

Promoting Open Access to Scholarly Data: A Study of the Electronic Thesis and Dissertation (ETD) Initiative at the Public and Private Universities of Bangladesh

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Abstract

By providing ideas on how to develop a good research topic, problem statement formulation, how to write a literature review without plagiarism, research methodology, data analysis, and recommendations and conclusions, scholarly data such as ETDs play an increasingly important role in improving the understanding of research and development. Academic articles, papers, citations, figures, tables, research reports, theses, and dissertations, as well as scholarly networks and digital libraries, are all included in the rapidly expanding category of scholarly data. Open access (OA) refers to the unrestricted use of electronic resources and open access to information. Any type of digital content, including text, data, software, audio, video, and multi-media, is eligible for open access. The majority of them merely deal with text, but an increasing number combine text with graphics, data, and executable code, non-scholarly content, like as books, movies, and music, can also be covered by OA. This article examines several facets of the "electronic dissertation and thesis (ETD) projects in private and public universities, including software selection, metadata collection, long-term preservation of digitized data, and other issues. The holistic approach to such projects that this paper proposes is sound project planning, which considers not only technical issues but also issues related to project policies, procedures, and copyright acknowledgments that arise in the process of providing open access, and it concluded that it played an important role in its success.

Keywords: Bangladesh, Electronic Theses and Dissertations (ETD), Institutional Repositories, Open Access, Open Science, Private Universities, Research Data, Scholarly Data

1. Background

In the last decade, the world has witnessed an unprecedented growth of literature in a diversified field of knowledge in academia and industry. Research output usually comes out in the form of articles, theses and dissertations in printed or electronic media. Most of the research output is published along with the agencies who sell it for profit. As a result, a huge number of research outputs are remaining unveiled to the scholars who live in 152 developing countries, which is 85.54% of the world's total populations" (WorldData.info, 2023). Recognizing the fact the 21st century was marked the beginning of the Open Access movement "to

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make research free and available to anyone with internet access and promote advances in the sciences, medicine, and health. Till 14 August 2023, 6780 individuals have put their signature for commitment to publish in open access journals and 1578 organizations signed for commitment to open access by supporting institutional self-archiving and/or open-access-journals” (BOAI,2023). “OA promises to make scholarly data or literature more accessible and more affordable and brings a hopeful solution to the scholarly communication crisis that has significantly impacted scholarly communities, libraries, and library readers for decades” (Song, 2007).

“Scholarly Data is rapidly growing data which contains information including millions of authors’ academic articles, papers, citations, figures, tables, research reports and theses/dissertations as well as scholarly networks and digital libraries, etc” (Xia et al., 2017; Lin et al., 2016; Caragea et al., 2014; Lehmann et al, 2006). “The concept of open access is made possible by rapid advances in digital technology and aims to overcome limitations that hinder scientific progress and information sharing” (Song, 2007). This article reviews “electronic dissertation and thesis (ETD) initiatives in private and public universities and discusses various aspects of this initiative, including software selection, metadata collection, and long-term preservation of digitized data and also describes technical considerations” (Song, 2007). This paper also suggests that sound “project planning, which considers not only technical issues, but also issues related to project policies, procedures, and copyright acknowledgments that arise in the process of providing open access, is the holistic approach to such projects and concluded that it played an important role in its success” (Song, 2007).

2. Literature Review

Since the beginning of the Open Access movement after the Budapest declaration, a few initiatives have been found in Bangladesh. Till 2023, a total of 12 open access repositories have been found in ROAR, and 15 repositories have been found by the director of the open access repository, which is a very insignificant number. A small amount of research and literature has also been found over the last 23 years. The literature review focuses on open access platforms and ETD initiatives in the higher educational sectors in Bangladesh.

The Open Access (OA) movement in Bangladesh began with a view to reducing the library budget to subscribe to journals and research materials. Uddin et al. (2014) stated that the OA movement is very slow in Bangladesh and that the pace of OA progress is very low. The first OA movement started in Bangladesh with the publication of ICDDR’B in 1997, followed by the publication of JDDR in 2000, followed by the establishment of JHPN in 2005. At the very beginning, a few public and private universities alike are working to establish institutional repositories at their respective institutions. With a few exceptions, OA is currently accessible in Bangladesh via both the golden and green routes. Rahman (2013) discovered that among 20 public and private universities, 65% of libraries have access to digital repositories or archives in Bangladesh. The extensive use of open source software in Bangladeshi university libraries was one of the study’s key findings. Perera and Rahman (2017) found that most of the records and archives of university libraries in Bangladesh and RCSS libraries in Sri Lanka maintain a controlled access system for internal members.

However, foreign researchers can request a specific thesis or dissertation from the respective library. The study also revealed that the Digital Archive of Agricultural Tracts and Journals (DAATJ) was the only collaborative network for ETD initiatives in the agricultural sector of Bangladesh. Bhuiyan (2019) summarized that the repositories listed in Bangladesh in the OpenDOAR database are mostly institutional repositories, and a small number of repositories have a large collection. Therefore, it is clear that public awareness of the concept of OpenDOAR repositories in Bangladesh is needed in order to promote research and development (Elahi and Mezbah-ul-Islam, 2018). Rahman (2015) noted that public universities started ETD projects mostly as a subset of institutional repositories, and DSpace is used as the core software for IR hosting platforms. Universities felt the need for a networked ETD in Bangladesh and suggested giving this responsibility to the UGC to take initiatives. In his study on the development of “open science” and the use of open access repositories to advance research, Rahman (2016) pointed that open access to Bangladeshi research is still infancy. Several of Bangladesh’s top universities are making their research freely available. Examples include the a2i project at the national level and the Digital Archive on Agricultural Theses and Journals (DAATJ) in particular for the agriculture disciplines. There is currently a shortage of infrastructure for creating institutional repositories at several universities in Bangladesh. Since 1971, basic resource sharing and networking across institutions have not been established. A number of initiatives, which were not supported by cooperation between the participating institutions or good policy at the national level, have been identified but cannot be sustained. There is still a shortage of core research activities in the field of applied science and engineering at the tertiary level.

From the above reviews it is clear that research activities as well as ETDs platforms are very insignificant in number in Bangladesh. For internal users only, universities host scholarly data in institutional repositories with limited access for outside users. Open access platform are growing popularity but no platform yet to be established at the national level except DAATJ for hosting all sorts of scholarly data to accelerate research and knowledge development.

3. Objectives

There is no doubt that without appropriate scholarly data no research can gain a fruitful output. Finding the pertinent information in the world’s unprecedented exploration of the data is very difficult and for which research greatly hampered. Maximum resources are published under pay wall and have to pay a big amount which is sometimes incapable of paying by young researchers from developing nations. As a result, universities should deposit their scholarly output for the greater benefit of the research community and should provide free access for all. The study’s main goal is to encourage researchers and scholars at Bangladesh’s public and private universities to have open access to scholarly data. The study’s additional goals were:

1. to evaluate the current ETD initiative in Bangladesh’s private and public universities;
2. to discuss various aspects including software selection, metadata collection, and long-term preservation of digitized data and also describe technical considerations;

3. to point out the shortcomings of ETD preservation in Bangladesh;
4. to evaluate the needs and prospects for future growth of ETDs;
5. to point out obstacles to the efficient growth of ETD habitats; and
6. to provide solutions.

4. Methodologies

Along with a review of related literature, a qualitative research methodology was used. The first section of this paper provides an overview of ETDs from the perspective of Bangladesh in an open access platform. It then goes on to describe various aspects of ETDs, such as software selection, metadata collection, and long-term preservation of digitized data, as well as technical considerations. It then transitioned into a discussion of the impact on the speed of scholarly communication. It concludes with suggestions that are appropriate for developing nations. The conceptual and textual data for the current study were gathered from primary and secondary information sources, including books, journals, magazines, newspapers, conference proceedings, official documents, unpublished sources, and various websites of the institutions and organizations of the chosen public and private universities of Bangladesh. After reviewing the literature, the findings are presented as figures and tables. Following data processing and analysis, each of the Tables and Figures was given a physical interpretation that corresponded to the numerical results in the real world. Ten university libraries (five public and five private) were chosen and put under scrutiny in order to ensure representation among public and private university libraries and to take into account services and user-friendliness. Different criteria were taken into account when choosing the sample. In order to learn more about the current situation and find qualified solutions to the issues, informal interviews with senior professionals were also conducted.

5. Open Access

By “open access to the literature,” we mean that it is freely available on the internet for all users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without any financial, legal, or technical barriers aside from those inherent to gaining access to the internet itself (UNESCO, 2023). On October 22, 2003, the English version of the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities was released. It is a significant turning point for the open access movement. It says “Open access (OA) means **free access to information** and **unrestricted use of electronic resources** for everyone. Any kind of digital content can be OA, from texts and data to software, audio, video, and multi-media. While most of these are related to text only, a growing number are integrating text with images, data, and executable code. OA can also apply to non-scholarly content, like music, movies, and novels” (Berlin Declaration, 2023). There are numerous directories for different types of resources, including databases for journals, books, repositories, scholarly resources, theses, and reprints. Such repositories

must comply with the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) in order to facilitate open access. Digital libraries, institutional repositories, digital repositories, library and information science, the open access movement, open access journals, and open access publishing are all examples of open access.

6. Bangladesh and Open Access Repositories

When BRAC University for the first time introduced an IR project supported with funding from INASP using Dspace Software, Bangladesh began participating in IR activities in various university libraries in 2007. Later, IR projects were launched in the libraries of some private universities. In a study on IR activities in Bangladesh funded by ICDDR'B, Chowdhury et al (2011) discovered that "ICDDR,B and BRAC University, a leading private university in Bangladesh, were working on IR using Dspace software supported with funding from INASP." Twenty public and private university libraries were used as a sample in a study on "Digital library initiatives in Bangladesh" by Alam & Islam (2011), which discovered that libraries have some electronic literature on CD-ROMs and DVDs. Only 15% of libraries said they had electronic copies of their research output. The study also showed that dual expertise has hampered digitization activities, especially in perfect OCR level scanning, metadata extraction, subject analysis, searching, and retrieval.

Since Bangladesh gained its independence in 1971, a sizable number of projects have been launched under the World Bank-supported Higher Education Quality Enhancement Project (HEQEP). Launched in May 2009, the project is a part of the government's Annual Development Program (ADP). Since the project's 2009–2015 duration, a total of 18 public and private university libraries, along with one information science and library management department at Rajshahi University, have received fund from this project (UGC, 2015).

**Table 1: Registry of Open Access Repository [ROAR], Director of Open Access Repository
[Accessed on 13-08-2023]**

Name of the Repository	Type	Software	Registry Date in ROAR	# of Records
BPATC Institutional Repository	Institutional	DSpace		
BRAC University Institutional Repository	Institutional	DSpace	30 August 2009	UNR*
Daffodil International University Institutional Digital Repository	Institutional	DSpace	14 August 2013	UNR
Dhaka University Institutional Repository	Institutional	DSpace		
E-Library on Disaster Management	Institutional	DSpace		
EWU Digital Library	Institutional	Greenstone	23 May 2013	UNR
EWU Institutional Repository	Institutional	DSpace	21 October 2014	UNR
Eastern University Digital Library	Institutional	Greenstone	26 July 2013	UNR
Eastern University Institutional Repository	Institutional	DSpace		

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IUB Library Digital Repository	Institutional	DSpace	20 May 2012	UNR
IUT Institutional Repository	Institutional	DSpace	12 August 2013	UNR
KUET Institutional Repository	Institutional	DSpace	2 November 2020	UNR
Knowledge Repository	Disciplinary	DSpace		
Repository of the Chittagong Veterinary and Animal Sciences University	Institutional	DSpace		
SAUL Archive	Institutional	DSpace		
Additional record found in ROAR				
ICDDR'B Digital Repository, Bangladesh	Institutional	DSpace	1 July 2012	UNR
IIUC Institutional Repository	Institutional	DSpace	4 June 2022	UNR
National Library Digital Repository	Institutional	DSpace	3 February 2014	UNR
BSMMU Digital Library	Institutional	DSpace	10 November 2008	UNR

* Unknown Number of Records

7. Theses and Dissertation as a part of Scholarly Data

Currently, Bangladesh has 112 private universities and 53 public universities (UGC website). This study discovered that while private universities have been producing ETDs as a required component of undergraduate and graduate level studies, public universities were producing ETDs as a partial fulfillment of the degree primarily for MPhil, PhD, and Masters level graduates. The study also showed that many institutions opted to use Open Source Software and DSpace to host their ETDs in IR for long-term preservation. These repositories are typically only accessible to University employees with an ID and password. Most often, there are no ETD policies, so in order to preserve ETDs, the institution must obtain the author's consent before creating a digital version of a TD. The only established ETD platform in Bangladesh is the Digital Archive on Agricultural Theses and Journals of Bangladesh (DAATJB). The study also showed that although DAATJB has been very beneficial to researchers, there have been no other initiatives to date (Rahman & Perera, 2022). Since the DAATJ project's launch on November 21, 2012, 7631 ETDs have been uploaded, as of August 14, 2023. The demand for ETDs among Bangladeshi students is rising. As they search for traditional TDs, students are relocating from one city to the next. For instance, Bangladesh's Ahsanullah University of Science and Technology, one of the best private universities, has been providing high-quality science and technology education since 1995. 21 students from 8 prestigious universities in Dhaka and Chattogram came to the university to consult graduate and undergraduate level theses during COVID-19. ETDs are currently being preserved by the university in institutional repositories (Rahman & Perera, 2022).

8. Findings of the Study

Openly accessible ETDs is still in its infancy into the Bangladeshi research. Several of Bangladesh's top universities are making their research freely available. Examples include the a2i project at the national level

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and the DAATJ in particular for the Agriculture disciplines. There is currently a lack of infrastructure for creating institutional repositories in many universities in Bangladesh. Since 1971, basic resource sharing and networking between universities have not been established. A few initiatives were discovered, but they were not successful due to the participating institutions' lack of cooperation and proper national policy. At the tertiary level of education, fundamental research activities in the field of applied science and sciences are still insufficient. The use of creative commons (CC) license has recently been practiced for better, equitable, reciprocal, contextual, inclusive and sustainable sharing of knowledge and culture at the private and public universities of Bangladesh. The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) is not maintained by universities that have created institutional repositories with the assistance of HEQEP and government funding. In essence, they restrict access to institutional members only.

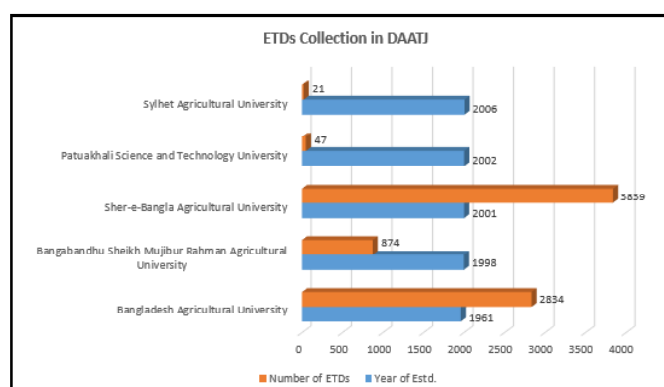


Figure 1: ETDs collection in DAATJ, Bangladesh

Source: <http://www.saulibrary.edu.bd/daatj/index.php>

Accessed on 07/08/2023

Table 2: Selected Public Universities and ETD status

SL	Name of the University	Policy	Internship Report	Project Report	Manuscript	Research Work	Thesis	M.Phil	Ph.D
1	University of Dhaka (DU)	01	16	02	16	197	191	865	855
2	Bangladesh University of Engineering and Technology (BUET)	233	377	806	02	2283	5033	6104	5596
3	University of Rajshahi (RU)	177	-	09	-	24	962	218	632
4	Jahangirnagar University (JU)		-		-			436	409
5	Khulna University of Engineering and Technology (KUET)	143	464	302	23	386	474	139	290

Table - 2 shows the ETD Repository status in Public University Libraries which are primarily M.Phil and Ph.D. theses. Among the public universities BUET has the largest number of ETDs though the university

established almost 40 years later of DU's establishment. In last one century of establishment of the University of Dhaka, 1812 Ph.D, 27 DSC, 8 DED, 12 DBA, 1670 M.Phil degree were awarded among the research from the various disciples till 30 June 2021 and more than 2500 students are conducting research in M.Phil and Ph.D level presently (Sarker, 2021, p.21). The research also showed that DU has introduced IR policy to submit ETDs and use the IR content from the campus and its beyond.

Table – 3: Selected Private Universities and ETD status

SL	Name of the University	Policy	Internship Report	Project Report	Manuscript	Research Work	Thesis/UG
1	BRAC University (BRACU)	6260	4514	7961	428	7305	4648
2	East West University (EWU)	137	156	97	3	139	2070
3	Ahsanullah University of Science and Technology (AUST)	-	-	17	-	319	2650
4	Daffodil International University (DIU)	-	2131	4890	-	-	586
5	United International University (UIU)	935	2319	2350	17	1423	300

Accessed into the above IR Site between August 7-8, 2023

Table – 3 shows the undergraduate and graduate student's thesis besides internship and project report and other different important documents of private universities in IR. Among the private universities BRACU has the largest number of Theses' of Under Graduates, then AUST Library. Among the private universities BRAC University has introduced institutional repository Policies and Guidelines in which content policy, community policy, preservation policy, submission policy and policy for Withdrawal of items from the Repository are clearly stated.

8.1 Right management

The study reveals that due to lack of proper policy libraries have to face hurdle for digitization of print Theses and Dissertations to ETDs. As a result, copyright should be cleared at the very beginning of the ETDs. Copyright has two opposing sides. On the one hand, it protects the right to reproduce the original works and gives the copyright holder exclusive control over doing so. The materials that the library or its organization has already paid for, however, are restricted in how readers and libraries can use them (Song, 2017).

8.2 Problems

In Bangladesh, difficulties with intellectual property rights, plagiarism, development costs, and long-term preservation are extremely important in addition to a number of infrastructure and technological impediments. Other significant issues include the lack of DOI, proper community and sub-community categorization, inadequate budget allocation, skills gap, the country's university libraries' overall automation status, lack of initiatives and policies, research and development work, the absence of networking and resource sharing initiatives, the role of UGC, the current copyright Act, the lack of voluntary ETD submission, and shortage

in equipment and ETDs related technology, problems in multitasking and network sharing, metadata format and access policy of ETDs.

9. Suggestions for Improvement of the Situation

After reviewing relevant literature (Rahman, 2015) and the findings of the study, the following recommendations are proposed for improvement of the situation:

- ❖ **Technology for the preservation of ETDs:** The current technological crisis in universities may be resolved by purchasing powerful servers and digitization equipment.
- ❖ **Simplified Copyright Act:** Bangladesh urgently needs a simplified copyright law for digital content. A streamlined Copyright Act for ETDs should be introduced, and the government, library professional organizations, and senior professionals should step forward.
- ❖ **Adequate supply of skilled workforce:** The nation needs to increase the number of trained library staff members by educating them on ICT, ETDs, the digitization process, the copyright act, metadata, the networked environment, and the modern library and information world through regular training, seminars, and workshops on various topics.
- ❖ **Initiatives from the University Authority:** All of the country's university authorities should cooperate and take the initiative to make ETDs of their TDs available in the library and mandate ETD submission for every student.
- ❖ **Budget allocation for adequate ETDs Budget:** Government and private university authorities should set aside adequate funds for the improvement of the library and ETDs environment.
- ❖ **Emphasis on ETD Life-Cycle:** Digital information must be managed throughout its lifecycle, from creation to storage, migration, and continuous access, in order to properly preserve ETDs. Universities should concentrate on these concerns.
- ❖ **The UGC's role in networked ETDs:** The UGC is to create a common database for ETDs for all of the nation's universities. The national library should be involved in copyright matters and professional training as a representative of the nation.
- ❖ **Emphasis on Collection Maintenance:** In the future, massive collections' libraries may face serious problems with collection maintenance. ETDs should be preserved for the long term with a variety of topics in mind rather than just one collection.
- ❖ **Common Metadata format for Bangladesh:** In order to keep Bangladesh's ETDs database current with international standards, it is necessary to establish a body to manage and maintain ETDs on central IR platforms.

- ❖ **ETDs Software:** In order to accomplish the project for the preservation of ETDs in Bangladesh and to provide interoperability and connectivity through a networked environment, a standard software platform must be introduced.

10. Limitation

While describing the ETDs situation in Bangladesh, other types of scholarly data, such as the millions of academic articles, papers, citations, proceedings, souvenirs, figures, tables, research reports, scholarly networks, digital libraries, and other publications, were not taken into account.

11. Conclusion

The paper argues that Scholarly Data is a potent tool for carrying out research because it prevents repetition of work, lessens manipulation of research, reviews previous studies, disseminates research findings globally, saves time and money for researchers and research projects, contributes to research direction, and protects the ethics of legitimate researchers. However, sufficient initiatives from national or individual levels were not found in Bangladesh. The study recommended that a national copyright commission be involved to address copyright issues, creative commons and open content platforms be encouraged, research funding for institutions be increased, professional staff be created, periodic training sessions be organized, adequate ICT infrastructure be developed, and each university be encouraged to draft an ETD policy that will serve as a guide for the full application process.

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