# Quantitative Analysis of Library and Information Science Journal Articles for the last Decade

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## Abstract

*A bibliometrics evaluation of issues under the "Journal of Library and Information Science" written from 2013 to 2020 is shown here. The total number of citations, their breakdown by year, the writers' publication habits, their output, and the extent to which they work together are all analysed. Articles from the "Journal of Library and Information Science" were downloaded and used to compile the statistics for the years 2013 through 2020. Subramanyam's method was utilised to determine the level of cooperation in this investigation. Additionally, collaborative efforts are dissected and analysed. There were 89 publications published throughout the 8 year period, with a total of 1866 citations accessible from inside those articles. Over the course of the journal's research period, most articles had several authors. In bibliometrics, the more the number of times an article is cited, the greater its significance. To learn more about how long it takes for an article to be referenced in other publications, bibliometrics analysis may be used. The authors draw on the results and interpretation of the current study to propose the following avenues for follow-up inquiry: investigating the citation patterns of publications outside of the current study's focus. It is possible to do an informatics, webometric, or scientometric study. It would be interesting to investigate the possibility of a sequential authorship pattern.*

*Key Words:* "Bibliometrics", "Bibliometrics analysis", "Citation Analysis", "Content Analysis", Library & Information Science.

## Introduction

In the analysis of citations, the emphasis is on the recurrence of certain citation patterns within a document. This strategy involves collecting, tallying, evaluating, and interpreting quotes from the existing body of written work. The bibliography is presented by the writers as a credible reference. It is a standard by which the veracity of a published article can be judged. Citation analysis is a standard part of data research, used to evaluate the

significance of specific pieces of literature (articles, authors, etc.). It is a standard part of data analysis and is acknowledged by most researchers. This is crucial when writing academic papers.

"Journal of Library and Information Sciences" is an international, peer-reviewed publication that appears twice a year. It is published by the "American Research Institute for Policy Development" (June and December). The journal's intended readership consists of librarian, data analyst, professional, executive, and the educators. The journals aim to disseminate authoritative studies on pressing problems and novel trends.

The most crucial means of scientific communication are primary journals. These are indicative of the fundamental concerns of an academic discipline or a particular profession. Primary journal articles measure a field's progress in literature and are a boon to anyone hoping to delve further into that topic.
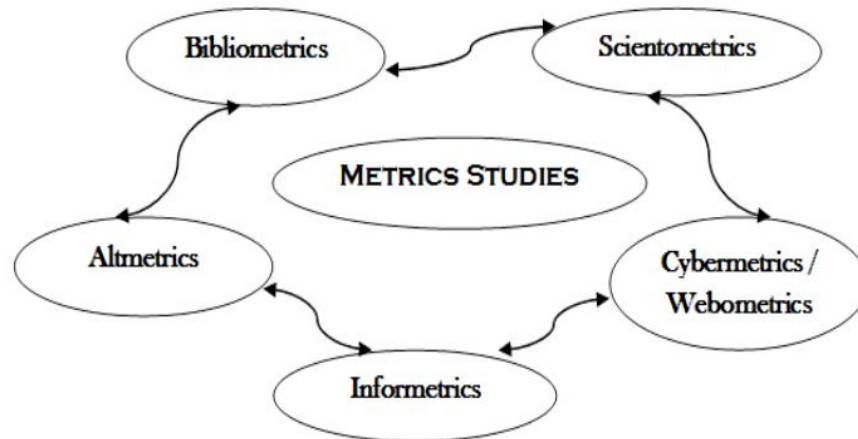


**Figure 1:** methods for analyzing authors' output

What is known as bibliometrics are quantitative studies of published works such as books, essays, and other types of writings. The results of these studies are used to monitor a writer's or researcher's productivity and influence. This can help with tenure and promotion, as well as in getting grants and other financial support. Bibliometrics, scientometrics, webometrics, and informetrics, all recent advances in library and information science, can help us make sense of important concepts from various disciplines. Scientometrics is a library and information science branch that aims to standardize methods for analyzing authors' output. As a field, scientometrics shares common ground with bibliometrics, informetrics, and webometrics.

## Bibliometrics

When it comes to texts, documents, books, and information, bibliometrics is the study or measurement of their many formats. Pritchard used the word "bibliometrics" in 1969 to describe the study of how books and other forms of written communication can be analyzed using mathematical and statistical techniques. The article discussed the correlation between the rising paper count in the literature and typical library database utilization habits. Bibliographic databases are statistically valid samples of research-based publication activity. Although bibliometrics was first developed in the field of library and information science, it has since found widespread use across the research landscape. Since its inception in 1958, bibliometrics has undergone a complete revolution.

## Scientometrics

With the goal of better comprehending the dynamics of scientific research as a social activity, the field of scientometrics examines the quantitative elements of the production, dissemination, and use of scientific knowledge.

## Webometrics/Cybermetrics

It involves looking at the numbers behind websites. Both scientometrics (the quantitative study of science as a discipline or economic activity) and informatics (the quantitative study of information of any kind) focus on quantifying knowledge. Everything on the Internet is connected and the same, although it varies depending on the topic. Webometrics, a branch of information science, is "the study of web-based content with primarily quantitative methods for social science research goals using techniques that are not field-specific," as defined by the American Statistical Association. "the study of web-based information with mostly quantitative methodologies for social scientific research purposes employing procedures that are not exclusive to one field of study," as defined by Thelwall, which emphasizes the creation of applicable methods for usage throughout the social sciences. This revised definition was meant to replace something other than the old one within the field of information science so much as to aid in spreading the word about good practices that weren't necessarily associated with that field. Webometrics, also known as cyber metrics, is a field of study that employs quantitative methods to analyze the World Wide Web to learn more about its structure, users, and the links they use. Webometrics is defined as "the study of the quantitative aspects of the production and use of information resources, structures, and technologies on the Web relying on Bibliometrics and Informatics methodologies"[1]. Almond and Ingwersen first defined Webometrics in 1997.

### Informetrics

Mathematical techniques are applied to the subject matter of information science in a field called informetrics. The focus is on the "what" and "how" of data collection and analysis. Formetrie) was first used by Nacke in 1979. Informatics spans the following areas because it deals with creating, distributing, and consuming data in any format and from any source.

### Altmetrics

Social media metrics are an alternate way of gauging a system's usefulness. It's the latest technique for studying and evaluating social media sites online. Download and view count, citations and mentions in citation management software, and content sharing across various social networks are all indicators of the influence of the digital dissemination and sharing of scientific and academic activity.

## Bibliometric Analysis

The scope of bibliometric analysis extends to multiple tiers, including nations, institutions, authors, and periodicals. It can also help determine cooperation patterns between various parties, such as nations, organizations, and authors. The field of library and information science (LIS) boasts a plethora of authoritative primary journals published by a wide range of international houses. Elsevier (USA) will publish 42 issues of the acclaimed flagship Library & Information Science Research by 2020. This publication is a peer-reviewed, interdisciplinary journal with two independent reviewers. The website states that the magazine "focuses on the research process in library and information science, notably demonstration of innovative methodologies and theoretical frameworks or unexpected expansions or implementations of well-known methods and instruments." Studies in the more technical fields of information science, such as information extraction, language processing, or bibliometrics, are often not published. As an alternative, it publishes academic publications with a social science emphasis.

# Literature review

Over the past decade, several researchers have used bibliometrics to examine the content of a wide range of scholarly publications. For instance, in their study of the international magazine Scientometrics, Dutt, Garg, and Bal[2] looked at 1,317 publications published between 1978 and 2001. This study concluded that the United States share of global output shrank throughout the study period, while those of the Netherlands, India, France, and Japan all grew. Science policy experts paid the most attention to the field of scientometric evaluation of countries and organizations. From 2000 to 2007, 975 papers were published in the Journal of the American Society for Information Science and Technology, and this study performed a bibliometric analysis of these works. The research found that "authors" from 47 different nations contributed to the journal[3].

It should be noted that American and British authors produced the most significant contributions. After reading all 239 articles in the Journal of Informetrics, Das analyzed all five volumes[4]. The study found that "publishing output" increased by a factor of two, with the greatest increase coming from works with two authors. Publishes work from 32 different nations. Patil and Lihitkar examined 1,005 articles from 55 volumes (1958–2014) of Library Herald, a publication of the Delhi Library Association in India[5]. "more than three-fourths of the papers were single written and almost half of the contributions were by librarians working in universities, colleges, and other institutes," the survey concluded.

Using a total of 1,698 publications published in the "Defence Scientific Information & Documentation Centre (DESIDOC) Journal of Library and Information Technology" between 1992 and 2019, Garg, Lamba, and Singh conducted a bibliometric analysis (28 years)[6]. " The research revealed that 1,698 articles were provided from 39 different nations. Indian writers wrote the majority of them. U.S. publications received the highest CPP and RCI scores, indicating that their studies had the most influence. Readers interested in a comprehensive overview of research published in specific journals can look to the work of Kevin, Zainab, and Anuar[7]. The authors analyzed 82 bibliometric analyses of individual publications during 1998-2008. Twenty-eight per cent of all articles were written by Indian authors, according to the research. Only Garg, Lamba, and Singh's study looked at the influence of the works cited elsewhere. Mallari and Togia[8] became the only research paper directly relevant to LISR (Library and Information Science Research) in the literature search.

In a scientometric study covering 1999-2018, Verma, Sinha, and Shukla analyzed the patterns of scholarly publication in the field of information and communication technology (ICT) as indexed by the Scopus database. A total of 18382 scholarly articles appeared during this time frame. In 2017, a record 1,622 (8.82%) scholarly works were released. We analyzed 7345 research articles in the field of computer science, analyzing their year-by-year distribution, growth rates (annual, compound, and relative), authorship patterns (authorship patterns), degree of collaboration (collaborative index), and more. Between 2000 and 2015, Vellaichamy and Jeyshankar (2020)22 combed through the pages of the Journal of Ornithology. There were 1353 papers published, in which Germany accounts for 359 (26.51%), the USA for 210 (15.53%), the United Kingdom for 148 (10.95%), and Spain for 139 (10.26%).

The authors also analyzed the most prominent authors and institutions, relative growth rate, the authorship patterns, the document kinds, the author cooperation levels, the output by language, the distribution of papers across regions, and the languages used. Esakkimuthu Vellaichamy (2020) performed a bibliometrics study of the "International Journal of Robotics Research" from 2010 to 2019. A total of 983 papers were published, with a range of 0.92 to 0.99 in terms of the degree of collaboration (the mean was 0.97). The results indicated that 2019 was the most prolific year for article publication, with most submissions between 16 and 20 pages. The authors Garg, Lamba, and Singh (2020)[6] investigated the publications' geographical spread and development

trend, identified the most productive writers and institutions, and tallied up the most often referenced authors. The survey says more articles were published during 2012-15, followed by period of years 2016-19. Authors from India contributed to a disproportionately high proportion of the papers (86.1%). The bibliometrics analysis of 4832 papers cited for the 297 articles published in the "Defence Scientific Information & Documentation Centre (DESIDOC) Journal of Library and Information Technology" between 2011-2015 has been identified by Bapte, Vishal Dattatray's (2017)[9]. This analysis was performed using various parameters, including patterns of authorship, distribution of citation, the degree of collaborations between authors, and core journals. There was a significant correlation (53.1%) between how often journals were mentioned and their impact factors. The research by Bharvey, Sharma, and Shrivastava (2016)[2] relied on articles published in the Journal of Vegetable Science between 2008 and 2012. The authors analyzed 3882 citations recovered from 376 articles in 13 issues published during 2008-12 to learn about the distribution of articles over time, the keywords used frequently, patterns of authorship, the degree of collaborations; the author rank lists search; the length of articles; the type of articles; and the affiliations of the contributing authors. Publications peaked in 2009, according to the authors. Researched literature includes "Sujatha & Padmini," 2015[10], "Journal of IEEE Transactions on Antennas and Propagation". Of the 3442 articles written between 2010 and 2014, 820 cited external sources. 2014 saw the most publications with 789, while the average annual number is 688. The United States topped all countries with 921 articles delivered, followed by China with 574 articles and India in 21st position with 54 articles. The "Thavamani and Kotti (2015)"[11] study compiled a bibliometric analysis of research published on collaborative leadership between 2009 and 2014. The study investigated 223 research contributions and 343 authors, looking at year-to-year changes in contribution volume and author volume, job trends over time and volume, author productivity, authorship trends around the globe, author efficiency, and authorship growth and development. Collaborative writing obviously outperforms individual efforts, as seen by the average degree of collaboration. As part of their research, Vellaichamy and Jeyshankar (2015)[12] looked into the 158 articles in the Journal of Webology between 2004 and 2013. The value of C (the degree of cooperation) varies from 0.18 to 0.693, on average being 0.44. A total of 24.68% of articles analyzed were found to be web-based, while 15.82% were found to be social-media based. There are more articles from India than any other country, including Iran, the U.K., the U.S., or Australia. Collective research tendencies and authorship patterns in veterinary medicine were studied by Chandra Arya (2012)2. We can see that multi-authored papers are far more common in the "Indian Journal of Veterinary Medicine" (95.55%) than single-authored publications (4.45%). Degree of Collaboration equals 0.96 in veterinary science. An average of 2.92 writers per work is found. Kumar and Moorthy's (2011) bibliometric study spanned a decade. There were 271 articles published, citing 3428 sources; researchers looked at the distribution of references by length, year, institution, and authorship to draw this conclusion.

## Objectives

The purpose of this research is to examine the development of scholarly output over the last decade, from 2013 to 2020, in nine blocks of three years each, and to identify trends in article growth, citation impact using Citation per Paper (CPP) and i-10 index, highly cited paper identification, and patterns of domestic and international collaboration. The journal's content is structured around the following:

1. To obtain the complete list of articles published and citations for the specified publication between 2013-20;

2. To determine the number of articles published in a particular year by the journal from 2013-20;

3. Determine patterns of authorship from 2013-20 in the aforementioned journal;

4. To investigate the output of author.

5.  To investigate the documents type mentioned by writers in their research work between 2013-20,

6.  To investigate the degree of collaborations between authors,

7.  Create a ranking list of the journals cited by writers;

## Methodology

Journal of Information and Library Sciences (http://jlisnet.com) is where all of the data used in the research can be found. All of the downloaded articles and citations are placed in a Microsoft Excel spreadsheet where they may be analyzed from several angles. The study's goal is to do a bibliometrics analysis of the Journal of Library and Information Sciences. The timeframe for this study is just from 2013 to 2020.

In contrast, this study assessed the qualitative and quantitative methodologies used in articles published in the journal between 2013 and 2020. This research is a bibliometrics examination of *1866* articles appearing in Library and Information Science Research between the given years.

## Result

The analysis is based on the 89 articles and 1866 references cited in the Journal of Library and Information Sciences by the authors throughout the 2013-2020 study periods. The average number of quotations per article is 20.96; these quotations formed the basis for the assessment and interpretation of the study. The information was examined under the following headings:

**Table 1:** Average of citations per article

| Total number references | 1866 |
|---|---|
| Total number of articles | 89 |
| Average citations/article | 20.97 |

### *Year-Wise Distribution*

The maximum number of citations that is 382 (20.38%), is published from 2019, while the least numbers of citations, 65 (3.22%) are from 2013. This is seen in Table-2 and Figure-2.

**Table 2:** Year-wise Distribution

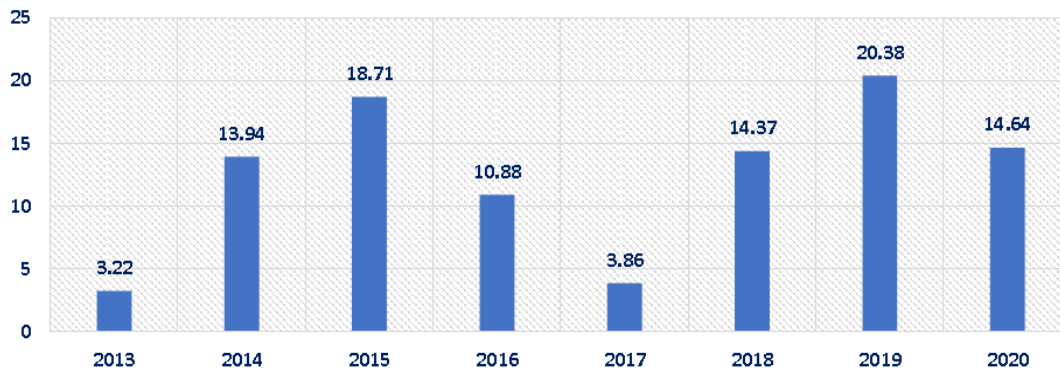| Year | Vol. No. | Number of citing papers | Number of cited items | % of Cited items |
|---|---|---|---|---|
| 2013 | 1 | 4 | 65 | 3.56 |
| 2014 | 2 | 13 | 255 | 13.63 |
| 2015 | 3 | 11 | 350 | 18.69 |
| 2016 | 4 | 11 | 202 | 10.90 |
| 2017 | 5 | 5 | 74 | 3.97 |
| 2018 | 6 | 13 | 266 | 14.26 |
| 2019 | 7 | 17 | 382 | 20.28 |
| 2020 | 8 | 15 | 272 | 14.74 |
| | Total | 89 | 1866 | 100 % |

**Figure 2:** Year-wise Distribution

## Volume-Wise Contributions

The volume and issue information for published journal articles is shown in Table 3. Volume 7 (2019) has the most published articles with 18, followed by volume 8 (2020) with 16 articles; Volume 2 (14) and Volumes 4 and 6 (12) are the same, and volume 3 has 12 articles (10). Minimum of three papers published in a volume (2013).

**Table 3:** Volume-wise Contributions

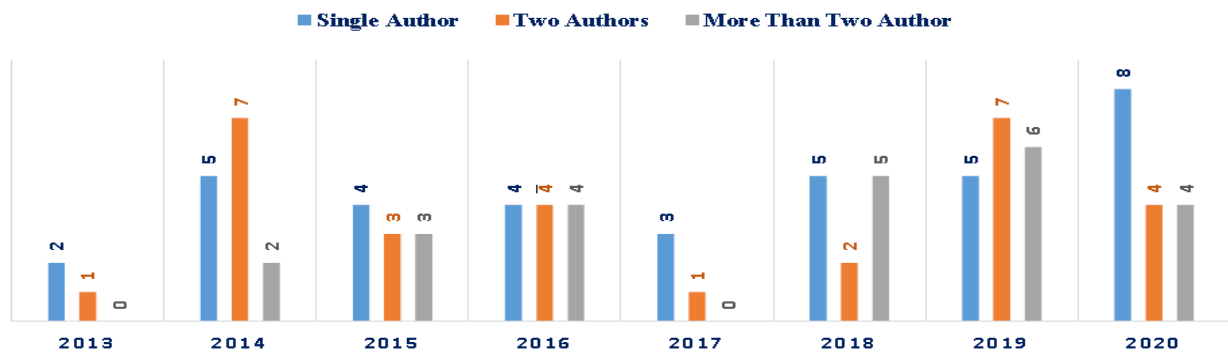| S. No. | Year | Vol. No. | Single author | Two authors | More than two authors | Total authors |
|--------|------|----------|---------------|-------------|------------------------|---------------|
| 1 | 2013 | 1 | 2 | 1 | 0 | 3 |
| 2 | 2014 | 2 | 5 | 7 | 2 | 14 |
| 3 | 2015 | 3 | 4 | 3 | 3 | 10 |
| 4 | 2016 | 4 | 4 | 4 | 4 | 12 |
| 5 | 2017 | 5 | 3 | 1 | 0 | 4 |
| 6 | 2018 | 6 | 5 | 2 | 5 | 12 |
| 7 | 2019 | 7 | 5 | 7 | 6 | 18 |
| 8 | 2020 | 8 | 8 | 4 | 4 | 16 |
| Total | | 8 | 36 | 29 | 24 | 89 |
| % | | | 40.45 | 32.58 | 26.97 | 100 |

## Authorship Pattern of Contribution

The authorship's distributions of 89 journal articles published in total 8 volumes are depicted in Table-4 and Figure 3. The maximum number of publication by a single author is 36 (40.45%), followed by two writers with 29 (32.58%) and more than two authors with 24 (26.97%). The fact that 59.55 per cent of published articles result from joint authorship demonstrates that collaborative research is prevalent today.

**Table 4:** Authorship pattern of contribution

| S. No. | Year | Vol. No. | Single author | Two authors | More than two authors | Total authors |
|---|---|---|---|---|---|---|
| 1 | 2013 | 1 | 2 | 1 | 0 | 3 |
| 2 | 2014 | 2 | 5 | 7 | 2 | 14 |
| 3 | 2015 | 3 | 4 | 3 | 3 | 10 |
| 4 | 2016 | 4 | 4 | 4 | 4 | 12 |
| 5 | 2017 | 5 | 3 | 1 | 0 | 4 |
| 6 | 2018 | 6 | 5 | 2 | 5 | 12 |
| 7 | 2019 | 7 | 5 | 7 | 6 | 18 |
| 8 | 2020 | 8 | 8 | 4 | 4 | 16 |
| Total | | 8 | 36 | 29 | 24 | 89 |
| % | | | 40.45 | 32.58 | 26.97 | 100 |



**Figure 3:** Authorship pattern of contribution

## *Degree of Collaboration (K. Subramanyam's Formula)*

"K. Subramanyam's formula" (1983) has been used in this part to obtain the degree of collaboration for this study. This is

$$C = Nm / Nm + Ns$$

Here,

C is "Degree of collaboration";

Nm is "Number of multiple authors";

Ns is "Number of single authors";

The value of the "Degree of collaboration" (C) of the study is 0.60 (53 / 89 = 0.60)

Table- 5 and Figure- 4 illustrate the level of collaboration between writers and their works. During the eight years, single writers produced 36 articles, while multiple authors written jointly 53 articles, as presented in the table and graph. In terms of year and volume, the journal's degree of collaboration lies between (0.25 to 1) ranges. (0.72). Despite changes in the collaboration's degree, the maximum level in 2019 is 0.72. Throughout the period (2013-2020), the average degree of cooperation (C) is 0.60, suggesting that collaborative research among authors is widespread in the publication.

**Table 5:** Degree of collaboration (Subramanyam's Formula)

| S. No. | Year | Vol. No. | Multi authord papers (Nm) | Single authord papers (Ns) | Nm+Ns | Degree of collaboration (C) |
|---|---|---|---|---|---|---|
| 1 | 2013 | 1 | 1 | 2 | 3 | 0.33 |
| 2 | 2014 | 2 | 9 | 5 | 14 | 0.64 |
| 3 | 2015 | 3 | 6 | 4 | 10 | 0.60 |
| 4 | 2016 | 4 | 8 | 4 | 12 | 0.67 |
| 5 | 2017 | 5 | 1 | 3 | 4 | 0.25 |
| 6 | 2018 | 6 | 7 | 5 | 12 | 0.58 |
| 7 | 2019 | 7 | 13 | 5 | 18 | 0.72 |
| 8 | 2020 | 8 | 8 | 8 | 16 | 0.50 |
| | Total | | 53 | 36 | 89 | 0.60 |
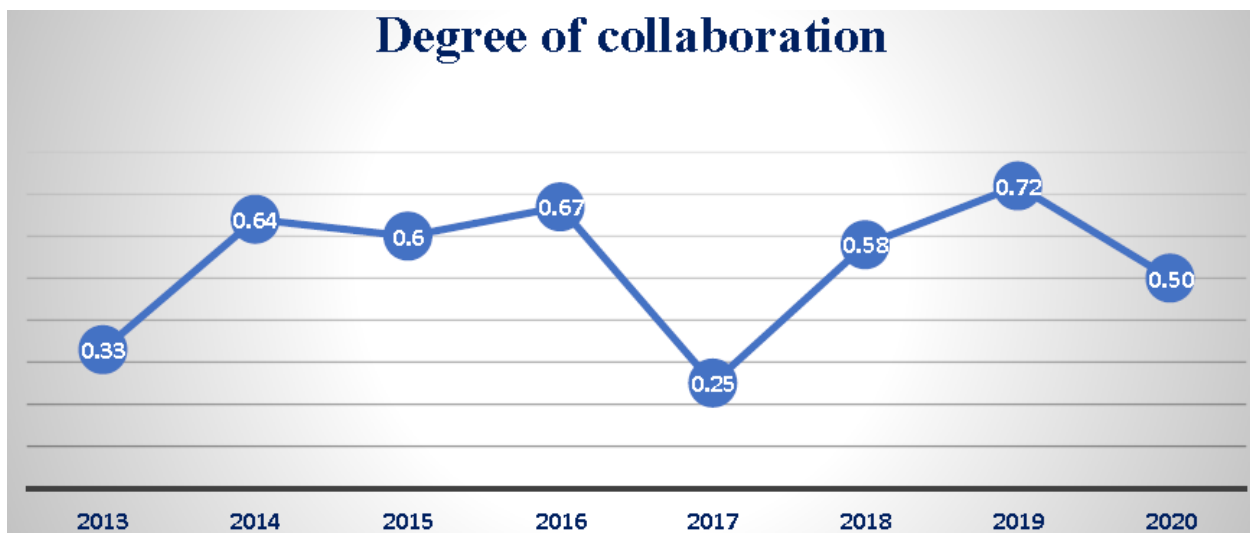


**Figure 4:** Degree of collaboration

## Author Productivity

During 2013 and 2020, the journals had 175 contributing authors who together published 89 articles, for an 'AAPP' of 1.97 and a 'PPA' of 0.51. This year, 2019, has had the most output per author 18 (0.44). Table-6 and Figure-5 show the full extent of the dispersion of this pattern.

**Table 6:** Authors' productivity

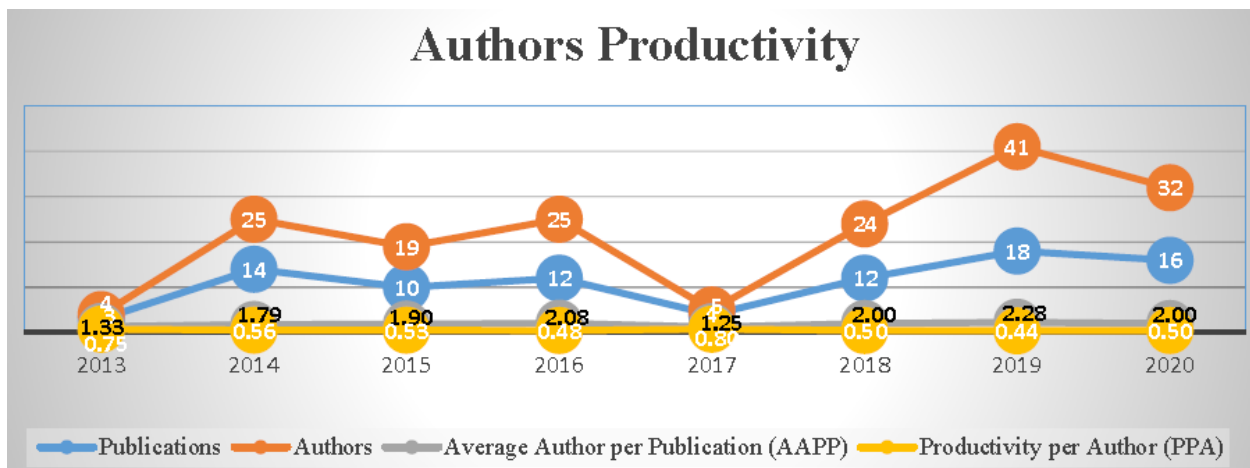| S. No. | Year | Publications | Authors | Average Author per Publication (AAPP) | Productivity per Author (PPA) |
|---|---|---|---|---|---|
| 1 | 2013 | 3 | 4 | 1.33 | 0.75 |
| 2 | 2014 | 14 | 25 | 1.79 | 0.56 |
| 3 | 2015 | 10 | 19 | 1.9 | 0.53 |
| 4 | 2016 | 12 | 25 | 2.08 | 0.48 |
| 5 | 2017 | 4 | 5 | 1.25 | 0.8 |
| 6 | 2018 | 12 | 24 | 2 | 0.5 |
| 7 | 2019 | 18 | 41 | 2.28 | 0.44 |
| 8 | 2020 | 16 | 32 | 2 | 0.5 |
| | Total | 89 | 175 | 1.97 | 0.51 |

**Figure 5:** Authors' productivity

## *Length of Articles Wise Contributions*

The duration of articles published from 2013 to 2020 is shown in Table 7. In order to put a figure on the length and quantity of pages in scholarly publications, a range of pages has been developed that accounts for 10 standard deviations between each category. There are 53 articles (59.55%) that are between 1 and 10 pages long, 28 articles (31.46%) that are between 11 and 20 pages long, 5 articles (5.62%) that are between 21 and 30 pages in length, and 3 articles (3.37%) that are 31 pages or longer.

**Table 7:** Length of articles wise contributions

| S. No. | No. of pages | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 01 - 10 | 3 | 7 | 3 | 6 | 3 | 9 | 11 | 11 | 53 | 59.55 |
| 2 | 11 - 20 | 0 | 6 | 3 | 5 | 1 | 2 | 6 | 5 | 28 | 31.46 |
| 3 | 21 - 30 | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 5 | 5.62 |
| 4 | 31 and above | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 3.37 |
| | Total | 3 | 14 | 10 | 12 | 4 | 12 | 18 | 16 | 89 | 100 |

## *Source of documents distributions*

About 53.14 percent of academics' output is articles, whereas for books it is 17.96 %, online resources are 14.8 %, conference papers are 8.10 %, reports and newsletters are 3.49%, thesis and dissertations contributes 1.39%, and reference works 1.1 %. The most often cited sources are articles published books, the Web, conference papers, newsletters, reports, theses, and dissertations.

**Table 8:** Source of Documents Distributions

| S. No. | Sources of document cited | No. of documents | % |
|---|---|---|---|
| 1 | Journals articles | 991 | 53.14 |
| 2 | Books | 335 | 17.96 |
| 3 | Web based sources | 276 | 14.80 |
| 4 | Conference proceedings | 151 | 8.10 |
| 5 | Reports/ Newsletters | 65 | 3.49 |
| 6 | Thesis/ Dissertation | 26 | 1.39 |
| 7 | Dictionary/ Encyclopedias/ Directory | 13 | 0.70 |
| 8 | Newspapers | 8 | 0.43 |
| | Total | 1865 | 100 |

*Journals Rank List*

"Library Philosophy and Practice (e-journal)" from the United States received the most citations with 72, followed by "The Electronic Library" with 16 and "International Journal of Humanities and Social Sciences" with 14. The following is a list of the top 10 most-cited journals.

**Table 9:** Top 10 journals rank list

| Rank | Journals | No. of citations |
|------|----------|------------------|
| 1st | "Library Philosophy and Practice" (e-journal) | 73 |
| 2nd | "The Electronic Library" | 17 |
| 3rd | "International Journal of Humanities and Social Sciences" | 15 |
| 4th | "Journal of Business Ethics" | 9 |
| 5th | "Libri" | 11 |
| 6th | "Turk Kütüphaneciler Derneği Bülteni" | 10 |
| 7th | "Journal of Information Science" | 8 |
| 8th | "Journal of Documentation" | 11 |
| 9th | "Scientometrics" | 7 |
| 10th | "Journal of Librarianship and Information Science" | 9 |

# Conclusion

According to the output pattern, the growth rate of articles produced throughout the study period varies significantly from one block to the next. The results of the preceding bibliometrics study indicate that the United States of America is the preeminent research location for the discipline of library and information science worldwide. Its total number of articles is the greatest, leading to local and international cooperation. The biggest number of journals published in the USA was indexed by the four worldwide abstracting and indexing services on the subject of LIS, which lends credence to this claim. The United States is home to renowned academic institutions and literary figures. The United States produced most of the most-cited papers, yet its CPP value for papers is lower than that of Norway and Finland. Only out of the total number of articles published in Library and Information Science Research were never mentioned by other researchers, suggesting that this journal is a reliable outlet for high-quality research. This indicates that the journal's readers find great value in published articles.

The current investigation may be useful to researchers in bibliometrics and scientometrics. According to the data collected for this study, most participants are located in India. Eighty-nine publications published between 2013 and 2020 were cited 1866 times. An average of 20.96 citations per article is found. Out of 89 articles, 2019 accounted for 18 (or 20.38 per cent) and had 380 citations. During this period, the top 991 journals are mentioned the most. Fifty-three of 89 papers (59.55%) had multiple authors (1121 citations). The electronic journal Library Philosophy and Practice consistently ranks first. The current study's authors make the following recommendations for follow-up investigation based on its results and analyses. In addition to webometric, scientometric, and temporal authorship analyses, journal and field-specific citation patterns may be performed.

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