Scholarly Publishing in India: The Mapping of Open Access Journals Indexed in DOAJ

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ABSTRACT: The study is to determine India's contribution to the open access domain according to the Directory of Open Access Journals (DOAJ). Open access has proved to be a new venue that gives a big respite to academic community from escalating price rise of journal subscriptions. The data for the study was collected from DOAJ in May 2017. The dataset of 254 journals was downloaded and analysed on various parameters. The results show that India's contribution to DOAJ has been on continuous increase. Among the developing nations, the contribution of India is remarkable. The research can be further elaborated on the impact of open access in SAARC (South Asian Association. for Regional Cooperation) nations. Open access will benefit the developing nations like India to achieve their academic goals.

I. Introduction

Sharing and access to information is essential for the development of the universe of knowledge. Journals become an appropriate vehicle for transmission and dissemination of information in the form of articles, communication, and notes. Open access is a new method of dissemination of scientific research. Due to escalating increase in subscription prices of journals by commercial publishers, open access journals have emerged as a boon for academic community. Open access publishing provides free access to journal articles.

The cost factor of journals is a big hindrance in the free flow of information. Open access privides a viable option for sharing research results in the research community. The phenomenon of open access is strengthened by the movements and initiatives like *Budapest Open Access Initiative* (2002), *Bethesda Statement on Open Access Publishing* (2003), and *Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities* (2003). These three initiatives are the landmarks in the development of open access movement.

Open access has evolved into two modes: gold open access and green open access. Gold open access is achieved by authors paying APC (article processing charge) to publishers. Green open

access is achieved by authors submitting the pre-prints or post-prints of their peer-reviewed articles to institutional repositories or subject-based repositories (Contreras, 2012; Kinal & Rykiel, 2013).

Suber (2012) further differentiated two ways of free online access, "gratis open access" and "liber open access". G*ratis open access* means free from price barrier while *liber open access* means free from price as well as from some permission barriers.

The continuous free availability of information helps in the development of society in terms of economics, politics, and culture. The economic progress of a country depends upon the knowledge corpus of the nation. There is a direct relationship of economic development and information generation and dissemination in a nation (Cabrera, 2015).

Traditionally, developing nations suffered from information delay due to the unavailability of proper IT infrastructure, poor internet connection, and e-resources behind a paywall. Compared with the developing nations, the developed ones have better educational resources that facilitate their development and progress. Thus, open access has huge potential in providing free-of-cost technical savoir faire and scientific knowledge to developing nations and peoples who cannot afford to pay for it (Krisop & Chan, 2005; Xia, 2012; Nwagwu, 2013).

II. Literature Review

Numerous studies have done in the area of open access.

Tomaszewski, Poulin, and MacDonald (2013) discussed about avenues for librarians to publish information literacy (IL) related articles in OA discipline-specific pedagogical journals. *DOAJ* was used as a tool to identify OA journals outside of the LIS field. Results had shown that only 32 OA journals were related to "pedagogy" in their scope.

Yuan and Hua (2011) studied the citation impact of LIS OA journals listed in *DOAJ*. Their study covered *Journal of Medical Library Association*, *D-Lib Magazine*, *Information Research*, *Ariadne*, *Cybermetrics*, and *First Monday*. These journals are also indexed in *LISA* (*Library and Information Science Abstracts*) and have high citation impact in *Web of Science*.

Seo, Chung, Yun, Park, Park, and Ahn (2016) analysed the institutional research productivity of Seoul National University from 1998 to 2014. It was found that the trend towards open access papers increased since 2006 as evidenced in *Web of Science* and *Scopus* databases.

Many studies highlighted the open access initiatives in India. Some describes the position of OA journals in *DOAJ* (Joshi, Vatnal & Manjunath, 2012; Lone, Rather & Shah, 2008).

Miguel, Bongiovani, Gomez, and Bueno-de-la-Fuente (2013) examined the open access initiative in Argentina. They described the green and gold road approaches to OA in Argentina and its significant growth.

Ghane and Niazmand (2016) studied open access journals published in D-8 (Developing-8 or D-8 Organization for Economic Cooperation) countries and registered in *DOAJ* for the period of 2000-2004. They analysed the growth of open access journals in these countries along with other parameters to identify the strength and weakness of these journals.

Frandsen (2009) statistically analysed the publishing behaviour of authors in OA and non-OA journals regarding citations using the datasets from biology, mathematics, and pharmacy and pharmacological science. His findings showed that publishing behaviour of authors in OA and non-OA journals revealed different citation patterns.

Chaudhuri and Thohira (2010) analysed 33 articles and 1,100 citations from eleven top science and medical journals in 2004, 2006, and 2008 and found that there was an increasing trend among authors using open access and hybrid open access journals.

III. Research Methodology

The *Directory of Open Access Journals* (DOAJ) was started in 2003 at Lund University, Sweden with 300 OA journals. It has now over 9,000 open access journals. *DOAJ* indexes peer-reviewed open access journals of high quality, not restricted by country, language or subject area. The main purpose of the directory is to increase the visibility and coverage of the open access journals. *DOAJ* has 2, 497,697 articles from 9,456 journals ash of May 2017.

The data for the study was collected from DOAJ in May 2017. The dataset of journals pertaining to the country of publisher “India” was downloaded along with such variables as number of Journals Added, Subject, Peer Review Process, Host Platform, License, Article Processing Information, and Language.

IV. India’s Output to *DOAJ*

DOAJ indexed the research output from about 129 countries as of May 2017.

Table 1. Top OA Publishing Countries in DOAJ

s/n	Country	No. of Journals	%
1	Brazil	983	10.39
2	United Kingdom	835	8.83
3	Egypt	594	6.28

4	Indonesia	582	6.15
5	United States	558	5.90
6	Spain	521	5.51
7	Poland	437	4.62
8	Iran	299	3.16
9	Romania	294	3.11
10	Germany	289	3.06
11	Italy	278	2.94
12	India	254	2.68

Table 1 shows the top open access publishing countries as indexed in *DOAJ*. Brazil ranked first with 983 open access journals (10.39%), followed by United Kingdom (835, 8.83%), Egypt (594, 6.28%), Indonesia (582, 6.15%), United States (558, 5.90%), Spain (521, 5.51%), Poland (437, 4.62%), Iran (2993.16%), Romania (294, 3.11%), Germany (289, 3.06%), Italy (278, 2.94%) and India (254, 2.68%).

1. Growth of India's OA Journals in DOAJ

In 2003, 9 open access journals published in India were recorded in DOAJ. The number has now reached 254 OA journals.

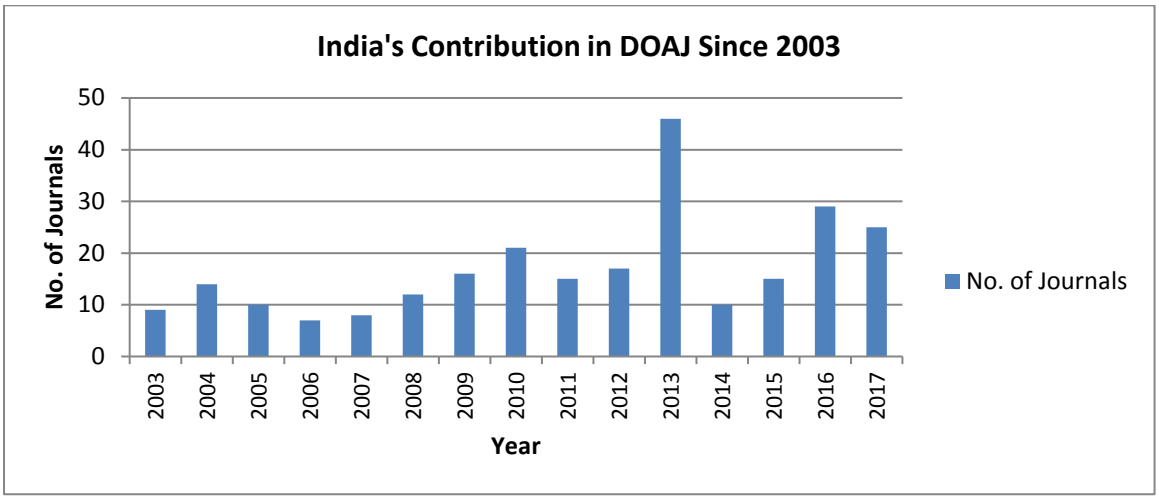

Figure 1. India's Contribution in DOAJ since 2003

Figure 1 shows that the highest growth occurred in the year 2013 with an addition of 46 OA journals. The year 2016 saw an addition of 29 OA journals, making it the second most productive year. Between 2003 and 2017, there is a constant growth in terms of new OA journals in the Directory.

2. Growth of India's OA Journals by Subject

Table 2(a). Growth of OA Journals by Broad Subject Division

Subject Division	No. of Journals	% of the Total
Sciences	234	92.13
Social Sciences	14	5.51
Humanities	6	2.36
Total	254	100

Table 2(a) shows the distribution of India's OA journals by broad subject division. Sciences rank first with 234 OA journals (92%), followed remotely by Social Sciences (14, 5.51%) and Humanities (6, 2.36%). It clearly indicates that open access domain is far more popular in Sciences than in Social Sciences and Humanities as far as India is concerned.

Table 2(b). Growth of OA Journals by Subject/Discipline

Subject/Discipline	Number of Journals	%
Social Sciences	6	2.36
Research Journals	3	1.18
Arts	2	0.79
Humanities	1	0.4
Law	1	0.4
Education	2	0.79
Library and Information Science	2	0.79
Language and Literature	3	1.18
Science: (General)	4	1.57
Science: Physics	5	1.97
Science: Mathematics	7	2.76
Science: Chemistry	4	1.57
Science: Biology	11	4.33
Science: Microbiology	4	1.57
Science: Geology	2	0.79
Science: Biochemistry	1	0.4
Science: Environmental Sciences	1	0.4
Medicine: (General)	42	16.53
Medicine: Internal Medicine	52	20.47
Medicine: Public Aspects of Medicine	10	3.93
Medicine: Surgery	14	5.51
Medicine: Pediatrics	6	2.36
Medicine: Dentistry	20	7.87

Medicine: Homeopathy	1	0.4
Medicine: Therapeutics, Pharmacology, Pharmacy and materia medica	21	8.27
Ayurveda, Naturopathy and Yoga	3	1.18
Technology: (General)	6	2.36
Technology: Mechanical Engineering	1	0.4
Technology: Civil Engineering	2	0.79
Technology: Electrical Engineering	5	1.96
Technology: Chemical Technology	4	1.57
Technology: Biotechnology	1	0.4
Computer Science, Computer Science Engineering and IT	4	1.57
Agriculture	3	1.18
Total	254	100

Table 2(b) shows the narrower division of subjects in terms of sub-disciplines. "Medicine: Internal Medicine" has most OA journals (52, 20.47%), followed by "Medicine: General" (42, 16.53%), "Medicine: Therapeutics, Pharmacology, Pharmacy and materia medica" (21, 8.27%), "Medicine: Dentistry" (20, 7.87%), "Medicine: Surgery" (14, 5.51%) and "Medicine: Public Aspects of Medicine" (10, 3.93%), etc. It is clear that medical sciences dominate India's OA journal publishing.

3. Most Productive OA Publishers in India

Table 3. Most Productive OA Publishers in India

Publisher Category	**Professional**	**University**	**College**	**Society/ Association**	**Government**	**Total**
Number of Journals	211	7	7	18	11	254
%	83.07	2.76	2.76	7.08	4.33	100

Table 3 shows that Professional Publishers have a lion's share (211, 83.07%), followed remotely by Society/Association (18, 7.08%), Government (11, 4.33%), and University and College have (7, 2.76%) respectively. It is clear that professional publishers publish more journals than any other categories. Therefore, it is no wonder that they have more OA journals than that of the others.

4. Journal Production and Hosting Platforms

Hosting platforms used by journals for displaying their content vary from commercial to open source.

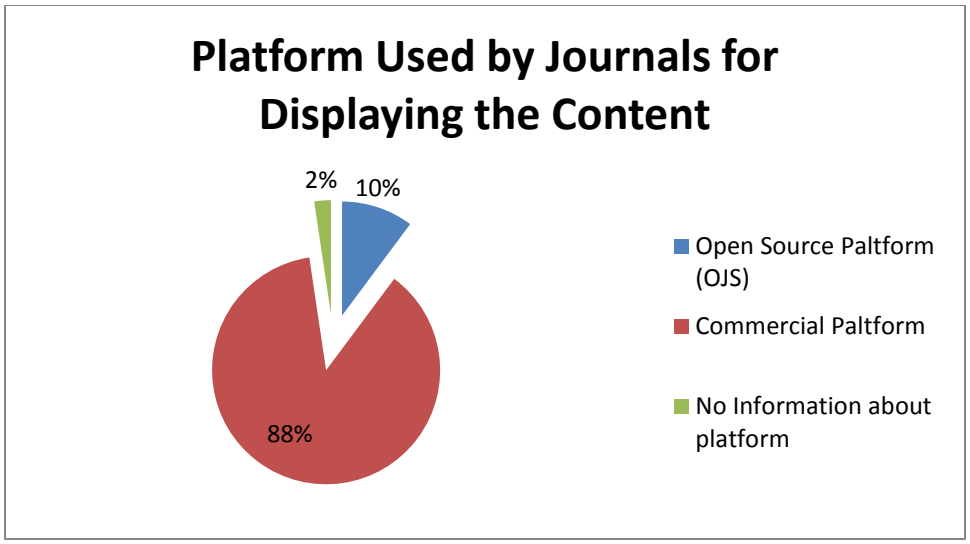

Figure 2. Platform Used by Journals for Displaying Their Content

Figure 2 shows that most publishers favour commercial platforms for their journal production and hosting. Publishers using commercial platform constitute about (88%) of the total. Open Journal System (OJS) has been used by 10% of journals while 2% of journals do not provide information about which platform they use for hosting their journal content.

5. OA Journals by Language

Table 4. OA Journals by Language

Language	No. of Journals
English	254
Hindi, English	2
Marathi, Hindi, English	1

Table 4 shows that most OA journals (254) published in India are in English language. One reason is because English is a widely used means of communication all over the world. For a wider dissemination of research outputs from India, English is the choice. All 254 OA journals published in India use English while 2 of them (*Anusandhan Vigyan Shod Patrika* and *Shodh Sanchayan*) are in both Hindi and English and 1 of them (*Lokavishkar International E- Journal*) is in Marathi, Hindi, and English.

6. DOAJ Seal

DOAJ has created a seal for open access journals based on features like accessibility, openness, discoverability, reuse, and author rights. These features do not have any relation with the scholarly

quality of the papers published. OA journals must have the following features to qualify for the seal:

- an archival arrangement in place,
- permanent identifiers,
- article level metadata,
- embed machine readable CC licensing information,
- reuse and remixing of the content,
- deposit policy,
- allowance for the author to hold the copyright without restrictions.

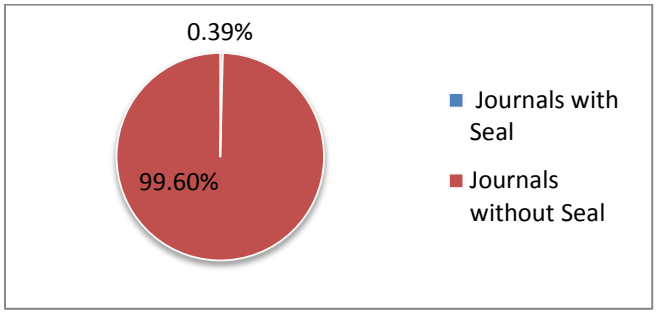

Figure 3. DOAJ Seal

Figure 3 shows that of the 254 OA journals published in India, only one (0.39%) journal (*International Journal of Physiotherapy*) qualifies the parameter while 253 journals (99.60%) fail to qualify for the DOAJ seal.

7. Article Processing Charges

In contrast to Green OA journals which publish research article free of charge, Gold OA journals require a payment from authors for processing their articles.

Table 5. Article Processing Charges (APC)

	Journals with APC	***Journals without APC***	***No Info about APC***	***Society Funded***
Number of Journals	101	139	13	1
%	39.7	54.7	5.2	0.4

Table 5 shows that 139 (54.7%) OA journals do not require article processing charges while 101 (39.7%) require article processing charges. 13 (5.2%) OA journals do not disclose whether they require APC or not. One journal (0.4%) (*Indian Journal of Neurosurgery*) is funded by the society.

8. Peer Review

There are different types of peer review.

Table 6. OA Journals by Peer Review Status

Peer Review	No. of Journals	%
Double Blind Peer Review	128	50.39
Blind Peer Review	23	9.06
Peer Review	98	38.58
Open Peer Review	02	0.79
No Information	03	1.18
Total	254	100

Table 6 shows the different types of peer review practices adopted by Indian OA journals. 128 (50.39%) journals use the double blind peer review method to review submissions. 23 (9.06%) use the blind peer review. 98 (38.58%) use the peer review. Two journals (*Kerala Heart Journal* and *Current Trends in Technology and Sciences*) use the open peer review method, thus constituting. Three journals (*Octa Journal of Environmental Research*, *Journal of Earth System Science* and *International Journal of Yoga*) do not disclose whether or what peer review method is adopted.

9. CC License

A Creative Commons license is a better alternative to the traditional "all rights reserved" setting. It solves many conflicts caused by copyright (Chen & Olijhoek, 2016; Kim, 2007).

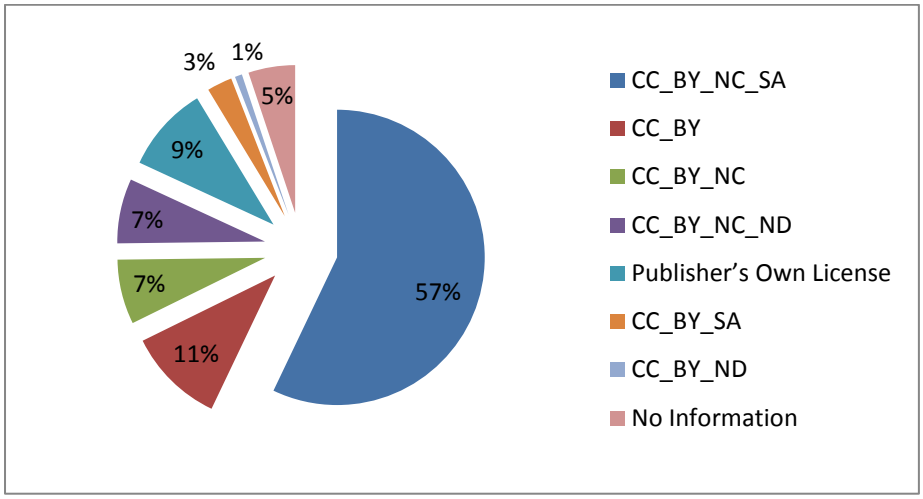

Figure 4. CC Licenses Adopted by Type

Figure 4 shows that the CC_BY_NC_SA license (57%) is most widely adopted by India's OA journals, followed by CC_BY (11%), CC_BY_NC (7%), CC_BY_NC_ND (7%), CC_BY_SA (3%), and CC_BY_ND (1%). 5% of journals do not disclose their CC license adoption. 9% of journals use their own licenses.

V. Conclusion

The footprints of Indian OA journals in DOAJ are remarkable. Since 2003, the growth of India's OA journals is on a steady rise from 9 journals in 2003 to 254 journals in 2017. India is the 12th most productive OA journal publishing country according to *DOAJ*.

By subject, sciences dominate OA journal publishing in India while social sciences and humanities are still lagging behind.

By publisher category, professional publishers are major contributors to OA journal publishing. University/college and societies/associations share a much smaller percentage due to their limited publishing capacity. Government agencies contribute 4.33% in OA journals because many departments have adopted an open access policy such as the Department of Science and Technology (DST) and Department of Biotechnology (DBT) under the Ministry of Science and Technology of the Government of India (Singh, 2016). As per the policy mandate all publications resulted from the publicly funded research should be made public soon. Other governmental bodies such as University Grants Commission (UGC) and Indian Council of Social Science Research (ICSSR) set up similar policies to support the open access movement in India.

By publishing or hosting platform, Open Journal System (OJS) is used for 10% of India's OA Journals while 88% journals still use commercial platforms.

By language, all 254 OA journals are published in English. Only 2 journals are bilingual and one journal is trilingual.

By the DOAJ seal, only one (0.4%) journal has been granted with a DOAJ seal while 253 (99.6%) journals fail to qualify for this recognition.

By APC, 139 (54.7%) OA journals published in India do not have APC's.

By type of peer review, 128 (50.39%) OA journals published in India adopt double bind peer review process and another 23 (9.06%) adopt the blind peer review. In addition, 98 (38.58%) use a peer review process.

By CC license, CC_BY_NC_SA is the most adopted CC license (57%) by OA journals published in India.

OA journals prove to be a great means to provide maximum benefits to the academic community and in turn a great option for developing countries like India.

References

Cabrera, K. I. (2015). Comparative analysis of public policies in open access models in Latin America, Brazil and Argentina cases. *International Journal of Educational Technology in Higher Education, 12*(1), 15-24. doi: https://doi.org/10.7238/rusc.v12i1.1947 or https://dialnet.unirioja.es/descarga/articulo/5584478.pdf

Chaudhuri, Jayati; & Thohira, Mariyam. (2010). Usage of open-access journals: Findings from eleven top science and medical journals. *The Serials Librarian*, 58(1/4), 97-105. doi: https://doi.org/10.1080/03615261003623070

Chen, Xiaotian; & Olijhoek, Tom. (2016). Measuring the degrees of openness of scholarly journals with the open access spectrum (OAS) evaluation tool. *Serials Review, 42*(2), 108-115. doi: https://doi.org/10.1080/00987913.2016.1182672

Contreras, Jorge L. (2012). Open access scientific publishing and the developing world. *St. Antony's International Review, 8*(1), 43-69. URL: http://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1031&context=fac_works_papers

Creative Commons. (2017). *About the licenses*. URL: https://creativecommons.org/licenses/

DOAJ. (2017). *Directory of open access journals*. URL: https://doaj.org

Ennas, Gianfranco; & Guardo, Maria Chiara Di. (2015). Features of top rated gold open access journals: An analysis of the Scopus database. *Journal of Informetrics, 9*(1), 79-89. doi: https://doi.org/10.1016/j.joi.2014.11.007

Frandsen, Tove Faber. (2009). Attracted to open access journals: A bibliometric analysis in the field of biology. *Journal of Documentation, 65*(1), 58-82. doi: https://doi.org/10.1108/00220410910926121

Frandsen, Tove Faber. (2009). The integration of open access journals in the scholarly communication system: Three science fields. *Information Processing & Management, 45*(1), 131-141. doi: https://doi.org/10.1016/j.ipm.2008.06.001

Ghane, M. R.; & Niazmand, M. R. (2016). Current status of open access journals published in D8 Countries and registered in the Directory of Open access Journals (Pre-2000 to 2014). *The Electronic Library, 34*(5), 740-756. doi: https://doi.org/10.1108/EL-06-2015-0107

Gul, Sumeer; Shah, Tariq Ahmed; & Nisa, Nahida Tun. (2014). Emerging web 2.0 applications in open access scholarly journals in the field of agriculture and food sciences. *Library Review, 63*(8/9), 670-683. doi: https://doi.org/10.1108/LR-05-2013-0060

Joshi, Anupama N.; Vatnal, R. M.; & Manjunath, G. A. (2012). Open access initiatives: A boon to academic libraries. *Library Philosophy and Practice (e-journal)*. 792. URL: https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1913&context=libphilprac

Kim, M. (2007). The creative commons and copyright protection in the digital era: Uses of creative commons license. *Journal of Computer-mediated Communication, 13*(1), 187-209. doi: https://doi.org/10.1111/j.1083-6101.2007.00392.x

Kinal, Jaroslaw; & Rykiel, Zbigniew. (2013). Open access as a factor of enhancing of the global information flow. *Procedia - Social and Behavioral Sciences*, 83(4), 156-160. doi: https://doi.org/10.1016/j.sbspro.2013.06.030

Krisop, Barbara; & Chan, Leslie. (2005). Transforming access to research literature for developing countries. *Serials Review, 31*(4), 246-255. doi: https://doi.org/10.1016/j.serrev.2005.09.003 or https://pdfs.semanticscholar.org/e3ad/b35c120cc9da7def28a34d25bb6c33cb468e.pdf

Kumar, G. H.; Hemantha, V.; Srinivasa, Reddy; Bhaskara, M.; & Chandra, B.T. (2012). India's contribution to agriculture and food sciences through open access literature. *DESIDOC Journal of Library & information Technology, 32*(1), 53-58.

Lone, Fayaz; Rather, Rafiq; & Shah, Gh. Jeelani. (2008). Indian contribution to open access literature: A case study of DOAJ and OpenDOAR. *Chinese Librarianship: an International Electronic Journal*, 26. URL: http://iclc.us/cliej/cl26fayaz.pdf

Miguel, Sandra; Bongiovani, Paola C.; Gomez, Nancy D.; & Bueno-de-la-Fuente, Gema. (2013). Prospect for development of open access in Argentina. *The Journal of Academic Librarianship, 39*(1), 1-2. doi: https://doi.org/10.1016/j.acalib.2012.10.002

Nwagwu, Williams E. (2013). Open access initiatives in Africa: Structure, incentives and disincentives. *The Journal of Academic Librarianship, 39*(1), 3-10. doi: https://doi.org/10.1016/j.acalib.2012.11.024

Schopfel, Joachim. (2017). Open access to scientific information in emerging countries. *D-Lib Magazine, 23*(3/4). doi: https://doi.org/10.1045/march2017-schopfel

Seo, JeongWook; Chung, Hosik; Yun, Jungmin; Park, Jin Young; Park, Eunsun; & Ahn, Yuri. (2016). Usage trends of open access and local journals: A Korean case study. *PLOS ONE, 11*(5), e0155843. doi: https://doi.org/10.1371/journal.pone.0155843

Singh, Prerna. (2016). Open access repositories in India: Characteristics and future potential. *IFLA Journal, 42*(1), 16-24. URL: http://journals.sagepub.com/doi/abs/10.1177/0340035215610131

Solomon, David J.; Laakso, Mikael; & Bjork, Bo-Christer. (2013). A longitudinal comparison of citation rates and growth among open access journals. *Journal of Informetrics, 7*(3), 642-650. doi: https://doi.org/10.1016/j.joi.2013.03.008

Solomon, David J.; Laakso, Mikael; & Bjork, Bo-Christer. (2016). *Converting scholarly journals to open access: A review of approaches and experiences*. URL: https://dash.harvard.edu/handle/1/27803834

Suber, Peter. (2012). *Open access*. Cambridge: MIT Press. URL: https://www.dropbox.com/s/5cxsyzs58a5yx5q/9286.pdf?dl=0

Tomaszewski, Robert; Poulin, Sonia; & MacDonald, Karen I. (2013). Publishing in discipline-specific open access journals: Opportunities and outreach for librarians. *The Journal of Academic Librarianship, 39*(1), 61-66. doi: https://doi.org/10.1016/j.acalib.2012.11.008

Trencheva, Tereza; & Todorova, Tania Yordanova. (2014). Open access to scientific information: Comparative study in DOAJ. *Library Management, 35*(4/5), 364-374. doi: https://doi.org/10.1108/LM-08-2013-0070

Wikipedia (2017). *Peer review*. URL: https://en.wikipedia.org/wiki/Peer_review

Xia, Jingfeng. (2012). Diffusionism and open access. *Journal of Documentation, 68*(1), 72-99. doi: https://doi.org/10.1108/00220411211200338

Yuan, Shunbo; & Hua, Weina. (2011). Scholarly impact measurements of LIS open access journals: Based on citations and links. *The Electronic Library, 29*(5), 682-697. doi: https://doi.org/10.1108/02640471111177107

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