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Bibliometric Analysis of Library Philosophy and Practice: A study based on Scopus Database

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Abstract

Bibliometric is an emerging thrust area of research and has now become a well established part of information research and a quantitative approach to the description of documents. Bibliometric has grown out of the realization that literature is growing and changing out of a rate with which no librarian or information worker equipped with traditional bibliographic skills and methods could keep abreast. This study aims to present a bibliometric analysis of the Library Philosophy and Practice journal, the aim being to offer a summary of research activity in library and information science and characterize its most important aspects. The paper analyzes a bibliometric study of 1402 articles were published during the period from 1998 to 2018 in the Library Philosophy and Practice journal. The paper covers the bibliometric analyses of year-wise distribution of articles, category-wise classification of papers, subject-wise distribution of articles, authorship patterns, and institutions-wise distribution of contributions.

Keywords: Bibliometrics, Bibliometric Analysis, Scopus database, Content analysis, Authorship pattern, Citation analysis and LIS journals.

Introduction

Bibliometrics is a research method used in library and information science. It is a quantitative study of various aspects of literature on a topic and is used to identify the pattern of publication, authorship, and secondary journal coverage to gain insight into the dynamics of growth of knowledge in the areas under consideration. This can lead to better organization of information resources, which is essential for effective and efficient use. Bibliometrics has attained sophistication and complexity with a national, international, and interdisciplinary character. Bibliometrics is the analysis of the structure of literature using various tools, counting, rank-frequency distributions, and citation analysis; and although the structure of literature is basic to all disciplines, it is particularly important in the area of information retrieval.

Alan Pritchard, who first used the word “bibliometrics,” described it as the “application of mathematics and statistical methods to books and other media of communication.” This was paraphrased by Robert A. Fairthorne as “quantitative treatment of the properties of recorded discourse and behaviour appertaining to it.” In a later article,

“Bibliometrics and Information Transfer,” Pritchard explained bibliometrics as the “metrology” of the information transfer process and its purpose is analysis and control of the process.” He based his interpretation upon the fact that measurement is “the common theme through definitions and purposes of bibliometrics” and “the things that we are measuring when we carry out a bibliometric study are the process variables in the information transfer process.” The British Standard Glossary of Documentation of Terms explained bibliometrics as the study of the use of documents and patterns of publication in which mathematical and statistical methods have been applied, which is basically the same as Pritchard’s original definition.

In 1948, the great library scientist, S.R. Ranganathan, coined the term “librametry”, which historically appeared first and was intended to streamline the services of librarianship. Bibliometrics is analogous to Ranganathan’s librametrics, the Russian concept scientometrics, infometrics, and subdisciplines like econometrics, psychometrics, sociometrics, biometrics, technometrics, chemometrics, and climetrics, where mathematics and statistics are applied to study and solve problems in their respective fields. Scientometrics is now used for the application of quantitative methods to the history of science and overlaps with bibliometrics to a considerable extent.

Citation analysis denotes the statistical analysis or mathematical analysis of references or citations appended at the end of each article. Much useful information for location and identification of existing and emerging knowledge of a discipline comes to the limelight through analysis of both cited and citing papers. It can be used for identifying the core journals and the characteristic features of a discipline such as authorship pattern, bibliographical form, subject type, etc.

Review of Literature

Yeoh and Kaur (2008) analyses the publication output of Research in Higher Education for subject support in collection development in the light of growing interest in diversified domains of research in higher education. Consequently, analysis of 40 issues of publications revealed a diversified usage pattern of bibliographic reference sources by contributing researchers, with a cumulative total of citations being 8,374. A positive trend in research collaboration of contributing authors, and a steady growth in the use of reference sources, periodicals and web documents in the citations signify the trend of scholarly communication of research works in the electronic age. Similar to other disciplines of research findings, journals and books were the most cited source materials for researchers thrash out.

Crawley-low, Jill. (2006) has used bibliometric technique to analyze the citation patterns of researches published in the American Journal of Veterinary Research(AJVR).Journal titles have been ranked in decreasing order of productivity to create a core list of journals most frequently used by veterinary medical researchers. Akhter, Hussain, Nishat , Fatima & Kumar, Devendra.(2011) have made a bibliometric study of papers published in the Electronic Library Journal covering year-wise distribution of articles, Category-wise classification of papers, subject-wise distribution of articles, authorship pattern & institution-wise distribution of contributions. Thanuskodi, S. (2011).This study makes an analysis of the papers published in Indian Journal of Chemistry from different angles i.e. authorship pattern, number of contributions, geographical distribution, length of articles and the number of documents cited. Warraich, Nosheen Fatima (2011) have studied

11 issues of the journal of Library & Information Science on the basis of different parameters, viz author productivity, author collaboration, author institutional and geographical affiliation, language and length of papers, number of citations and the year wise distribution of papers.

Jena, Swain and Sahu (2012) in their bibliometric study of The Electronic Library from 2003 to 2009 revealed some interesting bibliometric traits of this journal. Taking the above mentioned literature into context, the present study aims to provide some value addition to the corpus of literature on bibliometric studies. Zainab (2009) in their bibliometric study on Malayasian Journal of Computer Science evaluated the article productivity of the journal from 1985 to 2007 using Lotka's Law. The study further revealed authorship, co-authorship pattern by degree of authors' collaboration that ranged from 0.25 to 0.95. Patra, Bhattacharya and Verma (2006) analyzed the growth pattern, core journals and authors' distribution in the field of bibliometrics.

According to Thanuskodi (2010), The present study is a bibliometric analysis of articles and references in Library Philosophy and Practice from 2005 to 2009. The analysis covers the number of articles, authorship patterns, subject distribution of articles, average number of references per article, forms of documents cited, year-wise distribution of cited journals, rank list of journals, etc. Strong and weak points are discussed, as the basis for improvement and development. Verma, Tamrakar and Sharma (2007) revealed that the majority of articles in journals published in India have two authors and that the majority of the contributions are from New Delhi. Tiew (2000) found that 53% of journal articles contained self-citations and that there was a tendency for authors affiliated to the institution that published the journal to cite the journal. Shokeen and Kaushik (2004) in their study on Indian Journal of Plant Physiology found that journal articles are predominant with 81% of total citations. The ratio of author self citation to total citations is 1:16.65. The ratio of Journal Self Citation to total citation is 1:31.91. The results also highlight that 398 citations are below 10 years old, whereas 358 citations are below 20 years but more than 10 years old.

Biswas, Roy and Sen (2007) conducted a bibliometric study on Economic Botany from 1994-2003 and revealed that among the citations, books accounted for 59%, journals 41% while, e-citations were quite negligible. Furthermore, they found that the highest numbers of contributions were emanated from academic institutions such as universities. Dhiman (2000) has done ten year bibliometric study Ethno botany Journal published during 1989-1998. In this paper examines year-wise, institution-wise, country-wise, authorship pattern, range of references cited and length of the articles.

To the best of my knowledge no bibliometric study has yet been conducted to analyze the several quantifiable characteristics of the content of Library Philosophy and Practice journal during 1998–2018. In this bibliometric analysis, we examined 3 elements: articles, authors and citations. This journal was chosen as the single source journal for the bibliometric study because of its uniqueness.

Need for the Study

Periodicals are the indicators of literature growth in any field of knowledge. They emerge as the main channel for transmitting knowledge. Due to the escalating cost of the periodicals and lack of adequate library budgets, the selection of any particular journal for a library should be done carefully. Library authorities are forced to reduce the number of

journal subscriptions. Bibliometric analysis has many applications in library and information science in identifying research trends, core journals, etc., and thereby framing subscription policies for tomorrow. These studies will be helpful for librarians in collection development.

About the journal

Library Philosophy and Practice (LPP) (ISSN 1522-0222) is a peer-reviewed electronic journal owned and published by the University Libraries of the University of Nebraska--Lincoln, Lincoln, Nebraska, USA. LPP publishes articles exploring the connection between library practice and the philosophy and theory behind it. These include explorations of current, past, and emerging theories of librarianship and library practice, as well as reports of successful, innovative, or experimental library procedures, methods, or projects in all areas of librarianship, set in the context of applied research.

Objectives

- To determine the number of papers published in *Library Philosophy and Practice* 1998 to 2018.
- To ascertain the major source of publication and types of documents.
- To examine the authorship pattern and collaboration trend of research in the journal.
- To examine the authorship pattern of papers.
- To determine the most prolific authors.
- To identify the institution-wise contribution of papers.
- To study the geographical distribution of contributions.
- To study the citation counts of all the published papers of the journal.

Methodology

In the present study the methodology applied is bibliometric analysis, used to study the bibliographic features of articles and citation analysis of references appended at the end of each article, published in the journal from 1998 - 2018. For this study the relevant data has been collected from the scopus database. The publication data of the journal has been drawn from Scopus database journal coverage years from 1998 to 2012 and 2014 to 2018. The data recorded has been tabulated and analyzed for making observations regarding the progress and development of *Library Philosophy and Practice* for the last twenty years.

Data Analysis

Year-wise distribution of articles

Table-1 shows the year wise publication statistics of *Library Philosophy and Practice*. Within this specified period of Scopus coverage years from 1998 to 2012 and 2014 to 2018, a total number of 20 years including 1402 documents have been published. It is found that the

highest number of 195 articles published in the year 2011 at a rate of 13.91%. The lowest numbers of articles are published in the year 1998 having 3 articles at a rate of 0.21%. The average publication per year is 70 articles.

Table 1. Year-wise distribution of publications

Sl. No.	Year	No. of contributions	Percentage
1	1998	3	0.21
2	1999	6	0.43
3	2000	7	0.50
4	2001	6	0.43
5	2002	10	0.71
6	2003	8	0.57
7	2004	11	0.78
8	2005	18	1.28
9	2006	35	2.50
10	2007	54	3.85
11	2008	66	4.71
12	2009	111	7.92
13	2010	152	10.84
14	2011	195	13.91
15	2012	78	5.56
16	2014	156	11.13
17	2015	67	4.78
18	2016	119	8.49
19	2017	136	9.70
20	2018	164	11.70
		1402	100.00

Category-wise classification of papers

Table 2 focuses that the document wise classification of the papers published during period from 1998 to 2018. The study reveals that the maximum number of articles published as under the category of research article i.e. 12976 (92.51%), whereas 90 (6.42%) articles published under the review category. There were a small numbers of articles published as under the short survey category, i.e., 6 (0.43%). There were a very small numbers of articles published as conference paper, editorial and note category, i.e. 0.21 % each.

Table 2. Document-wise distribution of publications

Sl. No.	Type of Document	No. of contributions	Percentage
1	Article	1297	92.51
2	Review	90	6.42
3	Short Survey	6	0.43
4	Conference Paper	3	0.21
5	Editorial	3	0.21
6	Note	3	0.21
	Total	1402	100.00

Geographical Distribution of Contributors

It is revealed from the table-3 that, during this period of study about 45 country have contributed there papers in Library Philosophy and Practice. Out of 1402 contributions, authors from Nigeria have been contributed highest article 550 (39.23 percent), India comes to the second position contributing 310 articles (22.11percent), and United States in the third position 211 articles (15.05 percent), followed by Iran 68 articles (4.85 percent), Pakistan 62 (4.42 percent), Ghana 55 articles (3.92 percent), Malaysia 26 articles (1.85 percent), Bangladesh 16 articles (1.14 percent) and South Africa 14 articles (1.00 percent). It is also found that authors from the remaining countries have contributed below 1 % articles.

Table 3. Country-wise distribution of publications – Top 20

Rank	Country	No. of contributions	Percentage
1	Nigeria	550	39.23
2	India	310	22.11
3	United States	211	15.05
4	Iran	68	4.85
5	Pakistan	62	4.42
6	Ghana	55	3.92
7	Malaysia	26	1.85
8	Bangladesh	16	1.14
9	South Africa	14	1.00
10	Tanzania	13	0.93
11	Indonesia	10	0.71
12	Uganda	10	0.71
13	Saudi Arabia	8	0.57
14	Kenya	4	0.29
15	Turkey	4	0.29
16	Australia	3	0.21
17	Botswana	3	0.21
18	Fiji	3	0.21
19	Greece	3	0.21
20	United Kingdom	3	0.21

Ranking of Authors

Table 4 shows the ranking of authors/contributors of articles. There are a total of contributors or authors for 1402 articles. Bhatti R from Pakistan is the most prolific author with 19 publications. Mahmood K from Pakistan comes second with 15 articles. The third prolific author Thanuskodi S belongs to India. The fourth and fifth prolific authors Mahajan P and Ugah A D with 12 publications each.

Table 4. Prolific authors with publications – Top 20

Rank	Author	No. of contributions	Percentage
1	Bhatti, R.	19	1.36
2	Mahmood, K.	15	1.07
3	Thanuskodi, S.	15	1.07

4	Mahajan, P.	12	0.86
5	Ugah, A.D.	12	0.86
6	Shafique, F.	9	0.64
7	Popoola, S.O.	8	0.57
8	Khan, S.A.	7	0.50
9	Maharana, B.	7	0.50
10	Okello-Obura, C.	7	0.50
11	Ameen, K.	6	0.43
12	Eke, H.N.	6	0.43
13	Ogunniyi, S.O.	6	0.43
14	Sambo, A.S.	6	0.43
15	Sethi, B.B.	6	0.43
16	Ugwu, C.I.	6	0.43
17	Akerele, J.A.	5	0.36
18	Amusa, O.I.	5	0.36
19	Anyira, I.E.	5	0.36
20	Asogwa, B.E.	5	0.36

Institutions-wise distribution of papers

Table 5. Institution-wise distribution of publications – Top 20

Sl. No.	Year	No. of contributions	Percentage
1	University of Ibadan	78	5.56
2	University of Nigeria	55	3.92
3	Delta State University Nigeria	51	3.64
4	Covenant University	31	2.21
5	Islamia University	29	2.07
6	University of the Punjab, Lahore	27	1.93
7	University of Kashmir	20	1.43
8	University of Lagos	19	1.36
9	University of Ghana	19	1.36
10	Nnamdi Azikiwe University	18	1.28
11	Annamalai University	18	1.28
12	Obafemi Awolowo University	17	1.21
13	Michael Okpara University of Agriculture	17	1.21
14	Sambalpur University	15	1.07
15	San Jose State University	15	1.07
16	University of Uyo	14	1.00
17	Federal University of Technology, Owerri	13	0.93
18	Bayero University	13	0.93
19	University of Agriculture, Abeokuta	13	0.93
20	University of Ilorin	13	0.93

Table 5 shows institution-wise distribution of articles published in the *Library Philosophy and Practice* during the period under study. Out of 1402 contributions, University of Ibadan have been contributed highest article 78 (5.56 percent), University of Nigeria comes to the second position contributing 55 articles (3.92 percent), and Delta State University in the third position 51 articles (3.64 percent), followed by Covenant university 31 articles (2.21 percent), Islamia university 29

(2.07 percent), University of the Punjab, Lahore 27 articles (1.93 percent), University of Kashmir 20 articles (1.43 percent), University of Lagos and University of Ghana each 19 articles (1.36 percent).

Year-wise distribution of Citations

Table 6. Year-wise distribution of Citations

Year	Rank	No. of Papers	No. of Citations	Average No. of Citations /paper	Cumulative	
					Citation	Percentage
1999	7	6	116	19.33	116	0.39
2000	18	7	65	9.29	181	0.61
2001	16	6	80	13.33	261	0.88
2002	19	10	80	8.00	341	1.15
2003	17	8	98	12.25	439	1.48
2004	14	11	155	14.09	594	2.00
2005	15	18	242	13.44	836	2.82
2006	6	35	682	19.49	1518	5.12
2007	11	54	878	16.26	2396	8.08
2008	13	66	955	14.47	3351	11.31
2009	12	111	1666	15.01	5017	16.93
2010	9	152	2766	18.20	7783	26.26
2011	10	195	3317	17.01	11100	37.45
2012	8	78	1451	18.60	12551	42.34
2014	5	156	3697	23.70	16248	54.82
2015	2	67	1882	28.09	18130	61.17
2016	1	119	3645	30.63	21775	73.46
2017	3	136	3757	27.63	25532	86.14
2018	4	164	4108	25.05	29640	100.00
Grand Total		1402	29640	21.14	29640	100.00

Table 6 indicates year-wise distribution of citations. Over the 20 years of 1402 articles, a total of 29640 citations have been appended. The average no of citations per article is varying from year to year. The table reveals that maximum numbers of average citations have been published (30.63%) in the year 2016. Hence the year 2016 stood in the first position with maximum number of citations per paper, whereas 28.09 % in the year 2005, 27.63 % in the year 2017, 25.05 % in the year 2018 and 23.70 % in the year 2014. The average number of citations determined for the whole articles in the whole year is 21.14 %.

Authorship Pattern

Table 7. Authorship Pattern

Year	Number of Authors					Total
	1	2	3	4	5 & more	
1998	3					3
1999	5		1			6
2000	6		1			7
2001	6					6
2002	7	3				10
2003	6	2				8
2004	7	4				11
2005	14	3		1		18
2006	21	13	1			35
2007	27	19	6	1	1	54
2008	34	23	9			66
2009	74	25	7	5		111
2010	74	61	13	3	1	152
2011	85	76	29	5		195
2012	32	31	12	2	1	78
2014	56	58	32	8	2	156
2015	22	23	17	4	1	67
2016	34	47	30	7	1	119
2017	37	59	30	7	3	136
2018	41	61	44	14	4	164
Total	591 (42.16)	508 (36.23)	232 (16.55)	57 (4.06)	14 (1.00)	1402 (100.00)

The authorship pattern was analyzed to determine the percentage of single and multiple authorship. It is clear that articles are the major constituent of Library Philosophy and Practice journal items. As indicated in Table 7, our author sample consists of 2601 authors for 1402 articles. Due to that we decided to continue our study on articles only, and ignore other kinds of contribution, which have little if any relevance to trends in LIS research. This table shows that majority of authors preferred to publish their research results in single authorship mode (591 articles; 42.16 percent) followed by two authorship mode (508 articles; 36.23 percent) and three authorship mode (232 articles; 16.55 percent) followed by four authorship mode (57 articles; 4.06 percent) while, articles published by five and more than five authors (14 articles; 1.00 percent) were quite negligible.

Degree of Collaboration

Table 8. Degree of Collaboration

Year	Single author paper (NS)	Multiple author paper (NM)	NM+NS	Degree of collaboration (C)
1998	3		3	0.000
1999	5	1	6	0.167
2000	6	1	7	0.143
2001	6		6	0.000
2002	7	3	10	0.300
2003	6	2	8	0.250
2004	7	4	11	0.364
2005	14	4	18	0.222
2006	21	14	35	0.400
2007	27	27	54	0.500
2008	34	32	66	0.485
2009	74	37	111	0.333
2010	74	78	152	0.513
2011	85	110	195	0.564
2012	32	46	78	0.590
2014	56	100	156	0.641
2015	22	45	67	0.672
2016	34	85	119	0.714
2017	37	99	136	0.728
2018	41	123	164	0.750
Total	591 (42.16)	811 (57.84)	1402 (100.00)	0.578

A study of degree of collaboration in an area of bibliometric studies, shows the trend in pattern of single and joint authorship in the journal of Library Philosophy and Practice from 1998 to 2018, as shown in the table 8. The degree of collaboration ranges from 0 to 0.750. The average degree of collaboration is 0.578 during the period under study.

To determine degree of collaboration in quantitative terms, the formula given by K. Subramanyam (1983) was used.

$$C = \text{NM} / \text{NM} + \text{NS}$$

Where C = Degree of collaboration

NM= Number of Multiple authors

NS = Number of Single authors

$$C = 811 / 811 + 591$$

In the present study the value of C = 0.578

As a result, the degree of collaboration in the *Library Philosophy and Practice* journal is 0.578, which clearly indicates its dominance upon joint author contribution.

Conclusion

These findings are much helpful for librarians and information scientists while taking decision regarding collection development removing out dated documents from the shelves and also in maintaining need based collection in librarians. The Journal of Library Philosophy and Practice is a top ranking open access journal in the field of Library and Information Science. The geographical coverage of journal is high with 46 foreign country coverage. It is a popular journal of international researchers, which constitutes 22.11% publications of Indian authors.

The publishing trend totally depends on the output of contributors, patterns of contributions and the quality of research. The year 2018 shows the maximum number of contributions to the *Library Philosophy and Practice* journal. This study reveals that the categories of article distributions are remarkable in this research journal. The majority of the articles were contributed by joint authors. It is registered that Bhatti, Mahmood, and Thanuskodi were most proliferate authors who have contributed nineteen articles, Fifteen articles

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