UCLA
Electronic Green Journal

Title
Sustainable Scholarly Communication through Institutional Repositories: A Case Study on Enhancing University Rankings in a Public University in Bangladesh

Permalink
https://escholarship.org/uc/item/1123g1zk

Journal
Electronic Green Journal, 1(52)

Authors
Akhi, Khadiza Akther
Yesmin, Shamima

Publication Date
2025-10-30

DOI
10.5070/G3.39637

Copyright Information
This work is made available under the terms of a Creative Commons Attribution License, available at https://creativecommons.org/licenses/by/4.0/

Peer reviewed

eScholarship.org Powered by the California Digital Library
University of California

Electronic Green Journal
Volume 1, Issue 52

Sustainable Scholarly Communication through Institutional Repositories: A Case Study on Enhancing University Rankings in a Public University in Bangladesh

Khadiza Akther Akhi & Shamima Yesmin
Noakhali Science and Technology University, Noakhali, Bangladesh

Abstract

Institutional repositories (IRs) play a vital role in enhancing the visibility of a university's intellectual and research output while also promoting more sustainable scholarly communication. This study examines the status of research visibility at Noakhali Science and Technology University (NSTU), Bangladesh, and evaluates the potential of an IR to improve the university's global ranking. Using a mixed-method approach, data were collected through surveys of departmental offices (documenting 5,472 preserved student research reports) and interviews with the university librarian. Comparative insights were also drawn from five leading universities with established IRs, alongside faculty research output data retrieved from Scopus. Results show that although an IR can substantially increase research visibility, NSTU stays in the planning phase of implementation. The findings underscore the strategic importance of developing comprehensive IR to combine research output, expand accessibility, and strengthen institutional ranking.

Introduction

At present, people can access information more easily than ever before caused by the development of the internet and related digital reproduction and communication technologies (Pappalardo, 2007). Information and Communication Technologies (ICT) completely transformed scholarly communication, improving the accessibility and exposure of scholarly production on a massive scale (Singh, 2016). The lack of funding for libraries and the unheard-of increase in subscription costs marginalize underdeveloped nations (Chan, 2004). Assuming the seriousness of this problem, the Open Access (OA) movement has helped to make scholarly literature more visible and accessible by removing obstacles (Antelman, 2004; Jayakanth et al., 2008; Norris et al., 2008; Parray et al., 2023). The notion of OA is supported by the idea of Institutional Repositories.

The Institutional Repository (IR) is a sort of digital library (Jantz & Wilson, 2008) or technical infrastructure in the institution that prioritizes research; a favored choice for providing open access to research output (Abrizah et al*.,* 2010). A system or procedure for securely managing, storing, and distributing digital content to the scholarly community (Shoeb, 2009). For tertiary educational institutions, IRs are a prudent investment for institutions of higher learning. A university-based IR is a set of services offers to the university community through the dissemination of digital materials created by its community members (Lynch, 2003). As a low-cost technique of preservation and dissemination, IRs have a good chance of minimizing the barriers to access scholarly communication (Luca & Narayan, 2016; Lee et al., 2015; Norris et al., 2008; Pinfield, 2015; Stanton & Liew, 2012).

In the early stages, the deployment of IR was predominantly deployed at research-intensive higher education institutions. The major goals were to share their work as far as possible and to advance knowledge in their area of expertise (Chan, 2004). However, IR has now expanded to include courseware, subject-specific repositories, technical reports, theses, and dissertations, and many more institution-specific documents (Bailey, 2005; Abrizah et al*.,* 2010). Research materials like conference papers, working papers, pre- and post-prints of journal articles, administrative data, e-learning objects, and e-thesis are typically included in the content of repositories that act as electronic publishers and produce e-books and e-journals (Crow, 2002; Ghosh & Kumar Das, 2007; Jones et al., 2006; Jain, 2011), conference proceedings, bulletins, news articles, memoranda, statistical reports, bibliographic citations, patents, book chapters audio/video; and so on (Mukhlesur Rahman & Mezbah-ul-Islam, 2014).

Building an IR involves using specific repository software like Greenstone, DSpace, Eprint, Dlibra, Fedora, and others to store and disseminate the local contents (Oberhiri-Orumah & Baro, 2023). Li and Banach (2011) identified the following software used in organizing local content: DSpace, Digital Commons, Greenstone, ContentDM, and DigiTool. Several studies have stated the most popular software in managing IR contents is DSpace, as it, by default, represents communities (departments of university) and collections (research papers, project reports, news), while workflow management support is essential for item submission by individuals (Baro et al*.,* 2014; Ahammad, 2019; Marsh, 2015; Anyaoku et al., 2019).

Bangladesh has recently seen a rise in open-source digital repository platforms that freely preserve and share research output. DSpace, Greenstone, Eprints (Shoeb, 2009; Mukhlesur Rahman & Mezbah-ul-Islam, 2014) Fedora, Invenio, or SLiMS (Islam et al., 2020) are some of the commonly used software. While it stays challenging to find which choice delivers the greatest advantages, DSpace is recognized as one of the most extensively used platforms for building institutional repositories (Islam et al., 2020; Islam et al., 2022). Whichever software is used, Koulouris et al. (2013) suggested looking at the development of IR policies on content submission, types of materials to be added to an IR, digital preservation, and copyright issues.

Statement of the Problem

Bangladesh is recognized as one of the most prominent developing nations in the world. It has 53 public universities (government-run), 112 private universities (non-government-run), and 3 international universities (UGC, 2023), all of which offer library services using advanced digital library software. The first Open Access (OA) initiative in Bangladesh began at the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), which made the *Journal of Diarrheal Disease Research (JDDR)* publicly accessible in 1997 and established an Institutional Repository (IR) in 2005 (Uddin et al., 2014). Despite many open-source IR systems being available, Bangladeshi university libraries have not effectively adopted these tools for digital preservation (Islam et al., 2022). Consequently, the visibility of university research output and the growth of citation impact are hindered, both of which are critical factors in university rankings.

University ranking has been a topic of major concern both in the international and national arena. According to a wide range of performance metrics, institutions have received several global rankings (Liu & Cheng, 2005). Numerous factors are considered in these evaluations, including the institution's reputation, the student-to-faculty ratio, the proportion of international students, the number of Nobel Prizes and other awards, the number of highly cited papers, articles published in Science and Nature, the h-index, web visibility, etc. (Hossain & Ahmed, 2020). Many universities and research institutions today embrace open access as a matter of policy that mandates depositing scholarly works in open-access repository systems (Van Noorden, 2009) to meet the indicators (especially citation), as it seemed to have a better citation advantage compared to traditional publishing models (Norris et al., 2008).

The development of IR can help in redefining the creation, distribution, and use of resources (Bhardwaj, 2014). They provide users with information that was previously unavailable for a variety of reasons, such as the paywall/subscription models used by commercial channels of scholarly communication, the lack of supplementary information (such as unpublished reports and working papers, multimedia and audiovisual items, learning objects, other special item types, bibliographic references, datasets, lecture notes, and so forth) (Bashir et al., 2022). Therefore, the long-established relationship between authors, publishers, and academic libraries has been transformed and redefined due to the introduction of IR for issuing scholarly research and knowledge (Oguz & Assefa, 2014). Numerous studies on different aspects of IR in Bangladesh, such as the status of IR, initiatives and challenges and strategy in developing IRs, comparison among IR among several countries, and IR model. However, this study investigates how developing an IR affects obtaining success in university rankings.

Literature Review

Extensive scholarly research has been undertaken on digital preservation within IR initiatives in Bangladesh. The functioning of DSpace and Greenstone's institutional repositories was described in detail by Ahmed and Shoeb (2009). However, deciding which is the best is quite difficult. The process of setting up an IR at the Independent

University, Bangladesh (IUB) using open-source DSpace software was documented by Shoeb (2010). According to the study, DSpace is one of the most popular programs for creating IRs, even though it is quite challenging to set up which one provides the greatest value. Chowdhury et al. (2011) offered an assessment of the current situation and looked at the potential for IR, with a specific focus on the establishment of IR utilizing DSpace software in Bangladesh. They explained the idea of IR, highlighting the development and progress of IR in Bangladesh, and encouraged the establishment of IR in the libraries of respective organizations/institutions.

The use of IR software was examined by Jaber Hossain and Islam (2012), however, emphasis was placed on the evaluation of all library services. Islam and Akter (2013) concentrated on open access (OA) in Bangladesh as well as the many sides of OA in developing nations. They concentrated on Open Access Institutional Repositories (OAIR) and their academic exchange and made some recommendations for OAIR development in Bangladesh. Mostofa et al. (2015) talked about how IRs may improve intellectual exchange and higher education in Bangladesh. They tried to prove the relationship between IRs and scholarly communication as well as the current situation and impact of IRs in higher education. Tabassum et al. (2015), examined the factors that influenced the usage of digital libraries based on a case study of East West University Digital Library (EWUDL) in Bangladesh. Islam et al. (2022) proposed a model for creating an efficient digital maintenance system using institutional repository software in the university library.

The benefits of IR in tertiary institutions may reduce the need for library space, boost readership, reduce damage to original materials, and make scholarly research available to a global audience (Oberhiri-Orumah & Baro, 2023). According to Omeluzor (2014), IRs help contributors and institutions alike. Institutions gain from IR because it improves learning, online teaching, and research, especially in higher institutions of learning. An IR presents an institution's intellectual capital to many scholars and serves as a concrete indicator of an institution's quality, increasing its visibility, prestige, and public value. The benefits of IRs for contributors were mentioned by Dhanavandan and Tamizhchelvan (2013) as they are likely to benefit from open access to a larger audience of researchers, increased impact of researchers' work, easy accessibility to research work and the development of new research methods, self-archiving, and increased citation to published scholarly work.

One important factor used to assess the quality of a university is the quality and volume of a university's research output (Anenene et al., 2017). Research productivity is one of the key metrics used to rate universities, according to Grundy (2017). In other words, it considers a university's ranking among its contemporaries for outstanding research. The research impact (citations) is a crucial criterion as well (Grundy, 2017). The research influence indicator examines how well universities are doing at issuing new ideas and knowledge by tracking how often their published works are cited by other academics around the world. For instance, Independence University, Bangladesh was ranked by the Cybermetrics Lab in their list of the top 100 universities in Bangladesh (in their January 2009 ranking, Independence University was ranked 75th on the Indian subcontinent, first among private universities, and third overall behind Bangladesh

University of Engineering and Technology (BUET) and Dhaka University (DU)). According to Shoeb (2010), this rating was found by the university's research output, its reputation both nationally and internationally, the number of academic papers it produced and published, and the scope and influence of its online presence.

Kim (2018) investigated the current state of the open access IRs of highly ranked Asian universities using the global university rankings published by U.S. News (2018) and the Times Higher Education website study. The OA-IRs of highly ranked institutions and the OA-IRs of all Asian universities show a considerable difference about the number of depository items.

Although some obstacles to institutional repository development have been identified, including insufficient infrastructure, erratic internet connectivity, a lack of funding, inconsistent power supplies, the collection of materials for institutional repositories, a shortage of qualified personnel in the information and communications technology field, copyright concerns, and a lack of institutional repository policies (Islam & Akter, 2013; Baro & Nwabueze-Echedom, 2023), but these obstacles are not inviolable. To keep the university in the race for competitive higher education and scholarly communication, IRs could play a dynamic role by creating awareness and issuing scholarly works conducted at the university.

Objectives

This study aims to investigate institutional repositories, research productivity, and the extent of visibility at a public university in Bangladesh. The goals are as follows:

- explore the departmental procedure for preserving students' thesis projects or internship reports.
- assess the status of faculty research output and how they made these visible to a global audience.
- find the library's role in consolidating research output as a central hub of the university.
- analyze the use of IR content in other universities and its contribution to research visibility of their stakeholders.
- demonstrate the potential impact of IRs on university ranking success.

Methodology

This study is based on both quantitative and qualitative research methods. At present, Noakhali Science and Technology University has two institutes and thirty-one degree-offering departments (NSTU, 2023). All the institutes and departmental (33) administrative heads were surveyed using a semi-structured questionnaire to know the current number of students and faculty members in the department; their practice of preserving students' research output; the number of preserved copies of research reports; do they maintain any register book or Excel sheet or any other software for storing their students' research reports, whether they deposit a copy in the central library or not.

To know the present status of the research output of NSTU faculty members along with students, a worldwide citation database, Scopus, was searched by the affiliation of NSTU Institutes. To identify which tools faculty members are using to show their research output, the top twenty highly cited faculty members of NSTU were selected from the Scopus database and then checked their profiles individually in ResearchGate, Google Scholar, ORCID, and LinkedIn as commonly used research visibility tools. Evidence of their profile on certain tools is represented by '1' and absence is '0' and calculate the frequency and percentage accordingly.

An interview was conducted with the librarians of NSTU Central Library to know their role in preserving institutional research outcomes as a knowledge center. The interview session was conducted to know their present collection of students' thesis papers and project reports; their preservation method; do they use any software to manage the collection; their initiatives for IR, content collection, and preservation; and their plan.

Five library professionals from top-tier university libraries (both public and private university libraries) were also interviewed (by phone) to find their IR status using software, collection, searching and usage statistics of their IR contents. These libraries were purposely selected based on the preference of their prior year of establishment of IR and collection.

Results and Discussion

Status of students' thesis, report, and project (through departmental office heads)

At present, NSTU has six faculties and two institutes; these faculties include 31 bachelor's degrees offering departments (NSTU, 2023). Almost all departmental curricula include theses, projects, and internship reports as a mandatory course in the last semester (year 4, term 2) in the undergraduate program. A survey with all departmental office heads was conducted using a semi-structured questionnaire. From the survey data, there are 5472 research reports stored in the departmental office (using a registered book or MS Word/Excel sheet) (see Table 1). There is no obligation to deposit a copy of the research report in the library. Therefore, this research has a smaller number of readers and less opportunity to be reviewed and cited in other research works.

Table 1
Departmental Students' Research Scenario in NSTU.

Faculty /Institute	Name of Institute/ Department.	Year of Establishment.	No. of Faculty members (including study leave)	No. of undergraduate students	No. of graduate students	No. of Honor's research report (thesis, project) Preserved in dept.

Institute	Institute of Information Sciences	2015	9	160	N/A	43
	Institute of Information Technology	2015	13	128	N/A	27
Faculty of Engineering and Technology	Computer Science & Telecommunication Engineering	2006	17	200	31	452
	Applied Chemistry & Chemical Engineering	2006	29	196	90	588
	Information & Communication Engineering	2013	16	200	38	300
	Electrical & Electronic Engineering	2016	8	121	N/A	65
Faculty of Science	Fisheries & Marine Science	2006	25	176	28	498
	Pharmacy	2006	28	230	24	547
	Microbiology	2009	24	123	24	365
	Applied Mathematics	2010	17	271	49	309
	Food Technology & Nutrition Science	2012	20	120	75	369
	Environmental Science & Disaster Management	2012	20	230	50	288
	Biotechnology & Genetic Engineering	2012	24	125	50	214
	Agriculture	2013	15	185	7	276
	Statistics	2016	10	193	26	78
	Oceanography	2016	10	149	N/A	64
	Biochemistry & Molecular Biology	2018	6	141	N/A	N/A
	Zoology	2018	5	90	N/A	N/A
	Soil, Water & Environment	2023	3	N/A		N/A
	Chemistry	2023	4	N/A	N/A	N/A
	Physics	2023	3	N/A	N/A	N/A
	English	2010	20	220	100	34

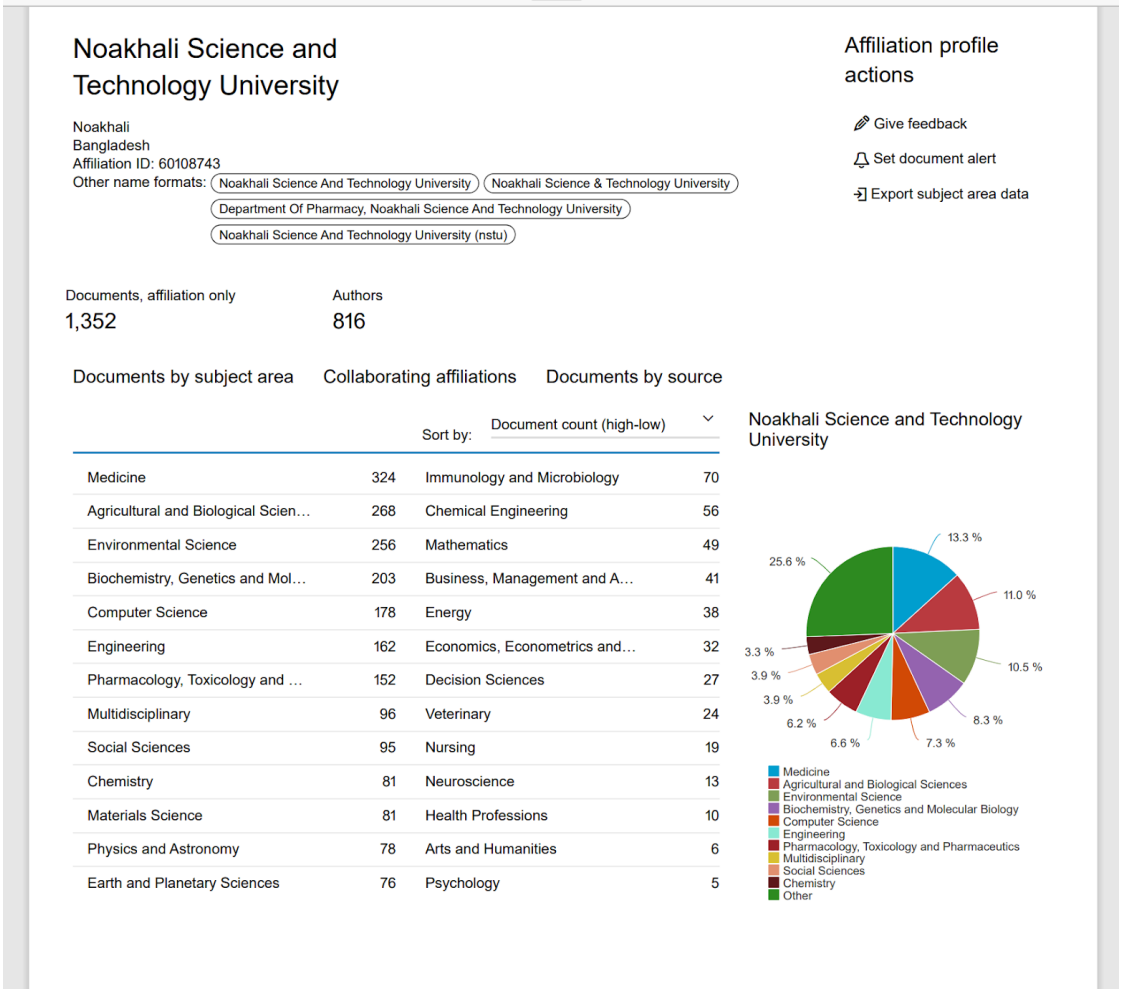
Faculty of Social Science and Humanities	Economics	2013	20	210	45	42
	Bangladesh and Muktijuddho Studies	2015	13	181	47	21
	Sociology	2017	5	190	N/A	44
	Bangla	2017	14	145	N/A	N/A
	Social Work	2018	4	130	N/A	N/A
Faculty of Business Administration	Business Administration	2012	14	278	61	419
	Management Information Systems	2018	8	190	N/A	48
	Tourism and Hospitality Management	2017	09	180	N/A	48
Faculty of Education Sciences	Education	2018	6	180	N/A	43
	Education Administration	2018	4	130	N/A	N/A
Faculty of Law	Law	2018	4	160	N/A	290
Total						**5472**

(N/A means Not Applicable. The students of these departments are not at this stage.)

Status of NSTU-affiliated research output (by faculties, students, or together) in Scopus

After searching the Scopus database by the Institution of NSTU, 1352 documents appeared (see Figure 1). Most documents were research papers and very minimal of these were articles, book chapters, reviews, conference papers, notes, or editorials. Medicine, biological science, and environmental science were more prevalent areas than other areas of scientific research.

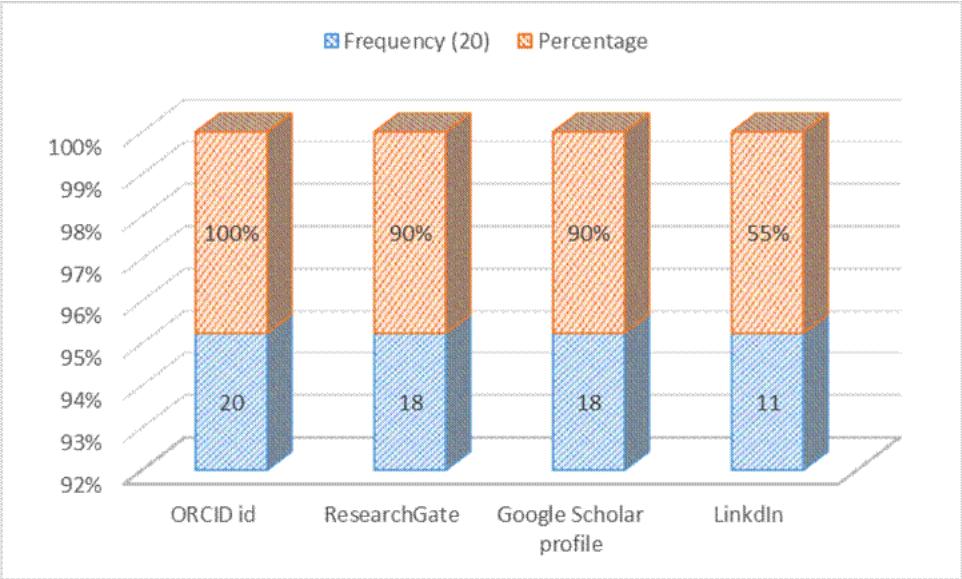
Figure 1
Noakhali Science and Technology University (NSTU) affiliated research output in Scopus



Among the top ranked faculty members, the profiles of the first twenty were examined using the most common research visibility platforms such Google Scholar, ResearchGate, ORCID, and LinkedIn to assess the global visibility of their research output. The results show that these faculty members consistently use multiple platforms to enhance the visibility and accessibility of their work, as well as to increase citation impact. Among these tools, ORCID and Google Scholar are the most widely used (see Figure 2). This trend suggests a strong likelihood that faculty members would also contribute their intellectual output to an Institutional Repository (IR), if the university sets up one.

Figure 2

Faculty Members' Preferred Research Visibility Tools



Findings from the Interview with NSTU Librarians

Most NSTU departments need a course in research monograph, thesis, project, or related areas. According to the librarian, there is no obligation to send a copy of any research output for library preservation. Therefore, every year, an approximate estimation of 25-30 research reports is sent to the library according to departmental wish. From the year of establishment of the university (2005/2006) till now a total of 474 theses and project reports are preserved in the library. In response to the question, in which process does the library authority preserve the sent thesis papers? Does the library keep any register as evidence of its existence? For quick location, the librarian mentioned they are keeping a manual file to support their entry and find these. Though there is a high user demand about these reports to borrow or scan to have a self-guideline in doing such tasks, the library authority allows only reading facilities for these research reports rather than photocopying or borrowing privileges.

At present there is no IR for NSTU library. Librarians contemplate that the lack of adequate budget and technical skills are the main barriers. However, they have an enthusiastic plan to set up IR soon. In this regard, they are seeking technical support from the university authority. They prefer free and Open-Source Software packages like DSpace for setting up it, as DSpace mostly implements open-source IR software in university libraries in Bangladesh (Islam et al., 2020). The library authority strongly believes that an IR has a significant impact on upgrading the university ranking, as there is a strong correlation between citation per faculty/ institutions with ranking success.

Evidence of using IR content usage of other libraries

Although institutional repositories are not yet widespread in Bangladesh, the concept of IR and the practice of managing and delivering digital content through it is not new. Several libraries in Bangladesh have begun to implement IRs, and their approaches cover a wide spectrum of services and content (Mukhlesur Rahman & Mezbah-ul-Islam, 2014). The studies of Chowdhury et al. (2011), Mukhlesur Rahman and Mezbah-ul-Islam (2014), Islam et al. (2020), and Islam et al. (2022) showed evidence of the following libraries as one of the first initiating libraries in developing IR and therefore their collection is also high as compared to others. The search statistics of IR contents are very impressive (see Table 2) to increase interest in other libraries in displaying and delivering their intellectual output to researchers.

Table 2
Searching Statistics of IR Contents of Other Libraries

SL. No.	Library Name (anonymous)	Year of Launching	Used IR software	Record/ Collection	Searching status
1	A	2014	DSpace	4750*	7,52,557
2	B	2007	DSpace	13119*	2,60,753
3	C	2013	DSpace	2014*	6,65,398
4	D	2009	DSpace	4322*	1,43,936
5	E	2016	DSpace	4653*	51,735

**Updated till May 2023 (the collection is a continuous process)*

University Ranking Indicators

All currently published global university rankings combine different indicators to produce an overall score on the university's performance (Hossain & Ahmed, 2020). See Table 3.

Table 3
Indicators and Weights of World University Rankings

University Rankings	Indicators	Weight in percentage (%)
Academic Ranking of World Universities (ARWU) (2023)	Alumni Winning Nobel Prizes and Fields Medals	10
	staff winning Nobel Prizes and Fields Medals	20
	highly cited researchers	20
	articles published in Nature and Science	20
	papers indexed in Science Citation Index-Expanded and Social Sciences Citation Index	20

	Per capita academic performance of an institution	10
QS World University Rankings (2023)	academic reputation	30
	employer reputation	15
	faculty/student ratio	10
	citations per faculty	20
	International faculty ratio	5
	International student ratio	5
	International Research Network	5
	employment outcomes	5
	sustainability	5
Times Higher Education World University Rankings (2023)	teaching (the learning environment)	30
	research (volume, income, and reputation)	30
	citations (research influence)	30
	International outlook (staff, students, and research)	7.5
	and industry income (knowledge transfer)	2.5
Webometrics Ranking of World Universities (2023)	visibility i.e., number of external links	50
	transparency or openness i.e**., top cited authors**	10
	and excellence or scholar i.e., **top cited papers**	40
SCImago Institutions Rankings (2023)	**research output**	50
	innovation	30
	and societal impact	20

How University Ranking is dominant by IR contents

Though the type of indicators used in global ranking may vary greatly (Enserink, 2007), these are mostly dominated by research and associated citations. Among the three categories of ranking indicators are education; environmental performance; and research and academic repute. Global rankings place a higher value on research output and associated metrics than they do on other indicators (Lukman et al*.,* 2010; Dill & Soo, 2005). The reason for this is that research is the easiest and most correct indicator to measure (Sheeja et al*.,* 2018). As a result, institutions that prioritize research consistently rank at the top of the globe (Salmi, 2011). To support a university in ranking schemes, one of the main criteria is its intellectual output (Sheeja et al*.,* 2018).

The university's production of research publications and the number of citations of such publications are important metrics in both international and domestic rankings (Huang 2011; Khaki-Sedigh, 2017). Universities should therefore make great attempts to improve their reputation, making their research outcomes visible. Nonetheless, academic libraries could be well-positioned to carry out this task because of having potential to take the lead in providing strategies, services, and resources to enhance the output and research visibility for various researchers and their institutions, and they can be a valued partner in institutional ranking (Östlundh, 2019). One of the best options is the digital preservation of research output through developing IR to serve as a platform for the visibility of intellectual content (Oberhiri-Orumah & Baro, 2023). IR offers advantages to individual researchers and institutions by allowing improved management of intellectual outputs and freeing up the process of dissemination (Antelman, 2004).

Thus, IR has the potential to increase the visibility, prestige, ranking, and public value of researchers and institutions (Oguche, 2016).

The citation count of a university is one of the most significant indicators for global ranking. Every year a huge amount of research work is completed by the stakeholders NSTU (see Table 1; Figure 1). If these will be visualized through IR properly as other universities (see Table 2), these can be used for research purposes and ultimately there will be a possibility to be cited in other research and enhance achieving university ranking success.

Discussion and Conclusion

The first aim of this study was to explore the departmental procedures for preserving students' thesis projects and internship reports. To achieve this goal, a semi-structured questionnaire was used to survey all departmental office heads. According to the survey data, 5,472 research reports are currently kept in departmental offices, managed either using MS Word/Excel spreadsheets or registered books. There is no requirement for these research reports to be deposited in the library. As a result, these works have limited readership and offer fewer opportunities for evaluation and citation in other studies.

The second aim of this study was to assess the status of faculty members' research output and how they make their work visible to a global audience. To address this aim, the Scopus database was searched for publications affiliated with Noakhali Science and Technology University, yielding 1,352 documents, including book chapters, articles, reviews, conference papers, notes, and editorials. To evaluate how faculty members present their research to a worldwide audience, the profiles of the top twenty faculty members were examined on the most popular research visibility platforms, such as Google Scholar, ResearchGate, ORCID, and LinkedIn. The results show that ORCID and Google Scholar are the most widely used platforms for enhancing the visibility and accessibility of their research findings.

The third goal was to find the library's role in accumulating research output as a knowledge hub for the university. To achieve this, the university librarian was interviewed. The librarian said that sending a copy of any research result for library preservation is not mandatory. Currently, the library holds 474 theses and project reports, dating back to the year the university was founded. The search statistics for Institutional Repository (IR) materials from other Bangladeshi libraries that have already implemented IR are quite remarkable. This aligns with the fourth aim, which is to examine the usage of IR content in other universities and its role in enhancing the research visibility of their stakeholders. Therefore, the library can play a significant role in setting up an IR by highlighting and delivering its intellectual output to researchers.

Finally, the last aim was to prove the impact of IR on university ranking success. To explore this, the most widely used international university rankings and their metrics were examined. Research output and related metrics are given more weight in global rankings compared to other indicators across the three ranking categories: education, environmental performance, and research and academic reputation.

The current status of IR in tertiary academic institutions in developing countries remains unsatisfactory, despite its tremendous potential to free up library space, increase readership, improve access to local content, reduce the deterioration of original materials, aid in the dissemination of scholarly output, and foster the globalization of research findings (Oberhiri-Orumah & Baro, 2022).

Although IR is not a new concept for preserving, managing, and issuing digital content, this practice is not yet widespread in Bangladesh. Most university libraries in Bangladesh have not yet adopted Digital Library Software (DLS) for building institutional repositories; some libraries are not even aware of it (Islam et al., 2022). Numerous challenges exist, including lack of funding, inadequate ICT facilities, unreliable internet connectivity, unstable power supply, shortage of skilled personnel, copyright issues, and absence of IR policies. It is crucial for tertiary academic institutions considering the establishment of IR to address these challenges.

Open-source Digital Library Software (OSDLS) as an IR system has created opportunities for universities in Bangladesh, as library budgets are relatively limited and cannot afford to buy, keep, and upgrade proprietary IR systems (Islam et al., 2022). IR enables researchers to improve broad access to research content, reduce research duplication, and help in producing quality research (Houghton, 2007). Ultimately, this increases citations and contributes to advancing university ranking success.

Recommendations

- This study strongly recommends that tertiary educational institutions in Bangladesh prioritize and invest in the development of IR to highlight their research outputs globally.
- University authorities should require all departments to send copies of students' theses and project reports to the library.
- Faculty members should also be encouraged to deposit their research papers in the IR, alongside using other research visibility tools.
- Comprehensive IR policies addressing submission, access, and preservation of digital content to foster sustainable scholarly communication should be developed and strictly enforced.

Khadiza Akther Akhi <khadiza2413@student.nstu.edu.bd>, BSS Student, Institute of Information Sciences, Noakhali Science and Technology University, Noakhali-3814, Bangladesh.
Shamima Yesmin <shamima.iis@nstu.edu.bd>, Assistant Professor, Institute of Information Sciences, Noakhali Science and Technology University, Noakhali-3814, Bangladesh https://orcid.org/0000-0002-9206-5885

Declaration of interest statement
The authors declare that they have no conflict of interest in this research.

References

Abrizah, A., Noorhidawati, A., & Kiran, K. (2010). Global Visibility of Asian Universities' Open Access Institutional Repositories. *Malaysian Journal of Library & Information Science*, *15*(3), 53-73.

Ahammad, N. (2019). Open-source digital library on open educational resources. *The Electronic Library*, *37*(6), 1022-1039.

Ahmed, S.M.Z, & Shoeb, M.Z.H. (2009). Measuring service quality of a public university library in Bangladesh using SERVQUAL. *Performance measurement and metrics*, *10*(1), 17-32.

Anenene, E. E., Alegbeleye, G. B., & Oyewole, O. (2017). Factors contributing to the adoption of institutional repositories in Universities in South-West Nigeria: Perspectives of Library Staff. *Library Philosophy & Practice*.

Antelman, K. (2004). Do open-access articles have a greater research impact? *College & Research Libraries*, *65*(5), 372-382. https://doi.org/10.5860/crl.65.5.372

Anyaoku, E. N., Echedom, A. U. N., & Baro, E. E. (2018). Digital preservation practices at the university libraries: an investigation of institutional repositories in Africa. *Digital Library Perspectives*, *35*(1), 41-64. https://doi.org/10.1108/DLP-10-2017-0041

ARWU (2023, 30 March). *Shanghai Ranking's Academic Ranking of World Universities Methodology 2020*. ShanghaiRanking

Bailey Jr, C. W. (2005). *Open access bibliography: liberating scholarly literature with e-prints and open access journals*. Washington, DC: Association of Research Libraries, 2005.

Baro, E. E., Godfrey, V. Z., & Eze, M. E. (2014). Electronic theses and dissertations initiatives: A survey of university libraries in Nigeria. *International Information & Library Review*, *46*(1-2), 41-50. https://doi.org/10.1080/10572317.2014.936265

Baro, E. E., & Nwabueze-Echedom, A. U. (2023). An evaluation of institutional repository development in African universities. *IFLA journal*, *49*(1), 18-38. https://doi.org/10.1177/03400352221089672

Bashir, S., Gul, S., Bashir, S., Nisa, N. T., & Ganaie, S. A. (2022). Evolution of institutional repositories: Managing institutional research output to remove the gap of academic elitism. *Journal of Librarianship and Information Science*, *54*(3), 518-531.https://doi.org/10.1177/09610006211009592

Bhardwaj, R. K. (2014). Institutional repository literature: A bibliometric analysis. *Science & Technology Libraries*, *33*(2), 185-202. https://doi.org/10.1080/0194262X.2014.906018

Chan, L. (2004). Supporting and enhancing scholarship in the digital age: The role of open-access institutional repositories. *Canadian Journal of Communication*, *29*(3), 277-300.

Chowdhury, M. H. H., Uddin, N., Afroz, H., & Sameni, A. H. (2011). *Building institutional repositories in Bangladesh using DSpace: A new paradigm of scholarly communication.* Independent University, Bangladesh. https://ar.iub.edu.bd/handle/11348/147

Crow, R. (2002). *The case for institutional repositories: A SPARC position paper.* ARL Bimonthly Report, (223), 1–4. http://www.arl.org/newsltr/223/instrepo.html

Dhanavandan, S., & Tamizhchelvan, M. (2014). A study on recent trends and growth of institutional repositories in South Asian countries. *International Journal of Information Library and Society*, *3*(1), 8.

Dill, D. D., & Soo, M. (2005). Academic quality, league tables, and public policy: A cross-national analysis of university ranking systems. *Higher education*, *49*, 495-533. https://doi.org/10.1007/s10734-004-1746-8

Enserink, M. (2007). Who ranks the university? *Science*, *317*(5841), 1026-1028. DOI: 10.1126/science.317.5841.1026

Ghosh, S. B., & Kumar Das, A. (2007). Open access and institutional repositories—a developing country perspective: A case study of India. *IFLA journal*, *33*(3), 229-250. https://doi.org/10.1177/0340035207083304

Grundy, P. (2017). World University Rankings 2015-2016 Methodology. available at: www.timeshighereducation.com/news/ranking-methodology-2016

Hossain, M. N., & Ahmed, S. Z. (2020). Use of scholarly communication and citation-based metrics as a basis for university ranking in developing country perspective. *Global knowledge, memory and communication*, *69*(6/7), 461-482. https://doi.org/10.1108/GKMC-09-2019-0112

Houghton, J. (2007). Scholarly communication in a knowledge-based economy.

Huang, M. H. (2011). A comparison of three major academic rankings for world universities: From a research evaluation perspective. *Journal of Library & Information Studies*, *9*(1).

Islam, M. A., & Akter, R. (2013). Institutional repositories and open access initiatives in Bangladesh: A new paradigm of scholarly communication. *Liber Quarterly*, *23*(1), 3-24.

Islam, M., Uddin Munshi, N., Islam, N., & Hossain, A. (2020). Digital preservation activities of institutional repositories in some selected public university libraries of Bangladesh: an analytical study. The Eastern Librarian, 25(1), 24-40.

Islam, M. M., Islam, M. N., Munshi, M. N. U., & Haider, M. S. (2022). An effective digital safeguarding system in university libraries: A model plan. *Data and Information Management*, *6*(1), 100007. https://doi.org/10.1016/j.dim.2022.100007

Jaber Hossain, M., & Islam, A. (2012). Understanding perceived service quality and satisfaction: A study of Dhaka University Library, Bangladesh. *Performance Measurement and Metrics*, *13*(3), 169-182. https://doi.org/10.1108/14678041211284713

Jain, P. (2011). New trends and future applications/directions of institutional repositories in academic institutions. *Library Review*, *60*(2), 125-141.

Jantz, R. C., & Wilson, M. C. (2008). Institutional repositories: Faculty deposits, marketing, and the reform of scholarly communication. *The journal of academic librarianship*, *34*(3), 186-195. https://doi.org/10.1016/j.acalib.2008.03.014

Jayakanth, F., Minj, F., Silva, U., & Jagirdar, S. (2008). ePrints@ IISc: India's first and fastest growing institutional repository. *OCLC Systems & Services: International digital library perspectives*, *24*(1), 59-70. https://doi.org/10.1108/10650750810847260

Jones, R. E., Andrew, T., & MacColl, J. (2006). *The institutional repository*. Elsevier.

Khaki Sedigh, A. (2017). Ethics: An indispensable dimension in the university rankings. *Science and Engineering Ethics*, *23*, 65-80. https://doi.org/10.1007/s11948-016-9758-1

Kim, E. (2018). The Current State of Open Access Institutional Repositories of Asian Universities and Highly Ranked Asian Universities. Conference: The First International Conference on Library and Information Science: From Open Library to Open Society 2018, Aug. 18-19, Sukhothai Thammathirat Open University, Thailand.

Koulouris, A., Kyriaki-Manessi, D., Giannakopoulos, G., & Zervos, S. (2013). Institutional repository policies: best practices for encouraging self-archiving. *Procedia-Social and Behavioral Sciences*, *73*, 769-776. https://doi.org/10.1016/j.sbspro.2013.02.117

Lee, J., Burnett, G., Vandegrift, M., Baeg, J. H., & Morris, R. (2015). Availability and accessibility in an open access institutional repository: a case study. *Information Research: An International Electronic Journal*, *20*(1), n1.

Li, Y., & Banach, M. (2011). Institutional repositories and digital preservation: Assessing current practices at research libraries. *D-lib Magazine*, *17*(5/6).

Liu, N. C., & Cheng, Y. (2005). The academic ranking of world universities. *Higher education in Europe*, *30*(2), 127-136. https://doi.org/10.1080/03797720500260116

Luca, E., & Narayan, B. (2016). Redesigning the open-access institutional repository: A user experience approach. In *Digital Libraries: Knowledge, Information, and Data in an Open Access Society: 18th International Conference on Asia-Pacific Digital Libraries, ICADL 2016, Tsukuba, Japan, December 7–9, 2016, Proceedings 18* (pp. 275-281). Springer International Publishing.

Lukman, R., Krajnc, D., & Glavič, P. (2010). University rankings use research, educational and environmental indicators. *Journal of cleaner production*, *18*(7), 619-628.https://doi.org/10.1016/j.jclepro.2009.09.015

Lynch, C. A. (2003). Institutional repositories: essential infrastructure for scholarship in the digital age. *portal: Libraries and the Academy*, *3*(2), 327-336. Doi: 10.1353/pla.2003.0039

Marsh, R. M. (2015). The role of institutional repositories in developing the communication of scholarly research. *OCLC Systems & Services: International digital library perspectives*. https://doi.org/10.1108/OCLC-04-2014-0022

Mostofa, S. M., Begum, B., & Mezbah-ul-Islam, M. (2015). Impact of institutional repositories (IRS) to improve educational research and scholarly communication with special reference to Bangladesh and India. *Journal of Social Sciences and Humanities Research*, *1*(1), 1-8.

Mukhlesur Rahman, M., & Mezbah-ul-Islam, M. (2014). Issues and strategy of institutional repositories (IR) in Bangladesh: a paradigm shift. *The Electronic Library*, *32*(1), 47-61. https://doi.org/10.1108/EL-02-2012-0020

Norris, M., Oppenheim, C., & Rowland, F. (2008). The citation advantage of open-access articles. *Journal of the American Society for Information Science and Technology*, *59*(12), 1963-1972. doi: 10.1002/asi.20898.
NSTU (2023). Noakhali Science and Technology University. available at: https://nstu.edu.bd/.
Oberhiri-Orumah, G., & Baro, E. E. (2023). The extent of building and managing local contents in institutional repositories: a survey of tertiary institution libraries in Nigeria. *Global Knowledge, Memory and Communication*, *72*(4/5), 464-483. https://doi.org/10.1108/GKMC-08-2021-0139
Oguche, D. (2016). Enhancing scholarly communication in Nigeria: the role of open access institutional repositories. *Nigerian Current Legal Problems*, *7*(2), 344-366.
Oguz, F., & Assefa, S. (2014). Faculty members' perceptions towards institutional repository at a medium-sized university: Application of a binary logistic regression model. *Library Review*, *63*(3), 189-202. https://doi.org/10.1108/LR-07-2013-0088
Omeluzor, S. U. (2014). Institutional Repository (IR) Awareness and Willingness of Faculty Staff to Deposit Research Work: A Study of Faculty Staff in Selected Public and Private University in Nigeria. *Open Access Library Journal*, *1*(9), 1-11.
Östlundh, L. (2019). The role of academic libraries in ranking of institutional research impact.
Pappalardo, K. M., Fitzgerald, A. M., Fitzgerald, B. F., Kiel-Chisholm, S. D., O'Brien, D., & Austin, A. (2007). A guide to developing open access through your digital repository.
Parray, U. Y., Khan, A. M., Mir, A. A., & Mir, S. M. (2023). Unveiling the present status of open access repositories: a comparative analysis of India and China. *Library Management*, (ahead-of-print). https://doi.org/10.1108/LM-09-2022-0084
Pinfield, S. (2015). Making open access work: The "state-of-the-art" in providing open access to scholarly literature. *Online information review*, *39*(5), 604-636.
QS World University Rankings (2023), "QS world university rankings", available at: QS World University Rankings – QS Quacquarelli Symonds (accessed 30 November 2023).
Salmi, J. (2011). The challenge of establishing world-class research universities in developing countries. In *Leadership for world-class universities* (pp. 242-258). Routledge.
SCImago Institutions Rankings (2023), "SCImago institutions ranking: Ranking Methodology." Methodology (scimagoir.com)
Sheeja, N. K., Mathew, S., & Cherukodan, S. (2018). Impact of scholarly output on university ranking. *Global knowledge, memory and communication*, *67*(3), 154-165. https://doi.org/10.1108/GKMC-11-2017-0087
Shoeb, M. Z. H. (2009). Access management for digital repository. *DESIDOC Journal of Library & Information Technology*, *29*(4), 21.
Shoeb, M.Z.H. (2010). Developing an institutional repository at a private university in Bangladesh. *OCLC Systems & Services: International digital library perspectives*, *26*(3), 198-213.
Singh, P. (2016). Open access repositories in India: Characteristics and future potential. *IFLA journal*, *42*(1), 16-24. https://doi.org/10.1177/0340035215610131
Stanton, K. V., & Liew, C. L. (2011). Open Access Theses in Institutional Repositories: An Exploratory Study of the Perceptions of Doctoral Students. *Information Research: An International Electronic Journal*, *16*(4), n4.
Tabassum, M., Roknuzzaman, M., & Islam, M. M. (2015). Usage of a digital library system at a private university library in Bangladesh. *Annals of Library and Information Studies (ALIS)*, *62*(2), 94-103.
Times Higher Education World University Rankings (2023), "World university rankings 2023: methodology", World University Rankings 2023: methodology | Times Higher Education (THE)
Uddin, M. N., Koehlmoos, T. L. P., & Hossain, S. A. S. (2014). Bangladesh: An overview of open access (OA) initiatives. *Library Philosophy and Practice (e-journal). Paper*, *1101*
University Grants Commission of Bangladesh (2023) http://www.ugc.gov.bd/.
Van Noorden, R. (2009). Open-access publishing gains another convert. *Nature (Published online 3 June 2009 doi: 10.1038/news. 2009.538)*. https://doi.org/10.1038/news.2009.538
Webometrics Ranking of World Universities (2023). Ranking web of universities. http://161.111.47.11/en/Methodology