Efficiency and technological efficiency of universities library of Bangladesh: chronological development of IIUC Library

Md. Nurul Islam 1,2
1 National University, Gazipur, Bangladesh
2 Library and Information Science, IIUC
nim.du@yahoo.com

Available online at: www.isca.in, www.isca.me
Received 2nd October 2018, revised 17th December 2018, accepted 15th January 2019

Abstract

This study evaluates the core performance, scenario and efficiency levels of the private universities library sectors in Bangladesh and tries to calculate the efficiency, technical efficiency levels also. The study examines the core performance and activity of the private university library in Bangladesh where applying the “Data Envelopment Analysis (DEA)” method for measuring the university library accomplishment that’s developed by Charnes, Cooper, and Rhodes, 1978. It is an input and output oriented data analysis and this study conducting by seven private universities library data in Bangladesh from 2015 to 2017. This study finds that most of the private universities libraries are inefficient for their fewer service times, poor Books, Human Resource and Technological equipment’s system. Though, all universities are trying to develop their dynamic and technological efficient condition and services after 2016. But only two private university libraries are gained tough position during the study periods. This study assists the decision makers to pay more attention to the significant library activities that may help in increasing the efficiency positions and ranking of the university library as compared to another library. Besides, this study will improve the management of the private universities library in setting up plans and technological strategies.

Keywords: Private University Library, Efficiency, DEA, Technological Development, Library Development, Bangladesh.

Introduction

At a glance IIUC: “International Islamic University Chittagong (IIUC)” is approved by Bangladesh Government as well as the “University Grants Commission (UGC)” of Bangladesh1,2. This University got approval on February 11, 1995, and founded in 1995 by “Islamic University Chittagong Trust (IUCT)”. Having fulfilled the University and UGC requirements as laid down “the Private University Act 1995-13. In 1995 this University started functioning with three faculties like as “Faculty of Shariah and Islamic Studies”, Modern Science and Administrative Science intending to following policies as “Islamization of Knowledge” with different branches academic curricular of knowledge so that it’s students gains to combine quality with morality teaching from this University. Now, this University has been expanding its programs at short course Diploma, Bachelor and Masters under different facilities like as the faculty of Shariah and Islamic Studies, Arts and Humanities, Business Studies, Science and Engineering, Social Science, Law and Arabic language Institute. There is more than 16000 Bangladeshi and international student is conducting their studies at IIUC.

Central Library at IIUC: The library is the nerve house for any institution. This means it is one kind of storehouse of knowledge and information seekers. Any institution cannot run properly and cannot achieve its mission without a library. If, any institution has a sound and as a result Library its can conducting their academic activities actively. However, this studies conducted by International Islamic University Chittagong (IIUC) Central Library. It is established in 1995 by IIUC Trust Body in which financed by Government of Qatar. It is one of the most massive Central Library at IIUC amongst all the library of a private university in Bangladesh, having a space of 30,916 sq ft. And the library holds on huge quantity Books, Journals, Papers, periodicals, thesis papers, Research papers, reports, conference proceedings, manuals, handbooks, dictionaries, encyclopedias, , CD, DVD, VCD, and e-resources by sound management and functional activities of IIUC Library. And it also provides a corner of British Council services with flexible Wi-Fi environment for the knowledge of seekers at IIUC. At present, the library has a collection of more than 1, 50,000 processing 153432 books, 736 bound journals and magazines, and 1025 audio-visual materials. All services are given below: lending service, CAS (“Current Awareness Service”), SDI (“Selective Dissemination of Information”) Reading/Carrel room service, News Clippings, Information Literacy, Audio-visual service, Reprographic Service, Archival Service, British Council satellite Library Service, Free Wi-Fi Service, e-resources service.

Objective of the study: The main objectives of these studies are given below: i. To find out the current Online e-book service and user satisfaction, ii. To find out the ICT facilities in IIUC
private library in Bangladesh. iii. To find out the timing services, iv. To identify the status of IIUC library among private library in Bangladesh.

Literature review: The library is an essential part of any educational institution like as School, College, Madrasah, and University. It is joining part and parcel for earning and acquiring knowledge through individual study. It is also called the backbone of practicing knowledge all over the world. We live in the age of science where we cannot think or move without information and knowledge etc. the only the library can give all the information that's we need or want. However, our country day by day digitalized. And our country library adding latest information technology-based system and service like as Strong Wi-Fi services, online e-book service, and automation system etc. And many authors are differently presented their opinion for library digitalized and service like as if we moved physical shift to digitalized sector, computerized sector than the library would move highly significant or marking the beginning of a new development part of change in the library sector in our country⁴. Traditional publishing model and system are refused by E-Book⁵. E-Books helped us a quick transformation system in a book searching and borrowing at library and provided a new method by expanding the internet jungle⁶,⁷.

Library adds higher studies, research environment and also expanding advanced knowledge, other metals of the world to serve the all educational needs by University library⁸. E-library and Ebook are increasing our reading habit like reading newspapers, book⁹. Automation and Ebooks system provided to the reader of the library higher studies resources, comprehensive information and digital environment all over the world¹⁰. The new technology profoundly affected on library sector with a high efficiency and a new dimension for improving the library situation with reader demand and want all over the world and Library automation, digital library system, online information system, ICT data management process etc have rapidly increased because of its user satisfaction, cost-effectiveness and soft operational procedures¹¹,¹². Finally, we can say that Library automation and online service system creates a new world and unique environment for increasing information seeker and reader all over the world.

Methodology

Data Envelopment Analysis (DEA): In research task or studies uses many methods for conducting research operations, “Data Envelopment Analysis (DEA)” is one of them. It is a viral analysis tool all over the world, and “it is a data-oriented approach for evaluating the performance” “which converts multiple inputs into multiple outputs”¹³-¹⁶. And it is also inputs and outputs data-oriented approach. This method founded by and its developed by Charnes, Cooper, and Rhodes, 1978¹⁷,¹⁸. It is a statistical approach that compares each decision-making unit to the best DMU. All methods are input or output orientation. Where output programs include technical, scale, allocative efficiency and also conduct slacks, peers and technological change indicate. And technical proficiency is a separate part of scale efficiency and pure technical efficiency where professional competence helps to take effective management plan by converting inputs into outputs.

Why DEAP used?: DEA method is a very recognized tool for any research, and it is also a powerful services management and benchmarking technique for measuring efficiency levels of any kinds of task and management. Where efficient score assumed “1”, it's a standard ratio. If, any firm achieved this position and considered as an excellent firm, where their inputs, outputs, and Management runs well otherwise not. It is much better than others research tools because it has some advantages like as i. No need mathematical production function, ii. It uses input-output measurement, iii. We can also use many inputs and outputs variables in this method, and result accuracy is extreme and smooth here. For above cause, we used Data Envelopment Analysis programme (DEAP).

Data types and sources: We collect data by primary and secondary sources like as various publications like journals, books, magazines, newspapers, report of research scholars and visiting different universities and also direct online communications.

Results and discussion

This chapter is conducting a critical analysis part by using a DEAP software where represents the input-output oriented efficiency score from the VRS model in University Library data in Bangladesh. This study used 11 inputs and one output. By this analysis, we know the efficiency levels and also modern technology and IT levels of the university library sector in Bangladesh. Where compared each two years data.

Figure-1 shows that the efficiency of university library sector and also technological efficiency status from 2015 to 2017. The graph shows that the efficiency levels are increasing and decreasing during the study period. The figure shows the Eastern University efficiency score was .35 in 2015-16. This is the inefficient score. This university of library management system was expanding their efficiency score from .35 to .75 in 2016-17. Though, they could not achieve the efficient score. The efficiency score was .124 the Royal University Dhaka in 2015-16. In 2016-17 this university is increasing their efficiency score from .124 to .977. Though, it has an inefficient scorer. The efficiency score of BAUSTS was .007 in 2015-16 but next two years this university library management very rapidly their efficient score from .007 to .857 this means this library system will be achieved their proficient rating. The library efficiency score of Bangladesh Islamic University was .081 in 2015-16 and .923 in 2016-17 this implies this system expanding day by day. In 2015-16 the efficiency score of Hamdard University of Bangladesh was .21, and next two years their library management and technology is increasing where their expert
rating is .898. The efficiency score IIUC library science was a dominant position where their proficient score 1.499 this means the library science was competent overall in 2015-16. Suddenly their efficient count is decreasing during the period 2016-17 where the expert rating is one this implies this university library management system is changed during this period where less score is .499 before two years. In 2015-16 the BAUSTC Library Efficiency Score was .012 this means an inefficient scorer, but this library is increasing their efficiency score for their sound management system. This score is 1.08 in 2016-17 this implies this library system is developing day by day.

Figure-2 also shows their annual efficiency mean value of university library system or activities in 2015-16 the efficient score was .009 this mean overall library system in Bangladesh is inefficient position but next two years this sector is developing where their proficient rating switching from .009 to .922 through this score is disorganized but continuous developing this library system in Bangladesh.

Figure-3 shows all Malmquist Geometric average mean value of efficiency of all University Library in Bangladesh where conducting seven universities data. Eastern University efficiency ratio is .514 that’s shows an inefficient score. The average efficient rating of Royal University Dhaka is .348 in which inefficient score. BAUSTS is .076, Bangladesh Islami University .274, Hamdard University Bangladesh is .434, IIUC is 1.224 that's achieved an excellent, efficient rating. And BAUSTC is .116 that indicates an inefficient position where conducting data volumes from 2015 to May 2017. And the graph also noticed that BAUSTS Library is inferior position gained and IIUC Library gained their tough job that's ratio is 1.224 according to Malmquist geometric mean values.

![Figure-1: Efficiency of Malmquist index summary.](image1)

![Figure-2: Annual Means.](image2)
Figure-4 shows that, the Human Resource level of selecting University library sector in Bangladesh. Efficient Human Resources are needed for better services and better outputs, but most of the library is generated and conducted by a limited Human Resources like as the human resource ratio is 14 in Eastern University, is 3 in Royal University Dhaka, is 3 in BAUSTS, is 15 in Bangladesh Islami University, is 5 Hamdard University Bangladesh, is 32 in IIUC and is 2 in BAUSTC from 2015 to May 2017.

Where this study shows two university library ratio are poor like as 2 and only one university is created a better position of their human resource in the Library sector in Bangladesh.

Figure-5 shows the e-book volume ratio among University library in Bangladesh. This study shows that different universities library e-book ratio is different for their inefficient management and an inefficient technical system like as Eastern University has 15000, Royal University Dhaka has 300, BAUSTS has 5, Bangladesh Islami University has 3000, Hamdard University Bangladesh has 5, IIUC has 500 and BAUSTC 5. This study shows that Universities Library e-book is very poor overall for their inefficient technical position where their inefficient mechanical ratio is .302 from 2015 to 2017. Where three Universities is achieved a shallow opinion of their technical inefficient like as BAUSTS, HUB, and BAUSTC. On the other hand, Eastern University has gained a decidedly better position for modern technology and e-book sector.
Figure-6 shows the volume of Modern Technology levels of University Library in Bangladesh. We live in the age of science and IT. Where Modern technology is the essential part of our life and daily activities. And above graph represents the level of modern technology ratio among university library in Bangladesh where gaining ratio till May 2017 Eastern University 11 percent, Royal University Dhaka 3 percent, BAUSTS 1 percent, Bangladesh Islami University 10 percent, Hamdard University Bangladesh 25 percent, IIUC 24 percent and BAUSTC 10 percent that are very low comparing their demand of user.

And the graph shows the BAUISTS is 1% that's abysmal ratio and HUB is 25% of their modern technology ratio that indicates a good position among selecting university library in Bangladesh.

Figure-7 shows that the University Library books volume level of selecting university library in Bangladesh. Where 7 University library is conducting their operation by their different types of books. The graph compares the different collecting books volume levels of selecting University Library like as Eastern University has 10 percent, Royal University Dhaka 15 percent, BAUSTS 4 percent, Bangladesh Islami University 24 percent, Hamdard University Bangladesh 5 percent, IIUC 49 percent and BAUSTC 5 percent where books and raw material are very different among University Library in Bangladesh. The graph also shows that BAUSTS is the inferior position for poor book collection. On the other hand, only one University Library is gaining a decidedly better place for large books volume like as IIUC. This ratio is 49 percent that providing a sound library environment for their use at this time.
The Figure-8 shows that the library service time level where decorated 7 University libraries in Bangladesh. Service time is the most critical factor for growing resource person and sound environment for each library. The study shows that the different service time ratio like as the Eastern University providing 6480 minute each weekly, Royal University of Dhaka providing 4650(M), BAUSTS providing 2400(M), Bangladesh Islami University providing 3300(M), Hamdard University Bangladesh providing 2400(M), International Islamic University Chittagong providing 5040(M) and BAUSTC providing 3240(M) each week. It’s a most valuable factor for LID in Bangladesh. And the study also shows that the library services time is different among the University library system in Bangladesh. Above graph shows two libraries are an inferior position created their service time ratio like as BAUSTS and Hamdard University Bangladesh where their service time ratio both are 2400 minute per week. On the other hand, only one library is achieved a perfect position for their service time like as Eastern University. Its service time ratio is 6480 minute each week.

**Findings:** However, this study is calculated some positive and negative efficiency performance in private universities library in Bangladesh by using DEA method and considering the different types of data analysis were conducting seven private universities library in Bangladesh during the period is 2015 to 2017. This study shows that private universities library is inefficient. In 2015-16 annual efficiency mean value is .099 and .922 in 2016-17. This means the efficiency score is increasing technologically and physically day by day through private universities library system is not sufficient according to Figure-5 and 6. The inefficient score is .302 overall according to Malmquist DEAP method. Where most of the private universities library system is insufficient for their technological equipment’s and limited Human resources, management systems according to Figure-4. And they also provided their limited services time that is not sufficient time for the user. According to Figure-8 this study also shows that only two Universities library is achieved a tough position like as IIUC and BAUSTC. There is an efficient score of IIUC 1.499 in 2015-16 and 1 in 2016-17. And BAUSTC
efficient score is .012 in 2015-16 and 1.08 in 2016-17 according to figure.

Finally, we can say that Technologically, Services times and books are inefficient in private universities library sectors in Bangladesh though all industries are developing very rapidly.

**Conclusion**

This paper used the Data Envelopment Analysis (DEA) model i.e. CRS and VRS to examine and provide the quantitative proof by panel data in which collects by primary and secondary sources like as various publications, journals, books, magazines, newspapers, report of research scholars and visiting different universities and also directs online communications etc. This study shows the efficiency value or score of the private universities library in Bangladesh where the coverage period from 2015 to 2017. The study finds that the empirical results do confirm that most of the universities library is inefficient in 2015-16. Their inefficient ratio was EU-.35, RUD-.124, BAUSTS-.007, BUI-.081, HUB-.21, BAUSTC-.012 but only one private university library (IIUC) was a tough position during this time its efficiency ratio was 1.499. In 2016-17 most of the private universities library was developing their poor position like as EU-.754, RUD-.977, BAUSTS-.857, BUI-.923, HUB-.898, BAUSTC-1.08 and IIUC -1 where one university library (BAUSTC) improved their position, and it’s achieved an efficient location for their sound management system and technical development. But, one university library (IIUC) is decreasing their right productive place from 1.499 to 1 where .499 less for their internal policy problem, poor management system, and technological issues according to the Figure-1.

Finally, this study shows that only two universities are gained a tight position. The efficient score is 1(IIUC) and 1.08 (BAUSTC) through annual individually mean score is inefficient (.922 less dozen .078). For their less service time, Books and poor management system And this study also show that only one university (IIUC) gained efficient rating according to average efficiency value of geometric mean Figure-3.

So, we can say that above two private university libraries are benchmarked for others university library though needed more developments and this paper represent a new policy that helps to take proper managerial, technological and sound environmental decision on the private universities library in Bangladesh.

**References**

7. Rosenberg D. (2007). Forward ‘was written for Building a Digital Library at the University of Zimbabwe: A celebration of teamwork and collaboration. INASP Research and Education Case Studies.


17. Farrell M.J. (1957). Data Envelopment Analysis and Its Applications to Management. 120.