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## Information Literacy Research Publications in India: A Bibliometric Analysis

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### Abstract

*This study aims to analyze the Information literacy research in India using bibliometric tools. The web of science database has used to retrieve records related to Information literacy research for the period of 1993 to 2017. Publications are counted on year basis. The retrieved bibliographic citation data is analyzed using Histcite Software and different bibliographic techniques are also practiced. The authors analyzed the year-wise publication of the journal, authorship pattern, source-wise publication, etc.*

### Keywords

Bibliometric; Information literacy, Research Output, India, Authorship pattern.

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## INTRODUCTION

The most recent couple of decades, libraries have demonstrated a significant level of energy in the accumulation of building and initiative program exercises which included impressive investments. In Library and Information Science, the Bibliometric consider is one of the essential push zones to do Research. Historically bibliometric strategies have been utilized to follow connections among scholarly journal references and it is an arrangement of techniques used to study or measure texts and data. Bibliometrics is a set of methods used to study or measure texts and information. Citation analysis and content analysis are commonly used bibliometric methods. While bibliometric methods are most often used in the field of library and information science, bibliometrics has wide applications in other areas. In fact, many research fields use bibliometric methods to explore the impact of their field, the impact of a set of researchers, or the impact of a particular paper. Bibliometrics are now used in quantitative research assessment exercises of academic output which is starting to threaten practice-based research. Alan Pritchard (1969) has coined the word 'bibliometrics'. It is the application of mathematical and statistical analysis to bibliographic units. Sengupta (1985) Bibliometrics is the organization classification and quantitative evaluation of publication patterns of all macro and micro communication along with their authorship by mathematical and statistical calculus. Rita Gupta et al., (2014) has studied Indian dengue research output during the 10 years from 2003-12. Nageswara Rao et al., (2014) analyzed study on Bibliometric Analysis of the Journal of Propulsion and Power. Ratnabinti Masrom, Nor, Raja Zuraidah and Raja, RM (2016) described this bibliometric Analysis On Green Supply Chain Management covering the period of 2000-2014 based on the scope of 530 kinds of the literature of GSCM. Anwarul Islam, Md. (2011) conducted on webometrics study of Universities in Bangladesh. Bailon –Moreno, R. Jurado- Alameda, E. et al., (2005) the presented study was bibliometric laws: Empirical flaws of fit difficulties in the fitting of empirical values. Jeyshankar, R. (2014) analyzed a study on the quantitative of research output on anemia disease. Raja, S and Muthumari, S (2016) this study aims to represent the research performance of Indian Institute of Science (IISc) based on a Scientometric analysis of scientific research output. Raja, T Murugan, K (2015) studied the areas the bibliometric analysis of the Journal of Research and Reflections on Education from 2004 to 2013. This

study aims to analyze the information literacy research in India using bibliometric tools for the period of 1993 to 2017.

**OBJECTIVES OF THE STUDY**

- ❖ To study the pattern of growth of the research publications output in the Information literacy of during 1993-2017.
- ❖ Identify the most prolific research institutions in the field of IL in India and their citation impact.
- ❖ Find out the pattern of citations and to identify the highly cited papers.
- ❖ Find out the growth of literature in the field of Information Literacy Research in India.
- ❖ To study the publication productivity and the impact of Indian leading institutions and authors; To analyze the authorship pattern.
- ❖ To study the share of international collaboration in Indian publication output and the contribution of different collaborating countries;

**SCOPE AND LIMITATIONS OF THE STUDY**

The main purpose of the study is to find out the information about the latest trends in the development of the field of the Multidisciplinary subject a citation analysis “Information Literacy” and for this purpose, the study is based on articles in journals, authors published the books and papers published in conference proceedings published on Information Literacy subject from 1993 to 2017 Using statistical techniques, these will be used to interpret the data. More about this is described in and Limitation of the study following

- At this point, we did Citation analysis of tertiary source of information
- In the present study, we did exclude the citation analysis on patents.

**METHODOLOGY**

This paper is converse about the growth of literature on Information literacy research in India. The data is collected from Web of science database “Core Collection” for 25 years from 1993 to 2017. The keyword “Information literacy” was used in title field along with “India” in the country field and “1993 to 2017” in year field. The downloaded data were analyzed by using Excel and HistCite software tool.

**RESULTS AND DISCUSSION**

**Table 1 : Year wise publication of Documents**

Publication Year	Records	Percent	LCS	GCS	Mean	Median	Mode	Standard Deviation
1993	3	2.7	0	19	5.14	2.5	1	5.392194
1994	1	0.9	0	0				
1998	1	0.9	0	4				
1999	1	0.9	0	15				
2000	1	0.9	0	16				
2001	2	1.8	0	11				
2002	1	0.9	0	1				
2003	2	1.8	0	1				
2004	2	1.8	0	18				
2005	1	0.9	0	1				
2006	1	0.9	0	6				
2007	4	3.5	0	43				
2008	5	4.4	1	44				
2009	5	4.4	2	44				
2010	4	3.5	0	4				
2011	6	5.3	0	67				
2012	12	10.6	0	157				
2013	8	7.1	0	30				
2014	8	7.1	0	80				
2015	15	13.3	1	16				
2016	22	19.5	0	6				
2017	8	7.1	0	0				

Table 1 shows the year-wise distribution of documents published on Information literacy research in India during the period 1993-2017. The total 113 records are published during this period. The highest number of publications 22 (LCS 0, GCS 6) is published in the year 2016 but the highest number of cited articles 12 (LCS 0, GCS 6) and least publication in the years 1994, 98, 99, 2000, 2002, 2005 & 2006 with 1 publication. The analyzing the data the findings shows that the mean value of the publications is, 5.14, median 2.5, the mode is 1 and the standard deviation is 5.39 respectively.

**Table 2:** Document wise Publication

S.No	Document Type	Records	Percent	LCS	GCS
1	Article	107	94.7	4	530
2	Review	3	2.7	0	52
3	Article; Proceedings Paper	2	1.8	0	1
4	Letter	1	0.9	0	0

Table 2 shows the document wise distribution among the publication during the year 1993-2017. The highest number of publications is published in the form of articles and that covers 107 records (94.7%) with LCS 4 and GCS 530. The least number of publications was in the form of Letter (0.9%) that covers only 1 record.

**Table 3 :** Author Wise Publication Top 20 – Author

S.No	Author	Records	LCS	GCS
1	Joshi A	3	0	18
2	Acharya S	2	0	3
3	Bhattacharya SK	2	1	36
4	Das SK	2	0	16
5	Ghosh M	2	0	6
6	Goswami PR	2	0	1
7	Huettig F	2	0	29
8	Jabeen M	2	0	0
9	Karmakar S	2	0	8
10	Krishna S	2	0	4
11	Kumar A	2	0	0
12	Kumar S	2	0	16
13	Malleshappa K	2	0	4
14	Mishra RK	2	0	29
15	Prince M	2	0	113
16	Rafiq M	2	0	16
17	Ram S	2	0	17
18	Rao SS	2	0	13
19	Sharma S	2	0	1
20	Shashikumar	2	0	4

Table 3 shows the topmost productive authors based on a number of contributions. It shows that Joshi A was in the first place with a publication of 3 records.

Acharya S and followed by others were placed in the last position with a publication of 4 records.

### Authorship Pattern

Authorship pattern of the articles is presented in the Table No.3 the study reveals that of the total 463 authors have contributed 113 articles having the different frequencies of authors.

**Table 4:** Author Collaboration

No. of Author	No. of articles	% of Articles	Total No. of authors	% of Authors
Single Author	19	16.81	19	4.10
Two	18	15.93	36	7.78
Three	20	17.70	60	12.96
Four	18	15.93	72	15.55
Five	14	12.39	70	15.12
Six	10	8.85	60	12.96
More than Six	14	12.39	146	31.53
<b>Total</b>	<b>113</b>	<b>100.00</b>	<b>463</b>	<b>100.00</b>

The collected data showed that out of 463 articles, 19 (4.10%) were contributed by the single author, 36 (7.78) were contributed by the double author, 60 (12.96%) each contributed by three authors and six author, the highest number of papers has contributions of multi-authored for 146 with (31.53%) in Information Literacy Research in India.

The Degree of Collaboration of authors by year wise is presented in Table 5. The degree of collaboration ranges from 0.50 to 1. The average degree of collaboration is 0.57 during the period 1993 – 2017. Various methods have been the degree methods proposed to calculate the degree of research Collaboration. Here in the degree collaboration this study the formula proposed by Subramanyam (1983) has been used.

**Degree of Collaboration**

Year	Single Authored	Multi-Authored	Total Nm+Ns	Degree of Collaboration
1993	0	13	13	0.5
1994	0	2	2	0.5
1998	1	0	1	1
1999	0	9	9	0.5
2000	0	20	20	0.5
2001	0	7	7	0.5
2002	2	0	2	1
2003	0	4	4	0.5
2004	1	11	12	0.52
2005	0	5	5	0.5
2006	1	0	1	1
2007	1	24	25	0.510
2008	2	16	18	0.529
2009	0	16	16	0.5
2010	0	14	14	0.5
2011	0	16	16	0.5
2012	3	39	42	0.518
2013	0	34	34	0.5
2014	2	46	48	0.510
2015	3	50	53	0.514
2016	2	92	94	0.505
2017	1	26	27	0.509
<b>Total</b>	<b>19</b>	<b>444</b>	<b>463</b>	<b>12.615</b>

$$\text{Degree of Collaboration} = \frac{Nm}{Nm+Ns}$$

Where, C = Degree of collaboration in a discipline  
 Nm = number of multi-authored papers in the discipline  
 Ns = number of single papers in the discipline  
 Here Nm= 444  
 Ns = 19, C= 444/463 =.9589

**Table 6:**Journal wise publication Top 20 journal based on number of publication

S. NO	Journal	Records	LCS	GCS
1	Journal of Evolution of Medical and Dental Sciences-Jemds	9	0	0
2	Program-Electronic Library And Information Systems	5	0	32
3	Plos One	4	0	82

4	Asian Pacific Journal of Cancer Prevention	3	0	13
5	Electronic Library	3	0	21
6	Biomedical Research-India	2	0	4
7	Bmc Health Services Research	2	0	1
8	Bmj Open	2	0	7
9	Current Science	2	0	3
10	Desidoc Journal of Library & Information Technology	2	0	1
11	Public Health Nutrition	2	0	18
12	Qualitative & Quantitative Methods in Libraries	2	0	0
13	Universal Access to the Information Society	2	0	2
14	Acm Transactions on Computing Education	1	0	0
15	Acta Reumatologica Portuguesa	1	0	0
16	Aids	1	0	1
17	Aids and Behavior	1	1	5
18	Annals of the Association of American Geographers	1	0	5
19	Aquaculture International	1	0	0
20	Archives of Disease in Childhood	1	0	0

Table 4 shows the topmost 20 journals that published articles on Information literacy research in India and during the period. Information Literacy research journal placed in the first position with 9 records from Journal of Evolution of Medical and Dental Sciences-James. Archives of Disease in Childhood were in the 20th position with 1 record.

**Relative Growth Rate and Doubling Time**

The Relative Growth Rate (RGR) is the expansion in a number of articles/pages per unit of time. The mean Relative Growth Rate (R) over the particular time of interval can be calculated from the accompanying equation.

$$R(a) = (\ln W_2 - \ln W_1) / (2t - 1t)$$

1-2`R = mean relative growth rate over the specific period of interval

Where W2 and W1 are the cumulative Numbers of publications in year's 2T and 1T.

2T - 1T = the unit difference between the initial time and the final time

$$Dt = 0.693/RGR$$

loge 1W = log of Initial number of articles/pages

loge 2W = log of thefinal number of articles/pages after a specific period of interval

**Table 7:** RGR and Dt for Stem Cell Research Output by Year-wise

Year	Output	Cumulative	W <sub>1</sub>	W <sub>2</sub>	RGR
1993	3	3	0.477121	0.477121	0
1994	1	4	0	0.60206	0.60206
1998	1	5	0	0.69897	0.69897
1999	1	6	0	0.778151	0.77815
2000	1	7	0	0.845098	0.8451
2001	2	9	0.30103	0.954243	0.65321
2002	1	10	0	1	1
2003	2	12	0.30103	1.079181	0.77815
2004	2	14	0.30103	1.146128	0.8451
2005	1	15	0	1.176091	1.17609
2006	1	16	0	1.20412	1.20412
2007	4	20	0.60206	1.30103	0.69897
2008	5	25	0.69897	1.39794	0.69897
2009	5	30	0.69897	1.477121	0.77815
2010	4	34	0.60206	1.531479	0.92942
2011	6	40	0.778151	1.60206	0.82391
2012	12	52	1.079181	1.716003	0.63682
2013	8	60	0.90309	1.778151	0.87506
2014	8	68	0.90309	1.832509	0.28016
2015	15	83	1.176091	1.919078	0.74299
2015	22	105	1.342423	2.021189	0.67877

The RGR has decreased from 1994 (0.602) to 2017 (1.149) in the span of 22.The Doubling Time (Dt) has increased when calculated year wise.

**Table 8 :**Country wise Publication Top 28 Countries based on number of publication

S.No	Country	Records	LCS	GCS
1	India	110	4	546
2	USA	14	1	49
3	Australia	4	0	6
4	UK	4	0	124
5	Nepal	3	0	55
6	Netherlands	3	0	80
7	Peoples R China	3	0	67
8	Unknown	3	0	37
9	Ethiopia	2	0	51
10	Kenya	2	0	1
11	Peru	2	0	62
12	Canada	1	0	1
13	Cote Ivoire	1	0	1
14	Cuba	1	0	62
15	Denmark	1	0	11
16	Dominican Rep	1	0	62
17	Germany	1	0	0
18	Mexico	1	0	62
19	Nigeria	1	0	0
20	Pakistan	1	0	0

Table 8 shows the top 20 countries which have more publications on Information literacy research in India during the period 1993-2017 of study. India placed in the first position with 110 records (LCS 4 and GCS 546) and Pakistan comes on the 20th position with 1 records. Which shows more contribution in the form of research output on this topic is coming from India.

**Table 9 :** Cited reference wise Publication Top10 most cited literature

Cited References	Records	Cumulative	Percentage
Henrich J, 2010, BEHAV BRAIN SCI, V33, P61, DOI 10.1017/S0140525X0999152X	3	3	2.7
Rani PK, 2008, RURAL REMOTE HEALTH, V8	3	6	2.7
Singh YN, 2013, INT J BIOMETRICS, V5, P137	3	9	2.7
*Gov Ind, 2001, Rec Work Group Inf T	2	11	1.8
Addoor Krishna R, 2011, Med J Malaysia, V66, P48	2	13	1.8
Altmann Gtm, 2011, Acta Psychol, V137, P190, Doi 10.1016/J.Actpsy.2010.09.009	2	15	1.8
Arnett JJ, 2008, AM PSYCHOL, V63, P602, DOI 10.1037/0003-066X.63.7.602	2	17	1.8
Arokiasamy P, 2011, Health Policy Plann, V26, P429, Doi 10.1093/Heapol/Czq075	2	19	1.8
Basu Am, 2005, Soc Sci Med, V60, P2011, Doi 10.1016/J.Socscimed.2004.08.057	2	21	1.8
Baxi S, 1994, J OBST GYN INDIA, V44, P784	2	23	1.8
Berkman ND, 2011, ANN INTERN MED, V155, P97, DOI 10.7326/0003-4819-155-2-201107190-00005	2	25	1.8
Bhatia Vikas, 2004, Indian Journal Of Pediatrics, V71, P313, Doi 10.1007/Bf02724097	2	27	1.8
Boerma JT, 2008, LANCET, V371, P1259	2	29	1.8
Boyle Mh, 2006, Soc Sci Med, V63, P2242, Doi 10.1016/J.Socscimed.2006.04.034	2	31	1.8
Caldwell Jc, 1979, Pop Stud-J Demog, V33, P395, Doi 10.2307/2173888	2	33	1.8
Cetin En, 2013, Prim Care Diabetes, V7, P297, Doi 10.1016/J.Pcd.2013.04.002	2	35	1.8
Chakraborty J, 1996, J Assoc Physicians India, V44, P237	2	37	1.8
Chew LD, 2004, FAM MED, V36, P588	2	39	1.8
Chhabra P, 2007, INDIAN J PEDIATR, V74, P131, DOI 10.1007/S12098-007-0004-3	2	41	1.8
Chuttani C, 1990, CARC CALLING, V3, P4	2	43	1.8

Table 9 shows the list of top 20 most cited literature. Author Henrich J, came in the first position, 3 times

this article got cited by others. On the 10th position, Chuttani C comes with 2 citations.

**Table 10:** Institution wise Publication Top 20 Institution based on number of publication

S.No	Institution	Records	Percent	LCS	GCS
1	Indian Inst Technology	6	5.3	0	30
2	All India Inst Med Sci	4	3.5	0	22
3	Indian Council Med Res	4	3.5	2	44
4	Christian Med Coll & Hosp	3	2.7	0	13
5	Fdn Healthcare Technol Soc	3	2.7	0	7
6	Publ Hlth Fdn India	3	2.7	0	118
7	Univ Delhi	3	2.7	0	3
8	Aligarh Muslim Univ	2	1.8	0	15
9	Cent Leather Res Inst	2	1.8	0	13
10	Govt Med College	2	1.8	0	0
11	Indian Inst Management	2	1.8	0	0
12	Jawaharlal Nehru Univ	2	1.8	0	23
13	Jaypee Univ Informat Technol	2	1.8	0	17
14	Johns Hopkins Univ	2	1.8	0	12
15	Kings Coll London	2	1.8	0	113
16	London Sch Hyg & Trop Med	2	1.8	0	82

17	Madras Med Coll & Govt Gen Hosp	2	1.8	0	0
18	Mandya Inst Med Sci	2	1.8	0	4
19	Manipal Univ	2	1.8	0	4
20	Maulana Azad Med Coll	2	1.8	0	13

Table 10 shows the Institution wise distribution among the publication during the year 1993-2017. The highest number of publications is published in the form of articles and that covers 6 records (5.3%) Amongst the most productive 20 institutions involved in Information literacy research. Together have contributed 46% share (with 52 papers) in the cumulative publications output of India in Information literacy research. In Information literacy research three Indian institutions have registered higher publications than the group average. These are All India Institute of Indian Inst Technology with (6 papers) followed by All India Institution Medical Science (4 papers), Indian Council Medical Research (4 papers and followed by other institutions.

### CONCLUSION

The based on analyzed of 113 papers, indexed in the Web of science for the period of 25 years (1993-2017). The Histcite analysis of literature growth on Information literacy research in India shows USA has the most research output in this area. UK also followed in this area and contributing their research output. It was found that the highly cited papers by the institution in Public Health Foundation India and Kings College London these both of institution were most of the cited papers for global level. Among the prolific research institutions, Indian Inst Technology topped the list closely followed by All India Institute Medical Science and Indian Council Med Research. Among the journals used for publication of research results, Journal of Evolution of Medical and Dental Sciences-Jemds of Information Measurement was found to be the most popular amongst Indian Information literacy researchers.

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