

**Challenges and Strategies for Managing Electronic Theses and Dissertations in Public
University Libraries of Bangladesh**

Md. Abdul Hakim Shah

Deputy Librarian

Bangladesh University of Business and Technology

E-mail: shunto43@gmail.com

Muhammad Mezbah-ul-Islam, Ph.D.

Professor, Department of Information Science and Library Management

University of Dhaka

E-mail: mezbah2000@du.ac.bd

Md. Sharif Hossain

Lecturer, Department of Library and Information Science

Cox's Bazar International University

E-mail: sharif.du.ac@gmail.com

Abstract

In the recent years due to the advent of ICT Electronic Theses and Dissertations (ETDs) have playing a significant impact on academic community through teaching, research, and learning. This study aims to identify the challenges and present some strategies for the maintenance of ETDs in public university libraries of Bangladesh. In this connection for ensuring representativeness, researcher purposively selected 04 public university libraries out of 49 under the investigation. Data were collected from the selected university libraries and analyzed using SPSS v-20. The result highlighted that ETDs leading towards dynamism among the universities. Some of the major challenges for smooth development of ETDs were common metadata format,

standard preservation and dissemination policy, networked central database, ICT infrastructure and adequate skilled manpower.

Keywords: Electronic theses, dissertations, University libraries, Bangladesh

Introduction

In the age of information explosion, the flow of digital information has multiplied rapidly (Vargo, 2020). Electronic Theses and Dissertations (ETDs) enhanced access to information (Salau, 2019). A thesis or dissertation is a paper submitted by a scholar in support of an academic degree or professional certification application that discusses the author's research and findings (ISO, 1986). Electronically presented Theses and Dissertations are called ETDs (VT, 2017). In this study, the term 'Thesis' refers to the scholastic book submitted for the Master's degree and 'Dissertation' submitted for the Doctorate (PhD.).

At present Bangladesh have 49 public universities (UGC, 2021) which are autonomous and financed by the government (Alom, 2018). All public universities have the authority to provide MPhil. and Ph.D. degrees in a variety of fields, but no private university is permitted to do so. As a result, only public universities issue Theses and Dissertations (TDs) as part of the MPhil. and Ph.D. degrees, which is the subject of this paper. Technology integration and open-source initiatives (Haneefa, 2018) as well as forming a new perspective on intellectual property rights (Hossain, 2020) have also energized ETDs. This phenomenon is also present in Bangladesh, a first growing developing country that gained a reputation for its ICT and digital governance in Asia. In Bangladesh, there has been considerable progress in the application of ICT in library services. Hossain, (2019) reported that the Government of Bangladesh (GOB) placed great importance on ICT-equipped libraries in its National Education Policy (NEP) 2010, and the plan for ICT in Education and libraries of all types is included in this policy.

In Bangladesh, ETDs preservation was started as a subset of the Institutional Repository (IR). University libraries frequently hosting their local Institutional Repository within their Digital Library (Saini, 2018). But most University Libraries have failed to meet the criteria for the preservation of ETDs despite the advent of Information Communication Technology (ICT) and the digital revolution. Most of the university libraries hosted their institutional repository by using open-source software such as DSpace. In light of the aforementioned flaws, this study is to investigate the challenges and strategies for managing ETDs in Public University Libraries of Bangladesh so that both the researchers and the university community are greatly being benefitted from exploring EDTs. The factors that affect the development of ETDs into the Bangladesh context may likewise be shot for other developing countries.

The study's objectives

The following are the specific objectives of this study:

- To Identify the challenges of ETDs preservation at public university libraries of Bangladesh.
- To identify which strategies can be implemented to resolve the challenges.

Literature Review

Theses and dissertations are well-known for being a rich and unique source of information; their generation, coordination, and management at academic institutions should not be overlooked. (Saloi, 2021; Cristia, 2020). The term ETDs is associated with Institutional Repository, Digital Library, Research Management System and Knowledge Management System. Millions of ETDs are available worldwide, in a variety of fields and disciplines, and in a variety of languages (Fox, 2021). DSpace, GSDL, and Eprints are the three most popular DLS for constructing an ETD repository (Pharcy, 2020). The first Thesis was written institutionally in Germany in the

seventeenth century (Barton, 2005). Preservation of ETDs intensified after the Networked Digital Library of Theses and Dissertations (NDLTD) received funding from the US Department of Education in 1996 (Fineman, 2003). After that, various initiatives have been taken worldwide for the preservation of ETDs.

A study was conducted by Evans (2006) on South African graduate students and famous the advantages and imperfections of ETDs. In this study, the author listed some concerns such as preservation, plagiarism, impact on potential publication, etc. as well as technical expertise and sufficient funding is essential to implement the ETD project. Another study that demonstrates the development and growth of (ETDs) in India. The aim of the study was to examine the growth and development of ETDs, the current state of ETD repositories, and the composition and construction of ETD repositories in India. DSpace is the most widely used open access repository program in India, according to the report. Foster (2012) reported that undergraduate theses represent an intellectual asset of the university that should be recognized and managed in long-term appropriate archives. Researcher further suggested that the implementation of an Eprint system to build IR. At North-west University in South Africa, Bangani (2018) conducted a research on the academic and social impacts of engineering electronic theses and dissertations. Sengupta (2012) provides an overview of the current state of e-thesis repositories in Asia, stating that Japan is the pioneer in terms of e-thesis repositories. The English language and the DSpace open-source software are the most preferable to create e-thesis repositories. It is quite simple to build up an ETD collection in an institutional repository in this technological age (Perera, 2013). Academic institutions have steadily made the shift from publishing paper theses and dissertations to accepting electronic copies, also known as ETDs, over the last two decades (Perrin, 2015). Haneefa (2018) conducted a study focusing on the collection, software used, and policy frameworks of ETDs of different

academic and scientific institutions in India. According to the report, India's University Grants Commission enacted the "UGC Regulations, 2005" to improve the country's ability to produce ETDs.

According to a related literature review, no major research on the topic of the study has ever been conducted in Bangladesh. While ETDs have a small number of scholarly works, a large number of books and research articles are available in the fields of library automation (Islam, 2018), institutional repositories (Rahman, 2020), knowledge management (Islam, 2020), digital libraries (Rahman, 2020), automation, and ICT application. Shuva (2012) conducted a study on building digital libraries in Bangladesh. The study showed the way of building a digital library and its challenges. Another study was conducted by Rahman (2014) on the development of IR practice in Bangladesh. The study's goals were to display the institutional repository's (IR) various initiatives, as well as to define opportunities, explore methods, and frame guidelines for creating an institutional repository in Bangladesh. DSpace is the most commonly used IR program worldwide, according to this report. Shuva (2014) stated in his study that Bangladeshi University libraries are in process of digitization by adopting subscribed e-resources. The government already has taken several steps to digitization such as information development, repository development, and e-services for citizens but the initiatives to develop national wide digital libraries are not sufficient. Rahman (2015) conduct a study on practice and trends of ETDs preservation at university libraries in Bangladesh. The study discusses the present status, insufficiencies of preservation, barriers, and suggestions for the smooth development of ETDs. Mostafa (2018) conducted a similar study into the status of ETD facilities in Bangladesh's three public university libraries. The true situation of ETD facilities in Bangladeshi university libraries was investigated in this report. The study's findings also revealed some obstacles for ETD services in Bangladesh,

as well as some methods to address them. The study's goals were to look at Bangladesh's ETD strategy, processes, strategic aspects, and SWOT review of current ETD initiatives.

From the above study, the concept of ETDs started from UMI in the year 1987 and became very popular within a short time in Europe, Australia, Asia, and even Africa too. The term ETDs is associated with Institutional Repository; Digital Library; Research Management System and Knowledge Management System. It is an important element of IR and Digital Library. There are now a huge number of ETD repositories all over the world. Bangladesh, however, as a developing nation, lags behind in this sector. Very insufficient infrastructure and lack of initiatives, no research was found on challenges and strategies for managing electronic theses and dissertations in public university libraries, though a very small number of journal articles have been published in this field. Some university libraries have started ETDs project as a subset of Digital Library but they are facing various challenges.

Methodology

This article has written using a qualitative methodology. Interviews and participant observation were the study methodologies, with the researcher's personal experiences also used as a tool for this study. Moreover, the online resources and websites have under-examined. To ensure representativeness different categories of four public university libraries have been selected based on the establishment which is in Dhaka City were purposely selected and brought under investigation. For the study, the university libraries were visited and consulted with several library staff about the total collection of ETD, its status, and service challenges for the authenticity and reliability of data.

Results

The following sections represent the results and major findings of the study. The findings from the collected data were compiled electronically and presented under three general themes.

These are:

- Existing status of ETDs in selected libraries
- Drawbacks and Challenges for ETDs preservation
- Strategies for resolved challenges.

a] Existing Status of ETDs in Selected Libraries:

Table-1, displays the statistics of the number of ETDs and the software platform used for the preservation of ETDs at respective university libraries. We can see Dhaka University Central Library (DU Library) have 3231, Bangladesh University of Engineering and Technology Library (BUET Library) have 5356, Shere-e-Bangla Agriculture University Library (SAU Library) have 2600 and Bangabandhu Sheikh Mujib Medical University Library (BSMMU library) have 3375 numbers of ETDs. The teachers, researchers, doctoral students, and Master of Science (MSc) students can easily access the database and get help for their research support. The DSpace, open source software is most preferable to develop ETDs repositories.

Table – 1: ETDs collections and software platform

| Sl. No. | Name of The Library | No of ETDs | Platform |
|---------|--|------------|----------|
| 1 | Dhaka University Central Library (DU Library) | 3231 | Dspace |
| 2 | Bangladesh University of Engineering and Technology Library (BUET Library) | 5356 | Dspace |
| 3 | Shere-e-Bangla Agriculture University Library (SAU Library) | 2600 | Dspace |
| 4 | Bangabandhu Sheikh Mujib Medical University Library (BSMMU library) | 3375 | SLIM |

The figure-1 shows that the ETDs collections of engineering university is the highest quantity in the same time the agriculture university is in lower position.

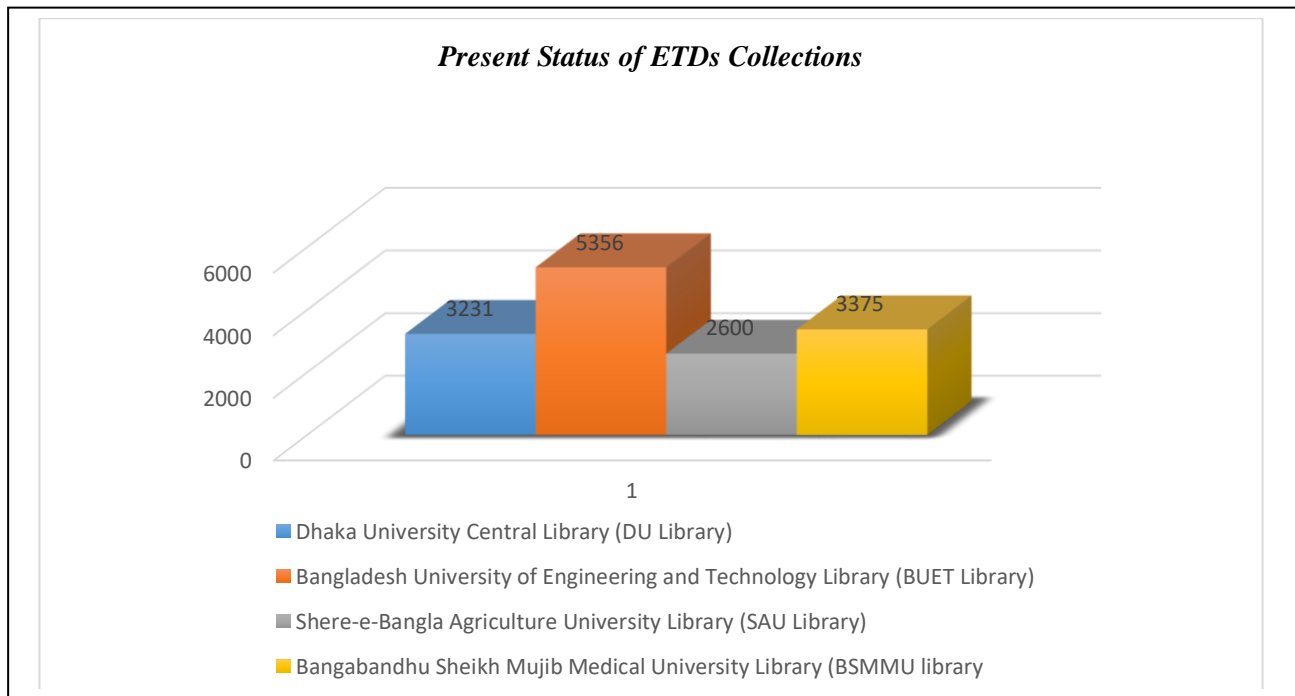


Figure-1: ETDs Collections

Table – 2: General information about the libraries

| Sr. No. | Library | Year of Establishment | Type of Academic Library | ETDs collection Started | Online Access Quantity | File Format | Average growth rate per Year |
|----------------|----------------|------------------------------|---------------------------------|--------------------------------|-------------------------------|--------------------|-------------------------------------|
| 1 | DU Library | 1921 | General | 2013 | 1676 | PDF | 5.83% |
| 2 | BUET Library | 1962 | Engineering | 2014 | 5356 | PDF | 6.55% |
| 3 | SAU Library | 2001 | Agriculture | 2010 | 2636 | PDF | 9.1% |
| 4 | BSMMU library | 1998 | Medical | 2010 | - | PDF | 8.44% |

Note: *BSMMUL= Bangabandhu Sheikh Mujib Medical University Library, BUETL= Bangladesh University of Engineering and Technology Library, SAUL = Sher-e-Bangla Agricultural University Library, DUL = University of Dhaka Library.*

Table-2 shows that University of Dhaka (DU) has established in 1921, the DU Library began its ETD program in 2013. The digital archive increased visibility and the use of full-text scholarly research output. The average growth rate of ETDs per year is 5.83%. The Dhaka University Library has an institutional repository policy for submission, copyright, and withdrawal of dissertations. The library has 12680 traditional paper-based theses and dissertations but the number of ETDs is 3231 which 1676 are accessible through online. The types of collections are General.

Bangladesh University of Engineering and Technology Library (BUET Library) has established in 1962, its ETDs program started in 2014, with service beginning in January 2015. The BUET Library has launched its on-line full-text dissertations at <http://lib.buet.ac.bd:8080/xmlui/>. The library has no local policy for an institutional repository. The number of Traditional Theses and Dissertations is 5356 and the ETDs are the same figure 5356. The types of collections are related to Engineering & Technology.

Shere-e-Bangla Agriculture University Library (SAU Library) was established in 2001 and started its ETDs preservation program from 2010. The SAU Library repository used DSpace open source software and launched its full-text Dissertations available online at <http://archive.saulibrary.edu.bd:8080/xmlui/>. The number of ETDs is 2636. The types of ETDs collections are based on Agricultural and related technology. The library has no local policy for an institutional repository.

The Institute of Postgraduate Medical Research (IPGMR) was established in December 1965 and became Bangabandhu Sheikh Mujib Medical University (BSMMU) in 1998. In 2010, the BSMMU Library began ETD collections. There are actually 3375 ETDs out of 5027 Traditional Theses and Dissertations. These ETDs are not open access and are only available at the BSMMU Library. The ETDs are managed by the System of Library and Information Management (SLIM) software. Types of collections of BSMMU library are based on medical research.

Table – 3: Average growth rate of ETDs last three years

| Sr. No. | Library | Number of ETDS added with the existing stock per year | | | Average growth rate per year |
|---------|---------------|---|---------|---------|------------------------------|
| | | 2017-18 | 2018-19 | 2019-20 | |
| 1 | DU Library | 107 | 120 | 338 | 5.83% |
| 2 | BUET Library | 230 | 252 | 570 | 6.55% |
| 3 | SAU Library | 275 | 187 | 248 | 9.1% |
| 4 | BSMMU library | 260 | 280 | 315 | 8.44% |

Table -3 shows that last three years how many ETDs added with the existing stock of the library and the average growth rate per year, the growth rate of ETDs collections at SAU Library is highest 9.1% per year on the other hand growth rate of DU Library is lowest 5.83%. on the other hand, BSMMU Library is 8.44% and the BUET Library is 6.55%.

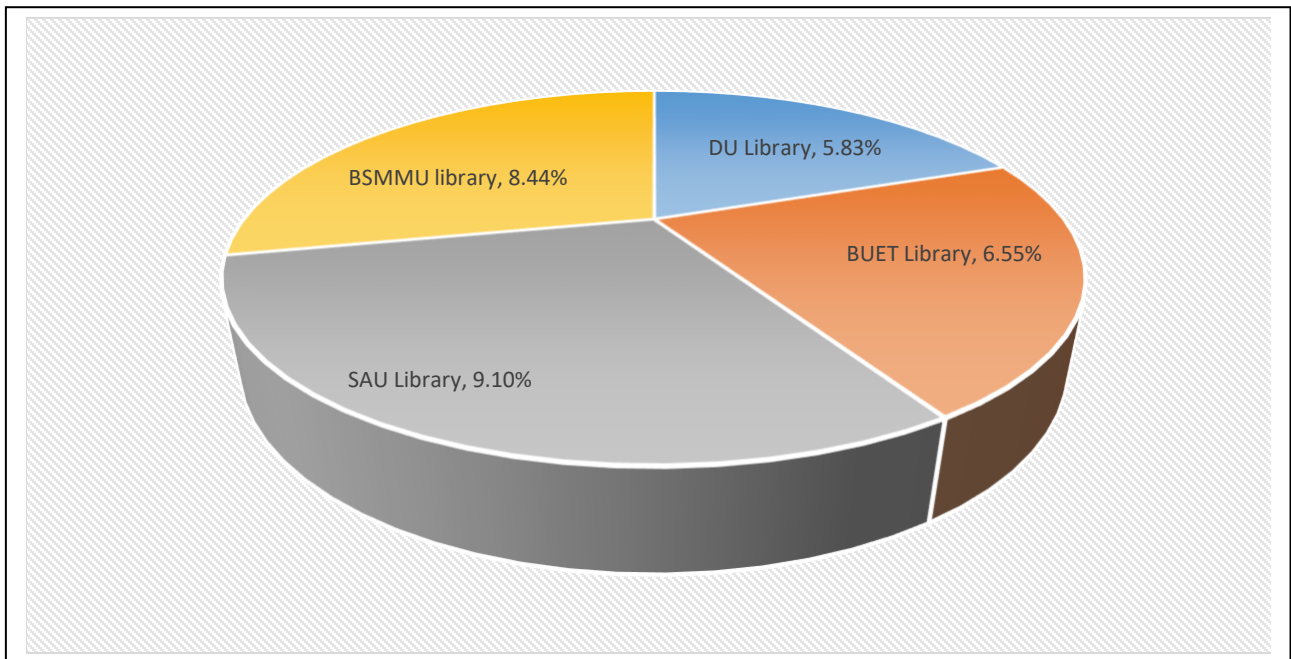


Figure-2: Average growth rate of ETDs last three years

b] Drawbacks and Challenges for ETDs preservation:

Interviews and participant observation and consulted with several library staffs the following challenges are identified for ETDs preservation in Bangladesh:

1. Software chose: To build an IR is often very costly and selecting the right software from the erroneous software (Finema, 2004). So it is the first challenge to implement an ETDs system though there is a huge number of open-source software are available. In this connection digital library software should be selected instead on Content Management System (CMS).

2. Fund: Limited participation, funds, and technical skills are incorporating multimedia (Copeland, 2004). Bangladesh has entered into a lower middle-income country leaving the status of low-income countries by World Bank ranking (Rahman, 2015). So constraint of sufficient budget allocation for digitalization is another challenge.

3. Initiatives and Policy: To take an ETDs preservation system initiative by the university authority and making policy, proper guidelines for the supervisor, and expert guidance create challenges for ETDs development and preservation (Rahman, 2015).

4. Copyright Issue: Librarians are always facing problems with copyright issues. (Shuva, 2012) The present copyright act of Bangladesh is not suitable for ETD's smooth development. So, it is very much important to enact a contemporary copyright law for ETDs preservation in the country. To work with the existing copyright act of Bangladesh is a challenge.

5. Shortage of skilled manpower: Lack of ICT knowledge, Metadata format, Online Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), digitization competencies, modern technology, and networked environment creates challenges for the tasks of ETDs (Rahman, 2015). There are a significant number of staff members in Bangladesh's public university libraries who have not strong and effective ICT skills (Shuva, 2012).

6. Research and Development work: As a developing country, there is a shortage of research and development work in Bangladesh. As a result, the creation and preservation of ETDs are still inadequate (Perera, 2017).

7. Networking and Resource Sharing Initiatives: IT infrastructure and High-speed internet connectivity are the pre-condition for networking and resource sharing (Prakash, 2017). To ensure proper networking and resource sharing initiative for the development of networked ETDs environment is a challenge.

8. Metadata format and access policy: A format for Metadata and access policy of ETDs online sharing and networking is still absent. It is regrettable to say that no archival standards for data format have yet been developed and similarly standard procedure for measuring longevity of electronic data format (Rahman, 2015). So metadata format and access policy is another important challenge.

9. Convert Picture to PDF: ETDs are the finished product of computer-assisted technology. For a long time, Public university libraries have had a huge number of paper-based traditional Theses and Dissertations. It is a challenge to convert traditional Theses and Dissertations into ETDs because the scanned versions of most of the theses are hazy, they converted from picture to PDF.

From the above discussion, it is very much clear that there are many challenges for ETDs' smooth development in Bangladesh such as ICT infrastructure development and a national policy on ETDs preservation and dissemination is the big issue today. Other related challenges like overall impecunious automation status of university libraries, insufficiency of research and development initiatives, unsuitable networking among universities and resource sharing activities, etc. are also considered.

c] Strategies for resolved challenges:

After review of related literature and open discussion with the expert professions the following strategies are offered for resolved challenges:

1) Preservation Policy: An active preservation program promotes respect for the library and its holdings, decreases material loss due to neglect or carelessness, and conserves resources by using preventive and remedial actions. successful ETDs preservation and dissemination depend on the creation of written policies and procedures of that institution. Lack of ETDs policy and initiatives have been found in different university libraries. For the smooth development of ETDs, it is essential to formulate a standard ETDs policy for every public university library.

2. Build up networked ETDs central database: A networked and open access ETDs central database is needed to implement ETDs service at university libraries in Bangladesh so that universities can produce their research work as ETDs. The government can take an initiative and implement it by the University Grant Commission (UGC) as well as the Bangladesh National Library can play an active role in copyright issues and professional training and development programs.

3. Implementation of common metadata format and simplifying Copyright Act: A common metadata format is essential for maintaining and monitoring of ETDs on central IR platforms. At the same time, the present copyright act of Bangladesh is not affable to ETD's smooth development. So ensuring a modern, updated world standard copyright act for our country is required.

4. To allocate sufficient budget, adequate supply of skilled manpower, making available ETDs preservation-related Technology: public university authority should allocate sufficient budget for the research and development activities. On the other hand, for the benefit of Information Technology skilled manpower is required everywhere especially on ICT, ETDs, Digitization Process, Copyright Act, Metadata, etc. Appropriate training and development activities can make people skilled. Furthermore, ETDs preservation-related technology should be available.

5. To emphasize on ETDs collection management: ETDs collection development and management is another big issue. Collections of ETDs should be subjective and classified on standard form. Sustainable storage media should also be implemented. ETDs collection, processing, circulation, and storage should be done effectively and efficiently. Document storage, access, and retrieval-related technology should be easy and user-friendly. Various initiatives have already been taken by public universities for encouraging the future development of ETDs. But fruitful initiatives of the university authority, allocation of sufficient budget, emphasis on ETDs life-cycle are also very important.

Conclusion

The university community are greatly being benefitted from exploring ETDs. It has a remarkable impact on the academic community in overall all teaching, research, and learning. In this paper, the author sought to explain status of ETDs in selected libraries, various challenges and the Strategies for resolved challenges. The Challenges and Strategies for ETDs preservation contribute to shaping development paradigms for ETDs, especially in developing countries like Bangladesh whose resources are limited and studies are also scarce. The factors that affect the development of ETDs in the context of Bangladesh can be applied in the same way to other developing countries.

Reference

- Alam, M.J. (2018), *Assessing Adoption and Satisfaction of Open Source Integrated Library Systems in the University Libraries of Bangladesh*, MPhil thesis, Bangladesh University of Professionals, Dhaka, Bangladesh.
- Bangani, S. (2018), “The impact of electronic theses and dissertations: a study of the institutional repository of a university in South Africa”. *Scientometrics*, Vol. 115, No. 1 pp. 131–151. Available at: <https://doi.org/10.1007/s11192-018-2657-2> (accessed 19 June 2021).
- Barton, M. D. (2005), *Dissertations: Past, Present, and Future*, PhD Dissertations, University of South Florida, USA. Available at: <https://scholarcommons.usf.edu/etd/2777> (accessed 19 June 2021).
- Chisita, C.T., Enakrire, R.T. and Muziringa, M.C. (2020), “Status of Electronic Theses and Dissertations (ETDs) in Academic Libraries in Zimbabwe”, *International Journal of e-Collaboration*, Vol. 16 No. 3, pp. 96-108. Available at: <https://doi.org/10.4018/IJeC.2020070106> (accessed 14 June 2021).
- Copeland, B. R. and Taylor, M. S. (2004) “Trade, Growth, and the Environment”, *Journal of Economic Literature*, Vol. 42, No. 1, pp. 7–71. Available at: [doi:10.1257/002205104773558047](https://doi.org/10.1257/002205104773558047) (Accessed 25 June 2021).
- Evans, D. (2006), *Perceptions and attributes of electronic theses and Dissertations (ETDs): a*

- South African Study*. MA Thesis, University of Zululand, Richards Bay, South Africa.
Available at: <https://www.researchgate.net/publication/46150311> (accessed 19 June 2021).
- Fineman, Y. (2003), "Electronic Theses and Dissertations", *portal: Libraries and the Academy* Vol.3, No. 2, pp. 219-227. Available at: doi:10.1353/pla.2003.0032. (accessed 19 June 2021).
- Fineman, Y. (2004), "Electronic theses and dissertations in music", *Music Library Association*, Second Series, Vol. 60, No. 4, pp. 893-907. Available at: DOI: 10.2307/4487253 (Accessed 25 June 2021).
- Foster, L., Rebecca, P., Celia, S. and Linda, W. (2012), "*Developing an Electronic Repository for Undergraduate Theses*" *Honors in Practice-online archive. Paper 160*, pp.135-146. Available at: <http://digitalcommons.unl.edu/nchchip/160> (Accessed 19 June 2021).
- Fox, E.A. (2021), "Building and Using Digital Libraries for ETDs", *The Journal of Electronic Theses and Dissertations (J-ETD)*, Vol. 1, Article 5. Available at: <https://scholarworks.uaeu.ac.ae/j-etd/vol1/iss1/5> (accessed 14 June 2021).
- Haneefa, K. M. and Divya, P. (2018), "Electronic Theses and Dissertations (ETDs) in India", *ICT Application in Academic Library Management*, Ess Ess Publications, pp. 199-222. New Delhi, India, Available at: <https://www.researchgate.net/publication/322599283> (accessed 10 June 2021).
- Hossain, Z. (2020), "Copyright Literacy of Library and Information Science Professionals in

- Bangladesh”, *IFLA Journal*, Vol. 46 No. 1, Available at: <https://doi.org/10.1177/0340035220904067> (accessed 10 June 2021).
- Hossain, Z., Hashmi, Y., and Mezbah-ul-Islam, M. (2019), “ICT Facilities and Literacy in Rural Non-Government Secondary School Libraries of Bangladesh”, *School Libraries Worldwide*; Edmonton, Vol. 25 No. 2, pp. 66-80. Available at: doi: 10.14265.25.2.005 (accessed 10 June 2021).
- Islam, N. M. and Islam, M. M. (2018), “The Status of Automation System at The International Islamic University Chittagong (IIUC) Library, Bangladesh: A Study,” *International Scientific and Vocational Journal (ISVOS Journal)*, Vol. 2, No. 2, pp. 125-135, Available at: <https://dergipark.org.tr/tr/download/article-file/615167> (accessed 22 June 2021).
- Islam, M. N., Islam, M.S. and Razzak, A. (2020), “Problems of knowledge management practices in libraries and information centres of Bangladesh” *IFLA Journal*, Vol. 46, No. 1, pp. 34-51. Available at: <https://doi.org/10.1177/0340035219894359> (accessed 22 June 2021).
- ISO. (1986), “International Standard ISO 7144: Documentation—Presentation of theses and similar documents” *International Organization for Standardization*, Geneva, Switzerland, available at: <https://www.iso.org/standard/13736.html> (accessed 9 June 2021).
- Mostafa, M.G. (2018), “Status of Electronic Theses and Dissertations (ETD) Services in the Three Public University Libraries of Bangladesh: an overview”, *Beyond the Boundaries of Rims and Oceans: Globalizing Knowledge with ETDs*. Conference proceedings of 21st

- International Symposium on Electronic Theses and Dissertations, (ETD 2018), Taipei, Taiwan. https://etd2018.ncl.edu.tw/images/phocadownload/8_3_Md._Golam_Mostafa_Extended_Abstract_ETD_2018.pdf (accessed 22 June 2021).
- Perera, K. (2013), “Role of ETD in Institutional Repositories”, *Conference Paper*, The 16th International Symposium on Electronic Theses and Dissertations, ETD 2013, Hong Kong. Available at: <https://www.researchgate.net/publication/237099498> (Accessed 21 June 2021).
- Perera, K. and Rahman, M. Z. (2017), *Bridging Information Disparities through ETDs in Academic Libraries: Case Studies from Sri Lanka and Bangladesh*. Available at: <https://www.researchgate.net/publication/320730346> (Accessed 25 June 2021).
- Perrin, J. M., Winkler, H. M. and Yang, L. (2015) “Digital Preservation Challenges with an ETD Collection — A Case Study at Texas Tech University”, *The Journal of Academic Librarianship*, Vol. 41, No. 1, pp. 98–104. Available at: [doi:10.1016/j.acalib.2014.11.002](https://doi.org/10.1016/j.acalib.2014.11.002) (accessed 19 June 2021).
- Pharcy, S. (2020), “A Study of Open Source Softwares Used for Creating a Digital Library”, *International Journal of Digital Content Management*, Vol. 1 , No. 1, pp. 163-176. Tehran, Iran.
- Prakash I N and Janardhana, R A N (2017), “Resource Sharing and Networking of Management Libraries: A Pre-Research Approach”, *International Journal of Applied Business and Economic Research*, Vol. 15, No. 15, pp. 265-273. Available at:

<https://www.researchgate.net/publication/323278260> (Accessed 25 June 2021).

Rahman, M., & Mezbah-ul-Islam, M. (2014). "Issues and strategy of institutional repositories (IR) in Bangladesh: a paradigm shift". *The Electronic Library*, Vol. 32, No. 1, pp. 47 – 61. Available at: <http://dx.doi.org/10.1108/EL-02-2012-0020> (Accessed 22 June 2021).

Rahman, M. S.(2020), "Challenges and Initiatives of Digital Library System and Institutional Repository: Bangladesh Scenario", *The Eastern Librarian*, Vol. 25, No. 1, pp. 1-23. Available at: https://lab.org.bd/wp-content/uploads/2020/08/01_v25n1_shafi.pdf (Accessed 22 June 2021).

Rahman, M. Z. (2015), "Current Practices and Emerging Trends in Preservation of Electronic Theses and Dissertations (ETDs) in University Libraries in Bangladesh", *ETD 2015 India: 18th International Symposium on electronic theses and dissertations: evolving genre of ETD's for knowledge discovery*. Conference Proceedings of the India Excel India Publishers, New Delhi, India. Available at: <https://www.researchgate.net/publication/294882490> (Accessed 22 June 2021).

Rahman, M. Z. (2015), "Current Practices and Emerging Trends in Preservation of Electronic Theses and Dissertations (ETDs) in University Libraries in Bangladesh". *ETD 2015 India: 18th International Symposium on electronic theses and dissertations: evolving genre of ETD's for knowledge discovery*. Conference Proceedings of the India, Excel India Publishers, New Delhi, India. Available at:

<https://www.researchgate.net/publication/294882490>.

Saini, O. P. (2018), "Understanding the Role of Institutional Repository in Digital Preservation in Academic Libraries: A Review of Literature", *Library Philosophy and Practice*.

Available at: <https://digitalcommons.unl.edu/libphilprac/1904/> (accessed 10 June 2021).

Salau, S.A. and Oyedun, G.U. (2019), "Sustainability Challenges of Electronic Theses and Dissertations in Nigerian Institutional Repositories", *Journal of Applied Information Science and Technology*, Vol. 12 No. 2, pp. 195-204.

Saloi, A. (2021), "Contribution of Electronic Theses and Dissertations (ETDs) by the Central Universities of Northeast India to the Shodhganga Project of INFLIBNET: An Evaluative Study", *Library Philosophy and Practice (e-journal)*. 4825. Available at: <https://digitalcommons.unl.edu/libphilprac/4825> (accessed 14 June 2021)

Sengupta, S. (2012), "E-thesis repositories: The Asian scenario", *Chinese Librarianship: an International Electronic Journal*, Vol.33. Available at:

<http://dspace.cusat.ac.in/jspui/handle/123456789/8069> (accessed 19 June 2021).

Shuva, N. Z. (2012), "Building digital libraries in Bangladesh: A developing country perspective", *International Information & Library Review*, Vol. 44, No. 3, pp. 132-146.

Available at: DOI: 10.1080/10572317.2012.10762924 (Accessed 22 June 2021).

Shuva, N. Z. (2014), "Are university libraries in Bangladesh ready to be digital?", *OCLC Systems & Services: International digital library perspectives*, Vol. 30, No. 2, pp. 108-

131. Available at: DOI 10.1108/OCLC-04-2013-0010 (accessed 22 June 2021).

UGC. (2021), “List of Public Universities | University Grand Commission of Bangladesh” *List of Public Universities | University Grand Commission of Bangladesh*, available at: <http://www.ugc-universities.gov.bd/public-universities> (accessed 9 June 2021).

Vargo, D., Zhu, L., Benwell, B. and Yan, Z. (2020), “Digital technology use during COVID-19 pandemic: A rapid review”, *Human Behavior and Emerging Technologies*, Vol. 3 No. 1, pp. 13-24.

VT. (2017), “Virginia Tech| Digital Library and Archives,” *Virginia Tech| Digital Library and Archives*, Virginia Tech, Drillfield Drive, Blacksburg, Virginia. Available at: <https://etd.vt.edu/index.html>. (Accessed 9 June 2021).