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A Bibliometric Study of Papers Published in Library and Information Science Research during 1994-2020

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ABSTRACT

The paper analysed 699 papers published in Library & Information Science Research (LISR) during the period of 1994-2020. Google Scholar was used to obtain the number of citations received by these papers until April 30, 2021. The study examined the geographical distribution of published articles and also identified prolific institutions and authors. The study examined the impact of output of countries, institutions and authors using citation per paper (CPP) and i-10 index as indicators of impact. The study also examined the pattern of growth and identified the highly cited papers. Based on the analysis of data it is observed that maximum articles were published during the three years block of 2015-2017. The geographical distribution of output indicates that 51 countries contributed the 699 papers. Highest number of papers was contributed by authors from the USA though it had a low value of CPP in comparison to Norway and Finland. Among the institutions, Florida State University (USA) topped the list. However, University of Illinois at Urbana-Champaign, USA had the highest value of CPP. During the period of study, 1,389 papers received 74,061 citations, of which only 41 (3 %) articles remained uncited.

Keywords: Bibliometrics; Scientometrics; Citation analysis; i-10 index; Library & Information Science Research

1. INTRODUCTION

Primary journals are the most important channels of scholarly communication. These reflect the issues of importance to a field of study and a profession. Papers published in primary journals are the indicators of literature growth in any particular field of knowledge and facilitate in making an in-depth study of a discipline in its entirety. Bibliometric analysis can be used at different levels like countries, institutions, authors and journals. It can also serve to identify collaborative patterns among different actors like countries, institutions and authors. A large number of primary journals are published in the discipline of library and information science (LIS) from different parts of the world by different publishers. *Library & Information Science Research* is a prestigious primary journal in the field of LIS, published by Elsevier (USA) and has published 42 volumes till 2020. It is a cross-disciplinary and double blind peer reviewed journal. According to the information available on the website of the journal https://www.journals.elsevier.com/library-and-information-science-research, the journal "focuses on the research process in library and information science, especially demonstrative of innovative methods and theoretical frameworks or unusual extensions or applications of well-known methods and tools. It publishes research articles primarily from a social science perspective and does not normally publish technical information science studies like algorithmic methods related to information retrieval or natural language processing or bibliometric studies". Impact Factor of the journal for 2019 is 1.485, SCImago journal ranking (SJR) for 2020 is 1.225 and the journal is listed in quartile one (Q1) for 2020 with h-index value 57. Major objective of the present study is to examine the pattern of growth of publications, identification of prolific countries, institutions and authors as well as the impact of their output in terms of average citations and i-10 index besides examining domestic and international collaboration of different countries.

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2. LITERATURE REVIEW

In past one decade, several authors have undertaken the bibliometric analysis of several individual journals. For instance Dutt, Garg and Bali[1] analysed 1,317 papers published during 1978-2001 in the international journal *Scientometrics*. "The study found that during the study period, the US share of output decreased, while the share of the Netherlands, India, France and Japan increased. The area of scientometric assessment of nations and institutions received the maximum attention". A bibliometric analysis of 975 articles published in the *Journal of the American Society for Information Science and Technology* from 2000 to 2007 was made by. Results of the study indicate that "authors' from 47 countries contributed articles to the journal[2]. The dominant contributions were

made by the authors from USA followed by the UK". Das[3] analysed 239 papers published in the five volumes of *Journal of Informetrics.* Findings of the study revealed that "the publication output doubled over the study period with highest number of two-authored contributions. Thirty two countries across the world contributed to the journal". Patil and Lihitkar[4] analysed 1,005 articles published in 55 volumes (1958-2014) of *Library Herald* published by Delhi Library Association, India. The study found that "more than three-fourth of the articles were single authored and about half of the contributors were by librarians working in the universities, colleges, and other institutes". Garg, Lamba and Singh[5] made a bibliometric analysis of 1,698 papers (based on complete count of papers) published in *DESIDOC Journal of Library and Information Technology* during 1992-2019 (28 years). "The study found that 1,698 articles were contributed by 39 countries. Among these, maximum contributions were made by Indian authors. However, the papers published by USA made the maximum impact as reflected by the values of citation per paper (CPP) and relative citation impact (RCI)". For a detailed review of studies on individual journals readers can refer to Kevin, Zainab and Anuar[6]. Authors made a review of 82 bibliometric studies of individual journals in different disciplines published during 1998-2008. The study found that "the Indian authors contributed 28 per cent of the total articles". None of the above quoted studies examined the impact of the published papers except the study by Garg, Lamba and Singh. The review of literature found one study related to *Library and Information Science Research (LISR)* by Malliari and Togia[7]. However, it is no way similar to the present study as it examined the research approaches and the types of quantitative and qualitative research methods used in articles published in the journal between 2005 and 2010. The present study is a bibliometric analysis of 699 papers published in *Library and Information Science Research* during 1994-2020 (27 years) with the objectives mentioned below.

3. OBJECTIVES OF THE STUDY

The aim of the study is to examine the pattern of growth of articles published during the 27 years period of 1994-2020 in nine blocks, each of three years and their distribution in terms of countries, institutions and authors and their citation impact using Citation per Paper (CPP) and i-10 index, citation pattern of the published articles and identification of highly cited papers and the pattern of domestic and international collaboration.

4. DATA, METHODOLOGY AND BIBLIOMETRIC INDICATORS USED

Authors downloaded the data from the website of the journal available at https://www.journals.elsevier.com/library-and-information-science-research for a period of 27 years from volume 16 (1994) to volume 42 (2020). Thus, 699 records published during 1994-2020 were downloaded. MS Excel software was used for downloading the data and analysis. Downloaded data consisted name of all the authors along with their affiliation(s), year of publication of the paper; and citations received by each paper. Though, the selected journal is indexed in different recognised global databases like Web of Science and Scopus. These databases were not accessible to the authors of the paper as these are very costly. Hence the citation data was obtained from Google Scholar in the month of April 2021. For finding out the number of citations, title of the paper was pasted in the search box of Google Scholar and the number of citations as reflected in the search results was recorded in the MS Excel data sheet. Data was analysed to examine growth of articles published during the study period of 1994 to 2020, most prolific countries, institutions and authors and the impact of their output using citation per paper and i-10 index. Authors also examined the citation pattern of output and identified highly cited papers as well as pattern of domestic and international collaboration. Authors have used the method of complete count for analysis of publications output and the citations received by them. This method is different from the first author count where only the first author gets the credit. In the complete count method each country or institution or authors in multi-authored papers are given unit credit for their contributions which inflates the number of contributions and citations. The actual number of papers in the present case was 699 and these have also increased to 1389, because of the method of complete count.

Four different bibliometric indicators namely TNP: total number of publications published during 1994-2020, TNC: total number of citations received by these papers during 1994-2020 (April 30, 2021) as reflected by Google Scholar, CPP: citation per paper, and i-10 index have been used for comparison of output and impact of countries, institutions and authors. The details of these indicators can be seen in Garg, Lamba and Singh. Google scholar developed i-10 index and it was obtained by analyzing the citation data. It indicates the number of publications that received 10 or more citations. For example, suppose USA received 34,479 citations for 647 papers published by it. Of these, 509 papers received 10 or more citations. Hence i-10 index for USA will be 509.

5. RESULTS AND ANALYSIS

In the following paragraphs we discuss the results of the study on different parameters mentioned under the objectives.

Table 1. Chronological distribution of output

Year	TNP	TNP (%)	Growth rate (%)
1994-1996	47	6.7	-
1997-1999	54	7.7	14.5
2000-2002	50	7.2	(-)7.4
2003-2005	72	10.3	44.0
2006-2008	83	11.8	15.3
2009-2011	90	12.9	8.4
2012-2014	96	13.7	6.7
2015-2017	109	15.6	13.5
2018-2020	98	14.0	(-)10.1
Total	699	100	
Average per block	77.7		

Table 2. Distribution of output and impact of most prolific countries

#	Country	TNP	TNC	CPP	i-10index (%)
1.	USA	647	34439	53.2	509 (78.7)
2.	Canada	145	10463	72.2	124 (85.5)
3.	UK	82	5383	65.6	71 (86.6)
4.	Australia	82	4776	58.2	72 (87.8)
5.	China	46	677	14.7	23 (50.0)
6.	Finland	40	4051	101.3	38 (95.0)
7.	Iran	30	415	13.8	11 (36.7)
8.	South Korea	26	1395	53.7	23 (88.5)
9.	Norway	24	2605	108.5	21 (87.5)
10.	Taiwan	24	1069	44.5	17 (70.8)
11.	Spain	23	608	26.4	14 (60.9)
12.	Hong Kong	21	1276	60.8	17 (81.0)
13.	Israel	18	904	50.2	15 (83.4)
14.	Greece	14	641	45.8	8 (57.1)
	Sub-total	1,222	68,702	56.2	963 (78.8)
	Other 37 countries	167	5,359	32.1	101 (60.4)
Total		1,389	74,061	53.3	1064 (76.6)

Table 3. Distribution of output and impact of most prolific institutions

#	Name of the institution	TNP	TNC	CPP	i-10 index (%)
1.	Florida State University, USA	93	4582	49.3	86 (92.5)
2.	University of Western Ontario, Canada	40	3345	83.6	38 (95.0)
3.	The University of North Carolina at Chapel Hill, USA	34	2049	60.3	30 (88.2)
4.	University of Toronto, Canada	29	1270	43.8	23 (79.3)
5.	Indiana University Bloomington, USA	27	725	26.9	22 (81.5)
6.	McGill University, Canada	25	2301	92.0	22 (88.0)
7.	University of Tampere, Finland	24	3542	147.6	24 (100.0)
8.	University of Alberta, Canada	22	2528	114.9	22 (100.0)
9.	University of Tennessee, USA	22	2166	98.5	20 (90.9)
10.	The State University of New Jersey, USA	21	921	43.9	21 (100.0)
11.	Wuhan University, China	20	298	14.9	11 (55.0)
12.	Charles Stuart University, Australia	19	1149	60.5	19 (100.0)
13.	Queensland University of Technology, Australia	17	841	49.5	14 (82.4)
14.	The University of Hong Kong, Hong Kong	17	967	56.9	15 (88.2)
15.	University of Illinois at Urbana-Champaign, USA	16	2496	156.0	12 (75.0)
16.	University of Kentucky, USA	15	607	40.5	7 (46.7)
17.	University of Wisconsin-Milwaukee, USA	15	400	26.7	5 (33.3)
	Sub total	456	30,187	66.2	391 (85.7)
	Other 376 institutions	933	43,874	47.0	673 (72.1)
Total		1389	74,061	53.3	1064 (76.6)

5.1 Chronological Distribution of Output

Table 1 presents the distribution of output during the period of 1994-2020 in nine different blocks of three years each. This grouping is done as the yearly data may fluctuate and may not provide the correct pattern of literature growth. During the study period 699 articles in 27 volumes were published by the journal. Thus, on average, 25.9 papers in each volume and 77.7 articles in each block of three years was published by the journal. Data depicted in Table 1 indicates that the journal published less than average number of articles per block in the first four blocks, the lowest being in the first block of 1994-1996. The number of articles started increasing after the third block of 2003-2005 and highest number of articles were published in the block of 2015-2017 in which the journal published about 16 per cent of all articles followed by articles in the last block of 2018-2020 contributing about 14 per cent of articles. Thus, in these two blocks, the journal published about 30 per cent of total articles. Table 1 also indicates that in terms of the absolute output, the number of papers is increasing; however, rate of growth of published articles is inconsistent. Highest rate of growth (44 %) was during the period of 2003-2005 and the number of articles published had a negative rate of growth for the two blocks of 2000-2002 and the last block of 2018-2020.

5.2 Prolific Countries and Impact of their Output

Analysis of data indicates that 51 countries contributed the total output. Table 2 depicts data on the distribution of output and its impact in terms of citations per paper (CPP) and i-10 index by prolific countries. Fourteen countries depicted in Table 2 contributed one percent or more papers and accounted for ~88 per cent of the total output and the remaining 37 countries contributed about 12 per cent of the total output. The pattern of output indicates a highly skewed distribution of research output as the output of the 37 countries not listed in Table 2 varied between one to 12 papers only. Among the prolific countries listed in Table 2, USA produced the maximum number of publications contributing about 46.6 per cent of the total output similar to the study of the *Journal of the American Society of Information Science and Technology* by Mukherjee. This was followed by the output from Canada, which contributed much less number of papers as compared to the USA. Thus, these two countries together produced about 57 per cent of the total output. The remaining 12 countries not listed in Table 2 contributed 31 per

Table 4. Highly prolific authors

#	Author	Institution	TNP	TNC	CPP	i-10 index (%)
1.	Stvilia, Besiki	Florida State University, USA	10	437	43.7	9 (90.0)
2.	Savolainen, Reijo	University of Tampere, Finland	10	2284	228.4	10 (100.0)
3.	Gross, Melissa	Florida State University, USA	9	665	73.9	9 (100.0)
4.	Dilevko, Juris	University of Toronto, Canada	8	135	16.9	6 (43.2)
5.	Julien, Heidi	University of Alberta, Canada	7	949	135.6	7 (100.0)
6.	Aharony, Noa	Bar-Ilan University, Israel	7	358	51.1	6 (85.7)
7.	Large, Andrew	McGill University, Canada	6	666	111.0	6 (100.0)
8.	Thelwall, Mike	University of Wolverhampton, UK	6	279	46.5	6 (100.0)
9.	Van Scoy, Amy	University at Buffalo, USA	5	47	9.4	2 (40.0)
10.	McClure, Charles R.	Florida State University, USA	5	180	36.0	5 (100.0)
11.	Shaw, Debora	Indiana University, USA	5	99	19.8	3 (60.0)
12.	Latham, Don	Florida State University, USA	5	424	84.8	5 (100.0)
13.	Burnett, Gary	Florida State University, USA	5	300	60.0	5 (100.0)
14.	Luo, Lili	San Jose State University, USA	5	171	34.2	5 (100.0)
15.	Kazmer, Michelle M	Florida State University, USA	5	103	20.6	5 (100.0)
16.	Marty, Paul F.	Florida State University, USA	5	209	41.8	5 (100.0)
17.	Hernon, Peter	Simmons College, USA	5	275	55.0	4 (80.0)
18.	Shachaf, Pnina	Indiana University, USA	5	305	61.0	5 (100.0)
19.	Sin, Sei-Ching Joanna	Nanyang Technological University, Singapore	5	367	73.4	5 (100.0)
	Sub total		118	8253	69.9	109 (92.4)
	Other authors contributing papers in the range of 1-4		1271	65808	51.8	955 (75.1)
Total			1389	74061	53.3	1064 (76.6)

cent papers in the range of 14 to 82 papers. It also indicates a skewed distribution of output.

CPP and i-10 index was used to examine the impact of the publication output of these 14 prolific countries. The value of CPP for the global output is 53.3. Table 2 indicates that China, Iran, Taiwan, Spain, Israel, and Greece had lower value of CPP than the global value of CPP. Among these six countries, Iran had the lowest value of CPP followed by China. The value of CPP for USA is close to the global value. For rest of the countries, the value of CPP is more than the global value of CPP indicating that the papers published by these countries were cited more than the world average. Among the countries listed in Table 2, highest value of CPP is for Norway (108.5) followed by Finland (101.3). Among all the papers more than three-fourth (76.5 %) papers were cited 10 or more times and remaining papers (23.5 %) were cited less than 10 times. Among the countries listed in Table 2, USA had the highest number of papers cited more than 10 times in absolute terms, but proportion of papers cited 10 or more times having highest value of i-10 index was for Finland as 95 per cent of papers published by Finland were cited 10 or more times. Next in rank for proportion of papers being cited 10 more times was South Korea closely followed by Australia, Norway, UK, and Israel.

5.3 Distribution of Output and the Impact of Prolific Institutions

An analysis of data for institutional productivity found that 393 institutions from different parts of the world produced the total output. Average number of institutions per paper is 3.5. Prolific institutions producing one percent or more of the output have been depicted in Table 3. The output of these 17 institutions was about one-third (32.8 %) of the global output. The proportion of citations received by these institutions was 40.8 per cent of all the citations. Remaining 376 institutions produced 67.2 per cent of the total output and received about 59.2 per cent of all citations. Of the 17 institutions listed in Table 3, eight were located in USA and remaining nine institutions were located in Canada (4), Australia (2), Finland, China and Hong Kong one each. Florida State University (USA) topped the list with 6.7 per cent papers followed by University of Western Ontario (Canada) with 2.9 per cent share of papers. For the listed prolific 17 institutions the CPP is 66.2, which is higher than global value of CPP. Among these institutions, the value of CPP is highest (156.0) for University of Illinois at Urbana-Champaign, USA followed by University of Tampere, Finland with a CPP value of (147.6) and University of Alberta (Canada) with a CPP value of 114.9. At the same time the value of CPP was less than the average value of CPP for eight institutions. Among these seven institutions, Wuhan University (China) had the lowest value of CPP followed by University of Wisconsin-Milwaukee (USA), and Indiana University Bloomington (USA). All papers published by University of Alberta (Canada), The State University of New Jersey (USA), and Charles Stuart University (Australia) were cited 10 or more times.

5.4 Distribution of Output and the Impact of Prolific Authors

The total output was produced by 1,290 authors. Thus, the average number of authors per paper is 1.1. Table 4 lists 19 prolific authors contributing five or more papers during the study period. Of the 19 prolific authors, 12 were from the USA and the remaining seven were from Canada (3), Finland, Israel, UK and Singapore one each. Seven of 19 prolific authors were from Florida State University (USA) and two from Indiana University, USA. Remaining 10 authors were scattered in 10 different institutions. These 19 authors published 118 (8.5 %) papers. The remaining 91.5 per cent papers were contributed by 1,271 authors indicating a highly skewed output among the authors. Of the 1,271 authors, 921 (66.3 %) authors produced one paper only whereas the remaining 350 (25.2 %) authors produced two to four papers. Stvilia, Besiki of Florida State University (USA) and Savolainen, Reijo of University of Tampere (Finland) topped the list with 10 papers each. Table 4 indicates that the value of CPP was higher than global value of CPP (53.3) for nine authors, and for the remaining, it was less than 53.3. Among all the authors, CPP was highest (228.4) for Savolainen, Reijo of University of Tampere (Finland). Other two authors for whom the CPP was more than 100 were Julien, Heidi of the University of Alberta (Canada) and Large, Andrew of the McGill University (Canada). These three authors had high values of CPP because all their papers were cited 10 or more times. The value of CPP was lowest for Van Scoy Amy of the University of Buffalo (USA) and Dilevko, Juris of the University of Toronto (Canada), because the proportion of papers published by these authors cited 10 or more times was about 40 per cent.

5.5 Pattern of Citations and Highly Cited Papers

Citation counts are used to examine the impact of each article published in the journal by making a count of the number of times these are cited by other articles. Citation counts are used to evaluate the influence of an article by determining how often it has been cited by other researchers. High number of citations to a publication is considered as an indication of influence, visibility and impact. An author's visibility can be measured by determining how often his/her articles have been cited in other articles. Table 5 depicts the citation distribution of papers published in the journal during 1994-2020. Citations of papers were examined in the last week of April 2021. During this period, 1,389 papers received 74,061 citations. Of the total papers included in the analysis only a minuscule number 41(3 %) of papers were not cited. Of the total cited papers, 11.9 per cent were cited between 1-5 times. The remaining papers were cited more than five times. About 15 per cent papers were cited more than 100 times of which 53 (3.8 %) were cited more than

Table 5. Distribution of citations

Number of citations	TNP (%)	Total citations
0 (Uncited)	41 (3.0)	0
1	27 (1.9)	27
2	27 (1.9)	54
3	31 (2.2)	93
4	32 (2.3)	128
5	50 (3.6)	250
6-10	136 (9.8)	1085
11-15	125 (9.0)	1656
16-20	109 (7.8)	1980
21-25	71 (5.1)	1636
26-50	300 (21.6)	11050
51-100	225 (16.2)	16082
101-200	142 (10.2)	18958
201-300	53 (3.8)	12122
> 300	20 (1.4)	8940
Total	1,389 (100.0)	74,061

Table 6. Highly cited papers

#	Author (affiliation) and bibliographic detail of paper	TNC (CPY)
1.	Savolainen, R. (University of Tampere, Finland) LISR, 17(3), 1995, 259-294	1326 (53)
2.	Haythornthwaite, C. (University of Illinois, USA) LISR, 18(4), 1996, 323-342	1228 (51)
3.	Talja, S. (University of Tampere, Finland) LISR, 21(4), 1999, 459-477	474 (23)
4.	Williamson, K. (RMIT University, Australia) LISR, 20(1), 1998, 23-40	474 (22)
5.	Jansen, B.J. (The Pennsylvania State University, USA) LISR, 28(3), 2006, 407-432	384 (27)
6.	*Connaway, L.S.; *Dickey, T.J. and **Radford, M.L. (*OCLC Research, USA and**Rutgers University, USA) LISR, 33(3), 2011, 179-190	382 (42)
7.	Onwuegbuzie, A.J. (University of Central Arkansas, USA) LISR,19(1), 1997, 5-33	353 (15)
8.	Seonghee, K. and *Boryung, J. (Chung-Ang University, Korea, and *Louisiana State University, USA) LISR, 30(4), 2008, 282-290	340 (28)
9.	Gross, M. and Latham, D. (The Florida State University, USA) LISR, 29(3), 2007, 332-353	333 (26)
10.	Julien, H. and Barker, S. (University of Alberta, Canada) LISR, 31(1), 2009, 12-17	332 (30)
11.	Aabo, S. and Audunson, R. (Akershus University College of Applied Sciences, Norway) LISR, 34(2), 2012, 138-149	314 (39)
12.	Agosto, D.E. and Hughes-Hassell, S. (Drexel University, USA) LISR, 27(2), 2005, 141-163	306 (20)
13.	Westbrook, L. (University of Michigan, USA) LISR,16(3), 1994, 241-254	305 (12)
	Total	6551

200 times and 20 (1.4 %) papers were cited more than 300 times.

5.6 Highly Cited Papers

Highly cited papers which were cited more than 300 times have been depicted in Table 6. These 13 papers attracted 6,551 (8.8 %) of all citations. Two most highly cited papers which received more than 1000 citations originated from University of Tampere (Finland) and the other from University of Illinois (USA). Of the 13 highly cited papers, 8 papers originated from institutions located in the USA and the rest five originated from Finland (2), Australia, Canada, and Norway one each. Since the number of citations received depends upon the citation window, i.e., the time period for which citations were calculated. The variation in citations was normalised by using Citation per Year (CPY) used by Garg and Tripathi[9]. Analysis of data based on CPY results a change in the ranking of authors based on total citations. For example, the author ranked at 6 will change to rank 3 if arranged by CPY. Similarly, the paper ranked at 11 will also change to 4. However, rank for the first two authors remain unchanged. Of the 19 highly cited papers one is authored in international collaboration (# 8) and one in domestic collaboration (# 6).

5.7 Pattern of Domestic and International Collaboration

During 1994-2020, of the 699 papers published in the journal, 192 (27.5 %) were published in domestic collaboration by 26 different countries and 83 (11.8 %) papers in international collaboration by 27 different countries. Table 7 depicts the distribution of papers in domestic and international collaboration by country. Of the 192 papers published in domestic collaboration, 104 papers were published by USA followed by Canada (15) and UK (9). Thus, these three countries published 128 (66.7 %) papers in domestic collaboration and remaining 64 (33.3 %) papers were published by 23 countries. Of the 78 papers published in international collaboration, 25 papers were published by USA followed by Canada (12) and China (8) and the remaining 37 papers by other 12 countries. USA published 25 papers in international collaboration with 15 different countries. Highest number of collaborative papers was published with Canada (5) followed by Australia and South Korea three each and Finland and China two each. Only one paper each was published in collaboration with UK, Honduras, New Zealand, South Africa, Mexico, Thailand, Japan, Sweden, India, and Taiwan. Canada published four papers in international collaboration with USA followed by three papers with Australia and two papers with UK.

Florida State University (USA) published the highest number of papers in domestic collaboration with different institutions located in the USA. University of Maryland had the highest (3) number of papers in collaboration, while six other universities had two papers, and nine universities had only one paper in collaboration with Florida State University. University of Tennessee at Knoxville, USA had collaboration with six different universities. Among other institutes, University of Toronto (Canada) had collaboration with four different institutes and the University of Western Ontario London, Ontario had three collaborative papers.

Table7. Distribution of domestic and international collaborative papers by country

#	Country	Papers in domestic collaboration	Papers in international collaboration	Total papers
1.	USA	104	25	129
2.	Canada	15	12	27
3.	UK	9	4	13
4.	Australia	7	5	12
5.	China	7	8	15
6.	Iran	6	1	7
7.	South Korea	5	2	7
8.	Taiwan	4	3	7
9.	Spain	4	0	4
10.	Hong Kong	4	2	6
11.	Israel	3	0	3
12.	Pakistan	3	1	4
	*Other 15 countries with international collaboration **Other 14 countries with domestic Collaboration	21**	15*	36
Total		192	78	270

*Other 15 countries with international collaborative links (Portugal, Malaysia, Uganda, Norway, Netherlands, United Arab Emirates, Qatar, Tanzania, Sweden, South Africa, Ghana, and Zimbabwe each one, Greece two and Finland & Singapore each three).

**Other 14 countries with domestic collaborative links (Portugal, Malaysia, India, France, Argentina, Italy, and Slovenia each one & Finland, Greece, Norway, Denmark, New Zealand, Czech Republic, and Nigeria each two).

6. DISCUSSION

The present study examined the pattern of growth of research using the output of publications in block of three years each published during the period of 1994-2020 in the journal *Library and Information Science Research*. It also identified prolific countries, institutions and authors and the impact of their output using CPP and i-10 index. The study also identified the highly cited papers and pattern of domestic and international collaboration. The study indicates an increasing trend of output during the study period. A highly skewed distribution of research output has been observed for countries, institutions and authors. For instance, 14 most prolific countries produced ~88 per cent articles and only 12 per cent output was contributed by 37 countries. USA was found to be the most productive country; however, the value of CPP for the USA is lower than Norway and Finland. Of the 17 prolific institutions nine were located in the USA and remaining eight in Canada, Australia, Finland, China and Hong Kong. The value of CPP was highest for University of Illinois at Urbana-Champaign, USA followed by University of

Tampere, Finland. Wuhan University (China) had the lowest value of CPP. Most of the prolific and highly cited authors were also from the USA. Citation analysis of papers indicates that only a minuscule number 41(3 %) of papers remained uncited and the remaining papers were cited one or more times. USA published highest number of papers in domestic as well as in international collaboration and among the institutions Florida State University had published highest number of papers in absolute terms as well as in domestic collaboration.

7. CONCLUSION

Based on the pattern of output it is observed that block to block rate of growth of published articles during the study period is inconsistent. Based on the above bibliometric analysis it can be concluded that USA is the global leader in the field of library and information science research. It contributed the highest number of papers in absolute terms as well as highest number of papers in domestic and in international collaboration. In support of this, it is important to mention here that the four international abstracting and indexing services in the field of LIS indexed highest number of journals published by the USA[10]. Most of the prolific institutions and authors are also from the USA. Most of the highly cited papers also originated from the USA, though the CPP value for papers published by USA are less than Norway and Finland. Based on the number of uncited papers it can be argued that *Library and Information Science Research* is a vehicle for high-quality research as only 41 papers of the total papers remained uncited. This indicates that papers published in the journal are of high relevance to its readers. It is expected that the present study might be of interest to the scholars working in the area of bibliometrics and scientometrics.

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