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Altmetric Analysis of Scholarly Articles Published in DESIDOC Journal of Library and Information Technology

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The present study aims to examine the altmetric presence in scholarly articles and track the academic and societal utilization of research published in the DESIDOC Journal of Library and Information Technology. The population consists of the scholarly articles published in DJLIT and indexed on the Web of Science from the year 2005 to 2020. Web of Science database was used to measure the number of article citations and Altmetric Explorer was used to get the Altmetric Attention Score. Out of the 573 scholarly articles indexed on the Web of Science, 27 (4.71%) articles had an altmetric attention score. The highest number of received citations was 63, and the highest altmetric attention score was 13. The research findings demonstrated that India is the majorcontributor with 85% of the scholarly articles to DJLIT. Twitter (43.39%) followed by Wikipedia (20.75%) are the popular digital media platforms where DJLIT articles were mentioned. Librarians were the most active readers of DJLIT research on Mendeley with 242 readers (25.07%) and the Social Science discipline with 368 highest readers (38.13%) on Mendeley who reads DJLIT Publications.

Keywords: *Altmetric, Scholarly Articles, DESIDOC Journal of Library and Information Technology, DJLIT, Web of Science*

1 INTRODUCTION

Traditional citation metrics do not provide a clear understanding of the impact of research in the scholarly world, particularly in scientific communication. In recent times a new technique is developed called "Altmetric"

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which tracks and measures the scholarly impact as well as the societal impact to evaluate research published in digital forms and formats. The term altmetric, also known as alternative metrics, appeared first in the year 2010 in "Altmetrics: A manifesto" (Priem, Tarborelli, Groth, &Neylon, 2010)[1]. The manifesto did not provide a definition but gave a clear vision of what altmetrics are. Further Priem (2014)[2] defined altmetric as the "study and use of scholarly impact measures based on activity in online tools and environments." Bornmann (2014)[3] stated that "altmetric is a term to describe web-based metrics for the impact of publications and other scholarly material by using data from social media platforms." NISO (2016)[4]defined"altmetric as a broad term that encapsulates the digital collection, creation, and use of multiple forms of assessment that are derived from activity and engagement among diverse stakeholders and scholarly outputs in the research ecosystem." Altmetric works to map the scholarly impact of web-based digital tools and tracks the qualitative data complementary to citation-based, traditional metrics with the help of persistent identifiers.

2 DESIDOC JOURNAL OF LIBRARY AND INFORMATION TECHNOLOGY (DJLIT)

DESIDOC Journal of Library and Information Technology (DJLIT) is an international, open access, peer-reviewed journal which is a bi-monthly publication. It mainly publishes research articles and review papers related to library and Information Science and Information Technology applied to libraries. DJLIT covers broad subject areas like Information systems, Knowledge management, Collection building & management, Information behavior & retrieval, Librarianship/library management, Library & information services, Records management & preservation, etc. Users of DJLIT are librarians, documentation and information professionals, researchers, students etc. DJLIT is indexed in Scopus, Web of Science (Emerging Source Citation Index), UGC-CARE, Dimensions, LISA, LISTA, EBSCO, J-Gate Plus, Proquest, Library Literature and Information Science Index/Full-text, The Informed Librarian Online, Indian Science Abstracts, Indian Citation Index, WorldCat, Google Scholar, etc.[5] The periodical started in 1980 as DESIDOC Bulletin-a four-page newsletter-basically to publish the activities of the DESIDOC. In the late 1980s, a new era of information technology dawned in India. In 1992, the Bulletin was renamed as DESIDOC Bulletin of Information Technology (DBIT). In 2008, DBIT became a primary research journal and was again renamed as DESIDOC Journal of Library and Information Technology (DJLIT). Since then, only primary research work, after peer-evaluation, is accepted for publication.[6]

3 NEED AND SIGNIFICANCE OF THE STUDY:

Traditional metrics like article citation counts and journal impact factor usually take a longer time and reflect only one dimension of the impact of research but altmetric provides immediate information with broader picture of article impact.[7] Scholarly articles published in DJLIT are often practical oriented so scholarly as well as the societal impact of research may be judged more broadly by using altmetric data instead of relying on only traditional metrics. The basic purpose of this research is to examine the altmetric presence in scholarly articles and track the academic and societal utilization of research published in DJLIT.

4 REVIEW OF LITERATURE

Akers (2017)[7] conducted a study to introduce altmetric to the Journal of the Medical Library Association (JMLA) and explained how altmetrics may be better than traditional citations in reflecting the impact of JMLA articles. Erfanmasnesh (2017)[8] conducted a study to examine the altmetric presence in articles published in Scopus-indexed Library and Information Science (LIS) journals. Ezema&Ugwu (2019)[9] studied the research impact of Library and Information Science (LIS) journals using Web of Science (WoS), Scopus and Google Scholar (GS) and then examined whether there is a correlation between their citations and altmetric attention. Rangaswamy&Rajenrda Babu (2019)[10] examined which journals and articles have got the high citations as well as an altmetric attention score in the field of Library and Information Science. The objective of this study was to analyze 5 LIS journals indexed by Google Scholar Metrics 2019. Sankar and Sarangapani (2020)[11] explored the coverage of LIS literature published in 2019 with the primary objective as to know the scholarly communication of LIS Literature on social media and evaluate the altmetric attention score. Tang & Vann (2020)[12] investigated the multidimensional perspective of scholarly articles published in the top-tier Library and Information Science (LIS) journals. The relationships between the impact factors (altmetric attention score, citation count and Mendeley readership) were analyzed, and reader profiles were characterized and studied.

5 OBJECTIVES OF THE STUDY

1. To find out the country-wise count of scholarly articles published in DJLIT and indexed in Web of Science.
2. To find out the top ten highly cited scholarly articles published in DJLIT and indexed in Web of Science.
3. To track altmetric presence in scholarly articles published in DJLIT.
4. To identify mostly used digital media platforms by DJLIT readers for sharing research.

5. To find out the geographical and demographical details of Mendeley readers by professional status and readers by discipline.

6 SCOPE AND LIMITATIONS OF THE STUDY

The scope of the study was limited to the articles published in DESIDOC Journal of Library and Information Technology (DJLIT), which was indexed in the Web of Science (WoS) core collection under the Emerging Sources Citation Index (ESCI).In Web of Science, the search query was run limited to articles published between 2005 to 2020, with a Digital Object Identifier (DOI) and indexed the literature of Library and Information Science under the subject area (Category) namely 'Information Science & Library Science.' All other types of documents that are indexed in the Web of Science like Editorial Material, Review, Early Access, Letter, Correction, Biographical Item, Book Review, Proceedings Paper, News Item, Database Review, Bibliography, Software Review, Retraction, Retracted Publication, Hardware Review, Art Exhibit Review, etc. were excluded from this study.

7 MATERIALS AND METHODS

A quantitative method was adopted for this study. All statistical data of scholarly articles were collected through structured observation by reviewing the Web of Science and Altmetric Explorer databases.

7.1 Data Sources

"Web of Science (WoS) is the world's most trusted publisher-independent global citation database. Guided by the legacy of Dr. Eugene Garfield, inventor of the world's first citation index, the Web of Science is the most powerful research engine, delivering best-in-class publication and citation data for confident discovery, access and assessment".[13]

"Altmetric.com is a London-based digital science company with a vision to track and analyze the online activity around scholarly research outputs"[14]

7.2 Data Collection

Data were collected in two types i.e. primary data and secondary data.

7.2.1 Primary Data

The primary bibliographic data of the scholarly articles published in DESIDOC Journal of Library and Information Technology were retrieved from Web of Science core collection and used Emerging Sources Citation Index (ESCI) as DESIDOC Journal of Library and Information Technology is indexed in ESCI from the year 2005. Accordingly, the time span of this study was from the year 2005 to 2020.To retrieve the primary data, a structured

query was run in Web of Science with the following fields with tags:

- Publication Title (SO): DESIDOC Journal of Library and Information Technology
- DOI (DO): 10.*
- Publication Year (PY): 2005-2020
- Document Type (DT): Article

573 bibliographic records of scholarly articles were retrieved by executing the above query in the advanced search option of Web of Science.(Image 1) The above query was run on 23rd August 2021 and all the data was collected on the same date.

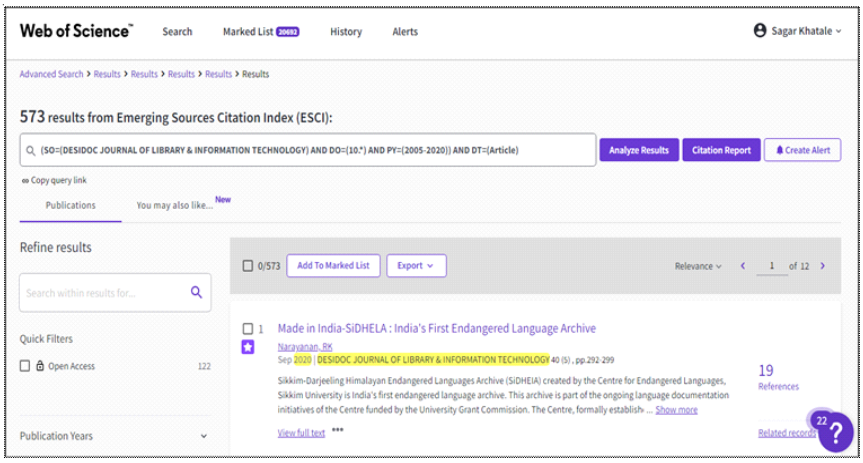


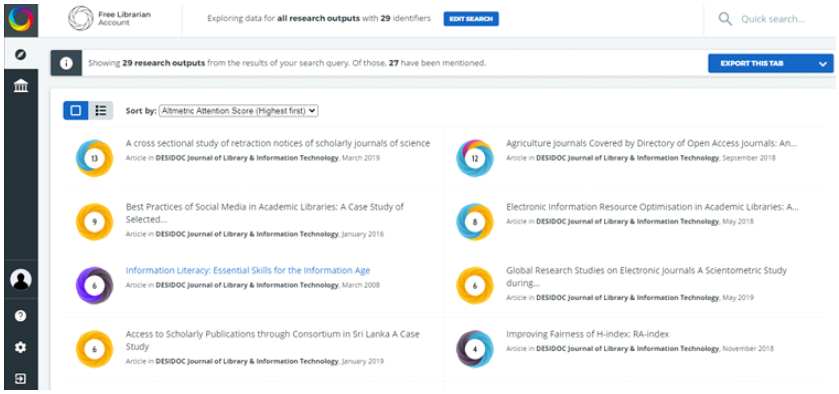
Image 1: Web of Science Search Results

7.2.2 Secondary Data

Altmetric.com provides login based free service of altmetric explorer (Research Output Tab) to librarians as a Free Librarian Account where one can search the research outputs using different scholarly identifiers like Digital Object Identifier, ArXiv ID, etc. Maximum 50 scholarly identifiers are allowed in each search.

The retrieved primary bibliographic data of 573 scholarly articles from Web of Science were checked in the altmetric database using Altmetric Explorer. 12 Search queries of 50 DOI'swere run in altmetric explorer to retrieve the secondary data. Out of 573 scholarly articles from Web of Science, 29 articles are tracked by altmetric.com out of those 27 (4.71%) scholarly articlesreceived at least 01 Altmetric Attention Score. (Image 2) All the details of the 27 articles tracked by altmetric.com were saved in excel file for further analysis.

(*Source*: Altmetric.com)



(Source: Altmetric.com)

Image 2: AltmetricExplorer Search Results

8 DATA ANALYSIS

Data retrieved from Web of Science and Altmetric Explorer is further analyzed to get the results of the research.

Article 1	A cross-sectional study of retraction notices of scholarly journals of science	Mar-2019	39 (2)
Article 2	Agriculture Journals Covered by Directory of Open Access Journals: An Analytical Study	Sep-2018	38 (5)
Article 3	Best Practices of Social Media in Academic Libraries: A Case Study of Selected Engineering College Libraries of Odisha	Sep-2016	36 (5)
Article 4	Electronic Information Resource Optimisation in Academic Libraries: A Comparative Study on Licensing Provision of Commercial Publisher	May-2018	38 (3)
Article 5	Access to Scholarly Publications through Consortium in Sri Lanka A Case Study	Jan-2019	39 (1)
Article 6	Global Research Studies on Electronic Journals A Scientometric Study during 1990 2017	May-2019	39 (3)
Article 7	Information Literacy: Essential Skills for the Information Age	Mar-2008	28 (2)

Article 8	Improving Fairness of H-index: RA-index	Nov-2018	38 (6)
Article 9	Finding Facets of Academic Integrity and Plagiarism through the Prism of a Citation Database	Mar-2019	39 (2)
Article 10	Secure Authenticated Key Exchange Protocol for Credential Services	Jul-2009	29 (3)
Article 11	Open Access to Electronic Theses and Dissertations	Jan-2008	28 (1)
Article 12	Retrospective Conversion of Nehru Memorial Museum and Library: Issues and Perspective	May-2008	28 (3)
Article 13	Bibliometrics to Altmetrics: Changing Trends in Assessing Research Impact	Jul-2015	35 (4)
Article 14	Research Contribution of Prof Atul H. Chokshi to Materials Science: A Scientometric Study	2013	33 (5)
Article 15	Open Access and Open J-Gate	Jan-2008	28 (1)
Article 16	Analysis of Open Access Scholarly Journals in Media & Communication	2013	33 (5)
Article 17	Development of Public Libraries through Public-private Partnership in India: Issues and Challenges	2013	33 (1)

Article 22	Regulations to Prevent Plagiarism in Higher Education in India A Critical Appraisal	Mar-2019	39 (2)
Article 23	Management of University Research Publication: A Case Study of JUIT Publication Database (JPubDB)	Jul-2016	36 (4)
Article 24	Journal Packing Density across Subject Disciplines among BRICS Countries: A Study	May-2018	38 (3)
Article 25	Availability of Open Access Books in DOAB: An Analytical Study	Mar-2016	36 (2)
Article 26	Tradition and Transition: The Journey of an iSchoolDeep in the Heart of Texas	Jan-2017	37 (1)
Article 27	Development of Online Legal Information System Lawyers Perceptions	Mar-2019	39 (2)

Table 1: Article Numbers with Title

Table 1 shows the list of all 27 articles with titles, published in DJLIT which were tracked by Altmetric.

8.1 Country-Wise count of Scholarly Articles Published in DJLIT

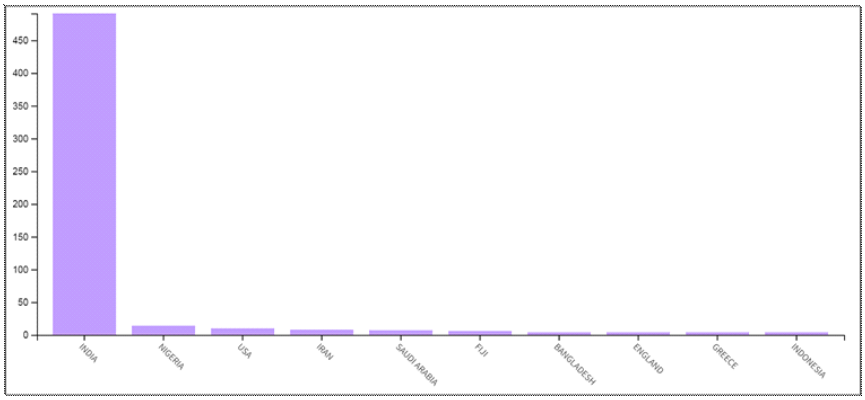


Figure 1: Country-wise count of Scholarly Articles Published in DJLIT

DJLIT has received contributions of scholarly articles from 32 countries of the world.The top10 countries in terms of the highest contribution of scholarly articles were taken for the analysis.From the 573 scholarly articles of DJLIT indexed in Web of Science, 491 (85.69 %) articles were contributed

by India, followed by Nigeria 14 (2.43 %), USA 10 (1.75 %), Iran 8 (1.40 %), Saudi Arabia 7 (1.22 %), etc. Data related to scholarly articles which are published in DJLIT showed that most articles (n=57) had been published in 2017 and 2018 and the least (n=5) in 2005.

8.2 Top Ten Highly Cited Scholarly Articles

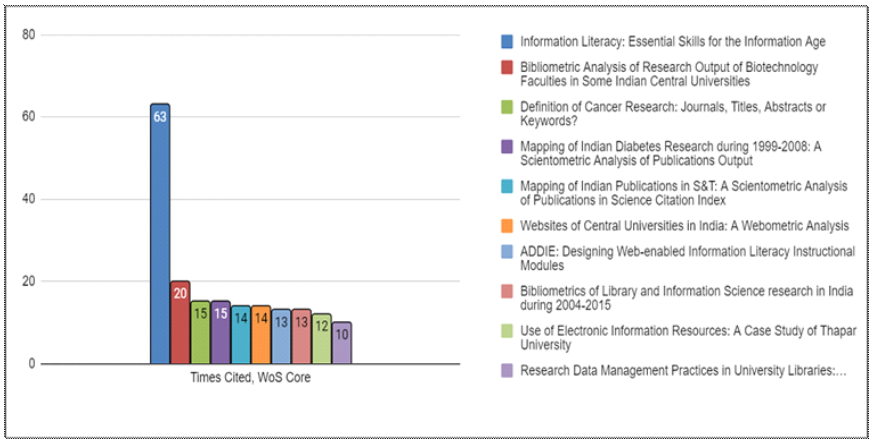


Figure 2: Top Ten Highly Cited Scholarly Articles

Figure 2 shows that the article "Information Literacy: Essential Skills for the Information Age" was the highly cited scholarly article with 63 citations and the only article from top ten highly cited articles that altmetric also tracks with an altmetric attention score of 6.

8.3 Altmetric presence in DJLIT articles:

Article Number	Altmetric Attention Score	Total Mentions																	Number of Mendeley readers
		News	Blog	Policy	Patent	Twitter	Peer review	Weibo	Facebook	Wikipedia	Google+	LinkedIn	Reddit	Pinterest	F1000	Q&A	Video	Syllabi	
Article 1	13	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	12
Article 2	12	0	2	0	0	6	0	0	0	0	1	0	0	0	0	0	0	0	13
Article 3	9	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32
Article 4	8	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	12
Article 5	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Article 6	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
Article 7	6	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	443

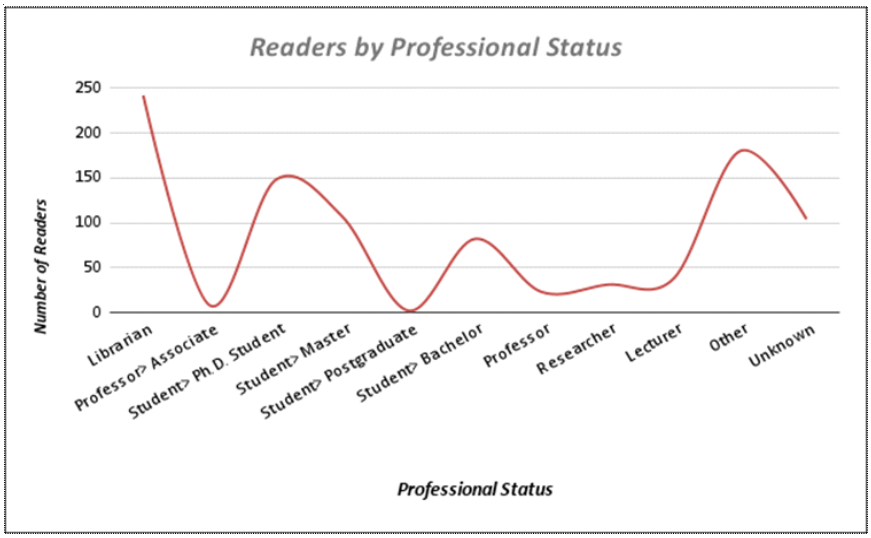
Article 8	4	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	10
Article 9	4	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	17
Article 10	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Article 11	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
Article 12	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
Article 13	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92
Article 14	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	21
Article 15	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	14
Article 16	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38
Article 17	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	21
Article 18	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	8
Article 19	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	32
Article 20	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Article 21	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	36
Article 22	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	22
Article 23	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	25
Article 24	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	8
Article 25	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	19
Article 26	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	15
Article 27	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	16

(*Source*: Altmetric.com)

Table 2: Altmetric presence in DJLIT articles

Table 2 demonstrates the Altmetric presence in DJLIT published research. Out of the total 573 scholarly articles indexed in Web of Science, Altmetric tracked 29 articles (5.06%) from which 27 (4.71%) articles received at least 01 Altmetric Attention Score. Out of 27 articles which altmetric attention score, 10 scholarly articles (37.04%) published in recent two years of data collection i.e. 2019 (n=06) and 2018 (n=04).An article titled 'A cross-sectional study of retraction notices of scholarly journals of science' receivedthe highest Altmetric Attention Score of 13.Article 07 titled 'Information Literacy: Essential Skills for the Information Age' got 443 readers on Mendeley which is highest from all scholarly articles.

8.4 Mostly Used Digital Media Platforms by DJLIT Readers



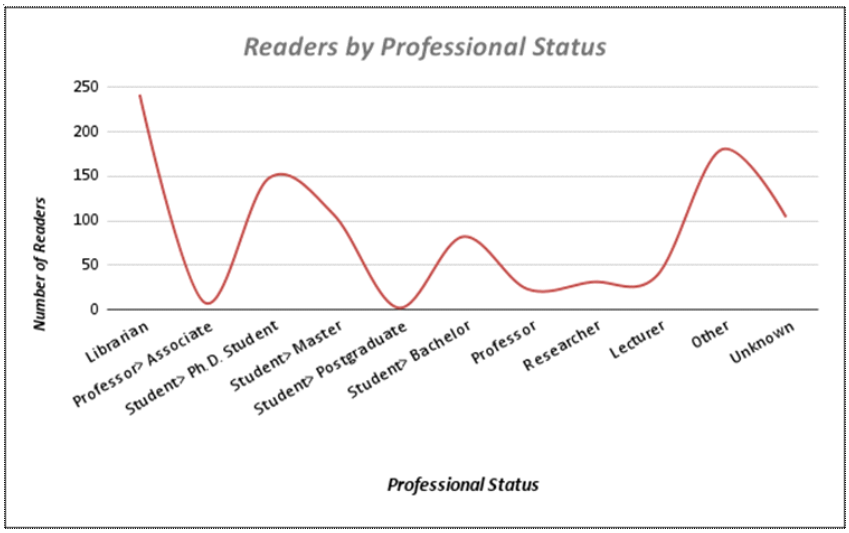
(*Source*: Altmetric.com)

Figure 3: Mostly Used Digital Media Platforms by DJLIT Readers

Figure 3 shows the mostused digital media platforms by DJLIT readers. Altmetric tracked 17 different digital media platforms to get the digital footprints of research published in DJLIT. Out of the total platforms, DJLIT users used Twitter (43.39%) to mention and share research published in DJLIT scholarly articles. The next highest number of mentions was on Wikipedia (20.75%) followed by Blog (15.09%), Policy (09.43%), Patent (05.66%) and Google+ (05.66%).

8.5 Demographic Details of Readers by Professional Status

Mendeley reader count is good evidence of the early impact of scientific output since it appears before citations.[15]



(*Source*: Altmetric.com)

Figure 4: Demographic Details of Readers by Professional Status

Figure 4 and Table 3 demonstrated the DJLIT readers on Mendeley by their professional status.There were mainly 11 categories of readers, including Librarian, Professor, Associate Professor, Lecturer, Researcher, Ph.D., Postgraduate, Master and Bachelor Students; Others and Unknown readers.Librarians were the active readers of DJLIT research on Mendeley with 242 readers (25.07%). The second highest category was the 'other'180 readers (18.65%) indicating that the non-academic community showed good interest in reading DJLIT research.The third highest number of users who reads DJLIT articleswas Ph.D. students with 148 readers (15.34%) followed by 107 Master'sstudents (11.09%).Lecturers (3.94%) were more active readers than Professors (2.38%)and Associate Professors (0.83%).

Article Number	Librarian	Associate Professor	Ph.D. Student	Master Student>	Postgraduate Student>	Bachelor Student>	Professor	Researcher	Lecturer	Other	Unknown	Total
Article 1	5	2	2	--	--	--	1	--	--	--	2	**12**
Article 2	3	--	1	--	--	2	1	--	--	4	2	**13**
Article 3	7	--	--	7	2	--	--	3	--	9	4	**32**
Article 4	3	--	2	1	--	--	--	2	--	2	2	**12**
Article 5	3	--	3		--	--	1	--	--	--	2	**9**

Article 6	3	1	2	1	--		--	2	--	--	4	**13**
Article 7	106	--	54	52	--	65	--	--	27	91	48	**443**
Article 8	1	--	6	1	--	--	--	--	--	--	2	**10**
Article 9	4	--	5	--	--	1	1	--	--	4	2	**17**
Article 10	--	--	--	--	--	--	--	--	--	--	--	**0**
Article 11	9	--	6	4	--	--	3	--	3	4	--	**29**
Article 12	--	--	2	--	--	--	1	--	--	--	1	**4**
Article 13	20	--	17	17	--	--	--	10	--	21	7	**92**
Article 14	5	--	4	3	--	--	1	--	--	3	5	**21**
Article 15	7	--	2	1	--	--	1	--	--	3	--	**14**
Article 16	14	--	3	4	--	5	--	3	--	8	1	**38**
Article 17	2	--	5	5	--	--	2	--	--	5	2	**21**
Article 18	4	--	1	--	--	--	1	2	--	--	--	**8**
Article 19	11	--	9	5	--	2	--	--	--	4	1	**32**
Article 20	--	--	1	1	--	--	1	--	1	--	--	**4**
Article 21	3	--	12	--	--	--	5	7	5	4	--	**36**
Article 22	9	--	3	--	--	--	1	--	--	4	5	**22**
Article 23	7	4	2	--	--	2	--	2	--	5	3	**25**
Article 24	1	1	2	1	--	--	1	--	--	1	1	**8**
Article 25	8	--	1	--	--	1	1	--	--	5	3	**19**
Article 26	3	--	--	3	--	1	1	--	2	3	2	**15**
Article 27	4	--	3	1	--	3	--	--	--	--	5	**16**
Total	**242**	**8**	**148**	**107**	**2**	**82**	**23**	**31**	**38**	**180**	**104**	**965**

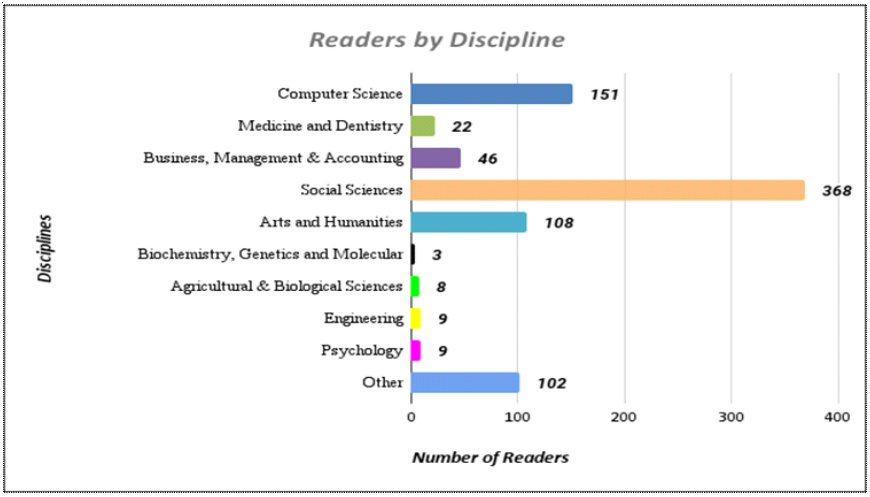
(*Source:* Altmetric.com)

Table 3: Demographic Details of Readers by Professional Status

8.6 Readers by Discipline

Data in Figure 5 shows the discipline-wise readers of DJLIT scholarly articles on Mendeley. The top 10 disciplines were selected for analysis as per

the highest number of readers from 18 different fields. the discipline identified as 'Unknown' in Mendeley was excluded from the analysis. Readers who belong to the Social Sciences discipline were the top readers with 368 readers (38.13%). Out of the total readers, 151 (15.64%) readers were from Computer Science, which stood as the second-highest discipline in terms of readership. The next highest discipline was Arts and Humanities with 108 readers (11.19%) and on the other hand, readers from the 'other' disciplines with 102 readers (10.57%)showed a great interest in reading DJLIT publications.



(*Source*: Altmetric.com)

Figure5: Details of Readers by Discipline

9 FINDINGS

This study investigated the altmetric presence in scholarly articles published in the DESIDOC Journal of Library and Information Technology with the highest digital media mentions. No doubt India has dominated the contribution to the journal as DJLIT is an Indian publication with 85.69 percent share amongst 32 countries who participated and published research inDJLIT. Articles published in the journal have received attention from 08 different digital media sources.27 out of the total 573 publications (with valid DOI) have received at least one attention from digital media platforms.Twitter was the platform providing the most altmetric data for DJLIT publications followed by Wikipedia mentions. Except for Twitter 43.39%,the results showed that the presence of DJLIT scholarly articles on other digital media platforms is not high, as just 15.9% of articleswere shared inBlog, 09.43%were mentioned in the Policy and 5.66% were mentionedin Patent. News, Peer Review, Weibo, Facebook,

LinkedIn, Reddit, Pinterest, F1000, Q&A, Video and Syllabi do not get even one mention for all the 27 articles tracked by Altmetric.

Mendeley is also the major source of altmetric data. This study made a profession-wise and discipline-wise comparison of the Mendeley readership of research outputs published in DJLIT.Mendeley's readership varied according to the user categories for DJLIT Publicationshowever the Librarians were reported as the highest readers. The possible reason for the highest readership by the Librarians is the subject coverage of DJLIT is Library and Information Science.Discipline-wise analysis of readership showed that 18different disciplines (including unknown) read DJLIT scholarly articles with higher readership recorded from Social Sciences, followed by Computer Science.Library and Information Technology is an interdisciplinary subject that comes under the Social Sciencesand is closely related to Computer Science.

10 CONCLUSION

DESIDOC Journal of Library and Information Technology is a well-known journal in the academic fraternity. DJLIT has set a standard to publish research related to new tools and Technologies in the field of Library and Information Science. Journal gives free online open access hence it is one of the highly preferred journalby the LIS Professionals in India. Academicians and researchers use this journal regularly to publish their research and readers to update themselves with current research performed in Library and Information Science.Findings of the research shows thatDJLIT gets very less online attention over the platforms that altmetric measure meaningthe awareness of societal impact amongst DJLIT users is less. It is suggested that the DJLIT should approach altmetric.com and enable journal-level altmetric service to track online attention more effectively and encourage the users to share and mention the research on digital media platforms as well.

Altmetric plays a vital role in measuring academic and social information and knowledge and helps to track the influence of information that is shared via various digital media platforms. Academicians have to understand the role of Altmetric in research communication and must use this new technique in the process of research evaluation.It is the need of time to study and explore the Altmetric technique to measure the research impact not only in the academic community but also in social engagements.

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