

Mapping Open Access Publishing Trends in Bangladesh: A Study with Reference to Open Access Journals and Repositories

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Abstract - Open Access initiative in Bangladesh dates back to the opening of icddr, b Journal of Diarrhoeal Disease Research (JDDR) in 1997 by International Centre for Diarrhoeal Disease Research, Bangladesh. Since then considerable development of Open Access has occurred. The study also provided some recommendations for improvement of IR and open movement in Bangladesh. The paper analyzes current open access publishing trends in Bangladesh in the light of open access journals and repositories in Bangladesh. The data for the study were collected from BanglaJOL and OpenDOAR (Directory of Open Access Repositories) in August 2017. The findings of the study indicate that the trends towards the development of open access repositories are increasing among higher education and research institutions in Bangladesh. Through BanglaJOL nearly 97% of journals in Bangladesh are published open access. There are total 11 IR found in OpenDOAR and ROAR in Bangladesh. It is found in this study that among 11 repositories 8 repositories have specified policy rules with regards to metadata, data, content, submission, and preservation. But the scenario is different in terms of OAI-PMH compliance. Presently only 3 repositories are following the OAI-PMH protocols in Bangladesh. Moreover, this trend should be increased to a larger proportion and all toll-access publishing would be turned open in Bangladesh through mass consciousness and initiatives at broader level. This study recommends that present trend should be increased to a larger proportion and all toll-access publishing would be turned open in Bangladesh through mass consciousness and initiatives at broader level.

Keywords: Open Access, Bangladesh, Institutional Repositories, Open DOAR, Bangla JOL, OAI-PMH

I. INTRODUCTION

Scholarly communication has changed dramatically since the development of the internet. The ability to publish, access and store scholarly works digitally has transformed not only how libraries store information, but how academic research is published. It has also been gaining momentum with the rapid growth and interest in open access worldwide over the past years. The rise of open access seems unstoppable. Individual and collaborative research efforts have been made by the academics from universities, researchers from institutions, employees from firms to influence open access movement all over the world. Today, open access journal has also gained its momentum by having their own impact factor and also indexed in various databases such as Web of Science and Scopus. Driven by this development, the growth rate for the open access

journal has increased rapidly over the year and regarded as phenomena in today's scholarly publishing landscape. Academicians and scholars have shown great interest, signaling their acceptance on this mode of publishing. One of the most highlighted advantages of open access journal is the free access to the journal content. Unlike the traditional publishing model where users have to pay, open access journal allows free access to almost everyone. Restrictions or barriers that are normally created through subscriptions have been totally eliminated, hence accelerating the pace of dissemination and creation of knowledge. The cost of journal subscriptions can now be used by the libraries for other development activities. Libraries and other research organization now easily can solve the serial crisis, skyrocketing prices of journal and budget cuts with the adoption of open access publishing model (Peekhaus and Proferes, 2015). It has entirely changed the traditional subscription-based model and provides opportunities for researchers to disseminate their research findings to a wide audience easily dodging the limitation by traditional publishing (Singh, 2016). Materials may also be placed in a subject repository hosted by a scholarly association or in an institutional repository (IR), hosted by a college, university, or research organization. In addition to formal repositories, many researchers host or post their own works on a personal website that may be associated with the university or belong to the individual faculty member.

The term "open access" denotes free availability on the public internet, permitting any 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 financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself (Budapest Open Access Initiative, 2002). According to the leading exponent of the open access movement Peter Suber (2012), Open access (OA) literature is: "digital, online, free of charge, and free of most copyright and licensing restrictions." As defined by the Budapest Open Access Initiative (2002): "by open access to this literature, we mean its free availability on the public internet, permitting any 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 financial, legal, or technical

barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.”

The term Open Access covers two different approaches- i) that of open access journals and ii) institutional repositories (Oppenheim, 2008; BOAI, 2002). It indicates the two main types of OA- the ‘gold’ and the ‘green’ open access. Green OA refers to self-archiving where an author places a copy of the published article or peer-reviewed manuscript in one or more online repositories either institutional or a subject-based, or a combination of both. On the other hand, Gold OA is publishing the article in an OA journal that allows free of charge access to the articles within it. Many electronic scholarly publishers are also involved in the World Health Organization’s HINARI, the Food and Agricultural Organization’s AGORA and the United Nations Environment Programme’s OARE initiatives and INASP’s AuthorAID, Journals Online and Publishers for Development (Pfd) etc.

These projects are helping many developing and low-income countries for providing free or low cost access to the scholarly resources. Crow (2002) defines institutional repositories as: “digital collections that capture and preserve the intellectual output of university communities respond to two strategic issues facing academic institutions- 1) they provide a central component in reforming scholarly communication by stimulating innovation in a disaggregated publishing structure and, 2) they serve as tangible indicators of an institution’s quality, thus increasing its visibility, prestige, and public value.” Researchers choose to share scholarly works through an open access repository or through an individual website or blog. Materials can be placed in a subject repository hosted by a scholarly association or in an institutional repository (IR), hosted by a college, university, or research organization.

In addition to formal repositories, many researchers host or post their own works on a personal website that may be associated with the university or belong to the individual researcher.

Self-archiving helps scholars to deposit their scholarly content in open electronic archives through Open Archives Initiative (OAI). OAI was created in 1999 as a practical way to improve scholarly communication for promoting interoperability between e-print repositories (Van de Sompel and Lagoze, 2000; Warner, 2003). Since then it has been developing and promoting interoperability standards to access and dissemination to all kinds of e-print archives content. There are many ETD platforms, for example NDLTD (Networked Digital Library of Theses and Dissertations) that have been supporting and encouraging the production and archiving of electronic theses and dissertations to uphold the intellectual achievements of an

university by making them available to a global audience (Suleman and Fox, 2003; Yiotis, 2008).

II. LITERATURE REVIEW

Kusekwa and Mushowani (2013) conducted a survey to report the state of open access (OA) initiatives in Zimbabwean universities and found that most universities in Zimbabwe had IR that promote open access. Three universities were found that had open access policies and others were working on implying open access policies to promote open access. They also found a low submission rate of content in repositories due to the skepticism about the OA movement. Chantavaridou (2008) surveyed the institutional repositories (IRs) in Greece to trace the progress of OA initiative and found that two academic institutions and one research institution of Greece signed The Berlin Declaration on open access and others were to bring the matter to the Senate. The biggest challenge in this study found was the fear of copyright infringement that resulting low deposit of content. Lone (2008) investigated the contribution of India in open access literature and found that India ranked 7th position in DOAJ in terms of number of OA journals and 10th position in line with Sweden and Spain in OpenDOAR in terms of number of OA repositories in the world. Pandita (2013) also conducted a study to determine the growth of open access publishing in India during 2002-2012 based on DOAJ and found that India experienced steady growth in introducing OA Journals except in the year of 2005 and 2011. Similarly, Sahu and Arya (2013) studied the scenario of open access practices in scholarly communication in India with respect to open access initiatives, awareness among authors and researchers on open access publishing and contribution of different subject areas towards open access publishing. The results reported that Indian was in the 4th position in OA journals publishing and in 7th position in terms of number of IRs after Brazil in the world. It also showed that the awareness of open access among the researchers in India was gradually increasing through open access journals, IRs and by self-archiving. Fabian (2013) evaluated the open access adoption in the Czech Republic focusing on both green and golden route. The result showed that the Czech Republic can be identified as average in certain respects in comparison with other Central European countries in regards of awareness, infrastructure and adoption of open access.

Uddin, Koehlmoos and Hossain (2014) reported that the first OA initiative in India was began at icddr, b in 1997. They examined OA developments in Bangladesh to describe the current status and progress of OA journals and institutional repositories in Bangladesh for exploring the possibility of for fostering open access in Bangladesh. Islam and Akter (2013) also examined the status of and OA initiatives in Bangladesh in terms of open access repositories in Bangladesh. The study also provided some recommendations for improvement of IR and open movement in Bangladesh. The research gap in the context of Bangladesh is there have been any research that have

focused on both open access journals and OA repositories in Bangladesh. Therefore present study attempt to determine the trend of open access scholarly publishing in Bangladesh based on BanglaJOL and Open DOAR.

III. RESEARCH QUESTIONS

1. What are the developments and trends of open access initiatives in Bangladesh?
2. What is the status of rate of publications grown in Journals and Repositories in Bangladesh?
3. How is the subject wise distribution of open access journals in Bangladesh?
4. What is the status of open access repositories in Bangladesh?

IV. METHODOLOGY

To answer the above-stated research question, a web survey of literature was adopted in this study. Primarily two databases- Banglajol and OpenDOAR were selected as the data source. Banglajol is a database that provides substantive list and abstracts and full-text of articles published in local Bangladeshi journals across all disciplines. Besides, major international databases like Web of Science, DOAJ, Scopus, Google Scholar, Open-Jgate, Proquest, Ebsco, Researchgate have been selected to achieve the objectives. The data were also collected from OpenDOAR to find out the present scenario of the IR in Bangladesh. OpenDOAR (Directory of Open Access Repositories) maintains a quality-assured listing of open access repositories to enhance and support the academic and research activities around the globe. OpenDOAR is maintained by SHERPA Services, based at the Centre for Research Communications at the University of Nottingham. From the list of repositories in OpenDOAR, 'Bangladesh' was selected and analyzed. According to OpenDOAR data, 12 Bangladeshi repositories are represented. But among them one repository has been excluded due to the duplication of same repository. Finally, 11 repositories have been selected for the study. Then the data were processed and analyzed using a MS-Excel and presented.

V. RESULTS

A. Open Access Initiatives in Bangladesh

There have been very few open access initiatives at government and learning institutions in Bangladesh. The chapter of open access initiatives in Bangladesh first started through making publicly available icddr, b Journal of Diarrhoeal Disease Research (JDDR) in 1997 by International Centre for Diarrhoeal Disease Research, Bangladesh (icddr, b) (Uddin, Koehlmoos and Hossain, 2005). The early attempts to create an institutional repository (IR) was that of the icddr, b and it was set up in 2005. Later some of the institutions have been developed Institutional repositories (IRs) and many are trying to develop. The Government of Bangladesh also recommended

the adoption of open access through issuing the Right to Information (RTI) Act 2009 in the Bangladesh Gazette on April 6, 2009 (Islam and Akter, 2013).

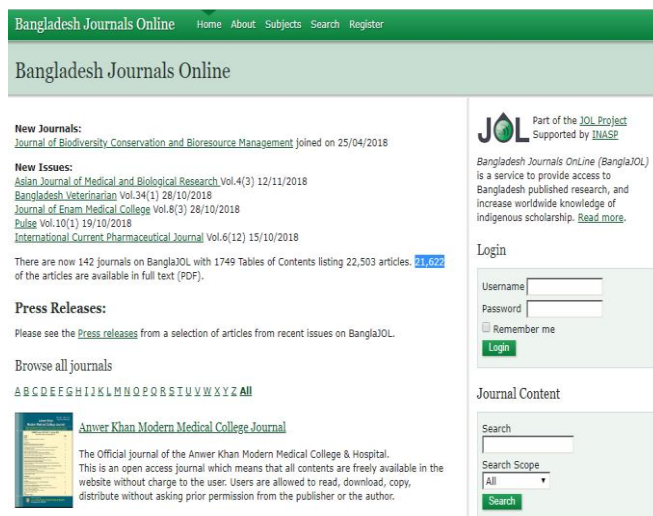


Fig. 1 Homepage of Bangladesh Journal Online

The open access journals in Bangladesh are mainly initiated by Banglajol. Bangladesh Journals Online (BanglaJOL) is a service to provide access to journals published in Bangladesh covering the wide range of academic disciplines. It aims to provide as much visibility and use to the participating journals in wide-range of disciplines by providing access for fostering worldwide knowledge of indigenous scholarship. To date Banglajol covers about 142 journals since its inception in September 2007. It is a project supported by INASP. BanglaJOL is now hosted by Ubiquity Press and managed by the Bangladesh Academy of Sciences (BAS) through the Open Journals System created by the Public Knowledge Project based in Canada. It allows the scholarly content of journal listed on BanglaJOL through Open Archives Initiative search engines for harvesting the metadata for each journal content and thus making the content available to a global research community.

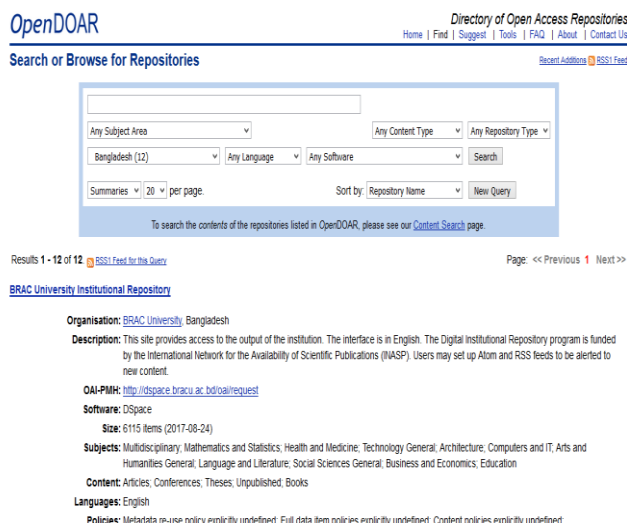


Fig. 2 IR of Bangladesh in OpenDOAR

All the material on BanglaJOL is free to view, search and browse with the copyright retained by the journals or authors through the permission for use and re-use of the material that falls outside Fair Use. Thus Banglajol has been very active for fostering open access in developing countries like Bangladesh since 2007. Besides, some individual institutions have adopted the open access principles and policy by realizing the benefits of open access. Open Access Bangladesh chapter has also been formed in February 17, 2017 for advocating open access and sharing success stories of the open access movement in the world and Bangladesh (Dhaka Tribune, 2017). Nowadays many institutions and individuals from

Bangladesh join the Open Access Week event and opencon every year.

B. Open Access Journals in Bangladesh

As of 24 August, 2017 there are 142 journals on BanglaJOL with 1749 Tables of Contents listing 22,503 articles. 21,622 of the articles are available in full text and rest 792 articles are available containing abstract of them (Table I). From figure 3 it is observed that among 20,662 articles BanglaJOL provides fully open access to 96.17% articles and partial access to 3.87% articles. It is evident that only 3.87% articles are not in full text. So it is hoped that Bangladesh is about to golden road of open access publishing.

TABLE I LIST OF OA JOURNALS IN BANGLAJOL (AS OF 24.08.2018)

OA Literature	Total No. of Journals	Total table of contents	Total No. of articles	Article with full-text
Journal	142	1749	22,503	21,622

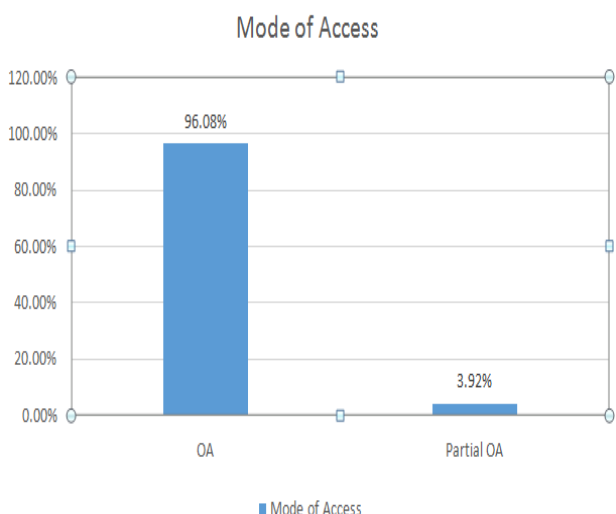


Fig. 3 Mode of Open accessibility of Journals

C. Subject-Wise Distribution of Journals

Ten disciplines are covered in the e-theses repositories. The open access journals were analyzed subject-wise and included in the ten broad subject areas (Fig. 4). As of December 2018, the majority (42) of the open access journals are from medicine and health sciences, followed by pure science (35), agriculture (29), IT and computer science (11), arts and social sciences (9), engineering and technology (8), law, multidisciplinary and library & information science (2 each) and Education (1). This depicts that medicine and health sciences are the major contributors to open access journals in Bangladesh. The top five subject areas reported are: medicine and health sciences, science general, agriculture, IT and computer sciences, arts and social sciences. The researchers of law, library and information science and education are contributing least toward open access publishing.

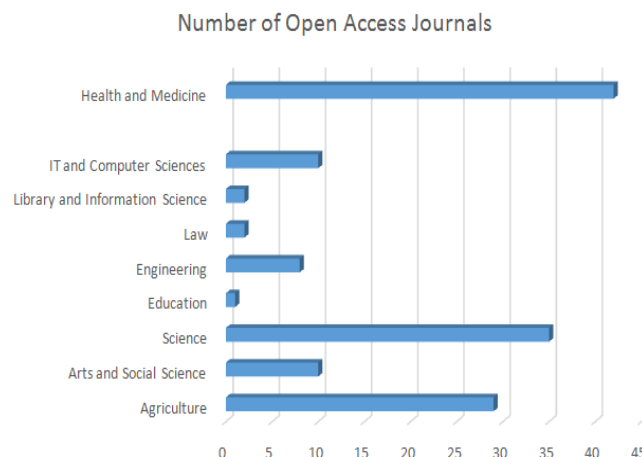


Fig. 4 Subject-wise distribution of Journals

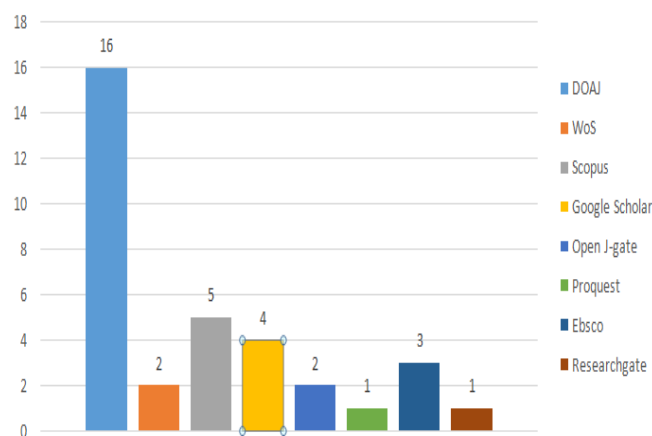


Fig. 5 Indexing of Open Access Journals

D. Indexing of Open Access Journals

Quality issue is a major concern in open access publishing model. There is much skepticism among publishers and authors that articles in gold open access journals are less peer-reviewed than toll-access journals (Oppenheim, 2008).

But things are changing now. Nowadays, open access journals have their own impact factor and also indexed in various international databases such as Web of Science, Scopus and so on. Therefore open access journals available in BanglaJOL were studied to identify whether they are indexed in some popular indexes or not. The DOAJ database is used by many as an indicator for international comparison. Currently, there are 16 journals of Bangladesh registered in this database. It proves that the number of journals in Bangladesh in DOAJ is increasing (Fig. 5). Currently Scopus database contains 5 journals and all of them are also in DOAJ. It is very disheartening to observe that only 2 journals of Bangladesh are indexed in WOS. However Google scholar, Ebsco, OpenJ-gate, Proquest and Research gate contain 4, 3, 2, 1 and 1 Journals respectively.

E. OA Journals According to Journal Quality Indicator

To determine the quality of OA journal, four journal quality indicator- DOI, ISSN, CC by License and membership in OASPA were studied in this research (Fig. 3). The result showed that among 142 journals of BanglaJOL 41 journals have their ISSN, 21 journals have their DOIs, 4 journals have their CC by license and only 1 journal have the membership of OASPA.

F. Open Access Repositories in Bangladesh

One of the important characteristics for repositories included in the OpenDOARis type of repository. There are 3 categories of repository- disciplinary, institutional or aggregating in OpenDOAR. By analyzing the repositories, it was found that all repositories are ‘Intuitional’ in Bangladesh. In case of subject of repositories, it was found that except Sher-e-Bangla Agricultural University Library repository, all repositories in Bangladesh are multidisciplinary in nature. It is also found that all 11 repositories are also registered in ROAR database.

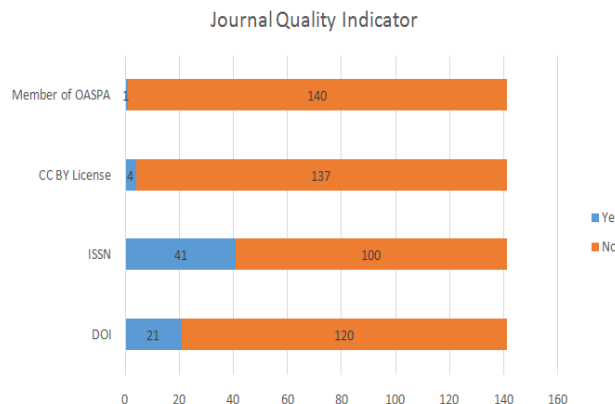


Fig. 6 OA Journal quality indicator

TABLE II OA REPOSITORIES IN BANGLADESH (AS OF 19 JULY, 2018)

Repository Name	OpenDoar	ROAR	Subject	Type	Software	No. of Records
BRAC University Institutional Repository	Yes	Yes	Multi-disciplinary	Institutional	Dspace	7625
Daffodil International University Institutional Digital Repository	Yes	Yes	Multi-disciplinary	Institutional	Dspace	1739
Dhaka University Institutional Repository	Yes	Yes	Multi-disciplinary	Institutional	Dspace	815
E-Library on Disaster Management	Yes	Yes	Multi-disciplinary	Institutional	Dspace	1038
Eastern University Digital Library	Yes	Yes	Multi-disciplinary	Institutional	Dspace	378
EWU Institutional Repository	Yes	Yes	Multi-disciplinary	Institutional	Dspace	2242
Islamic University of Technology	Yes	Yes	Multi-disciplinary	Institutional	Greenstone	101
IUB Library Digital Repository	Yes	Yes	Multi-disciplinary	Institutional	Greenstone	109
ICDDR,B Knowledge Repository	Yes	Yes	Multi-disciplinary	Institutional	Dspace	6076
SAUL Archive	Yes	Yes	Agriculture, Food and Veterinary	Institutional	Dspace	1703
National Library Digital Repository	No	Yes	Multi-disciplinary	Institutional	Greenstone	502

Among the used software by the organizations and institutions in Bangladesh to build institutional repositories, DSpace ranked 1st with 8 repositories, followed by Greenstone with 3 repositories. There are no other software has been used managing IR in Bangladesh. Number of items in the repository is also an important criterion. In terms of number of records, BRAC University Institutional Repository has the largest number of items with 7625 items followed by ICDDR, B knowledge repository with 6076

items. The East West University Institutional Repository has 2242 items followed by Daffodil International University Institutional Digital Repository with 1739 items, SAUL Archive with 1703 items, E-Library on Disaster Management with 1038 items, Dhaka University Institutional Repository with 815 items, National Library Digital Repository with 502 items, IUB Library Digital Repository with 109 items, and Islamic University of Technology with 101 items.

G. OA Policy Followed by Institutions

Policy issue is important to govern the mandate for ensuring fair use. Suber (2004) opined that- “every university in the world can and should have its own open-access, OAI-compliant repository and a policy to encourage or require its faculty members to deposit their research output in the repository”. Policy information in OpenDOAR involves- data and metadata policy, content policy, submission and preservation policy. From Table III, it is evident that majority (8) of repositories (72.73%) specified policy rules with regards to metadata, data, content, submission, and preservation and only 3 (27.27%) do not specify repository policies.

TABLE III OA POLICY FOLLOWED BY INSTITUTION

Policy	Number of Repositories	Percentage
Specified	8	72.73
Not Specified	3	27.27
Total	11	100

H. OAI-PMH Compliant

OAI-PMH (Open Archives Initiative-Protocol for Metadata Harvesting) is a key element of the EPrints software and the protocol used for resource or metadata harvesting of the records from the archives. OAI-PMH is based on client-server architecture. OAI-PMH has now been widely used in discovery, grouping and classification, reference and citation-linking, rights management, preservation and so on. From Table IV, it is observed that only 3 out of 11 repositories follow the OAI-PMH protocols and the rest 8 are not.

TABLE IV REPOSITORIES WITH OAI-PMH

OAI-PMH	No. of Repositories	Percentage
Compliant	3	27.27
Non-compliant	8	72.73
Total	11	100

VI. CONCLUSION AND RECOMMENDATION

This paper discusses the current open access publishing trends in Bangladesh in light of open access journals and repositories in Bangladesh. From the above analysis, it can be stated that the concept of open access publishing has started growing in among the higher education and research institutions in Bangladesh. Open access seems to be going through a transitional stage in Bangladesh right now. It is found that through BanglaJOL nearly 96.08% of journals in Bangladesh are published open access. But there have little amount of journals found that are indexed in major international indexes and databases. To increase more impact factor and to be indexed in popular international databases, publishers should look into the quality assurance

by means of peer-review. Results indicate that medical and health sciences are the major contributors to open access journals in Bangladesh. But there is lack of other diverse areas to contribute through open access in Bangladesh. The result showed that among 142 journals of BanglaJOL 41 journals have their ISSN, 21 journals have their DOIs, 4 journals have their CC by license and only 1 journals have the membership of OASPA. The numbers are relatively low. But to ensure the quality of journal, more journals need to have ISSN and DOI number.

To determine the trends of open access repositories this study found that the current initiatives at the universities to build up IR are encouraging. There are total 11 IR found in OpenDOAR and ROAR in Bangladesh. Moreover, most of the institutional repositories found are run by university libraries in Bangladesh. It shows that the libraries are rapidly following the path of green road of open access repositories for providing open access. In policy issue, Bangladesh is doing well. It is found in this study that among 11 repositories 8 repositories have specified policy rules with regards to metadata, data, content, submission, and preservation. But the scenario is different in terms of OAI-PMH compliance. Presently only 3 repositories are following the OAI-PMH protocols in Bangladesh.

Still open access is not yet very well established in Bangladesh. There is lack of enforcement from the government bodies and other funding agencies to support free flow of research outputs. There are no prominent scientific publishers in Bangladesh. Therefore researchers publish their output in foreign journals and do not bother with the issue of making their articles open access. Finally, it can be stated that open access publishing is getting more attention in Bangladesh in recent years. Moreover this trend should be increased to a larger proportion and all toll-access publishing would be turned open in Bangladesh. Therefore a national citation index and new repositories should be formed across the country. The government of Bangladesh formulated Information (RTI) Act 2009. As part of the government’s initiative to build “Digital Bangladesh”, several initiatives have been undertaken in different sectors. The Bangladesh University Grants Commission (UGC), the statutory apex body in the field of university education in Bangladesh, has also been working to support the mentioned goal through enhancing and strengthening the quality of higher education and research in Bangladesh (UGC, 2016). UGC can play a pivotal role in fostering open access research in Bangladesh. Librarians and academics can advocating together towards open access publishing and can collaborate for formulating policy and strategy for fostering open access scholarly communication in Bangladesh.

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