Research Productivity of DESIDOC Journal of Library and Information Technology: A Bibliometric Review

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ABSTRACT
The study examines the research productivity of the DESIDOC Journal of Library and Information Technology (DJLIT) for a selected period of 2012-2020. In 2012, the Scopus database started indexing DJLIT publications, and it was the motivation behind choosing this specific period for the present study. The sourced data for the present study was extracted from the Scopus database covering the period 2012-2020. The various bibliometric parameters have been applied, such as year-wise distribution of publications with citations, RCI, ACPP, CAI, Citation analysis, the collaboration of authors, institutions and countries to measure the research productivity. The study's findings revealed that the number of publications over the years fluctuates up and down but expanded when the journal was indexed in Scopus. Further, joint authors' contribution found high at the rate of 358(67.42%), followed by single authorship 173(32.58%). The author, B. M. Gupta, was the most productive and cited author during the study period. The University of Delhi contributed 42 publications and identified as first among the top ten highly effective institutions. The study concludes that the DJLIT publishes good quality research articles covering the different aspects of library and information science disciplines. It comes under Q2 scoring category of journal citation ranking.

Keywords: Bibliometrics, DJLIT, Authorship pattern, Relative citation impact (RCI), Co-citation analysis,

INTRODUCTION
Journals (periodicals) are more significant for scientists and academic professionals in their academic pursuits. Journals are responsible for refining and defining information and acting as scientific filters. The importance of journals in academic life goes far beyond providing means of communication and permanent records. Journals have become deeply embedded in academic information. DESIDOC Journal of Library and Information Technology (DJLIT) is one of the premier journals in Library and Information Science covering multidisciplinary areas and is being published in India. In this study, researchers had selected DJLIT as a source journal to
conduct bibliometric studies ranging from 2012 to 2020 when Scopus began indexing DJLIT publications. This research study aims to perform a bibliographic analysis on the research productivity of DJLIT.

The term bibliometrics is the combination of two words, first, "Biblio", which is derived from the Greek word, "Biblion" means "book", and second, "metrics" derived from the Greek word "metrikos" means "measurement". Alan Pritchard coined Biliometrics in 1969. It refers to the application of mathematics to the study of bibliography. F.J. Cole & Nellie B. Eates represented the first recorded study on "bibliometrics" in 1917 in science progress. E.W. Hulme introduced the term Statistical bibliography. While bibliometric methods are most often used in the field of library and information science, bibliometrics has wide applications in other areas too. The bibliometric study is a simple statistical method of bibliography counting to evaluate and quantify the growth of a subject. Librarians and information professionals are the highest beneficiaries of the practical application of bibliometric data because such information is most useful in bibliographic control, database evaluation, and collection development.

**Brief History of DJLIT**

The journal DJLIT started in 1980 as DESIDOC Bulletin, a four-page newsletter to publish the activities of the Defence Scientific Information & Documentation Centre (DESIDOC), an information center of Defence Research & Development Organisation (DRDO), Ministry of Defence, Government of India to fulfill the information requirements of their scientists. The journal's first volume with both the issues (Issues 1 & 2) was published in 1981. In the late 1980s, an era of information technology dawned in India. Computers started revolutionising the working culture, and information science and technology were the appeals. The coverage in the DESIDOC Bulletin also kept pace with the time, and its content was enhanced with new columns like IT Scan, IT Events, Book Reviews, and Recommended Websites. In the 1990s, Dr. S.S. Murthy, the Editor-in-Chief, started special issues on topics of interest like Bibliographic Databases, Library Networks, Electronic Publishing, etc., well-known professionals as Guest Editors. In 1992, the Bulletin was renamed the DESIDOC Bulletin of Information Technology (DBIT). In 2008 it became the DESIDOC Journal of Library & Information Technology. Since January 2008, DJLIT became an open-access journal.
The DJLIT is a bimonthly, double-blind, peer-reviewed journal that publishes research articles and original reviews on library activities and services. DJLIT covers different library and information science disciplines, including information systems, knowledge management, collection development and management, information behavior and retrieval, library management, libraries and information services, document management and archiving, etc. It is also being indexed in various other leading databases such as Web of Science, UGC-CARE, Dimensions, LISA, LISTA, EBSCO, J-Gate Plus, ProQuest, Library Literature and Information Science Index, The Informed Librarian Online, Indian Science Abstracts, Indian Citation Index, WorldCat, Google Scholar, etc. Though different researchers performed studies on DJLIT using various parameters under the different duration of its publications. As per the SCImago Journal Rank measures (SJR 2019) report, DJLIT is listed under Quartile two (Q2). It is observed from the Scopus website that the Scopus coverage of DJLIT from 2012 to 2020 has been indicated with Citescore 1.0, SJR 0.281, and SNIP 1.968 as on January 17, 2021.

**Related works and studies**

Several bibliometric studies were performed by different authors, both at individual and collaborative levels, to analyse the contributions of journals during different periods.

Singh, Varma & Singh (2021) analysed research performance and resulted in the Journal of Informetrics (JOI) in 13 selected years 2007-2019. The study showed that at most 106 articles (10.84%) were published in 2017 and at least 33(3.37%) in 2007. The study also revealed that most of the articles were published by many authors. Out of 58 countries, only the United States contributed (12.40%) compared to other countries. Research shows that the Journal of Informetrics (JOI) performance is, on average, due to constant fluctuations in annual publication growth.

Das (2020) conducted a study in the Journal of Chemical Sciences over ten years (1987-1996). The study focuses on bibliometric indicators such as the author's model, the distribution of articles per year, the distribution of articles by number, the distribution by topic, etc. The study showed that the most articles were published in 1993 (127) and the least in 1994 (21) articles. Of the 717 articles in the Journal of Chemical Sciences, co-authors contributed 599(83.54%) articles, while the remaining 118(16.46%) articles were sole authors. Most of the work was done
in physical and theoretical chemistry with 291 articles, followed by inorganic and analytical chemistry with 208 articles.

Hussain & Saddiqa (2020) researched Pakistani Research Journals between 2005 and 2018. The analysis includes author sample, gender distribution, number of articles, article size, most prolific authors, number of references, and distribution by class. The study identified 137 articles that appeared during the study period, and most of the articles were published in 2017. Male and single-author trends were dominant.

Maity & Sahu (2019) presents the bibliometric profile of the journal of documentation for the period 2005-2015. The various bibliometric indicators have been used, such as annual performance, distribution of articles by sub-zone, type of published scientific papers, the geographical distribution of articles, institutional performance and degree of collaboration, etc. A total of 489 study materials were found in the study between 2005 and 2015. In addition, several articles on information-seeking behavior have been published.

Xu, Zhou & Baltrénaitė (2019) reviewed the journal "Engineering Ecology and Landscape Management" (JEELM) between 2007 and 2019. The authors argue that this is one of the scientific journals that focus primarily on man-made environmental change. The study presents trends emerging in studies published in JEELM. The authors used various bibliometric indicators such as the distribution of publications, citation structure, citation analysis, and critical factors of country, institution, and author contributions to the comprehensive analysis of the current state of JEELM.

Prabha, Mishra & Parameswaran (2018) conducted the bibliometric study on the Journal of Extension (JOE) published between 2008 and 2017 by analysing 2505 publications. The data was collected from the Scopus database. The study results showed that the Journal of Extension's average research output is 250.5 articles per year. It also shows that authors are more interested in publishing articles in journals than in any other category. It turned out that the most significant contribution came from the United States, with 2065 publications (88.93%).

Varma & Singh (2017) studied the bibliometric analysis of partnerships: the Canadian Journal of Library and Information Practice and Research between 2006 and 2016. The results showed that the cooperation rate found was 0.25, and Canada was a productive country, followed by the
United States. The study also clearly shows that Canada and the US made the most considerable contribution during the study period.

Singh (2017) analysed five volumes of Evidence-based library and information practice (EBLIP) published in 2011-2015. Studies show that 96% of contributions come from the top five countries and another 4% from the top seven countries. The study also shows that most articles published in Evidence-Based Library and Information Activities (EBLIP) fall into the category of research papers, followed by articles, databases, conference papers using Evidence in practice, etc.

Reddy (2017) observed the publication of the IEEE Transactions on Automation Science and Engineering article published in 2008-2017. The authors report that IEEE Transactions on Automation Science and Engineering is a favorite journal in science and engineering. Furthermore, the study found that most research articles were written by three authors, which is 785.

Kuri & Palled (2016) examined articles published in the Journal of the Library Association of India (ILA). The results showed that several authors wrote the majority of articles. This also shows that the cooperation rate is 0.51 and that India contributes the most significant number of articles.

On the other hand, similar studies carried out by various researchers in different subject domains, Yu, Xu, & Antuchevičienė (2019); Zhou, Xu & Zavadskas (2019); Yu, Xu & Fujita (2019); Tur-Porcar et al. (2018); Xu, Yu &Wang (2018); Laengle et al. (2017) & Ding (2017).

In this present study, researchers have limited their analysis by considering the period from 2012 onwards the Scopus database has started indexing DJLIT publications. There was no such study conducted during this period which covers this time period from 2012-2020. Thus, this study will provide the new dimensions and recent trends of DJLIT.

**OBJECTIVES OF THE STUDY**

The key objectives of the study are as follows: to identify the year-wise distribution of publications and citations with relative citation impact (RCI) and average citation per publication
(ACPP); to study the authorship pattern and co-authorship index (CAI); to analyse the citation of documents; to find out top collaborators like author, institution, country, funding agency; to find out the occurrence of keywords, and to analyse the co-citation of cited authors and cited sources.

METHODS USED

Data Source

A descriptive bibliometric study of scholarly publications published in the DJLIT covering 2012 to 2020 was conducted. Scopus is one of the largest databases of bibliographic information and citations from a wide range of publications, which gives a comprehensive picture of the impact of papers. The researchers have used the Scopus database at (http://www.scopus.com/) to retrieve the data because Scopus has started indexing DJLIT publications from 2012 to date. Thus, it is one of the first studies in this direction that cover only the Scopus indexed publications of DJLIT.

Search strategies

To trace out all the publication output of DJLIT during the selected period, researchers have searched the name of the journal in the keywords search option given in the search interface of the Scopus database. The search string used for retrieving the details is "SRCTITLE (desidoc AND journal AND of AND library AND information AND technology) AND (LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2020))". As a result, the researchers have retrieved the required bibliographic data as on January 12, 2021. A total of 531 publications were collected during the selected period.

Data Analysis

The various bibliometric measures have been applied in this study, such as year-wise distribution of publications with citations, annual growth rate (AGR), relative citation impact (RCI), authorship pattern, co-author index (CAI), citation analysis, most prolific authors, most collaborative institutes, top funding agencies, etc. All retrieved data were subsequently analysed, and tabulated for formulating the findings of the analysis. The VOSviewer software version 1.6.16 was used for network visualisation of the analysed results.
RESULTS AND DISCUSSIONS
Year-wise distribution of publication and citation with ACPP & RCI

Table 1 depicts the year-wise distribution of articles published in DJLIT and indicates the details regarding the distribution of 531 articles published from 2012-2020. A maximum of 69(12.99%) articles were published in 2012 when DJLIT was indexed in the Scopus database and a minimum number of contributions, i.e., 51(9.6%) in 2016. The year-wise distribution of publications has fluctuated with decreasing trends. The maximum number of citations found in the year 2014(253), followed by 2013(235), while the minimum in the year 2020(14). It also fluctuates over time. The average citation per publication is 2.6, whereas the maximum citation per publication is 4.19(2015), and the minimum is 0.26(2020).

\[
\text{Relative citation impact (RCI)} = \frac{\% \text{ of } TC}{\% \text{ of } TP}
\]

For example, Relative citation impact of the year 2012

\[
\text{RCI}_{2012} = \frac{14.17}{12.99} = 1.09
\]

Relative citation impact is maximum in the year 2015(1.61) followed by 2014(1.54), while minimum in the year 2020(0.1).

Table 1: Year-wise distribution of publications and citations with ACPP & RCI

<table>
<thead>
<tr>
<th>Year</th>
<th>TP</th>
<th>AGR</th>
<th>% of TP</th>
<th>TC</th>
<th>% of TC</th>
<th>RCI</th>
<th>ACPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>69</td>
<td>-</td>
<td>12.99</td>
<td>196</td>
<td>14.17</td>
<td>1.09</td>
<td>2.84</td>
</tr>
<tr>
<td>2013</td>
<td>66</td>
<td>-4.35</td>
<td>12.43</td>
<td>235</td>
<td>16.99</td>
<td>1.37</td>
<td>3.56</td>
</tr>
<tr>
<td>2014</td>
<td>63</td>
<td>-4.55</td>
<td>11.86</td>
<td>253</td>
<td>18.29</td>
<td>1.54</td>
<td>4.02</td>
</tr>
<tr>
<td>2015</td>
<td>54</td>
<td>-14.29</td>
<td>10.17</td>
<td>226</td>
<td>16.34</td>
<td>1.61</td>
<td>4.19</td>
</tr>
<tr>
<td>2016</td>
<td>51</td>
<td>-5.56</td>
<td>9.6</td>
<td>107</td>
<td>7.74</td>
<td>0.81</td>
<td>2.10</td>
</tr>
<tr>
<td>2017</td>
<td>60</td>
<td>17.65</td>
<td>11.3</td>
<td>174</td>
<td>12.58</td>
<td>1.11</td>
<td>2.90</td>
</tr>
<tr>
<td>2018</td>
<td>61</td>
<td>1.67</td>
<td>11.49</td>
<td>120</td>
<td>8.68</td>
<td>0.76</td>
<td>1.97</td>
</tr>
<tr>
<td>2019</td>
<td>54</td>
<td>-11.48</td>
<td>10.17</td>
<td>58</td>
<td>4.19</td>
<td>0.41</td>
<td>1.07</td>
</tr>
<tr>
<td>2020</td>
<td>53</td>
<td>-1.85</td>
<td>9.98</td>
<td>14</td>
<td>1.01</td>
<td>0.1</td>
<td>0.26</td>
</tr>
<tr>
<td>Total</td>
<td>531</td>
<td></td>
<td>100</td>
<td>1383</td>
<td>100</td>
<td>1</td>
<td>2.60</td>
</tr>
</tbody>
</table>

Authorship pattern

The researchers attempted to analyse the authorship pattern of publications that appeared during the selected period. Table 2 shows the year-wise contribution of the single and joint authors during the period of study. The analysis found that the maximum number of the research publications published by two authors was 245, followed by single authors who appeared 173.
Five & more authors published the minimum number of contributions with 11 publications. Further, the researchers observed that multi-authors contribute to most publications in the DJLIT during the selected period of study. The majority of 358(67.42%) contributions were by joint authors, and the rest of 173(32.58%) contributions were by a single author.

Table 2: Authorship pattern

<table>
<thead>
<tr>
<th>Year</th>
<th>Authors</th>
<th>TP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One</td>
<td>Two</td>
</tr>
<tr>
<td>2012</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>2013</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td>2014</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>2015</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>2016</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>2017</td>
<td>16</td>
<td>35</td>
</tr>
<tr>
<td>2018</td>
<td>15</td>
<td>28</td>
</tr>
<tr>
<td>2019</td>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>2020</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>173</td>
<td>245</td>
</tr>
</tbody>
</table>

Co-Authorship Index

The co-authorship index is measured using the formula which is suggested by (Garg & Padhi, 2001). Thus, the co-authorship index (CAI) can be mathematically expressed as:

\[
CAI = \left( \frac{\left(\frac{N_{ij}}{N_{io}}\right)}{\left(\frac{N_{oj}}{N_{oo}}\right)} \right) \times 100
\]

Where,

- \(N_{ij}\) = The number of publications having \(j\) authors in block \(i\)
- \(N_{io}\) = Total output of block \(i\)
- \(N_{oj}\) = The number of publications having \(j\) authors for all blocks
- \(N_{oo}\) = Total number of publications for all authors and all blocks

For example, Co-authorship index of the year 2012

\[
CAI_{2012} = \left( \frac{27/173}{69/531} \right) \times 100
\]

\[
CAI_{2012} = 120.1056
\]
Table 3 demonstrates the co-authorship index (CAI) of publications in DJLIT during the study period. The co-authorship index has been measured by calculating the proportional output of one, two, three, etc., authored papers published in the journal. Among the one authorship, the highest co-authorship index was found with a value of 139.5 in the year 2013. Similarly, in two authorships, the year 2017 witnessed the highest co-authorship index with a value of 126.4. In three authorships, the highest co-authorship index was identified as 139.7 in the year 2018. In four authorships, 2014 was identified as the highest co-authorship index with a value of 200.7. The highest co-authorship index found with five and above publications at the rate of 273.2 was in the year 2020. The lowest co-authorship index in five and above publications appeared as zero in 2013 and 2014.

<table>
<thead>
<tr>
<th>Year</th>
<th>One Author</th>
<th>Two Authors</th>
<th>Three Authors</th>
<th>Four Authors</th>
<th>Five &amp; Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>27(120.1)</td>
<td>30(94.2)</td>
<td>10(95)</td>
<td>1(36.6)</td>
<td>1(70)</td>
</tr>
<tr>
<td>2013</td>
<td>30(139.5)</td>
<td>26(85.4)</td>
<td>8(79.5)</td>
<td>2(76.6)</td>
<td>0(0)</td>
</tr>
<tr>
<td>2014</td>
<td>21(102.3)</td>
<td>28(96.3)</td>
<td>9(93.7)</td>
<td>5(200.7)</td>
<td>0(0)</td>
</tr>
<tr>
<td>2015</td>
<td>17(96.6)</td>
<td>25(100.3)</td>
<td>10(121.4)</td>
<td>1(46.8)</td>
<td>1(89.4)</td>
</tr>
<tr>
<td>2016</td>
<td>18(108.3)</td>
<td>22(93.5)</td>
<td>8(102.8)</td>
<td>1(49.6)</td>
<td>2(189.3)</td>
</tr>
<tr>
<td>2017</td>
<td>16(81.8)</td>
<td>35(126.4)</td>
<td>6(65.6)</td>
<td>2(84.3)</td>
<td>1(80.5)</td>
</tr>
<tr>
<td>2018</td>
<td>15(75.5)</td>
<td>28(99.5)</td>
<td>13(139.7)</td>
<td>3(124.4)</td>
<td>2(158.3)</td>
</tr>
<tr>
<td>2019</td>
<td>15(85.3)</td>
<td>26(104.4)</td>
<td>10(121.4)</td>
<td>2(93.7)</td>
<td>1(89.4)</td>
</tr>
<tr>
<td>2020</td>
<td>14(81.1)</td>
<td>25(102.2)</td>
<td>7(86.6)</td>
<td>4(190.8)</td>
<td>3(273.2)</td>
</tr>
</tbody>
</table>

Citation analysis of documents

With the help of VOSviewer visualisation software, the researchers analyse the citation of documents during the study period. A minimum of 5 citations for a single document has been fixed for the analysis. Out of the total of 531 papers, 99 meet the threshold. It found that Baskaran, C. (2013) "Research Productivity of Alagappa University during 1999-2011: a bibliometric study" has the highest citation with 20 citations, followed by Gopikuttan, A. (2014) with 18 citations and Siwach, A.K. (2015) with 17 citations. Figure 1 shows the distribution of citations of documents with scale. The yellow color shows the maximum citation in this figure, and the purple color defines the minimum number of citations.
Most prolific Authors

Table 4 provides the details of the top five most productive vs. most cited authors with their number of publications and citations that appeared in DJLIT during the selected study period (Patel et al., 2021). Among the authors who published their research output in DJLIT, from the National Institute of Science Technology & Development Studies India, B. M. Gupta was the most prolific author with the highest publication number of 20 with 61 citations. It was further determined that the authors S. Kumar, C. K. Ramaiah, S.M. Dhawan, and R. Gupta, were the most productive author, whereas the authors K.C. Garg, R. Gupta, S. Kumar, and A. Kumar were the most cited authors. Here, among the top five authors, three authors have been found in both measurements, which means more productive authors were cited higher.

Table 4: Most prolific Authors

<table>
<thead>
<tr>
<th>Author</th>
<th>Documents</th>
<th>Citations</th>
<th>Vs</th>
<th>Author</th>
<th>Citations</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.M. Gupta</td>
<td>20</td>
<td>61</td>
<td></td>
<td>B.M. Gupta</td>
<td>61</td>
<td>20</td>
</tr>
<tr>
<td>S. Kumar</td>
<td>17</td>
<td>32</td>
<td></td>
<td>K.C. Garg</td>
<td>41</td>
<td>7</td>
</tr>
<tr>
<td>C.K. Ramaiah</td>
<td>11</td>
<td>24</td>
<td></td>
<td>R. Gupta</td>
<td>33</td>
<td>10</td>
</tr>
<tr>
<td>S.M. Dhawan</td>
<td>11</td>
<td>18</td>
<td></td>
<td>S. Kumar</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>R. Gupta</td>
<td>10</td>
<td>33</td>
<td></td>
<td>A. Kumar</td>
<td>29</td>
<td>9</td>
</tr>
</tbody>
</table>
Contributions of Institutes/Organisations

Table 5 shows the top ten most productive institutions' contribution to DJLIT with their research publications during the selected study period, 2012-2020. Out of 531 total publications, it was identified that the University of Delhi (DU) contributed the highest number, with 42 appearing as the most productive institute, followed by the Council of Scientific and Industrial Research (CSIR) with 21 research publications. Jawaharlal Nehru University (JNU) secured the 3rd position with 19 publications, followed by Defence Research and Development Organisation (DRDO) with 18 publications. Pondicherry University contributed 14 research papers, followed by an equal number of 13 publications produced by Banaras Hindu University (BHU) and the Indian National Science Academy (INSA). National Institute of Science Technology and Development Studies (NISTADS) and Indira Gandhi National Open University (IGNOU) listed 11 publications each, followed by the University of Kashmir, with 10 publications.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Delhi</td>
<td>42</td>
</tr>
<tr>
<td>Council of Scientific and Industrial Research India</td>
<td>21</td>
</tr>
<tr>
<td>Jawaharlal Nehru University</td>
<td>19</td>
</tr>
<tr>
<td>Defence Research and Development Organisation India</td>
<td>18</td>
</tr>
<tr>
<td>Pondicherry University</td>
<td>14</td>
</tr>
<tr>
<td>Banaras Hindu University</td>
<td>13</td>
</tr>
<tr>
<td>Indian National Science Academy</td>
<td>13</td>
</tr>
<tr>
<td>National Institute of Science Technology and Development Studies India</td>
<td>11</td>
</tr>
<tr>
<td>Indira Gandhi National Open University</td>
<td>11</td>
</tr>
<tr>
<td>University of Kashmir</td>
<td>10</td>
</tr>
</tbody>
</table>

Highly productive Countries

Researchers analysed the data to identify the contributions from different countries. In VOSviewer, the strategic parameter as 2 minimum numbers of documents and five minimum numbers of citations of a country has been fixed. Out of the 33 countries, 10 meet the threshold. Figure 2(a) indicated the details of highly productive countries ranked among the first ten countries. The data analysis appeared that most publications, i.e., 453 (87.79%) were published as contributions from India. The second most contributions were from Nigeria, i.e., 16 (3.10%), followed by the United States with 10 (1.94%) contributions, followed by Iran with a contribution of 7(1.36%), followed by Fiji and Indonesia with 6(1.16%) each. South Arabia and South Africa are listed with 5(0.97%) contributions. The lowest number of contributions was
found from Malaysia and Spain, with one contribution each. Figure 2(b) shows the collaboration of India with other countries.

![Collaboration of India with other countries](image)

**Figure 2(a):** Highly productive countries

**Figure 2(b):** Collaboration of India with other countries.

### Top funding agencies

Figure 3 represents the details of the top ten funding agencies acknowledged by their publications in DJLIT during the selected study period. Among these funding agencies, the highest number of publication, 4 out of 21, funding agencies are identified as from the University Grants Commission (UGC), followed by three from the Department of Science and Technology (DST), Government of Kerala, followed by two each from Bangladesh Council of Scientific and Industrial Research, Defence Research and Development Organisation, Indian Council of Agricultural Research, Indian Council of Social Science Research, Shahid Beheshti University of Medical Sciences and Universitas Indonesia, followed by one each Andrew W. Mellon Foundation and Board of Research in Nuclear Sciences. The researchers found that UGC is the top finding agency for DJLIT publications during the study period and a statutory Organisation of the Government of India by an Act of Parliament in 1956 to coordinate, determine, and maintain teaching, examination, and examination standards examination research in university education.
Network visualisation of co-occurrence of keywords

The co-occurrence of keywords can effectively reflect research hotspots in the field of scientific disciplines, providing additional support for scientific research (Liao et al., 2018). We can determine the main directions and research trends by analysing keywords (Hong et al., 2019). The researchers used VOSviewer to analyse the co-occurrence of keywords. According to the VOSviewer manual, "each link has strength, represented by a positive numerical value. The higher this value is, the stronger the link will be. The total link strength indicates the number of publications in which two keywords occur together (Patel et al., 2021)". The data showed that 1734 keywords appeared in the entire spectrum of publications during the selected period of study. The co-occurrence threshold of keywords was set to 3, which were represented by 144 keywords. It found that 'India' with 41 occurrences, 'bibliometrics' with 36 occurrences, 'scientometrics' with 33 occurrences, 'e-resources' with 24 occurrences, and 'citation analysis' with 18 occurrences were top-five preferable keywords. Figure 4a shows the connectivity of the 'India' keyword with other keywords. Further, the researchers distributed the keywords into the following five clusters, red, green, blue, yellow, and purple in VOSviewer (Figure 4b). Cluster 1 (red): the red cluster deals with concepts like authorship pattern (17 links, 24 total link strength), libraries (15 links, 17 total link strength), information literacy (11 links, 12 total link strength). Cluster 2 (green): the green cluster deals with concepts like citation analysis (17 links, 32 total link strength), India (44 links, 70 total link strength), scientometrics (29 links, 62 total link strength). Cluster 3 (blue): the blue cluster deals with concepts like e-journals (18 links, 27 total
link strength), e-resources (28 links, 40 total link strength), library services (16 links, 25 total link strength). Cluster 4 (yellow): the yellow cluster deals with concepts like a digital library (18 links, 27 total link strength), information retrieval (14 links, 16 total link strength), open-source software (11 links, 16 total link strength). Cluster 5 (purple): the purple cluster deals with concepts like e-learning (12 links, 14 total link strength), internet (13 links, 16 total link strength), university (15 links, 16 total link strength).

Figure 4(a): The term "India" related to other terms& 4(b): Network visualisation of co-occurrence of keywords

Co-citation analysis:

Another critical measure of visualisations is co-citation analysis, which is performed for cited references, cited sources, and cited authors. For co-citation analysis of cited sources, with the help of VOSviewer visualisation software, applying the strategic parameter as 5 minimum number of citations of a source, out of 5388 total sources, 168 sources meet the threshold. For visualisation, using minimum links strength is 5. As well as cited authors, applying the strategic
parameter as 5 minimum number of author citations, out of 10993 total authors, 312 authors meet the threshold. For visualisation, using minimum link strength is 10. In figure 5(a), Scientometrics, DESIDOC Journal of Library and Information Technology (DJLIT), Library Management, Library Philosophy and Practice, Electronic Library, Library Review, etc., are the most co-cited sources (Figure 5b) B.M. Gupta, K.C. Garg, S. Kumar, A. Kumar, S.M. Dhawan, M. Madhusudhan, etc., are the most co-cited authors. The different colours represent the various clusters of similar groups of cited sources and cited authors.

Findings of the study

The primary purpose of this study was to explore the research productivity of DJLIT based on published literature indexed in the Scopus database from 2012-2020. The significant findings of the study are as follows:

- The study reveals that 1045 authors have contributed 531 publications during the selected study period from 2012 to 2020.
- The highest number 12.99% of publications were published in the year 2012, and the lowest number, 9.98% of research publications, appeared in the year 2020.
Joint authors made the maximum number (67.42%) of contributions, and the rest of (32.58%) contributions were the effort of single authors.

The highest co-authorship index pattern was identified with five and more publications at the rate of 273.2 in the year 2020.

The maximum number of citations emerged as 253 in 2014 whereas, the minimum number of citations appeared as 14 in 2020.

The most cited document was C. Baskaran, (2013) "Research Productivity of Alagappa University during 1999-2011: a bibliometric study" with 20 highest citations.

The most prolific author during the study of DJLIT was Gupta, B.M, with 20 publications and 61 citations.

It identified that the University of Delhi secures the first position in the most productive institutions category by contributing 42 publications to DJLIT.

The UGC was the top finding agency for DJLIT publications during the study period.

It indicates that a total of 1734 keywords appeared in the entire spectrum of publications during the selected period of study for making network visualisation of keyword co-occurrences. 'India', 'bibliometrics,' and 'scientometrics,' etc., were the top preferable keywords.

In co-citation analysis, found that 'Scientometrics' and 'DJLIT' were the most cited sources whereas B.M. Gupta and S. Kumar were the most cited authors.

**CONCLUSION**

DJLIT is one of the leading scholarly peer-reviewed open access journals in the field of Library and Information Science (LIS). Being an open-access journal in the field of LIS discipline, it has comprehensive coverage and wider visibility. It has published a significant number of scholarly articles to cater to the user community's needs, such as students, faculty members, and information professionals in the field of LIS. This journal covers specific areas like bibliometrics/scientometrics studies, user studies, information sources and services, digital libraries, LIS education, academic libraries, public libraries, special libraries, school libraries and children libraries, internet-based studies, collection development, information literacy, cataloging and classification, libraries and information professionals, information retrieval, information
management, knowledge management, and related legal issues in the field of LIS. Based on the study, it was found that the maximum number of articles was published in 2011.

Furthermore, it was identified that the highest numbers of contributions were by joint authors and the lowest contributions were by a single author. Finally, it was perceived that most of the researchers used citations from journal articles because journal articles are the top vehicle of emerging information dissemination. Therefore, DJLIT is one of the leading publications in library information science and a publishing platform for researchers, faculties, scientists to exhibit their academic publication endeavors.

REFERENCES


