP-2	6.08	0.48	AS-6	7.69	1.12	LP-4	6.69	0.79
11	IC-6	6.08	0.48	AS-5	7.69	1.01	IC-2	6.12	0.8
12	LP-4	6.08	0.63	IC-6	7.69	1.01	AS-6	6.12	0.9
13	AS-9	6.08	0.48	IC-4	7.65	1.13	AS-8	6.12	0.7
14	IC-2	6	0.49	LP-2	7.65	1.06	AS-2	6.08	0.86
15	AS-7	6	0.57	AS-1	7.62	0.9	LP-3	6.08	0.86
16	LP-5	6	0.4	AS-8	7.62	1.1	IC-6	6.38	0.7
17	AS-6	5.96	0.66	LP-4	7.54	0.99	LP-5	5.88	0.64
18	AS-8	5.96	0.45	LP-5	7.54	1.03	AS-1	5.85	0.69
19	AS-2	5.92	0.63	IC-2	7.46	1.14	IC-7	5.81	0.88
20	IC-7	5.92	0.48	AS-4	7.42	0.95	AS-7	6.23	0.71
21	AS-4	5.88	0.52	AS-9	7.42	0.86	AS-4	5.65	0.73
22	AS-3	5.73	0.6	AS-3	7.31	1.01	AS-3	5.35	0.67

4.4.3.1.2 Service Adequacy of icddr,bL: Core Questions

Service Adequacy (Adequacy = Perceived - Minimum) was calculated to see whether user's expectations of minimum service quality are being fulfilled or not. Combined and individual group-wise adequacy gaps were presented in the below mentioned table (Table 4.54).

Table 4.54 icddr,bL: Service Adequacy of all (N=105) and Particular Groups

Order	ID	ALL		Researcher		Others	
		Mean	SD	Mean	SD	Mean	SD
1	AS-1	-0.37	0.56	-0.37	0.54	-0.35	0.61
2	IC-1	-0.3	0.74	-0.39	0.68	-0.04	0.86
3	LP-1	-0.39	0.67	-0.32	0.57	-0.58	0.89
4	AS-2	-0.2	0.48	-0.3	0.43	0.12	0.5
5	IC-2	-0.19	0.52	-0.27	0.48	0.08	0.58
6	AS-3	-0.43	0.25	-0.45	0.22	-0.38	0.33
7	IC-4	-0.22	0.6	-0.27	0.58	-0.08	0.64
8	LP-2	-0.15	0.57	-0.25	0.54	0.15	0.56
9	AS-4	-0.3	0.4	-0.31	0.39	-0.27	0.43
10	IC-3	-0.57	0.72	-0.63	0.67	-0.38	0.86
11	AS-6	-0.18	0.49	-0.27	0.45	0.12	0.5
12	LP-3	-0.3	0.63	-0.34	0.56	-0.19	0.79
13	AS-5	-0.47	0.77	-0.59	0.72	-0.12	0.8
14	IC-5	-0.48	0.83	-0.5	0.75	-0.42	1.06
15	AS-7	-0.37	0.42	-0.4	0.41	-0.27	0.43
16	IC-6	-0.34	0.52	-0.37	0.52	-0.23	0.53
17	LP-4	-0.19	0.54	-0.27	0.53	0.08	0.5
18	AS-8	-0.11	0.51	-0.18	0.49	0.12	0.5
19	IC-7	-0.26	0.47	-0.31	0.43	-0.12	0.57
20	IC-8	-0.41	0.69	-0.54	0.65	-0.04	0.71
21	LP-5	-0.25	0.46	-0.28	0.44	-0.15	0.49
22	AS-9	-0.17	0.55	-0.27	0.53	0.15	0.49

Table 4.55 presents combined and individual group-wise adequacy gap ranked by mean value at icddr,b library. It was found that all items had negative values.

Table 4.55 shows Service Adequacy for icddr,b Library. While analyzing all the tables of AG scores, it was found that all MSs were lower than PS scores. In case of all users, the top five lower negative AG scores are AS-8 (-0.11), LP-2 (-0.15), AS-9 (-0.17), AS-6 (-0.18), and IC-2(-0.19). The lower gaps indicate that perceived services in getting such services are very near to fulfill user’s minimum expectation. On the other hand, the highest negative AG gap was IC-3 (-0.57), which refers that perceived service is very far away to meet the minimum expectation of users. In case of researchers, the top five negative AG scores were AS-8 (-0.18), LP-2 (-0.25), AS-9 (-0.27), LP-5 (-0.27) and AS-6 (-0.27). For others, the highest positive AG score is LP-2 (0.15) “Dependability in handling users’ service problems” and the highest negative AG gap is LP-3(-0.95) “A comfortable and inviting location”.

Table 4.55 icddr,bL: Service Adequacy of all (N=105) and Particular Groups (Ranked by Mean)

Order	ID	ALL		ID	Researcher		ID	Others	
		Mean	SD		Mean	SD		Mean	SD
1	AS-8	-0.11	0.51	AS-8	-0.18	0.49	LP-2	0.15	0.56
2	LP-2	-0.15	0.57	LP-2	-0.25	0.54	AS-9	0.15	0.49
3	AS-9	-0.17	0.55	IC-2	-0.27	0.48	AS-2	0.12	0.5
4	AS-6	-0.18	0.49	IC-4	-0.27	0.58	AS-6	0.12	0.5
5	IC-2	-0.19	0.52	AS-6	-0.27	0.45	AS-8	0.12	0.5
6	LP-4	-0.19	0.54	LP-5	-0.27	0.53	IC-2	0.08	0.58
7	AS-2	-0.2	0.48	AS-9	-0.27	0.53	LP-4	0.08	0.5
8	IC-4	-0.22	0.6	LP-4	-0.28	0.44	IC-1	-0.04	0.86
9	LP-5	-0.25	0.46	AS-2	-0.3	0.43	IC-8	-0.04	0.71
10	IC-7	-0.26	0.47	AS-4	-0.31	0.39	IC-4	-0.08	0.64
11	IC-1	-0.3	0.74	IC-7	-0.31	0.43	AS-7	-0.12	0.8
12	AS-4	-0.3	0.4	LP-1	-0.32	0.57	IC-7	-0.12	0.57
13	LP-3	-0.3	0.63	LP-3	-0.34	0.56	LP-5	-0.15	0.49
14	IC-6	-0.34	0.52	AS-1	-0.37	0.54	LP-3	-0.19	0.79
15	AS-1	-0.37	0.56	IC-6	-0.37	0.52	IC-6	-0.23	0.53
16	AS-7	-0.37	0.42	IC-1	-0.39	0.68	AS-4	-0.27	0.43
17	LP-1	-0.39	0.67	AS-7	-0.4	0.41	AS-7	-0.27	0.43
18	IC-8	-0.41	0.69	AS-3	-0.45	0.22	AS-1	-0.35	0.61
19	AS-3	-0.43	0.25	IC-5	-0.5	0.75	AS-3	-0.38	0.33
20	AS-5	-0.47	0.77	IC-8	-0.54	0.65	IC-3	-0.38	0.86
21	IC-5	-0.48	0.83	AS-5	-0.59	0.72	IC-5	-0.42	1.06
22	IC-3	-0.57	0.72	IC-3	-0.63	0.67	LP-1	-0.58	0.89

4.4.3.1.3 Service Superiority of icddr,bL: Core Questions

Table: 4.56 explores the service superiority gap of all and individual group of users.

Here, it is also mentionable that positive value is better than negative value.

Table 4.56 icddr,bL: Service Superiority of all (N=105) and Particular Groups

Order	ID	ALL		Researcher		Others	
		Mean	SD	Mean	SD	Mean	SD
1	AS-1	-2.15	0.83	-2.13	0.81	-2.23	0.91
2	IC-1	-1.82	0.92	-1.81	0.93	-1.85	0.88
3	LP-1	-1.80	0.85	-1.73	0.78	-2.00	1.02
4	AS-2	-2.12	0.72	-2.13	0.65	-2.12	0.91
5	IC-2	-1.84	0.84	-1.85	0.80	-1.81	0.98
6	AS-3	-2.47	0.77	-2.48	0.73	-2.42	0.90
7	IC-4	-1.93	0.84	-1.96	0.78	-1.85	1.01
8	LP-2	-1.77	0.90	-1.75	0.91	-1.85	0.88
9	AS-4	-2.16	0.92	-2.11	0.93	-2.31	0.88
10	IC-3	-2.15	0.84	-2.22	0.75	-1.96	1.08
11	AS-6	-2.18	0.73	-2.23	0.68	-2.04	0.87
12	LP-3	-2.40	1.10	-2.43	1.13	-2.31	1.01
13	AS-5	-2.18	0.82	-2.24	0.79	-2.00	0.89
14	IC-5	-2.23	0.96	-2.27	0.89	-2.12	1.18
15	AS-7	-2.40	0.64	-2.38	0.67	-2.46	0.58
16	IC-6	-2.07	1.01	-1.99	0.98	-2.31	1.09
17	LP-4	-1.81	0.88	-1.81	0.86	-1.81	0.94
18	AS-8	-1.99	0.79	-2.00	0.75	-1.96	0.92
19	IC-7	-2.26	0.69	-2.22	0.71	-2.38	0.64
20	IC-8	-2.28	0.73	-2.32	0.67	-2.15	0.88
21	LP-5	-1.90	0.89	-1.84	0.87	-2.08	0.93
22	AS-9	-1.87	0.56	-1.94	0.54	-1.65	0.56

Table 4.57 shows Service Superiority for icddr,b Library. For all participants at icddr,b, the most negative SG was -2.47 and lowest negative SG score was -1.77. For researchers and others, the lowest SG scores were -2.48 and -2.46 respectively. For all users, the top five highest negative SG scores were AS-3 (-2.47) “Employees who are consistently courteous”, AS-7 (-2.40) “Employees who understand the needs of their users”, LP-3 (-2.40) “A comfortable and inviting location”, IC-8 (-2.28) “Print and/or electronic journal collections I require for my work”, and IC-7 (-2.26) “Making information easily accessible for independent use”.

In case of researchers, the topmost problematic items were, AS-3 (-2.48), LP-3 (-2.43), AS-7 (-2.38), IC-8 (-2.32) and IC-5 (-2.27). Again, for others group, the items with lowest scores were AS-7 (-2.46), AS-3 (-2.42), IC-7 (-2.38) and LP-3 (-2.31).

**Table 4.57 icddr,bL: Service Superiority of all (N=105) and Particular Groups
(Ranked by Mean)**

Order	ID	ALL		ID	Researcher		ID	Others	
		Mean	SD		Mean	SD		Mean	SD
1	LP-2	-1.77	0.90	LP-1	-1.73	0.78	AS-9	-1.65	0.56
2	LP-1	-1.80	0.85	LP-2	-1.75	0.91	IC-2	-1.81	0.98
3	LP-4	-1.81	0.88	IC-1	-1.81	0.93	LP-4	-1.81	0.94
4	IC-1	-1.82	0.92	LP-4	-1.81	0.86	IC-1	-1.85	0.88
5	IC-2	-1.84	0.84	LP-5	-1.84	0.87	IC-4	-1.85	1.01
6	AS-9	-1.87	0.56	IC-2	-1.85	0.80	LP-2	-1.85	0.88
7	LP-5	-1.90	0.89	AS-9	-1.94	0.54	IC-3	-1.96	1.08
8	IC-4	-1.93	0.84	IC-4	-1.96	0.78	AS-8	-1.96	0.92
9	AS-8	-1.99	0.79	IC-6	-1.99	0.98	LP-1	-2.00	1.02
10	IC-6	-2.07	1.01	AS-8	-2.00	0.75	AS-5	-2.00	0.89
11	AS-2	-2.12	0.72	AS-4	-2.11	0.93	AS-6	-2.04	0.87
12	AS-1	-2.15	0.83	AS-1	-2.13	0.81	LP-5	-2.08	0.93
13	IC-3	-2.15	0.84	AS-2	-2.13	0.65	AS-2	-2.12	0.91
14	AS-4	-2.16	0.92	IC-3	-2.22	0.75	IC-5	-2.12	1.18
15	AS-5	-2.18	0.73	IC-7	-2.22	0.71	IC-8	-2.15	0.88
16	AS-6	-2.18	0.82	AS-6	-2.23	0.68	AS-1	-2.23	0.91
17	IC-5	-2.23	0.96	AS-5	-2.24	0.79	AS-4	-2.31	0.88
18	IC-7	-2.26	0.69	IC-5	-2.27	0.89	LP-3	-2.31	1.01
19	IC-8	-2.28	0.73	IC-8	-2.32	0.67	IC-6	-2.31	1.09
20	LP-3	-2.40	1.10	AS-7	-2.38	0.67	IC-7	-2.38	0.64
21	AS-7	-2.40	0.64	LP-3	-2.43	1.13	AS-3	-2.42	0.90
22	AS-3	-2.47	0.77	AS-3	-2.48	0.73	AS-7	-2.46	0.58

4.4.3.1.4 Top Common Desired Services: icddr,bL

The mean values of the top ten common DSs are ranked and compared by all and individual group of users at icddr,b (Table 4.58). In most cases, DS expectations had similarities across groups.

At icddr,b (Table-4.56), by all users, the highest ten DSs were IC-8, IC-3, LP-3, IC-5, LP-1, AS-5, IC-4, AS-7, AS-6, and AS-8. For researchers, the top ten DSs were IC-8, IC-3, LP-3, IC-5, LP-1, AS-5, IC-4, AS-7, AS-6, and AS-8. For other users, the top ten DSs were IC-8, LP-3, IC-5, LP-1, AS-5, IC-4 and AS-7. It is clear that all groups had almost similar desired services expectations. Here, with few exceptions, the top DS

items were related to library journal collection, library location, modern equipment, library space, knowledgeable staff, electronic resources and user needs.

Table- 4.58 icddr,bL: Top Common Desired Service by All and Individual Users (N=105)

Order	ID	Items	All	Researcher	Others
1	IC-8	Print and/or electronic journal collections I require for my work	x	x	x
2	IC-3	The printed library materials I need for my work	x	x	
3	LP-3	A comfortable and inviting location	x	x	x
4	IC-5	Modern equipment that lets me easily access needed information	x	x	x
5	LP-1	Library space that inspires study and learning	x	x	x
6	AS-5	Employees who have the knowledge to answer user questions	x	x	x
7	IC-4	The electronic information resources I need	x	x	x
8	AS-7	Employees who understand the needs of their users	x	x	x
9	AS-6	Employees who deal with users in a caring fashion	x	x	
10	AS-8	Willingness to help users	x	x	

4.4.3.1.5 LibQUAL+® Core Questions of icddr,bL: Zone of Tolerance

In order to measure the service level at icddr,b, the *Zone of Tolerance* (ZoT) was identified. For all users, only IC-8 and AS-8 were inside ZoT. For researchers, excluding AS-4 and AS-5 all the items were out of ZoT and in case of others LP-4, AS-7, AS-8, AS-9, IC-1 and IC- 2 were only inside of *Zone of Tolerance*.

Zone of Tolerance at ICDDR,B By All users

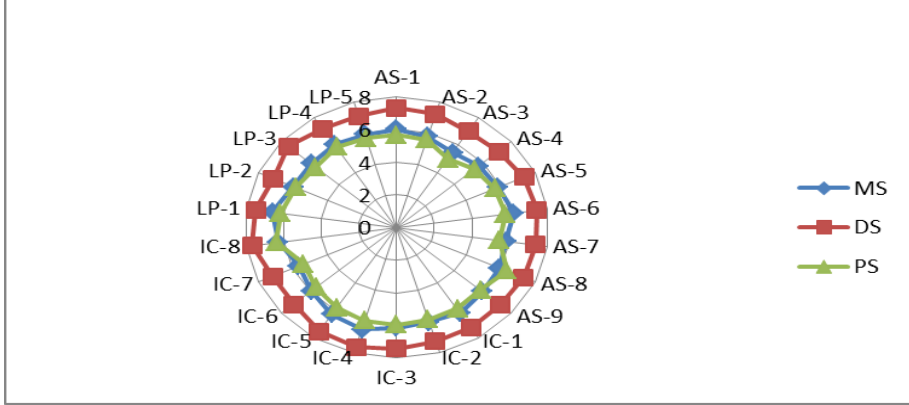


Figure 4.15 Zone of Tolerance of icddr,bL: All users

Zone of Tolerance at ICDDR,B By Researcher

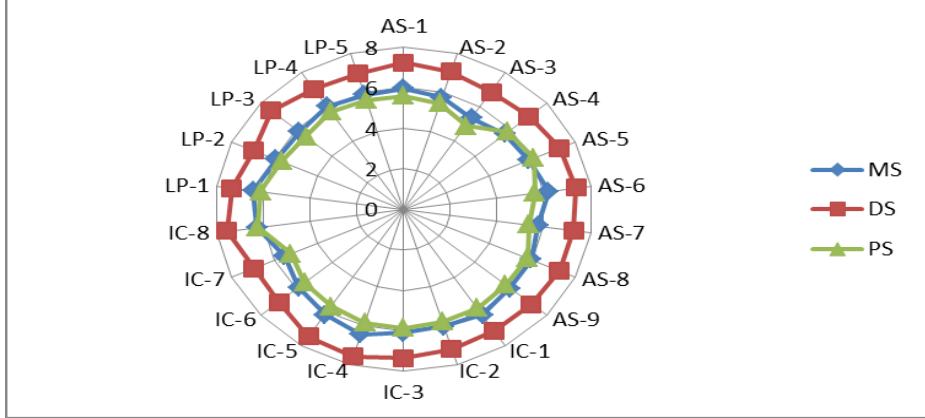


Figure 4.16 Zone of Tolerance of icddr,bL: Researcher

Zone of Tolerance at ICDDR,B By others

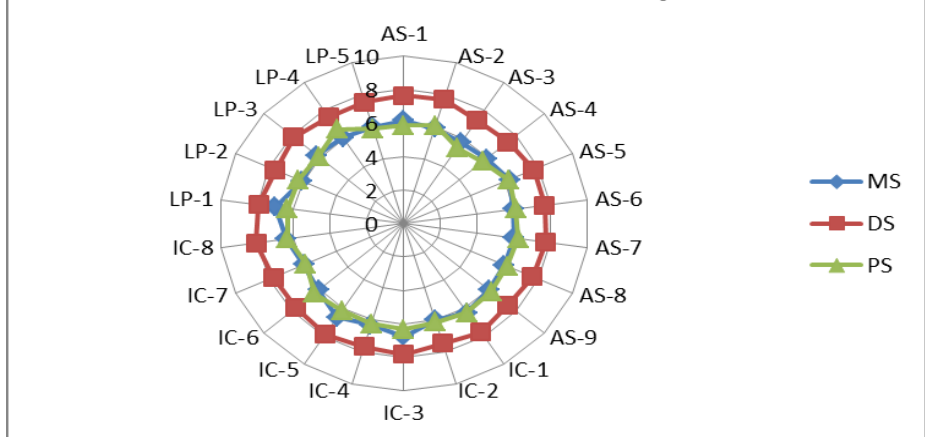


Figure 4.17 Zone of Tolerance of icddr,bL: others

4.4.3.2 Dimension Summary: Core Questions of LibQUAL+® (icddr,bl)

With a view to evaluate user perceptions of library service quality, dimension-wise investigation of LibQUAL+® core questions were investigated.

4.4.3.2.1 Exploratory Factor Analysis: icddr, bl

EFA Pattern Matrix and Factor Correlation Matrix of Desired Services are presented in Table 4.19. The method utilized include Principal Component Analysis extraction and Oblimin with Kaiser Normalization rotation method.

Table 4.59 EFA for Service Quality (Desired Service): icddr,bL (Pattern Matrix & Factor Correlation Matrix)

Items with corresponding dimensions	1	2	3	4
IC-1 Making electronic resources accessible from my home or office	.896	.127	-.057	.005
LP-3 A comfortable and inviting location	.878	.020	.051	-.082
AS-1 Employees who instill confidence in users	.807	-.262	.099	.159
AS-3 Employees who are consistently courteous	.692	.218	.074	.069
LP-4 A getaway for study, learning, or research	.561	.103	.103	.246
LP-2 Quiet space for individual activities	.550	.056	.525	-.147
IC-7 Making information easily accessible for independent use	.454	.204	.279	.159
IC-2 A library Web site enabling me to locate information on my own	.421	.610	-.094	.136
AS-2 Giving users individual attention	-.175	.911	.095	.051
LP-1 Library space that inspires study and learning	.014	.895	-.124	.200
IC-4 The electronic information resources I need	.271	.648	.215	-.169
AS-5 Employees who have the knowledge to answer user questions	-.055	.643	.415	-.055
IC-3 The printed library materials I need for my work	.240	.635	-.180	.282
AS-7 Employees who understand the needs of their users	.017	-.001	.847	.066
IC-6 Easy-to-use access tools that allow me to find things on my own	.032	.031	.828	.119
AS-6 Employees who deal with users in a caring fashion	-.005	-.024	.795	.233
AS-4 Readiness to respond to users' questions	.368	.159	.635	-.122
IC-5 Modern equipment that lets me easily access needed information	.111	.068	.602	.304
LP-5 Community space for group learning and group study	.335	.069	.084	.545
AS-9 Dependability in handling users' service problems	-.040	.054	.249	.743
IC-8 Print and/or electronic journal collections I require for my work	.196	.203	.210	.401
AS-8 Willingness to help users	.039	.139	.108	.787

Factor Correlation Matrix				
Factor	1	2	3	4
1	1.000	.410	.506	.383
2	.410	1.000	.367	.395
3	.506	0.367	1.000	.392
4	.383	.395	0.392	1.000

Extraction Method: Principal Component Analysis.
 Rotation Method: Oblimin with Kaiser Normalization.
 a. Rotation converged in 25 iterations.

Unlike other libraries, four factors were identified at icddr,b (Table: 4.59). These were Factor 1, which included eight items (IC-1, LP-3, AS-1, AS-3, LP-4, LP-2, IC-7 and IC-2), Factor 2, which included five items (AS-2, LP-1, IC-4, AS-5, and IC-3), Factor 3, which included five items (AS-7, IC-6, AS-6, AS-4 and IC-5) and Factor 4, which included four items (LP-5, AS-9, IC-8 and AS-8).

4.4.3.2.2 Confirmatory Factor Analysis: icddr,bL

The correlation matrix (Table: 4.60) showed higher and moderate correlations among indicators. So, the relationship of three-factor model was potential. Besides, scores available in structure of factor coefficients were also good i.e. there were a strong relationship among the items. (Figure 4.6).

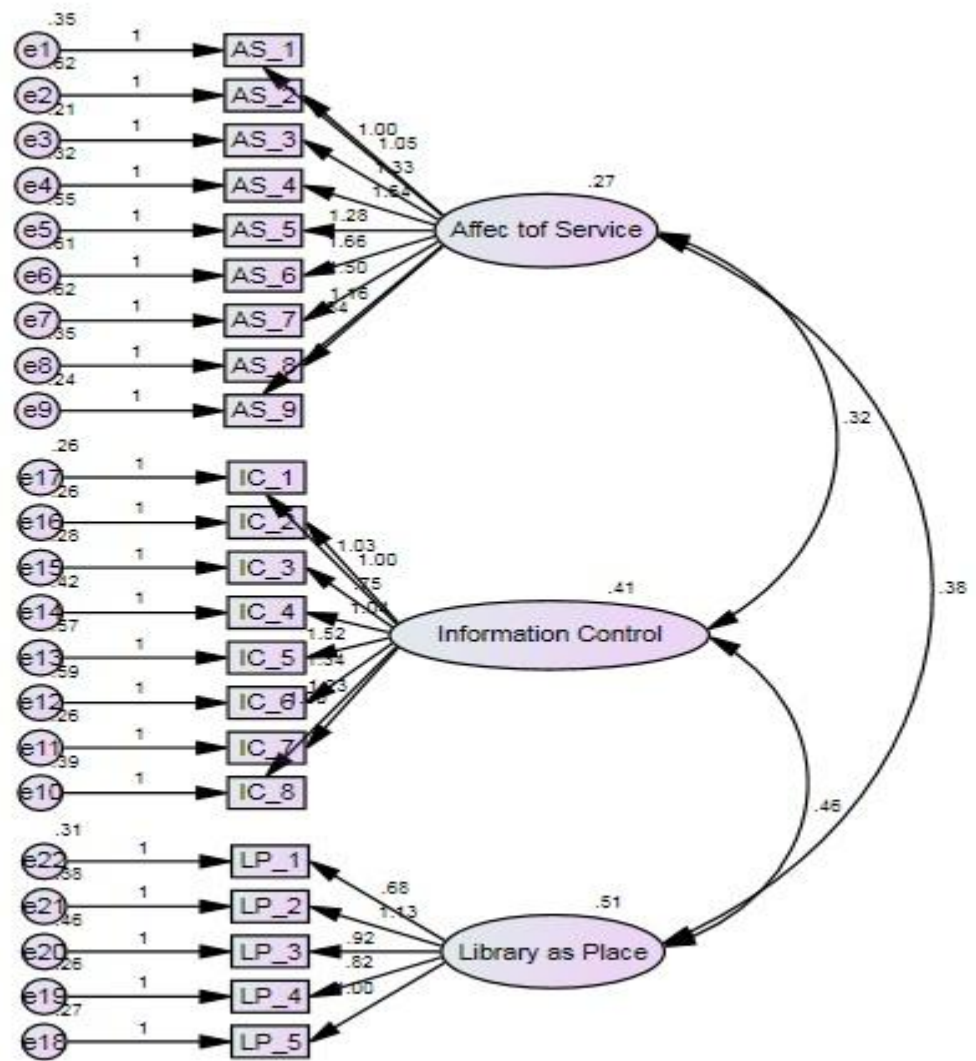


Figure 4.18 Structural Model of LibQUAL+®, icddr,bL Scores

Table 4.60 Item Correlation Matrix: icddr,bL

Items	AS-1	IC-1	LP-1	AS-2	IC-2	AS-3	IC-3	LP-2	AS-4	IC-4	AS-5	LP-3	AS-6	IC-5	AS-7	IC-6	LP-4	AS-8	IC-7	IC-8	LP-5	AS-9	
AS-1	-																						
IC-1	.689	-																					
LP-1	.153	.487	-																				
AS-2	.112	.375	.852	-																			
IC-2	.408	.629	.753	.616	-																		
AS-3	.595	.777	.534	.425	.735	-																	
IC-3	.376	.484	.732	.628	.776	.559	-																
LP-2	.623	.691	.360	.337	.542	.665	.401	-															
AS-4	.585	.606	.403	.438	.593	.720	.392	.854	-														
IC-4	.392	.601	.648	.596	.654	.599	.541	.565	.594	-													
AS-5	.356	.405	.612	.598	.567	.480	.535	.528	.619	.701	-												
LP-3	.620	.811	.357	.261	.607	.686	.466	.733	.602	.518	.294	-											
AS-6	.442	.453	.343	.356	.438	.549	.374	.636	.685	.463	.491	.469	-										
IC-5	.501	.514	.408	.447	.513	.525	.444	.707	.763	.514	.558	.512	.758	-									
AS-7	.414	.425	.314	.329	.408	.512	.343	.611	.658	.444	.466	.451	.798	.567	-								
IC-6	.452	.464	.352	.391	.449	.563	.384	.650	.700	.473	.502	.479	.768	.732	.823	-							
LP-4	.568	.680	.486	.359	.600	.707	.504	.549	.570	.532	.454	.573	.513	.529	.535	.582	-						
AS-8	.419	.472	.578	.485	.551	.540	.526	.472	.506	.449	.480	.382	.610	.710	.382	.495	.474	-					
IC-7	.571	.716	.560	.456	.643	.669	.557	.635	.644	.556	.513	.590	.520	.637	.665	.701	.728	.449	-				
IC-8	.497	.514	.528	.433	.553	.488	.559	.507	.534	.461	.481	.421	.455	.664	.490	.586	.539	.615	.734	-			
LP-5	.596	.666	.525	.422	.625	.729	.546	.616	.638	.525	.528	.561	.600	.703	.513	.492	.683	.805	.664	.536	-		
AS-9	.384	.379	.481	.391	.510	.457	.480	.402	.431	.417	.437	.363	.580	.534	.583	.586	.546	.742	.557	.501	.658	-	

4.4.3.2.3 LibQUAL+® Data of icddr,bL: Model Fit Statistics for

Model Fit Statistics (Confirmatory Factor Analysis) for LibQUAL+® Data for BSMMU Library was examined using Chi-square (χ^2), Relative/Normed chi-square (χ^2/df), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA).

Table 4.61 LibQUAL+® Data of icddr,bL:: Model Fit Statistics

Fit Indices	Value	Acceptable Range
χ^2	1210.18*	
Df	206	
P	0	
χ^2 /df	5.875	Not less than 2.0 to not higher than 5.0 are adequate (Tabachnick & Fidell, 2007)
RMSEA	0.116	Less than .05 indicates to good fit (Schumacker & Lomax, 2004).
CFI	0.695	Should be greater than .95 (Hu & Bentler, 2006)
NFI	0.654	Should be greater than .95 (Hu & Bentler, 2006)

Note: * $p < .001$

4.4.3.2.4 icddr,bL: Exploring Significant Differences (Mann-Whitney Test)

Like BSMMU and BIRDEM, to explore significant difference of Desired Service (DS) level by gender and dimension-wise gap scores by gender, Mann-Whitney test was carried out. The test results (Table: 4.62) indicate that there were no significant differences at icddr,b. Besides, the (Table: 4.63) explored the Dimension-wise gap scores by Gender. Significant differences were found in the dimension of LP i.e. “Library as a place” of AG, IC i.e. “Information Control” of SG and overall AG.

Table 4.62 icddr,bL: Mann-Whitney Test for Gender-wise DS level

SQ ID	Mann-Whitney U	Wilcoxon W	Z-value	Asymp. Sig. (2-tailed)
AS-1	1077.5	3492.5	-1.232	0.218
IC-1	1197.5	1863.5	-0.332	0.740
LP-1	1198	1864	-0.338	0.736
AS-2	1175.5	1841.5	-0.511	0.609
IC-2	1206.5	1872.5	-0.264	0.792
AS-3	1188	3603	-0.388	0.698
IC-3	1218	3633	-0.181	0.856
LP-2	1240	1906	-0.016	0.988
AS-4	1208	1874	-0.264	0.792
IC-4	1048.5	1714.5	-1.625	0.104
AS-5	1180	3595	-0.494	0.621
LP-3	1056	1722	-1.558	0.119
AS-6	1222	1888	-0.162	0.871
IC-5	1204	1870	-0.296	0.767
AS-7	1014	1680	-1.884	0.05*
IC-6	1068	1734	-1.400	0.162
LP-4	1147	1813	-0.744	0.457
AS-8	1235.5	3650.5	-0.052	0.959
IC-7	1073.5	1739.5	-1.245	0.213
IC-8	1152	3567	-0.728	0.466
LP-5	1240	1906	-0.015	0.988
AS-9	1138.5	1804.5	-0.913	0.361

Table 4.63 icddr,b Mann-Whitney Test for Dimension-wise Gap Scores by Gender

Gap	Dimension	Mann-Whitney U	Wilcoxon W	Z-value	Asymp. Sig. (2-tailed)
AG	AS	1149	3564	-0.67375	0.500
	IC	1038.5	3453.5	-1.43316	0.152
	LP	867.5	3282.5	-3.07656	0.002*
SG	AS	1016	1682	-1.54269	0.123
	IC	840.5	1506.5	-2.8336	0.005*
	LP	988	3403	-1.75723	0.079
AG	Over all	891	3306	-2.38218	0.017*
SG	Over all	941	1607	-2.03347	0.042

Note: * Significant at p < 0.05

4.4.3.3 LibQUAL+® Local Question Summary: icddr,bL

In the context of healthcare libraries in Bangladesh, five local questions were selected for this study in case of icddr,b library. The questions were related to resource, teaching of using electronic knowledge resources, library service hour, library orientation and library services. The local questions are:

Table 4.64 Selected Local Questions of LibQUAL+® Model: icddr,bL

ID	LibQUAL+® Local Questions
LQ-1	Library keeping me informed about resources and services
LQ-2	Librarians teaching me how to effectively use the electronically available databases, journals, and books
LQ-3	Adequate hours of service
LQ-4	Library orientations or instruction sessions
LQ-5	Providing services as promised

In the following table (Table 4.65), mean and SD scores for each of the local questions in respect of MS, DS, PS, AG, and SG were presented. In all cases, MS and DS means were higher and PS means were lower. Therefore, negative values emerged in Adequacy Gap and Superiority Gap.

At icddr,b, the highest DS was LQ-3 “Adequate hours of service” with high scores (7.7) and lowest DS was LQ-1 “Library keeping me informed about resources and services” with score (6.9). All AG gaps were negative, and the smallest negative gap was for LQ-1 “Library keeping me informed about resources and services” (-0.31) that was very close to minimum level. On the other hand, SGs were also negative with higher gaps. The most problematic gap was found for LQ-4 (-2.87) “Library orientations or instruction sessions”.

Table: 65 Local Questions (Mean and SD): icddr,bL

	ID	Minimum Mean (SD)	Desired Mean (SD)	Perceived Mean (SD)	Adequacy Mean (SD)	Superiority Mean (SD)
icddr,bL	LQ-1	5.78 (0.55)	6.9 (0.93)	5.49 (0.83)	-0.31 (0.7)	-1.44 (0.69)
	LQ-2	5.66 (0.72)	7.11 (1.05)	4.83 (0.86)	-0.84 (0.44)	-2.25 (0.74)
	LQ-3	6.31 (0.78)	7.7 (0.93)	5.44 (0.72)	-0.89 (0.68)	-2.26 (0.69)
	LQ-4	5.94 (0.66)	7.61 (6.04)	5.15 (0.82)	-0.81 (0.48)	-2.87 (0.87)
	LQ-5	6.05 (0.68)	7.2 (0.85)	5.28 (0.75)	-0.77 (0.47)	-1.92 (0.36)

4.4.3.4 General Satisfaction Responses: icddr,bL

Table 4.26 displayed the mean and SD scores for each of the general satisfaction questions, e.g. satisfaction with treatment, satisfaction with support and need and satisfaction with overall service quality. The table showed that among three satisfactory questions, S-2 (5.65) had the lowest and S-3 had the highest (6.93) level of satisfaction. So, it is proved that most of the users were not getting learning, research and teaching support from the library. Besides, among three questions, most of the users were satisfied with the quality of services provided by the icddr,b library.

Table 4.66 General Satisfactory Questions (Mean & SD): icddr.bl

ID	Name of Question	Mean (SD)
S-1	In general, I am satisfied with the way in which I am treated at the library	6.7 (0.57)
S-2	In general, I am satisfied with library support for my learning, research, and/or teaching needs	5.65 (0.91)
S-3	How would you rate the overall quality of the service provided by the library?	6.97 (0.88)

4.4.3.5 Information Literacy Outcomes Responses: icddr,bL

Table-4.27 shows the outcomes of information literacy (IL) questions through mean scores. The IL question was concerned with user interest, progress, efficiency, evaluation and competency. The questions were in a 9-point scale.

The table showed that IL-3 had the highest score (6.3) and IL-1 (5.72) had the lowest score. It is found that library enables the users to be more efficient in their academic pursuits. On the other hand, it is also evident that library informing the users about newly arrived information of their interest.

Table 4.67 Information Literacy Questions (Mean): icddr,bL

IL ID	Name of Question	Mean
IL1	The library helps me stay abreast of developments in my field(s) of interest	5.72
IL2	The library aids my advancement in my academic discipline	5.96
IL3	The library enables me to be more efficient in my academic pursuits	6.30
IL4	The library helps me distinguish between trustworthy and untrustworthy information	5.80
IL5	The library provides me with the information skills I need in my work or study	5.68

4.4.3.6. Library Use Summary: icddr,bL

Here, the summary of library usages at icddr,b was presented. In this study, library use summary is concerned with frequency of using resources at library premises, use of resources through library webpage and non-library gateways for information. This section showed (Table 4.68 and Figure 4.19) library users at icddr,b library.

At icddr,b, from the first question “How often do you use resources on library premises?” it is seen that daily, weekly, monthly and quarterly users were 38.10%, 45.71%, 10.48% and 5.71% consequently. Here, it is seen that the library was mostly used by weekly users.

The second question was “How often do you access library resources through a library webpage?”. The results showed that 58 (55.24%) users accessed resources through library webpages on weekly basis. Furthermore, the percentages for daily, monthly and quarterly access were 41.90% and 1.90% and 0.91% respectively.

For third question, “How often do you use Yahoo!, Google, or non-library gateways for information?”, the responses were 45.71%, 45.71%, 7.62% and 0.95% for daily, weekly and monthly and quarterly users respectively.

Table 4.68 icddr,bL: Summary of library use

Library Use Questions	Daily	Weekly	Monthly	Quarterly	Total
How often do you use resources on library premises?	40 38.10	48 45.71	11 10.48	6 5.71	105 100.00
How often do you access library resources through a library Webpage?	44 41.90	58 55.24	2 1.90	1 0.95	105 100.00
How often do you use Yahoo!, Google, or non-library gateways for information	48 45.71	48 45.71	8 7.62	1 0.95	105 100.00

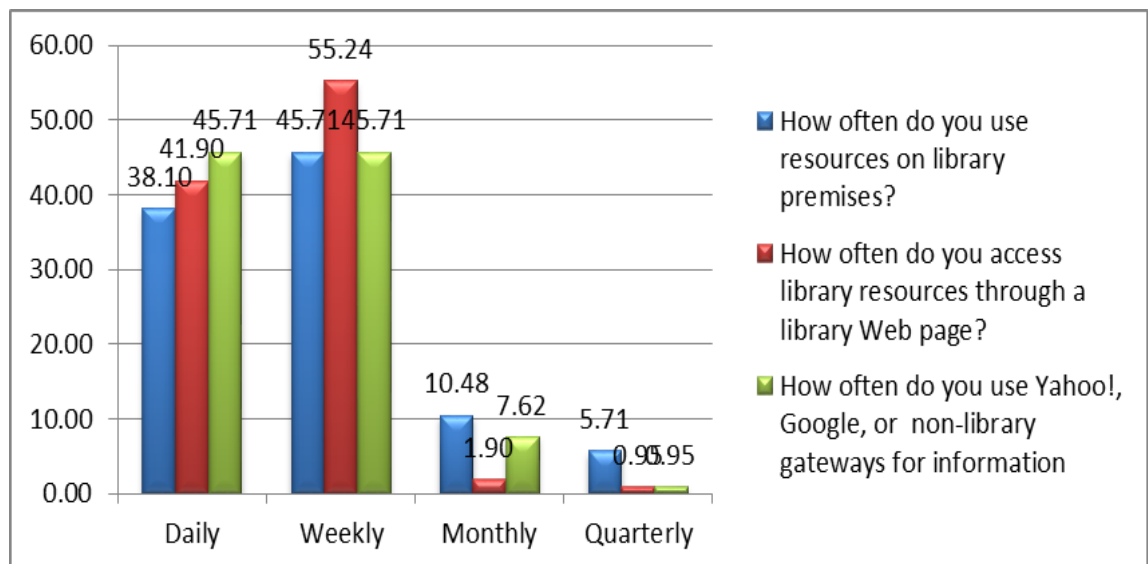


Figure 4.19 icddr,b: Summary of library use in Graph

4.4.4 National Health Library and Documentation Centre (NHLDOC):

4.4.4.1 Summary: Core Questions of LibQUAL+® (NHLDOC)

Here, the answer of core 22 questions of LibQUAL+® of NHLDOC were analyzed.

4.4.4.1.1 Responses of Users in respect of Minimum, Desired and Perceived Service

Table 4.69 presents the responses of users of NHLDOC in LibQUAL+® core questions to three levels of services (MS, DS & PS).

Table- 4.69 NHLDOC: Core questions (Mean & SD) by participating Users (N=93)

Order	ID	MS		DS		PS	
		Mean	SD	Mean	SD	Mean	SD
1	AS-1	6.82	0.71	8.25	0.75	5.56	0.87
2	IC-1	7.02	0.61	8.11	0.71	5.88	0.76
3	LP-1	7.45	0.81	8.42	0.80	6.37	0.92
4	AS-2	6.51	0.90	8.12	1.13	5.56	0.89
5	IC-2	6.81	0.66	8.23	0.77	5.77	0.84
6	AS-3	5.86	0.73	7.89	0.65	4.92	0.68
7	IC-3	7.09	0.70	8.39	0.79	5.91	0.80
8	LP-2	6.83	0.62	8.05	0.71	5.81	0.78
9	AS-4	6.26	0.75	8.05	0.73	5.32	0.84
10	IC-4	7.35	0.88	8.52	0.72	5.95	0.76
11	AS-5	6.59	0.89	8.35	0.84	5.67	0.83
12	LP-3	6.63	1.04	8.39	0.74	5.60	0.90
13	AS-6	7.01	0.88	8.34	0.74	5.69	0.87
14	IC-5	7.10	0.89	8.49	0.76	5.66	0.81
15	AS-7	6.37	0.76	8.28	0.71	5.34	0.85
16	IC-6	6.67	0.68	8.05	0.74	5.54	0.89
17	LP-4	6.84	0.78	8.05	0.77	5.81	0.77
18	AS-8	6.75	0.65	8.35	0.78	5.80	0.82
19	IC-7	6.18	0.79	8.03	0.71	5.33	1.00
20	IC-8	7.12	0.72	8.53	0.79	5.83	0.80
21	LP-4	6.60	0.69	8.01	0.76	5.59	0.88
22	AS-9	6.74	0.71	8.22	0.72	5.80	1.01

Table 4.70 – 4.72 represent the mean and SD scores ranked by mean values for all three level of services.

Table 4.70 NHLDOC: Core questions (Mean & SD) ranked by mean value by participating Users (N=93)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.45	0.81	IC-8	8.53	0.79	LP-1	5.87	0.92
2	IC-4	7.35	0.88	IC-4	8.52	0.72	IC-4	5.45	0.76
3	IC-8	7.12	0.72	IC-5	8.49	0.76	IC-3	5.41	0.8
4	IC-5	7.1	0.89	LP-1	8.42	0.8	IC-1	5.38	0.76
5	IC-3	7.09	0.7	IC-3	8.39	0.79	IC-8	5.33	0.8
6	IC-1	7.02	0.61	LP-3	8.39	0.74	LP-2	5.31	0.78
7	AS-6	7.01	0.88	AS-5	8.35	0.84	LP-4	5.31	0.77
8	LP-4	6.84	0.78	AS-8	8.35	0.78	AS-8	5.3	0.82
9	LP-2	6.83	0.62	AS-6	8.34	0.74	AS-9	5.3	1.01
10	AS-1	6.82	0.71	AS-7	8.28	0.71	IC-2	5.27	0.84
11	IC-2	6.81	0.66	AS-1	8.25	0.75	AS-6	5.19	0.87
12	AS-8	6.75	0.65	IC-2	8.23	0.77	AS-5	5.17	0.83
13	AS-9	6.74	0.71	AS-9	8.22	0.72	IC-5	5.16	0.81
14	IC-6	6.67	0.68	AS-2	8.12	1.13	LP-3	5.1	0.9
15	LP-3	6.63	1.04	IC-1	8.11	0.71	LP-5	5.09	0.88
16	LP-5	6.6	0.69	LP-2	8.05	0.71	AS-1	5.06	0.87
17	AS-5	6.59	0.89	AS-4	8.05	0.73	AS-2	5.06	0.89
18	AS-2	6.51	0.9	IC-6	8.05	0.74	IC-6	5.04	0.89
19	AS-7	6.37	0.76	LP-5	8.05	0.77	AS-7	4.84	0.85
20	AS-4	6.26	0.75	IC-7	8.03	0.71	IC-7	4.83	1
21	IC-7	6.18	0.79	LP-4	8.01	0.76	AS-4	4.82	0.84
22	AS-3	5.86	0.73	AS-3	7.89	0.65	AS-3	4.42	0.68

Table 4.71 NHLDOC: Core questions (Mean & SD) ranked by mean value by Researcher (n=76)

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.39	0.77	IC-4	8.53	0.7	LP-1	5.88	0.88
2	IC-4	7.33	0.82	IC-5	8.49	0.74	IC-4	5.45	0.73
3	IC-3	7.12	0.67	IC-8	8.49	0.81	IC-3	5.43	0.77
4	IC-8	7.11	0.74	LP-3	8.41	0.73	IC-1	5.37	0.74
5	IC-5	7.03	0.89	IC-3	8.39	0.77	AS-8	5.33	0.79
6	AS-6	7.01	0.95	LP-1	8.38	0.78	LP-4	5.32	0.74
7	IC-1	7	0.61	AS-6	8.37	0.75	IC-8	5.3	0.83
8	AS-1	6.86	0.72	AS-5	8.36	0.83	IC-2	5.28	0.81
9	IC-2	6.82	0.63	AS-8	8.33	0.79	LP-2	5.28	0.76
10	LP-2	6.8	0.61	AS-1	8.29	0.76	AS-9	5.24	0.96
11	LP-4	6.8	0.8	AS-7	8.29	0.71	IC-5	5.16	0.79
12	AS-8	6.79	0.64	IC-2	8.24	0.75	AS-6	5.14	0.87
13	AS-9	6.72	0.7	AS-9	8.21	0.74	AS-5	5.13	0.8
14	IC-6	6.66	0.68	IC-1	8.09	0.72	LP-5	5.12	0.88
15	LP-5	6.63	0.69	AS-4	8.07	0.72	AS-1	5.09	0.88
16	AS-5	6.57	0.84	AS-2	8.04	1.12	LP-3	5.05	0.9
17	LP-3	6.54	0.93	LP-2	8.03	0.67	IC-6	5.04	0.89
18	AS-2	6.46	0.86	LP-4	8.03	0.78	AS-2	5	0.89
19	AS-7	6.38	0.78	IC-6	8.01	0.7	AS-7	4.87	0.85
20	AS-4	6.29	0.78	IC-7	8	0.67	AS-4	4.84	0.83
21	IC-7	6.14	0.8	LP-5	7.99	0.74	IC-7	4.75	0.91
22	AS-3	5.86	0.71	AS-3	7.92	0.63	AS-3	4.41	0.68

**Table 4.72 NHLDOC: Core questions (Mean & SD) ranked by mean value by Others
(n=17)**

Order	ID	MS		ID	DS		ID	PS	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	7.71	0.99	IC-8	8.71	0.69	LP-1	5.79	1.1
2	IC-4	7.47	1.12	LP-1	8.59	0.87	AS-9	5.56	1.2
3	IC-5	7.41	0.8	IC-5	8.53	0.87	IC-1	5.44	0.9
4	IC-8	7.18	0.64	AS-2	8.47	1.12	LP-2	5.44	0.9
5	IC-1	7.12	0.6	IC-4	8.47	0.8	IC-4	5.44	0.9
6	LP-3	7.06	1.39	AS-8	8.47	0.72	IC-8	5.44	0.66
7	AS-6	7	0.5	IC-3	8.35	0.93	AS-6	5.38	0.86
8	LP-4	7	0.71	AS-5	8.35	0.93	AS-2	5.32	0.88
9	IC-3	6.94	0.83	LP-3	8.29	0.77	IC-3	5.32	0.95
10	LP-2	6.94	0.66	AS-6	8.24	0.75	AS-5	5.32	0.95
11	AS-9	6.82	0.73	AS-7	8.24	0.75	LP-3	5.32	0.88
12	IC-2	6.76	0.83	IC-6	8.24	0.9	IC-2	5.26	0.97
13	AS-2	6.71	1.1	AS-9	8.24	0.66	LP-4	5.26	0.9
14	AS-5	6.71	1.1	IC-1	8.18	0.73	IC-7	5.21	1.31
15	IC-6	6.71	0.69	IC-2	8.18	0.88	IC-5	5.15	0.93
16	AS-1	6.65	0.61	LP-2	8.18	0.88	AS-8	5.15	0.93
17	AS-8	6.59	0.71	LP-4	8.18	0.73	IC-6	5.03	0.94
18	LP-5	6.47	0.72	IC-7	8.18	0.88	LP-5	4.97	0.87
19	IC-7	6.35	0.79	LP-5	8.12	0.86	AS-1	4.91	0.8
20	AS-7	6.29	0.69	AS-1	8.06	0.66	AS-4	4.74	0.9
21	AS-4	6.12	0.6	AS-4	8	0.79	AS-7	4.74	0.9
22	AS-3	5.88	0.86	AS-3	7.76	0.75	AS-3	4.5	0.71

4.4.4.1.2 Service Adequacy of NHLDOC: Core Questions

The gap difference between Perceived Service and Minimum Service (Service Adequacy) was calculated to see whether user's expectation of minimum service quality are being fulfilled or not. In case of NHLDOC, the table (Table 4.73) showed combined and individual group-wise adequacy gap.

Table 4.73 NHLDOC: Service Adequacy of all (N=93) and Particular Groups

Order	ID	ALL		Researcher		Others	
		Mean	SD	Mean	SD	Mean	SD
1	AS-1	-1.76	0.51	-1.76	0.53	-1.74	0.44
2	IC-1	-1.64	0.56	-1.63	0.55	-1.68	0.64
3	LP-1	-1.59	0.5	-1.51	0.42	-1.91	0.71
4	AS-2	-1.45	0.34	-1.46	0.34	-1.38	0.33
5	IC-2	-1.53	0.37	-1.54	0.38	-1.5	0.35
6	AS-3	-1.44	0.36	-1.45	0.36	-1.38	0.33
7	IC-3	-1.67	0.5	-1.68	0.51	-1.62	0.49
8	LP-2	-1.52	0.36	-1.53	0.36	-1.5	0.35
9	AS-4	-1.44	0.38	-1.45	0.36	-1.38	0.49
10	IC-4	-1.91	0.71	-1.88	0.67	-2.03	0.87
11	AS-5	-1.42	0.3	-1.43	0.3	-1.38	0.33
12	LP-3	-1.53	0.58	-1.49	0.53	-1.74	0.75
13	AS-6	-1.82	0.68	-1.87	0.69	-1.62	0.6
14	IC-5	-1.94	0.8	-1.87	0.81	-2.26	0.66
15	AS-7	-1.52	0.39	-1.51	0.38	-1.56	0.43
16	IC-6	-1.63	0.49	-1.62	0.49	-1.68	0.53
17	LP-4	-1.53	0.43	-1.49	0.38	-1.74	0.56
18	AS-8	-1.46	0.36	-1.46	0.34	-1.44	0.43
19	IC-7	-1.35	0.53	-1.39	0.51	-1.15	0.61
20	IC-8	-1.79	0.62	-1.8	0.63	-1.74	0.56
21	LP-5	-1.51	0.35	-1.51	0.35	-1.5	0.35
22	AS-9	-1.45	0.58	-1.49	0.53	-1.26	0.75

In case of Adequacy Gap, negative values were found for all items. Table 4.74 focuses on combined and individual group-wise adequacy gap ranked by mean values at NHLDOC. In case of all users, the top five lower negative AG scores are IC-7 (-1.35)”, AS-5 (-1.42), AS-3 (-1.44), AS-4 (-1.44) and AS-2 (-1.45). For researchers, the largest negative AG gap is IC-4 (-1.88) “The electronic information resources I need” and lowest AG gap is IC-7 (-1.39) “Making information easily accessible for independent use”. For others, the lowest negative AG score was IC-7 (-1.15) “Making information easily accessible for independent use” and the highest negative AG gap was IC-5 (2.26) “Modern equipment that lets me easily access needed information”.

**Table 4.74 NHLDOC: Service Adequacy of all (N=93) and Particular Groups
(Ranked by Mean)**

Order	ID	ALL		ID	Researcher		ID	Others	
		Mean	SD		Mean	SD		Mean	SD
1	IC-7	-1.35	0.53	IC-7	-1.39	0.51	IC-7	-1.15	0.61
2	AS-5	-1.42	0.3	AS-5	-1.43	0.3	AS-9	-1.26	0.75
3	AS-3	-1.44	0.36	AS-3	-1.45	0.36	AS-2	-1.38	0.33
4	AS-4	-1.44	0.38	AS-4	-1.45	0.36	AS-3	-1.38	0.33
5	AS-2	-1.45	0.34	AS-2	-1.46	0.34	AS-4	-1.38	0.49
6	AS-9	-1.45	0.58	AS-8	-1.46	0.34	AS-5	-1.38	0.33
7	AS-8	-1.46	0.36	LP-3	-1.49	0.53	AS-8	-1.44	0.43
8	LP-4	-1.51	0.35	LP-4	-1.49	0.38	IC-2	-1.5	0.35
9	LP-2	-1.52	0.36	AS-9	-1.49	0.53	LP-2	-1.5	0.35
10	AS-7	-1.52	0.39	LP-1	-1.51	0.42	LP-4	-1.5	0.35
11	IC-2	-1.53	0.37	AS-7	-1.51	0.38	AS-7	-1.56	0.43
12	LP-3	-1.53	0.58	LP-5	-1.51	0.35	IC-3	-1.62	0.49
13	LP-5	-1.53	0.43	LP-2	-1.53	0.36	AS-6	-1.62	0.6
14	LP-1	-1.59	0.5	IC-2	-1.54	0.38	IC-1	-1.68	0.64
15	IC-6	-1.63	0.49	IC-6	-1.62	0.49	IC-6	-1.68	0.53
16	IC-1	-1.64	0.56	IC-1	-1.63	0.55	AS-1	-1.74	0.44
17	IC-3	-1.67	0.5	IC-3	-1.68	0.51	LP-3	-1.74	0.75
18	AS-1	-1.76	0.51	AS-1	-1.76	0.53	LP-5	-1.74	0.56
19	IC-8	-1.79	0.62	IC-8	-1.8	0.63	IC-8	-1.74	0.56
20	AS-6	-1.82	0.68	AS-6	-1.87	0.69	LP-1	-1.91	0.71
21	IC-4	-1.91	0.71	IC-5	-1.87	0.81	IC-4	-2.03	0.87
22	IC-5	-1.94	0.8	IC-4	-1.88	0.67	IC-5	-2.26	0.66

4.4.4.1.3 Service Superiority of NHLDOC: Core Questions

Table 4.16 shows combined and individual group-wise superiority gap.

Table 4.75 NHLDOC: Service Superiority of all (N=93) and Particular Groups

Order	ID	ALL		Researcher		Others	
		Mean	SD	Mean	SD	Mean	SD
1	AS-1	-3.19	0.75	-3.2	0.77	-3.15	0.7
2	IC-1	-2.73	0.64	-2.72	0.64	-2.74	0.66
3	LP-1	-2.55	0.58	-2.5	0.54	-2.79	0.69
4	AS-2	-3.06	0.58	-3.04	0.58	-3.15	0.61
5	IC-2	-2.95	0.68	-2.96	0.7	-2.91	0.62
6	AS-3	-3.47	0.5	-3.51	0.5	-3.26	0.44
7	IC-3	-2.97	0.69	-2.96	0.7	-3.03	0.62
8	LP-2	-2.75	0.6	-2.75	0.61	-2.74	0.56
9	AS-4	-3.23	0.81	-3.22	0.86	-3.26	0.56
10	IC-4	-3.07	0.71	-3.08	0.72	-3.03	0.72
11	AS-5	-3.19	0.57	-3.22	0.56	-3.03	0.62
12	LP-3	-3.28	0.97	-3.36	0.99	-2.97	0.8
13	AS-6	-3.16	0.77	-3.22	0.78	-2.85	0.7
14	IC-5	-3.34	0.84	-3.33	0.87	-3.38	0.7
15	AS-7	-3.44	0.69	-3.42	0.69	-3.5	0.71
16	IC-6	-3.02	0.77	-2.97	0.74	-3.21	0.92
17	LP-4	-2.75	0.62	-2.71	0.57	-2.91	0.8
18	AS-8	-3.06	0.7	-3	0.68	-3.32	0.73
19	IC-7	-3.2	0.76	-3.25	0.73	-2.97	0.87
20	IC-8	-3.2	0.78	-3.18	0.79	-3.26	0.75
21	LP-5	-2.92	0.7	-2.87	0.69	-3.15	0.7
22	AS-9	-2.92	0.98	-2.97	0.94	-2.68	1.13

Table 4.76 showed that NHLDOC had the highest SS gap (-3.51). It indicated to the least satisfaction of users.

For all users, the top five highest negative SG scores were AS-3 (-3.47) “Employees who are consistently courteous”, AS-7 (-3.44) “Employees who understand the needs of their users”, IC-5 (-3.34) “Modern equipment that lets me easily access needed information”, LP-3 (-3.28) “A comfortable and inviting location” and AS-4 (-3.23) “Readiness to respond to users’ questions”.

For researchers, only AS- 3 and AS-7 were in the top five ranking by all users. The top five items were AS-3 (-3.51), AS-7 (-3.42), LP-3 (-3.36), IC-5 (-3.33 and IC-7 (-3.25). In case of others, the top five negative SGs were AS-7 (-3.5), IC-5 (-3.38), AS-8 (-3.32), IC-8 (-3.26) and AS-4 (-3.26)

Table 4.76 NHLDOC: Service Superiority of all (N=93) and Particular Groups (Ranked by Mean)

Order	ID	ALL		ID	Researcher		ID	Others	
		Mean	SD		Mean	SD		Mean	SD
1	LP-1	-2.55	0.58	LP-1	-2.5	0.54	AS-9	-2.68	1.13
2	IC-1	-2.73	0.64	LP-4	-2.71	0.57	IC-1	-2.74	0.66
3	LP-2	-2.75	0.6	IC-1	-2.72	0.64	LP-2	-2.74	0.56
4	LP-4	-2.75	0.62	LP-2	-2.75	0.61	LP-1	-2.79	0.69
5	LP-5	-2.92	0.7	LP-5	-2.87	0.69	AS-6	-2.85	0.7
6	AS-9	-2.92	0.98	IC-2	-2.96	0.7	IC-2	-2.91	0.62
7	IC-2	-2.95	0.68	IC-3	-2.96	0.7	LP-4	-2.91	0.8
8	IC-3	-2.97	0.69	IC-6	-2.97	0.74	LP-3	-2.97	0.8
9	IC-6	-3.02	0.77	AS-9	-2.97	0.94	IC-7	-2.97	0.87
10	AS-2	-3.06	0.58	AS-8	-3	0.68	IC-3	-3.03	0.62
11	AS-8	-3.06	0.7	AS-2	-3.04	0.58	IC-4	-3.03	0.72
12	IC-4	-3.07	0.71	IC-4	-3.08	0.72	AS-5	-3.03	0.62
13	AS-6	-3.16	0.77	IC-8	-3.18	0.79	AS-1	-3.15	0.7
14	AS-1	-3.19	0.75	AS-1	-3.2	0.77	AS-2	-3.15	0.61
15	AS-5	-3.19	0.57	AS-4	-3.22	0.86	LP-5	-3.15	0.7
16	IC-7	-3.2	0.76	AS-5	-3.22	0.56	IC-6	-3.21	0.92
17	IC-8	-3.2	0.78	AS-6	-3.22	0.78	AS-3	-3.26	0.44
18	AS-4	-3.23	0.81	IC-7	-3.25	0.73	AS-4	-3.26	0.56
19	LP-3	-3.28	0.97	IC-5	-3.33	0.87	IC-8	-3.26	0.75
20	IC-5	-3.34	0.84	LP-3	-3.36	0.99	AS-8	-3.32	0.73
21	AS-7	-3.44	0.69	AS-7	-3.42	0.69	IC-5	-3.38	0.7
22	AS-3	-3.47	0.5	AS-3	-3.51	0.5	AS-7	-3.5	0.71

4.4.4.1.4 Top Common Desired Services: NHLDOC

In Table 4.36 - 4.39, the mean value of the top ten common DSs were ranked and compared by all and individual group of users. In most of the cases, DS expectations had similarities across groups.

At NHLDOC (Table-4.39), by all users, the highest ten DSs were IC-8, IC-4, IC-5, LP-1, IC-3, LP-3, AS-5, AS-8, AS-6, and AS-7. Besides, IC-8, IC-3, LP-3, IC-5, LP-1, AS-5, IC-4, AS-7, AS-6, and AS-8 were found to be highest DSs for researcher. For others user, IC-8, LP-3, IC-5, LP-1, AS-5, IC-4 and AS-7 were identified as top DSs. Here, with few exceptions, the top DS are related to Library journal collection, library location, modern equipment, library space, knowledgeable staff, electronic resources and user needs.

Table 4.77 NHLDOC: Top Common Desired Service by All and Individual Users (N=93)

Order	ID	Items	All	Researcher	Others
1	IC-8	Print and/or electronic journal collections I require for my work	x	x	x
2	IC-4	The electronic information resources I need	x	x	x
3	IC-5	Modern equipment that lets me easily access needed information	x	x	x
4	LP-1	Library space that inspires study and learning	x	x	x
5	IC-3	The printed library materials I need for my work	x	x	x
6	LP-3	A comfortable and inviting location	x	x	x
7	AS-5	Employees who have the knowledge to answer user questions	x	x	x
8	AS-8	Willingness to help users	x	x	x
9	AS-6	Employees who deal with users in a caring fashion	x	x	x
10	AS-7	Employees who understand the needs of their users	x		

4.4.4.1.5 LibQUAL+® Core Questions of NHLDOC: *Zone of Tolerance*

At NHLDOC (Figure: 4.20-4.22), the satisfactory levels are very frustrating as all attributes are outside of *Zone of Tolerance*.

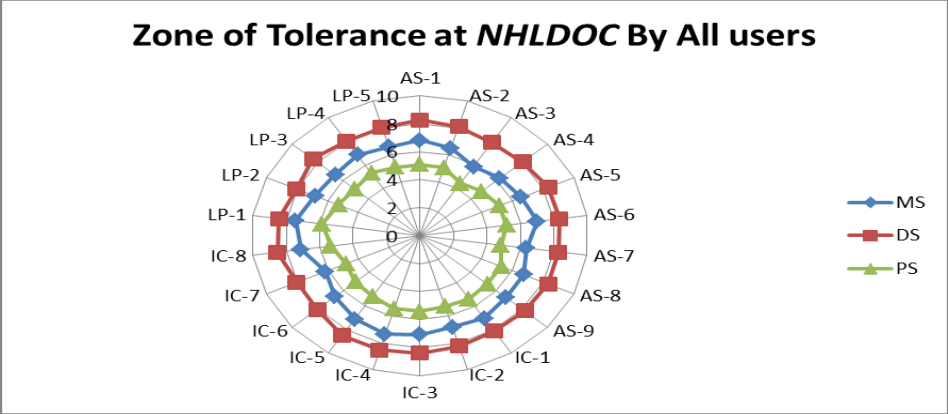


Figure 4.20 Zone of Tolerance, NHLDOC, All users

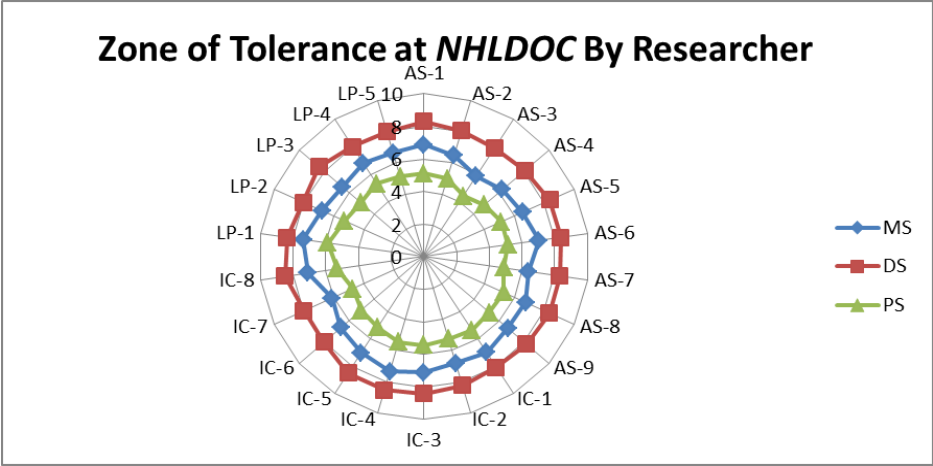


Figure 4.21 Zone of Tolerance of NHLDOC: Researcher

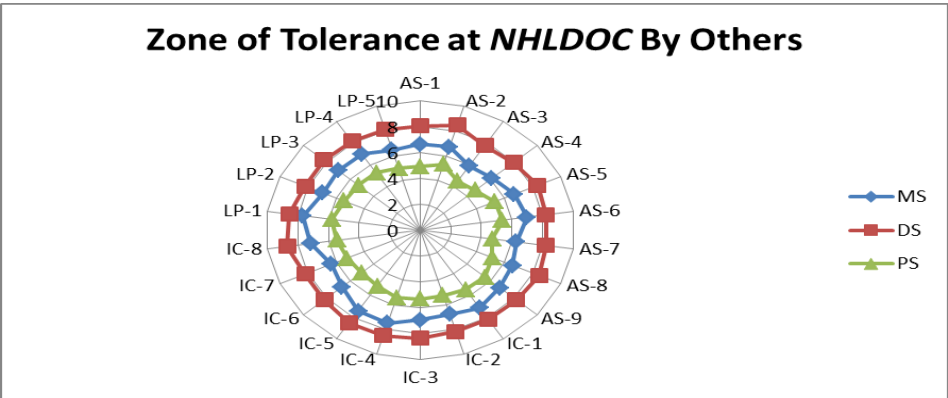


Figure 4.22 Zone of Tolerance of NHLDOC: Others

4.4.4.2. Dimension Summary: Core Questions of LibQUAL+® (NHLDOC)

With a view to evaluate user perceptions of library service quality, dimension-wise investigation of LibQUAL+® Core Questions were done. Combining groups are depending on factor correlation or factor loading.

4.4.4.2.1 Exploratory Factor Analysis: NHLDOC

EFA Pattern Matrix and Factor Correlation Matrix of Desired Services are presented in Table 4.78. Again, Principal Component Analysis extraction and Oblimin with Kaiser Normalization rotation method was used.

At NHLDOC, highest four factors were assembled, formation is Factor 1 (AS-7, LP-3, AS-6, AS-1, IC-1, LP-4 and LP-2), Factor 2 (AS-2, IC-5, IC-8, IC-4, IC-3 and IC-2), Factor 3 (AS-8, LP-1, AS-5, LP-5, AS-9, AS-4 and AS-3) and Factor 4 (IC-7 and IC-6).

Table 4.78 EFA for Service Quality (Desired Service): NHLDOC (Pattern Matrix & Factor Correlation Matrix)

Items with corresponding dimensions	1	2	3	4
AS-7 Employees who understand the needs of their users	1.013	-.115	-.122	-.070
LP-3 A comfortable and inviting location	.916	.114	-.030	.063
AS-6 Employees who deal with users in a caring fashion	.853	-.192	.036	-.243
AS-1 Employees who instill confidence in users	.831	.032	-.080	-.221
IC-1 Making electronic resources accessible from my home or office	.807	.116	.206	.133
LP-4 A getaway for study, learning, or research	.701	.247	.235	.173
LP-2 Quiet space for individual activities	.669	.175	.332	.159
AS-2 Giving users individual attention	-.166	.956	.183	.111
IC-5 Modern equipment that lets me easily access needed information	.097	.886	-.116	-.019
IC-8 Print and/or electronic journal collections I require for my work	-.012	.856	-.085	-.115
IC-4 The electronic information resources I need	.096	.852	-.131	-.052
IC-3 The printed library materials I need for my work	.068	.749	.019	-.209
IC-2 A library Web site enabling me to locate information on my own	.154	.506	.047	-.397
AS-8 Willingness to help users	-.103	-.054	.982	-.086
LP-1 Library space that inspires study and learning	-.032	.089	.961	.082
AS-5 Employees who have the knowledge to answer user questions	-.088	-.070	.854	-.247
LP-5 Community space for group learning and group study	.206	.182	.768	.109
AS-9 Dependability in handling users' service problems	.237	-.093	.668	-.137
AS-4 Readiness to respond to users' questions	.346	-.215	.665	-.067
AS-3 Employees who are consistently courteous	.484	-.302	.516	.024
IC-7 Making information easily accessible for independent use	.034	.223	.227	-.759
IC-6 Easy-to-use access tools that allow me to find things on my own	.078	.324	.180	-.638

Factor Correlation Matrix				
Factor	1	2	3	4
1	1.000	.386	.506	.383
2	.386	1.000	.367	.265
3	.506	0.367	1.000	.512
4	.383	.265	.512	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 25 iterations.

4.4.4.2.2 Confirmatory Factor Analysis: NHLDOC

CFA on original LibQUAL dimensionalities is shown below:

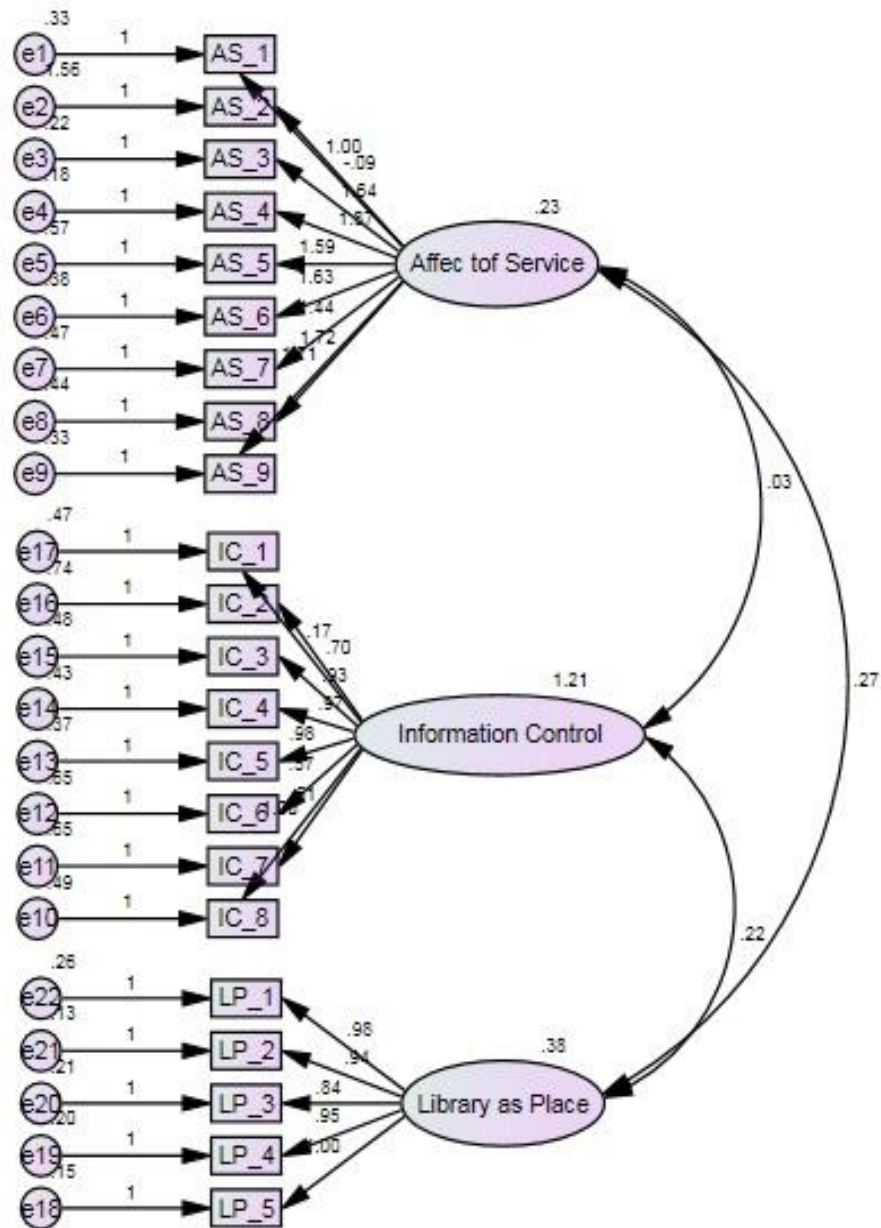


Figure 4.23 Structural Model of LibQUAL+, NHLDOC Scores

Table 4.79 Item Correlation Matrix: NHLDOC

	AS-1	IC-1	LP-1	AS-2	IC-2	AS-3	IC-3	LP-2	AS-4	IC-4	AS-5	LP-3	AS-6	IC-5	AS-7	IC-6	LP-4	AS-8	IC-7	IC-8	LP-5	AS-9	
AS-1	-																						
IC-1	.744	-																					
LP-1	.298	.511	-																				
AS-2	.130	.126	.167	-																			
IC-2	.375	.308	.261	.543	-																		
AS-3	.499	.641	.604	-.178	.030	-																	
IC-3	.286	.252	.136	.665	.628	-.054	-																
LP-2	.637	.802	.588	.191	.344	.617	.243	-															
AS-4	.502	.603	.726	-.078	.175	.810	.019	.669	-														
IC-4	.228	.145	.002	.723	.483	-.188	.653	.154	-.113	-													
AS-5	.391	.471	.747	.068	.219	.539	.154	.480	.643	-.053	-												
LP-3	.655	.782	.384	.105	.366	.539	.231	.742	.548	.213	.289	-											
AS-6	.790	.738	.400	-.102	.267	.647	.177	.662	.679	.073	.469	.772	-										
IC-5	.245	.197	-.015	.763	.573	-.185	.717	.207	-.107	.817	-.012	.246	.014	-									
AS-7	.777	.799	.344	-.097	.243	.642	.162	.721	.550	.082	.286	.859	.858	.074	-								
IC-6	.399	.307	.308	.410	.547	.151	.505	.364	.289	.455	.343	.323	.299	.463	.300	-							
LP-4	.624	.798	.559	.245	.341	.566	.259	.685	.541	.280	.306	.724	.638	.237	.722	.377	-						
AS-8	.327	.497	.881	.048	.198	.649	.081	.477	.756	-.051	.829	.303	.420	-.042	.273	.324	.466	-					
IC-7	.371	.291	.344	.358	.581	.249	.500	.287	.321	.432	.445	.283	.407	.361	.304	.779	.353	.389	-				
IC-8	.186	.105	.002	.787	.471	-.253	.728	.136	-.192	.757	.026	.169	.037	.732	.044	.470	.158	-.080	.458	-			
LP-5	.376	.632	.783	.206	.224	.659	.250	.703	.729	.124	.665	.516	.509	.079	.495	.422	.666	.731	.404	.153	-		
AS-9	.509	.548	.694	.061	.225	.677	.105	.570	.746	-.017	.719	.499	.611	.026	.502	.329	.495	.760	.342	-.017	.576	-	

4.4.4.2.3 Model Fit Statistics for LibQUAL+® Data

Model Fit Statistics (Confirmatory Factor Analysis) for LibQUAL+® Data for BSMMU Library was examined using Chi-square (χ^2), Relative/Normed chi-square (χ^2/df), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA).

Table 4.80 LibQUAL+® Data of NHLDOC: Model Fit Statistics

Fit Indices	Value	Acceptable Range
χ^2	1232.16*	
Df	206	
P	0	
χ^2 /df	5.981	Not less than 2.0 to not higher than 5.0 are adequate (Tabachnick & Fidell, 2007)
RMSEA	0.233	Less than .05 indicates to good fit (Schumacker & Lomax, 2004).
CFI	0.642	Should be greater than .95 (Hu & Bentler, 2006)
NFI	0.602	Should be greater than .95 (Hu & Bentler, 2006)

Note: * $p < .001$

4.4.4.2.4 NHLDOC: Exploring Significant Differences (Mann-Whitney Test)

With a view to identifying significant difference of Desired Service (DS) level by Gender and Dimension-wise gap score by Gender, Mann-Whitney test was carried out. The test (Table: 4.81) made clear that in NHLDOC, there were significant differences. Difference were observed for the items IC-3. Besides, the (Table: 4.82) explored the Dimension-wise gap scores by Gender. No significant differences were found in the dimension.

Table 4.81 NHLDOC: Mann-Whitney Test for Gender-wise DS level

SQ ID	Mann-Whitney U	Wilcoxon W	Z-value	Asymp. Sig. (2-tailed)
AS-1	688.5	3103.5	-1.329	0.184
IC-1	827	3242	-0.010	0.992
LP-1	819	3234	-0.090	0.929
AS-2	685.5	3100.5	-1.427	0.154
IC-2	739.5	3154.5	-0.847	0.397
AS-3	811.5	1111.5	-0.154	0.878
IC-3	620	3035	-1.981	0.048*
LP-2	777	3192	-0.520	0.603
AS-4	788	3203	-0.368	0.713
IC-4	718.5	3133.5	-1.068	0.286
AS-5	714.5	3129.5	-1.099	0.272
LP-3	683	983	-1.423	0.155
AS-6	759	3174	-0.655	0.512
IC-5	712	3127	-1.132	0.258
AS-7	764	1064	-0.598	0.550
IC-6	747	3162	-0.822	0.411
LP-4	789.5	3204.5	-0.385	0.701
AS-8	759	3174	-0.658	0.510
IC-7	705	3120	-1.282	0.200
IC-8	666.5	3081.5	-1.591	0.112
LP-5	783	3198	-0.448	0.654
AS-9	784.5	1084.5	-0.404	0.686

Note: * Significant at p < 0.05

Table 4.82 NHLDOC: Mann-Whitney Test for Dimension-wise Gap Scores by Gender

Gap	Dimension	Mann-Whitney U	Wilcoxon W	Z-value	Asymp. Sig. (2-tailed)
AG	AS	769.5	3184.5	-0.54844	0.583
	IC	771.5	3186.5	-0.51796	0.604
	LP	686.5	3101.5	-1.51515	0.130
SG	AS	701.5	1001.5	-1.12118	0.262
	IC	632	932	-1.77056	0.077
	LP	712.5	3127.5	-1.03744	0.300
AG	Over all	696	3111	-1.16499	0.244
SG	Over all	694	994	-1.17712	0.239

Significant at $p < 0.05$

4.4.4.3 LibQUAL+® Local Question Summary: NHLDOC

Five local question selected for this study concerning social and educational perspective of Bangladesh were related to resource, teaching of using electronic knowledge resources, library service hour, library orientation and library services. The local questions were in the following table.

Table 4.83 Selected Local Questions of LibQUAL+® Model: NHLDOC

ID	LibQUAL+® Local Questions
LQ-1	Library keeping me informed about resources and services
LQ-2	Librarians teaching me how to effectively use the electronically available databases, journals, and books
LQ-3	Adequate hours of service
LQ-4	Library orientations or instruction sessions
LQ-5	Providing services as promised

The following table (Table 4.84), Mean and SD score of each of the local questions in respect of MS, DS, PS, AG, and SG were presented. In all cases, MS mean and DS mean are higher and PS mean are lower. Therefore, negative values emerged in Adequacy Gap and Superiority Gap.

In INHLDLOC, the top most DSs was LQ-5 “Providing services as promised” with high scores (8.2). Among negative all AGs, the smallest AG scores was LQ- 2 “Librarians teaching me how to effectively use the electronically available databases, journals, and books” with score (-0.97). In case of SG, most problematic local question was LQ-2 (-2.69) “Library keeping me informed about resources and services” and LQ-3 (-2.63) “Adequate hours of service”. All these are related to library resources and instruction.

Table 4.84 Local Questions (Mean & SD): NHLDOC

	ID	Minimum Mean (SD)	Desired Mean (SD)	Perceived Mean (SD)	Adequacy Mean (SD)	Superiority Mean (SD)
NHLDOC	LQ-1	6.54 (0.84)	8.15 (0.91)	5.49 (1.07)	-1.04 (0.46)	-2.66 (0.79)
	LQ-2	6.2 (0.75)	7.92 (0.71)	5.24 (0.94)	-0.97 (0.45)	-2.69 (0.78)
	LQ-3	6.87 (0.94)	8.17 (1)	5.54 (0.97)	-1.33 (0.6)	-2.63 (0.78)
	LQ-4	6.61 (0.69)	7.98 (0.74)	5.47 (0.9)	-1.14 (0.43)	-2.51 (0.72)
	LQ-5	6.73 (0.72)	8.2 (0.73)	5.67 (0.96)	-1.06 (0.53)	-2.54 (0.89)

4.4.4.4 General Satisfaction Responses

Table 4.85 displayed the Mean score and Standard Deviation (SD) for each of the general satisfaction questions, e.g. satisfaction with treatment, satisfaction with support and need and satisfaction with overall service quality. The questions were in a 9-point scale from lowest to highest, where 1 mean strongly disagree and 9 mean strongly agree.. The table showed that among three satisfactory questions, S-1 (In general, I am satisfied with the way in which I am treated at the library) had the lowest (5.37) and S-3 (How would you rate the overall quality of the service provided by the library?) had the highest (5.57) level of user satisfaction.

Table 4.85 General Satisfactory Questions (Mean &SD): NHLDOC

ID	Name of Question	Mean (SD)
S-1	In general, I am satisfied with the way in which I am treated at the library	5.37 (1.04)
S-2	In general, I am satisfied with library support for my learning, research, and/or teaching needs	5.44 (1.03)
S-3	How would you rate the overall quality of the service provided by the library?	5.57 (1.09)

4.4.4.5 Information Literacy Outcomes Responses: NHLDOC

The below mentioned Table-4.27 shows the outcomes of information literacy (IL) questions through Mean score. The IL question was concerned with user interest, progress, efficiency, evaluation and competency. The questions were in a 9-point scale from lowest to highest, where 1 mean strongly disagree and 9 mean strongly agree. The table showed that IL-3 (The library enables me to be more efficient in my academic pursuits) had the highest score (6.14) and IL-2 (The library aids my advancement in my academic discipline interest) had the (5.6) smallest score.

Table 4.86 Information Literacy questions (Mean): NHLDOC

IL ID	Name of Question	Mean
IL1	The library helps me stay abreast of developments in my field(s) of interest	5.75
IL2	The library aids my advancement in my academic discipline	5.6
IL3	The library enables me to be more efficient in my academic pursuits	6.14
IL4	The library helps me distinguish between trustworthy and untrustworthy information	5.8
IL5	The library provides me with the information skills I need in my work or study	5.73

4.4.4.6 Library Use Summary: NHLDOC

This section (Table 4.87 and Figure 4.24) showed the statistics of use of BIRDEM Library in daily, weekly, monthly and quarterly basis.

At NHLDOC concerning first question “How often do you use resources on library premises?”, the responses for daily, weekly, monthly and quarterly users were 41.94%, 38.71%, 7.53% and 11.83% respectively.

For second question, “How often do you access library resources through a library webpage?” In this case, daily webpage users were 62 (66.67%). Furthermore, weekly, monthly and quarterly webpage users were 26.88%, 5.38% and 1.08% respectively.

For third question, “How often do you use Yahoo!, Google, or non-library gateways for information?”, the response rates for daily, weekly, monthly and quarterly users were 60.22%, 31.18%, 7.53% and 1.08% respectively.

Table 4.87 NHLDOC: Summary of library use

Library Use Questions	Daily	Weekly	Monthly	Quarterly	Total
How often do you use resources on library premises?	39 41.94	36 38.71	7 7.53	11 11.83	93 100.00
How often do you access library resources through a library Webpage?	62 66.67	25 26.88	5 5.38	1 1.08	93 100.00
How often do you use Yahoo!, Google, or non-library gateways for information	56 60.22	29 31.18	7 7.53	1 1.08	93 100.00

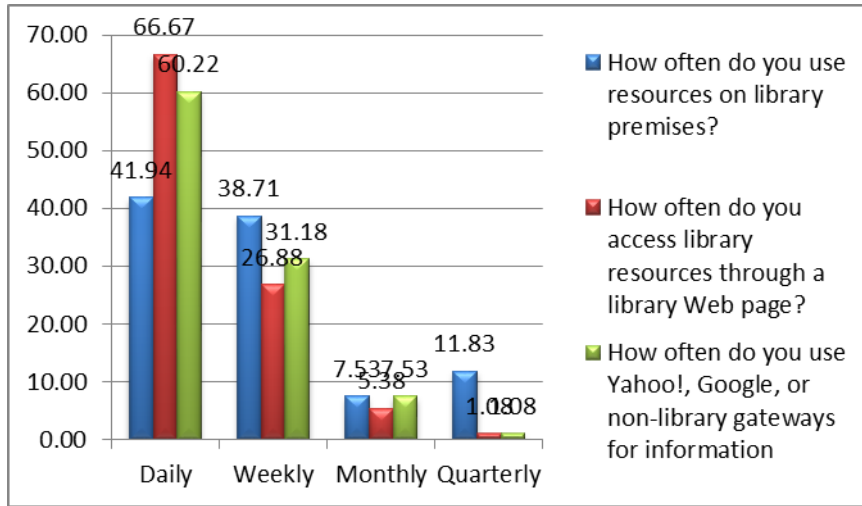


Figure 4.24 NHLDOC: Summary of library use in Graph

4.5 Findings and Comparative Study:

Question-1: In order to explore the answer to question “Which components are fulfilling the minimum expectations of users in getting quality service?”, the gap difference among Minimum Service and Perceived Service (Adequacy Gap Score) for was calculated. Table: 4.88 - 4.90 compare the AG gap scores for all four healthcare libraries.

Table 4.88 Adequacy Gap (AG): Core questions of All Category of users of Four Healthcare Libraries:

ID	BSMMU	BIRDEM	icddr,b	NHLDOC
AS-1	0.05	-1.09	-0.87	-1.76
AS-2	0.18	-0.9	-0.7	-1.45
AS-3	-0.25	-0.94	-0.93	-1.44
AS-4	0.1	-0.86	-0.8	-1.44
AS-5	0.35	-0.88	-0.68	-1.42
AS-6	-0.12	-1.15	-0.97	-1.82
AS-7	0.06	-0.95	-0.87	-1.52
AS-8	0.41	-0.85	-0.61	-1.46
AS-9	0.47	-0.83	-0.67	-1.45
IC-1	0.25	-0.99	-0.8	-1.64
IC-2	0.42	-0.93	-0.69	-1.53
IC-3	0.25	-0.98	-0.72	-1.67
IC-4	-0.1	-1.17	-1.07	-1.91
IC-5	0.03	-1.2	-0.98	-1.94
IC-6	0.16	-1.06	-0.84	-1.63
IC-7	0.02	-0.82	-0.76	-1.35
IC-8	0.14	-1.11	-0.91	-1.79
LP-1	0.11	-0.82	-0.89	-1.59
LP-2	0.34	-0.92	-0.65	-1.52
LP-3	0.07	-0.96	-0.8	-1.53
LP-4	0.34	-0.94	-0.69	-1.53
LP-5	0.28	-0.94	-0.75	-1.51

Table: 4.89 presents the top five Adequacy Gap scores of four healthcare libraries. This comparison made it clear that highest AG gaps were inherent to NHLDOC, followed by BIRDEM and icddr,b. The lowest AG scores were found in case of BSMMU Library.

Table 4.89 Top Five Adequacy Gap (AG): Core questions of All Category of users of Four Healthcare Libraries

Library	Top Five	ALL		Faculty		Postgraduate Student		Researcher		Others	
		ID	Mean	ID	Mean	ID	Mean	ID	Mean	ID	Mean
BSMMU	1	AS-9	0.47	AS-9	0.76	AS-9	0.31	IC-2	0.45	AS-9	0.91
	2	IC-2	0.42	AS-8	0.69	AS-8	0.25	AS-2	0.4	LP-2	0.64
	3	AS-8	0.41	IC-2	0.61	AS-2	0.23	LP-2	0.4	IC-2	0.45
	4	AS-5	0.35	AS-5	0.59	IC-2	0.23	IC-1	0.33	AS-6	0.45
	5	LP-2	0.34	AS-1	0.55	LP-2	0.21	LP-4	0.33	AS-8	0.36
BIRDEM	1	LP-1	-0.82	IC-7	-0.63	AS-9	-0.76	LP-1	-0.58	IC-7	-0.43
	2	IC-7	-0.82	AS-9	-0.63	AS-8	-0.83	AS-4	-0.89	AS-9	-0.43
	3	AS-9	-0.83	AS-8	-0.74	IC-7	-0.85	LP-3	-0.94	AS-4	-0.71
	4	AS-8	-0.85	LP-1	-0.78	AS-5	-0.88	IC-1	-0.97	AS-8	-0.71
	5	AS-4	-0.86	LP-2	-0.78	AS-2	-0.9	AS-2	-0.97	AS-2	-0.86
icddr,b	1	AS-8	-0.61					AS-8	-0.68	LP-2	-0.35
	2	LP-2	-0.65					LP-2	-0.75	AS-9	-0.35
	3	AS-9	-0.67					IC-2	-0.77	AS-2	-0.38
	4	AS-6	-0.68					IC-4	-0.77	AS-6	-0.38
	5	IC-2	-0.69					AS-6	-0.77	AS-8	-0.38
NHLDOC	1	IC-7	-1.35					IC-7	-1.39	IC-7	-1.15
	2	AS-5	-1.42					AS-5	-1.43	AS-9	-1.26
	3	AS-3	-1.44					AS-3	-1.45	AS-2	-1.38
	4	AS-4	-1.44					AS-4	-1.45	AS-3	-1.38
	5	AS-2	-1.45					AS-2	-1.46	AS-4	-1.38

It is found from Table: 4.90 that BSMMU Library was meeting most of the minimum expectations of users as 19 items were found positive. Besides, in BSMMU Library, postgraduates' minimum expectations were mostly fulfilled as they had 17 positive attributes. Secondly, minimum expectations of other users at icddr,b were mostly fulfilled as they had 15 positive attributes. BIRDEM Library and NHLDOC were not meeting minimum expectations of any category of users as negative AG scores emerged for all attributes.

Table 4.90 Minimum Expectation Fulfillment: Core questions of All Category of users of Four Healthcare Libraries

Library	User Group	Positive (+)/ Negative (-) AG	Meeting Minimum Expectation?	Item/Attribute that has positive AG
BSMMU	All User	+19, -3	19 attributes are meeting, 3 attributes are not	AS-1, AS-2, AS-4, AS-5, AS-7, AS-8, AS-9, IC-1, IC-2, IC-3, IC-5, IC-6, IC-7, IC-8, LP-1, LP-2, LP-3, LP-4 and LP-5
	Faculty	+16, -6	16 attributes are meeting, 6 attributes are not	AS-1, AS-4, AS-5, AS-7, AS-8, AS-9, IC-1, IC-2, IC-3, IC-5, IC-6, IC-8, LP-1, LP-2, LP-4 and LP-5
	Postgraduate Student	+17, -5	17 attributes are meeting, 5 attributes are not	AS-2, AS-4, AS-5, AS-7, AS-8, AS-9, IC-1, IC-2, IC-3, IC-4, IC-5, IC-6, IC-7, LP-2, LP-3, LP-4 and LP-5
	Researcher	+15, -7	15 attributes are meeting, 7 attributes are not	AS-2, AS-5, AS-8, AS-9, IC-1, IC-2, IC-3, IC-6, IC-7, IC-8, LP-1, LP-2, LP-3, LP-4 and LP-5
	Others	+15, -7	15 attributes are meeting, 7 attributes are not	AS-2, AS-5, AS-6, AS-8, AS-9, IC-1, IC-2, IC-3, IC-4, IC-6, IC-8, LP-1, LP-2, LP-4 and LP-5
BIRDEM	All User	- 22 (all)	Not meeting (All negative)	-
	Faculty	- 22 (all)	Not meeting (All negative)	-
	Postgraduate Student	- 22 (all)	Not meeting (All negative)	-
	Researcher	- 22 (all)	Not meeting (All negative)	-
	Others	- 22 (all)	Not meeting (All negative)	-
icddr,b	All User	- 22 (all)	Not meeting (All negative)	-
	Researcher	- 22 (all)	Not meeting (All negative)	-
	Others	+15, -7	15 attributes are meeting, 7 attributes are not	AS-1, AS-3, AS-4, AS-5, AS-7, AS-9, IC-1, IC-3, IC-4, IC-5, IC-6, IC-7, LP-1, LP-3 and LP-5
NHLDOC	All User	- 22 (all)	Not meeting (All negative)	-
	Researcher	- 22 (all)	Not meeting (All negative)	-
	Others	- 22 (all)	Not meeting (All negative)	-

Question-2: In order to explore the answer to question “Which components are fulfilling the desired expectation of users in getting quality service?”, the gap difference between Desired Service and Perceived Service (Superiority Gap Score) for each item was calculated. The tables below (Table: 4.91 - 4.93) compared the SG gap at all four healthcare libraries.

**Table 4.91 Overall SG status comparison against each of the items
by All user**

ID	BSMMU	BIRDEM	icddr,b	NHLDOC
AS-1	-1.44	-2.32	-2.15	-3.19
AS-2	-1.29	-2.36	-2.12	-3.06
AS-3	-2.04	-2.69	-2.47	-3.47
AS-4	-1.61	-2.44	-2.16	-3.23
AS-5	-1.4	-2.42	-2.18	-3.19
AS-6	-1.48	-2.34	-2.18	-3.16
AS-7	-1.82	-2.59	-2.4	-3.44
AS-8	-1.22	-2.28	-1.99	-3.06
AS-9	-1.14	-2.09	-1.87	-2.92
IC-1	-1.01	-1.92	-1.82	-2.73
IC-2	-1.13	-2.12	-1.84	-2.95
IC-3	-1.12	-2.11	-1.93	-2.97
IC-4	-1.33	-2.35	-2.15	-3.07
IC-5	-1.45	-2.48	-2.23	-3.34
IC-6	-1.34	-2.22	-2.07	-3.02
IC-7	-1.73	-2.4	-2.26	-3.2
IC-8	-1.34	-2.32	-2.28	-3.2
LP-1	-0.9	-1.83	-1.8	-2.55
LP-2	-1.07	-1.92	-1.77	-2.75
LP-3	-1.71	-2.47	-2.4	-3.28
LP-4	-1.07	-1.93	-1.81	-2.75
LP-5	-1.19	-2.08	-1.9	-2.92

Table: 4.92 presents the top five Superiority Gap scores of four healthcare libraries. This comparison made it clear that highest SG gaps were inherent to NHLDOC, followed by BIRDEM Library and then icddr,b. Again, the lowest SG scores were found in case of BSMMU Library.

Table: 4.92 Top Five Superiority Gap (SG): Core questions of All Category of users of Four Healthcare Libraries:

Library	Top Five	ALL		Faculty		Postgraduate Student		Researcher		Others	
		ID	Mean	ID	Mean	ID	Mean	ID	Mean	ID	Mean
BSMMU	1	AS-3	-2.04	AS-3	-2.02	AS-3	-2.07	AS-4	-2.14	AS-3	-1.82
	2	AS-7	-1.82	LP-3	-1.94	LP-3	-1.93	AS-3	-2.07	AS-7	-1.64
	3	IC-7	-1.73	IC-7	-1.63	AS-7	-1.93	AS-7	-2	IC-6	-1.64
	4	LP-3	-1.71	AS-7	-1.55	AS-1	-1.77	IC-7	-1.9	AS-4	-1.45
	5	AS-4	-1.61	AS-6	-1.33	IC-7	-1.75	IC-5	-1.83	IC-7	-1.36
BIRDEM	1	AS-3	-2.69	LP-3	-2.78	AS-3	-2.78	AS-4	-2.78	AS-3	-2.86
	2	AS-7	-2.59	AS-3	-2.56	LP-3	-2.71	IC-5	-2.78	AS-7	-2.71
	3	IC-5	-2.48	AS-7	-2.37	AS-7	-2.63	AS-3	-2.67	IC-5	-2.57
	4	LP-3	-2.47	AS-1	-2.22	AS-5	-2.59	AS-7	-2.67	IC-6	-2.57
	5	AS-4	-2.44	IC-8	-2.15	AS-4	-2.46	IC-7	-2.61	IC-8	-2.57
icddr,b	1	AS-3	-2.47					AS-3	-2.48	AS-7	-2.46
	2	LP-3	-2.4					LP-3	-2.43	AS-3	-2.42
	3	AS-7	-2.4					AS-7	-2.38	IC-7	-2.38
	4	IC-8	-2.28					IC-8	-2.32	LP-3	-2.31
	5	IC-7	-2.26					IC-5	-2.27	IC-6	-2.31
NHLDOC	1	AS-3	-3.47					AS-3	-3.51	AS-7	-3.5
	2	AS-7	-3.44					AS-7	-3.42	IC-5	-3.38
	3	IC-5	-3.34					LP-3	-3.36	AS-8	-3.32
	4	LP-3	-3.28					IC-5	-3.33	AS-4	-3.26
	5	AS-4	-3.23					IC-7	-3.25	IC-8	-3.26

From the above table, it is evident that among four institutions, no library was fulfilling the desired expectation of users.

Table 4.93 Desired Expectation Fulfillment: Core questions of All Category of users of Four Healthcare Libraries

Library	User Group	Positive (+)/Negative (-)SG	Meeting Desired Expectation?	Item/Attribute that has positive SG
BSMMU	All User	- 22 (all)	Not meeting (All negative)	-
	Faculty	- 22 (all)	Not meeting (All negative)	-
	Postgraduate Student	- 22 (all)	Not meeting (All negative)	-
	Researcher	- 22 (all)	Not meeting (All negative)	-
	Others	- 22 (all)	Not meeting (All negative)	-
Icddr,b	All User	- 22 (all)	Not meeting (All negative)	-
	Researcher	- 22 (all)	Not meeting (All negative)	-
	Others	- 22 (all)	Not meeting (All negative)	-
BIRDEM	All User	- 22 (all)	Not meeting (All negative)	-
	Faculty	- 22 (all)	Not meeting (All negative)	-
	Postgraduate Student	- 22 (all)	Not meeting (All negative)	-
	Researcher	- 22 (all)	Not meeting (All negative)	-
	Others	- 22 (all)	Not meeting (All negative)	-
NHLDOC	All User	- 22 (all)	Not meeting (All negative)	-
	Researcher	- 22 (all)	Not meeting (All negative)	-
	Others	- 22 (all)	Not meeting (All negative)	-

Question-3: In answer to the question “*is there any significant difference in overall service quality in terms of individual group or service dimension?*”, it was observed that there were significant differences at BSMMU for 21 attributes for DS level. BIRDEM and icddr,b both had significant differences for eight attributes, whereas NHLDOC had only one attribute. For individual group of users, the differences identified as, for BSMMU, AG AS, AG IC, AG LP, SG AS, SG IC, AG overall and SG overall. BIRDEM gaps AG IC, SG AS, SG IC, SG overall were significant. For icddr,b, AG AS was significant. At NHLDOC, the dimensions AG AS, and AG LP were statistically significant. Table: 4.94) explores the differences.

Table 4.94 Significant DS Attributes and Dimensions with Quality Gaps by Individual Group User's Status

Library	Significant Attributes	Significant Dimension (Quality Gaps)
BSMMU	AS-1, AS-2, AS-3, AS-4, AS-5, AS-6, AS-7, AS-8, AS-9, IC-1, IC-2, IC-3, IC-4, IC-5, IC-7, IC-8, LP-1, LP-2, LP-3, LP-4 and LP-5	Affect of Service (AG), Information Control (AG), Library as Place (AG), Affect of Service (SG), Information Control (SG), Overall (AG), Overall(SG)
BIRDEM	IC-1, IC-2, LP-2, IC-4, LP-3, AS-7, LP-4 and IC-7	Information Control (AG), Affect of Service (SG), Information Control (SG), Overall(SG)
icddr,b	AS-2, AS-7, AS-8, AS-5, IC-1, LP-2, LP-3 and LP-4	Affect of Service (AG)
NHLDOC	IC-8	Affect of Service (AG), Library as Place (AG)

In case of question “Do any dimension-wise variation by group of users in overall service quality?” it is explored (Table: 4.95) that excluding the dimension “Library as Place”, all other dimensions of AGs and SGs were significant at BSMMU. For BIRDEM, the dimension “Affect of Service” and “Information Control” were significant for Superiority Gap (SG); Adequacy Gap (AG) had only the dimension “Information Control” and as overall for AG. Only the dimension “Affect of Service” was significant for Adequacy Gap (AG) at icddr,b. NHLDOC library users’ significance is demonstrated, “Affect of Service” and “Library as Place for AG.

Table 4.95 Dimension-wise variation by Group of User: Kruskal-Wallis Test

Gap	Dimension	BSMMU		BIRDEM		icddr,b		NHLDOC	
		χ^2	Asymp. Sig.	χ^2	Asymp. Sig.	χ^2	Asymp. Sig.	χ^2	Asymp. Sig.
AG	AS	13.984	0.003*	6.187	0.103	6.199	0.013*	8.273	0.004*
	IC	17.374	0.001*	8.756	0.033*	0.234	0.628	0.815	0.367
	LP	9.825	0.020*	3.741	0.291	2.089	0.148	6.419	0.011*
SG	AS	16.949	0.001*	34.032	0.000*	0.032	0.857	3.559	0.059
	IC	11.630	0.009*	14.291	0.003*	1.571	0.210	0.176	0.675
	LP	7.600	0.055	6.656	0.084	1.047	0.306	0.248	0.618
AG	Over all	9.322	0.025*	3.774	0.287	0.113	0.737	0.782	0.377
SG	Over all	11.777	0.008*	20.343	0.000*	0.088	0.766	0.775	0.379

Note: * Significant at $p < 0.05$

Question-4: To answer the question: “Is there any significant difference in overall service quality in terms of age or service dimensions?”, it was found in Table: 4.96 that the differences were identified for BSMMU in AG AS, AG IC, and AG overall scores. For BIRDEM, only the dimension AG overall was significant. For icddr,b, AG LP and AG overall were statistically significant. At NHLDOC, there were no significant differences between the dimensions and age groups.

Table 4.96 Significant variation by Individual Group User’s Age

Institution	Significant Dimension (Gap)
BSMMU	Affect of Service (AG), Information Control (AG), Information Control (SG) and Overall (AG)
BIRDEM	Overall(AG)
icddr,b	Library as Place (AG) and Overall (AG)
NHLDOC	Non

Concerning dimension-wise differences, as shown in Table 4.97, the dimensions “Affect of Service” and “Information Control” had significant differences for Adequacy Gap (AG); Superiority Gap (SG) had differences in “Information Control” and overall AG scores at BSMMU. For BIRDEM, overall AG score was significant. The dimension “Library as Place” and overall AG were significant at icddr,b. There were no significant differences found for any of the NHLDOC scores.

Table 4.97 Dimension-wise Gap Scores by Age: Kruskal-Wallis Test

		BSMMU		BIRDEM		icddr,b		NHLDOC	
Gap	Dimension	χ^2	Asymp. Sig.	χ^2	Asymp. Sig.	χ^2	Asymp. Sig.	χ^2	Asymp. Sig.
AG	AS	14.068	0.003*	7.591	0.055	4.126	0.248	3.600	0.308
	IC	10.116	0.018*	7.278	0.064	6.606	0.086	2.102	0.551
	LP	1.291	0.731	2.931	0.402	9.088	0.028*	1.390	0.708
SG	AS	6.323	0.097	6.941	0.074	0.781	0.854	1.598	0.660
	IC	19.857	0.000*	6.485	0.090	6.088	0.107	3.237	0.356
	LP	1.137	0.768	2.006	0.571	1.289	0.732	7.575	0.056
AG	Over all	8.387	0.039*	10.864	0.012*	10.098	0.018*	2.187	0.534
SG	Over all	7.424	0.060	6.190	0.103	3.808	0.283	1.311	0.727

Note: * Significant at $p < 0.05$

Question-5: In answer to the question “*Is there any significant difference in overall service quality with regard to age or service dimensions?*”, it was found (Table 4.98) that there were significant differences at BSMMU for two DS level attributes (LP-3 and LP-4). BIRDEM had significant differences for 8 DS level attributes. icddr,b and NHLDOC both had difference for only one DS attribute. For male and female users, the dimension-wise differences were identified for BSMMU scores: AG LP and AG overall. For BIRDEM, AG IC, and for icddr,b AG IC were significant. For NHLDOC, the differences were not statistically significant.

Table 4.98 Dimensions-wise variation by Male/ Female

Library	Significant Attributes	Significant Dimension (Gap)
BSMMU	LP-3 and LP-4	Library as Place(AG) And Overall (AG)
BIRDEM	IC-1, IC-2, LP-2, IC-4, LP-3, AS-7, LP-4 and IC-7	Information Control(SG)
icddr,b	AS-7	Affect of Service (AG)
NHLDOC	IC-3	Non

Regarding significant difference for dimension-wise gap score e.g. AG and SG as well overall by individual Institutional group of user (Table 4.99), the test depicts that only the dimension “Library as Place” of SG is significant at all institutions combined. For BSMMU VS icddr,b, the dimension “Affect of Service” for SG is significant. For BSMMU vs NHLDOC, the dimension “Library as Place” for SG is significant and for BIRDEM vs icddr,b, the dimension “Affect of Service” for AG is significant. There is no significance difference is demonstrated for any other combination of the institutions.

Table 4.99 Dimension-wise variation by All Institution: Kruskal-Wallis Test

Gap	Dimension	All Institution		BSMMU and BIRDEM		BSMMU and icddr,b		BSMMU and NHLDOC		BIRDEM and icddr,b		BIRDEM and NHLDOC		icddr,b and NHLDOC	
		χ 2	Asymp. Sig.	χ 2	Asymp. Sig.	χ 2	Asymp. Sig.	χ 2	Asymp. Sig.	χ 2	Asymp. Sig.	χ 2	Asymp. Sig.	χ 2	Asymp. Sig.
AG	AS	0.310	0.958	0.067	0.796	0.305	0.581	0.075	0.784	0.073	0.787	0.001	0.982	0.054	0.816
	IS	2.712	0.438	0.931	0.334	0.945	0.331	2.398	0.121	0.000	0.989	0.404	0.525	0.354	0.552
	LP	0.379	0.945	0.273	0.601	0.005	0.946	0.000	0.995	0.285	0.594	0.201	0.654	0.004	0.951
SG	AS	7.010	0.072	0.000	0.987	5.189	0.023*	2.375	0.123	4.023	0.04*	1.812	0.178	0.335	0.563
	IS	2.201	0.532	0.228	0.633	2.081	0.149	0.711	0.399	0.709	0.400	0.087	0.768	0.345	0.557
	LP	9.646	0.022*	1.145	0.285	4.994	0.025	7.533	0.006*	1.323	0.250	2.949	0.086	0.360	0.548
AG	Over all	2.738	0.434	0.627	0.428	0.632	0.427	2.573	0.109	0.000	0.990	0.742	0.389	0.700	0.403
SG	Over all	3.665	0.300	0.065	0.799	3.150	0.076	1.059	0.303	1.874	0.171	0.425	0.515	0.524	0.469

Note: * Significant at p < 0.05

Question-6: With a view to the answer the question “*What are the services expected by users in healthcare libraries?*”, the top ten desired service items were presented under each healthcare libraries (Table:4.18; Table:4.38; and Table:4.56). The below mentioned table (Table: 4.100) explored the top common desired services of four healthcare libraries.

**Table 4.100 Top Ten Desired Services of Core questions: All Category of users of Four
Healthcare Libraries**

Library	User Group	Top Ten Desired Items									
BSMMU	All User	IC-8,	IC-4,	IC-5,	LP-3,	AS-6,	LP-1,	AS-7,	IC-3,	AS-5,	AS-8
	Faculty	LP-3,	AS-6,	IC-8,	AS-7,	AS-1,	IC-1,	IC-4,	IC-5,	LP-4,	LP-1
	Postgraduate										
	Student	LP-3,	AS-7,	AS-6,	IC-8,	IC-4,	IC-5,	AS-1,	AS-9,	IC-3,	LP-1
	Researcher	IC-5,	IC-4,	LP-1,	AS-2,	AS-8,	AS-5,	IC-3,	IC-8,	LP-3,	AS-6
	Others	IC-8,	LP-1,	IC-4,	LP-3,	IC-5,	AS-2,	IC-3,	IC-6,	IC-1,	LP-4
BIRDEM	All User	IC-4,	IC-5,	IC-8,	LP-1,	LP-3,	AS-8,	AS-5,	IC-3,	AS-6,	AS-2
	Faculty	LP-3,	IC-8,	AS-7,	AS-6,	LP-4,	IC-4,	IC-5,	AS-1,	IC-1,	IC-2
	Postgraduate										
	Student	IC-4,	IC-8,	LP-3,	IC-5,	LP-1,	AS-6,	AS-7,	AS-9,	AS-8,	AS-1
	Researcher	IC-5,	LP-1,	IC-4,	AS-5,	AS-8,	AS-2,	IC-3,	IC-8,	AS-6,	IC-2
	Others	IC-8,	LP-1,	IC-3,	IC-4,	IC-5,	AS-2,	LP-3,	AS-5,	AS-6,	IC-6
icddr,b	All User	IC-8,	IC-4,	LP-3,	IC-5,	LP-1,	AS-6,	IC-3,	AS-7,	AS-5,	AS-8
	Researcher	IC-4,	IC-8,	IC-5,	LP-3,	AS-6,	LP-1,	IC-3,	AS-5,	AS-7,	AS-8
	Others	IC-8,	LP-1,	LP-3,	IC-5,	IC-3,	AS-2,	AS-7,	IC-7,	IC-1,	AS-6
NHLDOC	All User	IC-8,	IC-4,	IC-5,	LP-1,	IC-3,	LP-3,	AS-5,	AS-8,	AS-6,	AS-7
	Researcher	IC-4,	IC-5,	IC-8,	LP-3,	IC-3,	LP-1,	AS-6,	AS-5,	AS-8,	AS-1
	Others	IC-8,	LP-1,	IC-5,	AS-2,	IC-4,	AS-8,	IC-3,	AS-5,	LP-3,	AS-6

From the above table, it is clear that the top DS of BSMMU Library were related to library journal collection, electronic resources, modern equipment, library location, library space and library printed materials. In case of BIRDEM Library, the top DSs were related to library's electronic resources, modern equipment, journal collection, and user care. At icddr,b, the top DSs were concerned with Library journal collection, library location, modern equipment, library space, knowledgeable staff, electronic resources and user needs. In respect of NHLDOC, the top DS scores were related to Library journal collection, library location, modern equipment, library space, knowledgeable staff, electronic resources and user needs.

Question-7: In answer to the question “Which things should the library in-charge consider for providing excellent service?”, separate *Zone of Tolerance (ZoT)* was determined for healthcare libraries. At BSMMU Library, (Figure: 4.1-4.5), for all users, all the attributes were inside of Zero of Tolerance except AS-3 and AS-6. For Faculty members, only LP-3, IC-4, AS-3 and AS-6 are outside of ZoT. Unsatisfactory items identified by postgraduates were AS-6, AS-1 and AS-3. Researchers found eighteen items inside of ZoT excluding AS-3, AS-4, IC-4 and AS-7. Other users identified AS-1, AS-3, AS-4 and LP-3 as unsatisfactory. In case of BIRDEM (Figure: 4.8-4.12) and NHLDOC (Figure: 4.15-4:17), there were no items inside the ZoT. In case of icddr,b, (Figure: 4.20-4.22) for all users, only IC-8 and AS-8 were inside ZoT. For researchers, excluding AS-4 and AS-5 all the items were out of ZoT and in case of other users, LP-4, AS-7, AS-8, AS-9, IC-1 and IC-2 were inside of *Zone of Tolerance*.

Question-8: With regard to question, “What are the factors that evaluate user's service quality?”, a dimension-wise investigation of LibQUAL+® Core Questions was carried out. In this case, exploratory and confirmatory factor analyses were used respectively. Table 4.101 shows the EFA output summary.

Table 4.101 Top Ten DS Items for all Libraries by All User Group

Library	Factor Loaded	No. of Items	Items
BSMMU	3	Factor 1(18)	LP-2, IC-2, AS-3, AS-4, IC-3, IC-1, AS-6, LP-5, IC-4, AS-5, AS-9, IC-7, AS-1, LP-3, IC-5, IC-8, LP-1 and AS-2
		Factor 2(2)	AS-8 and AS-7
		Factor 3(2)	LP-4 and IC-6
BIRDEM	3	Factor 1(9)	IC-7, AS-7, LP-2, IC-1, LP-3, IC-6, LP-4, AS-3 and IC-8
		Factor 2(11)	IC-2, IC-3, AS-9, AS-4, LP-5, IC-4, LP-1, IC-5, AS-8, AS-5 and AS-2
		Factor 3(2)	AS-1 and AS-6
icddr,b	4	Factor 1(8)	IC-1, LP-3, AS-1, AS-3, LP-4, LP-2, IC-7 and IC-2
		Factor 2(5)	AS-2, LP-1, IC-4, AS-5 and IC-3
		Factor 3(5)	AS-7, IC-6, AS-6, AS-4 and IC-5
		Factor 4(4)	LP-5, AS-9, IC-8 and AS-8
NHLDOC	4	Factor 1(7)	AS-7, LP-3, AS-6, AS-1, IC-1, LP-4 and LP-2
		Factor 2(6)	AS-2, IC-5, IC-8, IC-4, IC-3 and IC-2
		Factor 3(7)	AS-8, LP-1, AS-5, LP-5, AS-9, AS-4 and AS-3
		Factor 4(2)	IC-7 and IC-6

At BSMMU, 3 factors were constructed, the item distribution are Factor 1 (LP-2, IC-2, AS-3, AS-4, IC-3, IC-1, AS-6, LP-5, IC-4, AS-5, AS-9, IC-7, AS-1, LP-3, IC-5, IC-8, LP-1 and AS-2), Factor 2 (AS-7 and LP-4), and Factor 3 (LP-4 and IC-6).

Three factors were loaded for BIRDEM; construction of factors are, Factor 1 (IC-7, AS-7, LP-2, IC-1, LP-3, IC-6, LP-4, AS-3 and IC-8), Factor 2 (IC-2, IC-3, AS-9, AS-4, LP-5, IC-4, LP-1, IC-5, AS-8, AS-5 and AS-2) and Factor 3 (AS-1 and AS-6).

Four factors were explored for icddr,b. These are Factor 1 (IC-1, LP-3, AS-1, AS-3, LP-4, LP-2, IC-7 and IC-2), Factor 2 (AS-2, LP-1, IC-4, AS-5 and IC-3), Factor 3 (AS-7, IC-6, AS-6, AS-4 and IC-5) and Factor 4 (LP-5, AS-9, IC-8 and AS-8).

At NHLDOC, four factors were assembled, Factor 1 (AS-7, LP-3, AS-6, AS-1, IC-1, LP-4 and LP-2), Factor 2 (AS-2, IC-5, IC-8, IC-4, IC-3 and IC-2), Factor 3 (AS-8, LP-1, AS-5, LP-5, AS-9, AS-4 and AS-3), and Factor 4 (IC-7 and IC-6).

LP-5, AS-9, AS-4 and AS-3) and Factor 4 (IC-7 and IC-6), where negative correlation was identified.

Question-9: In response to the question “*What are the impact of local questions?*”, the three levels (MS, DS and PS) of service performances and gaps were calculated and ranked respectively. As shown Table: 4.102, the lowest AG gap (-0.31) and SG gap (-1.44) was inherent to LQ-1“Library keeping me informed about resources and services” for icddr,b.

Table 4.102 Local Questions: Mean (SD) of Minimum, Desired, Perceived, Adequacy & Superiority Gap

	ID	Minimum Mean (SD)	Desired Mean (SD)	Perceived Mean (SD)	Adequacy Mean (SD)	Superiority Mean (SD)
BSMMU	LQ-1	6.12 (0.93)	7.69 (1.04)	5.36 (1.22)	-0.77 (0.63)	-2.36 (0.85)
	LQ-2	5.91 (1.15)	7.58 (1.01)	4.81 (1.25)	-1.10 (0.62)	-2.80 (0.67)
	LQ-3	6.51 (1.13)	7.95 (0.99)	5.61 (1.25)	-0.94 (0.78)	-2.42 (0.70)
	LQ-4	6.17 (0.97)	7.59 (0.96)	5.39 (1.21)	-0.82 (0.63)	-2.22 (0.72)
	LQ-5	6.15 (0.79)	7.72 (0.72)	5.62 (1.23)	-0.56 (0.53)	-2.14 (0.88)
icddr,b	LQ-1	5.78 (0.55)	6.90 (0.93)	5.49 (0.83)	-0.31 (0.70)	-1.44 (0.69)
	LQ-2	5.66 (0.72)	7.11 (1.05)	4.83 (0.86)	-0.84 (0.44)	-2.25 (0.74)
	LQ-3	6.31 (0.78)	7.70 (0.93)	5.44 (0.72)	-0.89 (0.68)	-2.26 (0.69)
	LQ-4	5.94 (0.66)	7.61 (6.04)	5.15 (0.82)	-0.81 (0.48)	-2.87 (0.87)
	LQ-5	6.05 (0.68)	7.20 (0.85)	5.28 (0.75)	-0.77 (0.47)	-1.92 (0.36)
BIRDEM	LQ-1	6.59 (0.61)	7.87 (0.78)	5.55 (0.72)	-1.05 (0.53)	-2.32 (0.84)
	LQ-2	6.14 (0.67)	7.65 (0.68)	5.19 (0.80)	-0.95 (0.44)	-2.46 (0.70)
	LQ-3	6.89 (0.74)	8.10 (0.77)	5.78 (0.68)	-0.87 (0.53)	-2.32 (0.70)
	LQ-4	6.58 (0.61)	7.69 (0.71)	5.58 (0.63)	-1.00 (0.33)	-2.12 (0.58)
	LQ-5	6.59 (0.65)	7.86 (0.86)	5.63 (0.76)	-0.95 (0.39)	-2.23 (0.95)
NHLDOC	LQ-1	6.54 (0.84)	8.15 (0.91)	5.49 (1.07)	-1.04 (0.46)	-2.66 (0.79)
	LQ-2	6.20 (0.75)	7.92 (0.71)	5.24 (0.94)	-0.97 (0.45)	-2.69 (0.78)
	LQ-3	6.87 (0.94)	8.17 (1.00)	5.54 (0.97)	-1.33 (0.60)	-2.63 (0.78)
	LQ-4	6.61 (0.69)	7.98 (0.74)	5.47 (0.90)	-1.14 (0.43)	-2.51 (0.72)
	LQ-5	6.73 (0.72)	8.20 (0.73)	5.67 (0.96)	-1.06 (0.53)	-2.54 (0.89)

Question-10: In response to the question “*What are the outcome of Information Literacy?*”, a comparison of the mean scores of the responses to the information literacy (IL) outcome was illustrated in Table: 4.98 and Figure: 4.25.

Table 4.103 Response to the Information Literacy Questions by all healthcare institutions, Mean (SD)

IL ID	BSMMU	BIRDEM	icddr,b	NHLDOC
IL1	6.04	5.65	5.72	5.75
IL2	6.31	6.1	5.96	5.60
IL3	5.80	6.00	6.30	6.14
IL4	6.36	6.23	5.80	5.80
IL5	6.02	5.85	5.68	5.73

Regarding (IL-1) “The library helps me stay abreast of developments in my field(s) of interest”, BSMMU respondents had the highest score (6.40) followed by icddr,b (5.72), BIRDEM (5.65) and NHLDOC (5.75).

Concerning (IL-2) “The library aids my advancement in my academic discipline”, BSMMU was in the top position (6.31), whereas NHLDOC had the lowest score (5.60).

For (IL-3) “The library enables me to be more efficient in my academic pursuits”, the mean value of icddr,b was the highest (6.30), followed by NHLDOC(6.14), BIRDEM (6.00) and BSMMU (5.80).

In case of (IL-4) “The library helps me distinguish between trustworthy and untrustworthy information”, BSMMU’s score was the highest (6.36) for this statement, whereas BIRDEM scored second place with a score of 6.23. icddr,b and NHLDOC had the same score (5.80) for this statement.

For IL-5, “The library provides me with the information skills I need in my work or study”, BSMMU’s rating was the highest (6.02), followed by BIRDEM (5.85). Again, NHLDOC score was the lowest (5.73).

Comparison of the IL Questions by Mean Value

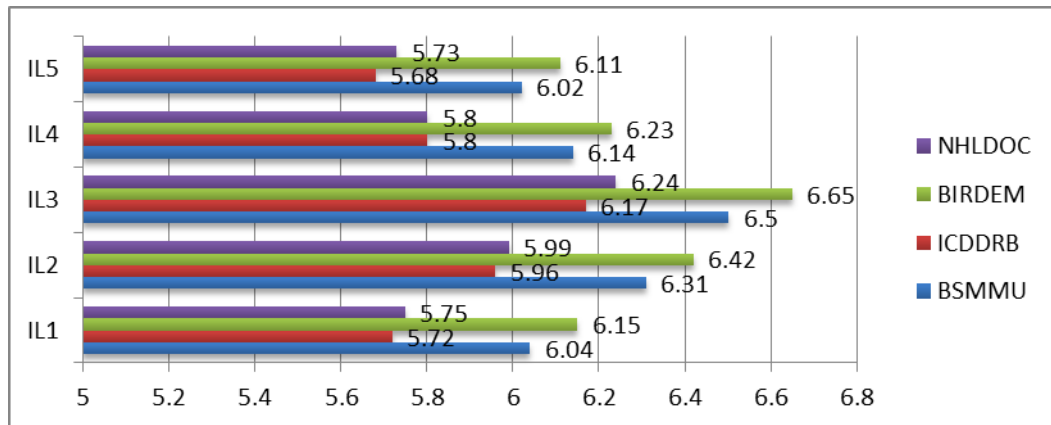


Figure 4.25 Mean Scores of Information Literacy Questions: All institutions

Question-11: With regard to this question “What is the level of user satisfaction in using the library?”, the below mentioned table (Table 4.104) displayed the mean score and SD scores for each of the general satisfaction questions.

Table 4.104 Satisfactory Questions of Institution: Mean (SD)

ID	BSMMU	BIRDEM	icddr,b	NHLDOC
S-1	6.02 (0.87)	5.54 (0.78)	6.70 (0.57)	5.37 (1.04)
S-2	6.07 (1.00)	5.76 (0.86)	5.65 (0.91)	5.44 (1.03)
S-3	6.21 (0.92)	5.45 (0.81)	6.97 (0.88)	5.57 (1.09)

Regarding satisfaction question-1, icddr,b respondents showed their satisfaction with the highest score (6.70), followed by BSMMU (6.02). Besides, BIRDEM and NHLDOC scores were 5.54 and 5.37 respectively.

Regarding satisfaction question-2, BSMMU scored the highest (6.07) and the second highest score was by BIRDEM (5.76). The lowest two scores of 5.44 and 5.65 were for icddr,b and NHLDOC respectively.

Concerning satisfaction question-3, icddr,b had the highest score (6.97). BSMMU had the second highest rating (6.21) and third highest score was for NHLDOC (5.57), while BIRDEM had lowest score (5.45).

CHAPTER- 5

Summary, Recommendation and Conclusion

5.1 Preface:

This Chapter elucidates the major findings of this research and recommends possible suggestions to overcome the problems inherent to healthcare libraries in Bangladesh, especially in Dhaka city.

5.2 Summary:

1. Frustration in fulfilling minimum expectation:

The study explored that among 22 core questions concerning affect of service, information control and library as a place, not a single expectation of users in respect of minimum service level was met. All the services provided by the healthcare libraries were lagging behind the users' minimum expectation.

2. Frustration in fulfilling desired expectation:

In respect of core 22-items of services, it was observed that none of the services met the desired expectations of users. There were huge gaps between the services that the healthcare library provided and the services that the users desired.

3. Frustration in Perceived service:

Most of the services that were provided to the users by four healthcare libraries were not satisfactory. The unsatisfactory services in respect of core questions were related to special care to users, indecent behavior of library staff, reluctance to responses to users, smart dealing with users, understanding user needs, relevant electronic information, easily access to resources through modern equipment, quite library space and comfortable location.

4. Deficiency in locally selected questions:

Among five local questions, perceived services were also lagging behind of users' minimum and desired expectation levels. The top ranked deficiencies were found for adequate hours of service and library orientation. This indicate that opening hours at healthcare libraries in Bangladesh, especially in Dhaka city, are not suited to users. Users expect that the library opening hours be extended. Moreover, it was found that healthcare libraries were not organizing orientation programmes for the users.

5. Lacking in information literacy questions:

In this study, deficiencies were observed in five information literacy-related items. Most problematic areas were related to required information skills provided by the library for a study and keeping users up to date in providing new development in the field of interest. It was found that healthcare libraries in Dhaka city were not providing their users with required information.

6. Low satisfaction of users:

In this study, it is found that the users were not satisfied with regard to how they are treated in the library, getting support for research need and quality of service provided by the library.

7. Large number of daily users:

This study made it clear that healthcare libraries in Bangladesh are regularly used by users.

5.3 Recommendation:

A resourceful, well-equipped, organized and digitized healthcare library operated by skilled manpower is the prerequisite for the development of medical science. But, Healthcare libraries in Bangladesh are engrossed with a lot of problems. To overcome these obstacles, the recommendations made from this research in respect of healthcare libraries in Dhaka city include:

Providing proactive service to users:

In general, healthcare library users are heterogeneous in nature. In case of taking any service from the library, they sometimes fail to get their expected items on time. Healthcare libraries should provide proactive services to users and handle service-oriented problems from users very carefully and cautiously so that the minimum expectation of users in getting any service can be fulfilled.

Develop assisting attitude:

Users are the heart and soul of a library. A library never fulfills its goal unless the library staff help the users willingly. Besides, among different types of services and facilities, library staff are also assessed by its users. In this study, it is found that most of the users are not getting support from the library staff in searching or getting any documents/information. This is why, healthcare libraries should take action so that library staff can come forward to help users spontaneously. In this connection, the librarian can set up a "Complain Box" where user can put their specific complains. Librarians can also encourage library staff to willingly come forward and assist users by introducing rewarding system for them.

Appointment of courteous employee in library:

This study makes it clear that employees who are providing services to users in most of the healthcare libraries are not behaving politely with users. As a result, users are being detached from library and users do not feel free in asking them any information needs or demands.

Understanding users' demands:

Most of the employees working at healthcare libraries are not serving users properly in meeting their knowledge-oriented requirements due to their poor medical science knowledge. In this case, various type of training, group discussion, medical literacy programme, etc. can be fruitful to increase the medical knowledge of employees.

Inviting Location:

Users desire that healthcare library to be set up in a comfortable and inviting location. But, in this study, it was found from the users' observation that healthcare libraries are not located in healthy and comfortable place. This is why, government or private donors should concentrate on creating an inviting place before setting up a library.

Dealing users smoothly:

Dealing library users smartly and smoothly will ultimately result in improved professional and institutional image. In this research, most of the users thought that the employees of the healthcare libraries are failed to deal with their users properly. Initiatives should be taken to teach the employee about how to smoothly deal with users in caring fashion.

Awareness Service of latest development of knowledge:

Medical science is changing rapidly. New ideas or thoughts are being created every day in all over the world. In such condition, informing the users about latest development of knowledge of their field interests is vital to keep users informed about these developments. This study found that this service is missing at most healthcare libraries. The libraries should introduce current awareness service for the clients.

Arrangement of library orientation programme:

Library is a growing organism. Its resources are always increasing every day. Library authority organizes these resource in a systematic way. It is very difficult for some users to find out the required resources as well as to be informed about different services offered by the library. Library orientation programs help a user to get an idea on how to use the library facilities and services In this research, it is found that in spite of having a huge demand from users, healthcare libraries are not arranging regular library orientation programme for the benefit of their users. Healthcare libraries should organize orientation programme for users on regular basis.

Instruction to use electronic resources:

In this digital age, libraries are trying to converge with electronic resources in order to cope with emerging technology. Libraries are increasingly subscribing to e-book, e-journal, etc. and then preserving those into their own databases. In general, the search knowledge for retrieving required information from such databases is not known to many users. The present study explores that healthcare libraries, in general, do not instruct the users on how to search these electronic resources effectively and efficiently. Special attempts should be taken by the healthcare librarians to ensure that library users are searching electronic database properly to retrieve their desired information.

5.4 Conclusion:

The present study attempted to measure the service quality of major healthcare libraries of Dhaka city with a view to find out the level of services inherent to these libraries. It was found that all the services provided by these libraries to the users are far below of their minimum and desired expectation levels. As a result, negative adequacy and superiority gaps were found. Besides, users' satisfaction levels in these libraries were very poor. In this situation, healthcare libraries in Bangladesh should come forward to providing innovative and emerging library services to meet users' desired services, at least, minimum expected services of the users are need to be addressed on an emergency basis.

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APPENDIX

I. (Demographic Information):

Please tick (✓) or answer more few question applicable to you

1. Name of the Institution

- BSMMU
- BIRDEM
- ICDDR'B
- NHLDOC

2. Your gender...

- Male
- Female

3. Your age in the range...

- 18 – 22 Years
- 23 – 30 Years
- 31-45 Years
- 46-65 Years

4. What best describes you?

- Faculty
- Graduate Student
- Undergraduate Student
- Researcher
- Others (Please specify) _____

II. (Survey):

Please rate the following statements (1 is lowest, 9 is highest) by indicating:

<i>Minimum</i>	the number that represents the <i>minimum</i> level of service that you would find acceptable
<i>Desired</i>	the number that represents the level of service that <i>you personally want</i>
<i>Perceived</i>	the number that represents the level of service that <i>you believe</i> our library currently provides

For each item, you must EITHER rate the item in all three columns OR identify the item as "N/A" (not applicable). Selecting N/A" will override all other answers for that item.

When it comes to...	My Minimum Service Level Is		My Desired Service Level Is		Perceived Service Performance Is		N/A	
	Low	High	Low	High	Low	High		
1) Employees who instill confidence in users	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
2) Making electronic resources accessible from my home or office	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
3) Library space that inspires study and learning	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
4) Giving users individual attention	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
5) A library Web site enabling me to locate information on my own	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
When it comes to...	My Minimum Service Level Is		My Desired Service Level Is		Perceived Service Performance Is		N/A	
	Low	High	Low	High	Low	High		
6) Employees who are consistently courteous	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
7) The printed library materials I need for my work	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
8) Quiet space for individual activities	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
9) Readiness to respond to users' questions	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
10) The electronic information resources I need	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
When it comes to...	My Minimum Service Level Is		My Desired Service Level Is		Perceived Service Performance Is		N/A	
	Low	High	Low	High	Low	High		
11) Employees who have the knowledge to answer user questions	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
12) A comfortable and inviting location	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
13) Employees who deal with users in a caring fashion	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
14) Modern equipment that lets me easily access needed information	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A
15) Employees who understand the needs of their users	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9	<input type="checkbox"/>	N/A

Please, indicate the degree to which you agree with the following statements:

When it comes to...	My Minimum Service Level Is		My Desired Service Level Is		Perceived Service Performance Is		N/A																					
	Low	High	Low	High	Low	High																						
16) Easy-to-use access tools that allow me to find things on my own	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="checkbox"/>
17) A getaway for study, learning, or research	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="checkbox"/>
18) Willingness to help users	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="checkbox"/>
19) Making information easily accessible for independent use	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="checkbox"/>
20) Print and/or electronic journal collections I require for my work	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="checkbox"/>
When it comes to...	Low	High	Low	High	Low	High	N/A																					
21) Community space for group learning and group study	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="checkbox"/>
22) Dependability in handling users' service problems	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="checkbox"/>
	Low	High	Low	High	Low	High	N/A																					

Please indicate the degree to which you agree with the following statements:

23) The library helps me stay abreast of developments in my field(s) of interest.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
24) The library aids my advancement in my academic discipline.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
25) The library enables me to be more efficient in my academic pursuits.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
26) The library helps me distinguish between trustworthy and untrustworthy information.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
27) The library provides me with the information skills I need in my work or study.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
28) In general, I am satisfied with the way in which I am treated at the library.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
29) In general, I am satisfied with library support for my learning, research, and/or teaching needs.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
30) How would you rate the overall quality of the service provided by the library?	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Extremely Poor	Extremely Good

31) Library keeping me informed about resources and services.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
32) Librarians teaching me how to effectively use the electronically available databases, Journals and books.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
33) Adequate hours of service.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
34) Library orientations or instruction sessions.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	Strongly Disagree	Strongly Agree
35) providing services as promised.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9		

Please indicate your library usage patterns:

36) How often do you use resources on library premises?	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Quarterly <input type="checkbox"/> Never
37) How often do you access library resources through a library Web page?	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Quarterly <input type="checkbox"/> Never
38) How often do you use Yahoo(TM), Google(TM), or non-library gateways for Information?	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Quarterly <input type="checkbox"/> Never

(Thank you very much for your nice cooperation