

A bibliometric analysis of the journal 'Indian Journal of Fibre and Textile Research, 1996 – 2004'

Kamal Lochan Jena
Librarian
Institute of Textile Technology, P.O. Choudwar Dt.
Cuttack, Pin – 754025
Email: kljena@rediffmail.com

A bibliometric analysis of the journal "Indian Journal of Fibre and Textile Research" for the period 1996 – 2004 has been carried out. The trend of publications such as the year wise distribution of articles, bibliographical distribution of citations, authorship pattern, citation pattern, average length of articles, number of tables and figures used, time lag, geographical distribution of authors and subject analysis have been studied.

Introduction

Literature is the body of thought expressed in published writings. The primary role of literature is to record and transmit ideas or discoveries that bring in advancement of knowledge. In the field of science & technology, growth of literature is in an exponential manner. Therefore, the process of selecting the appropriate and relevant literature becomes critical and difficult.

Bibliometric analysis is the quantitative description of literature and helps in the measurement of the patterns of all forms of recorded information and their producers. It has extensive applications in the field of library and information science particularly with regard to studying the trends in a subject. It helps in formulating need based development policy and provides objective data to inform managers to take timely decisions.

The first recorded study of Bibliometric topic was in 1917 by Coles & Eales with the '*Statistical analysis of literature of history of comparative anatomy*', which served as a model for applying the counting technique in the evaluation of international activities¹. Alan Pritchard first introduced the term 'Bibliometrics' in 1969 to mean 'the application of mathematics and statistical methods to books and other media of communications'². Roy has defined bibliometrics as a 'study of the process of information use by analyzing the characteristics of documents and their distribution by statistical methods'³. According to Sengupta et al, the bibliometrics is the 'organisation of classification

and quantitative evaluation of publication patterns of all macro and micro communications alongwith their authorship by mathematical and statistical applications and calculations⁴.

The current study is a bibliometric analysis of the journal "*Indian Journal of Fibre and Textile Research*" for the period 1996 to 2004. The journal has established itself as a leading technical journal in India in the field of Textile Technology. This journal is published by National Institute of Science Communication and Information Resources. It is a quarterly journal that publishes the original work of the authors and also publishes short communications, review articles, notes, book reviews, seminar/conference reports and synopsis of doctoral theses. So far, 29 volumes of the journal have been published. In this study, the articles published during the period 1994 to 2004 have been analysed.

Methodology

Nine volumes (vol 21 to 29) containing 35 issues (vol 26 no 01 & 02, Mar – Jun, 2001 contains one issue) of *Indian Journal of Fibre and Textile Research* published during the year 1996 to 2004 have been taken up for the study. The details with regard to each published article such as title of articles, number of authors, name of authors, address of authors, number of references and their forms, number of pages, number of tables and figures, date of receipt of article and the date of acceptance of article etc., were recorded and analyzed for making observations.

Table 1– Year wise distribution of publications

Year	No. of articles	% of articles	No. of articles per issue
1996	41	8.09	10.25
1997	46	9.07	11.50
1998	49	9.66	12.25
1999	58	11.44	14.50
2000	54	10.65	13.50
2001	57	11.24	19.00
2002	65	12.82	16.25
2003	69	13.61	17.25
2004	68	13.41	17.00
	507	100.00	14.49

Table 2 – Citation pattern of articles

Year	No. of articles	Cumulative total of articles	No. of citations	Cumulative Total of citations	Average citations per article	Cumulative average of citations	Average citations per journal issue
1996	41	41	910	910	22.20	22.20	227.50
1997	46	87	817	1727	17.76	19.85	204.25
1998	49	136	526	2253	10.73	16.57	131.50
1999	58	194	606	2859	10.45	14.74	151.50
2000	54	248	846	3705	15.67	14.94	211.50
2001	57	305	1167	4872	20.47	15.97	389.00
2002	65	370	1095	5967	16.85	16.13	273.75
2003	69	439	958	6925	13.88	15.77	239.50
2004	68	507	1189	8114	17.49	16.00	297.25
Total	507		8114		16.00		231.83

Analysis of the study

Year wise distribution of publications

Table 1 gives the year wise distribution of articles in the journal. The number varies from year to year and there is almost a constant increase in the number of articles from the year 1996 to 2004. Out of total 507 articles, the maximum numbers of articles are in the year 2003 contributing 69 articles, which is 13.61% to the total publications. The minimum numbers of articles are in the year 1996 with 41 articles, which is 8.09% of total publications. Regarding the maximum number of articles per issue, the year 2001 contributed an average of 19.00. This is because the issue no 1 and 2 are merged into one issue in this year. The minimum number of articles per issue is in the year 1996 contributing an average of 10.25.

For the period of study from the year 1996 to 2004, the average contribution of article to each issue is 14.49.

Citation Pattern

The distribution of citation pattern is given in the Table 2. The table shows the year wise distribution of articles and the number of citations thereof, total number of citations and average citations per article as well as average citations per journal issue. From the table it has been found that there is a total of 8,114 citations distributed among 35 journal issues having 507 articles. It is also seen that the number of articles is increasing but not in a uniform manner. Similarly, the number of citations per year is varying from year to year. The highest number of citations per article is in the year 1996 and the lowest number of citations per article is

Table 3 – Bibliographical distribution of citations

	Journals	Books	Proceedings	Reports	Theses	Patents	Standards	Electronic media	Others	Total
1996	714	65	41	6	6	61	7	-	10	910
1997	547	127	48	9	8	64	8	1	5	817
1998	431	51	20	2	10	5	6	-	1	526
1999	428	95	24	1	15	11	26	-	6	606
2000	622	90	66	5	8	28	13	-	14	846
2001	809	115	73	10	14	93	10	32	11	1167
2002	830	143	45	2	15	37	10	7	6	1095
2003	711	113	44	5	30	19	20	6	10	958
2004	906	143	56	12	19	6	31	6	10	1189
	5998	942	417	52	125	324	131	52	73	8114

Table 3(a) – Ranking of documents

S. No.	Rank	Bibliographic form	No. of cumulative	% of citations	Cumulative citations	%
1	1	Journals	5998	73.92	5998	73.92
2	2	Books	942	11.61	6940	85.53
3	3	Proceedings	417	5.14	7357	90.67
4	4	Patents	324	3.99	7681	94.66
5	5	Standards	131	1.61	7812	96.28
6	6	Theses	125	1.54	7937	97.82
7	7	Reports	52	0.64	7989	98.46
8	=7	Electronic Media	52	0.64	8041	99.10
9		Others	73	0.90	8114	100.00

in the year 1999. Likewise, the highest average citations per journal is in the year 2001 and the lowest average citations per journal is in the year 1998.

Bibliographical distribution of citations

The bibliographical forms of citations were divided into the following broad categories, journals, books, proceedings, reports, theses, patents, standards, electronic media and others. Though various other forms were present, but for the convenience they were merged into the above limited numbers. Table 3 represents the year wise distribution of citations. Table 3(a) represents the ranking of documents. From these two tables it has been seen that journals are cited predominantly in all the years followed by books. Out of the total citations, journals constitute 73.92 % whereas books constitute

11.61 % only and both constitute 85.53 % of total citations. Rest of the other forms constitutes less than 10 % of citations each: Out of the rest, proceedings constitute 5.14 %, patents 3.99 %, standards 1.61 %, theses 1.54 %, reports and electronic media both 0.64 % and others have 0.90%.

Authorship Pattern

The authorship pattern analysis determined the type of research. It is found from the Tables 4 and 4(a) that, out of 507 articles, three authored articles are highest in number and their percentage is 34.12. The two authored articles were 28.60 % followed by multi-authored articles of 22.88 %. The single authored articles were 14.40 % only.

Table 4 – Authorship pattern

Year	Single	Joint	Three	Multi	Total
1996	8	10	12	11	41
1997	6	8	16	16	46
1998	1	20	15	13	49
1999	7	8	23	20	58
2000	5	17	24	8	54
2001	25	14	12	6	57
2002	9	21	19	16	65
2003	8	26	24	11	69
2004	4	21	28	15	68
Total	73	145	173	116	507

Table 4(a) – Ranking of authorship pattern

S. No.	Rank	Authorship pattern	No. of citations	Percentage of citations	Cumulative citations	Cumulative citations
1	1	Three	173	34.12	173	34.12
2	2	Joint	145	28.60	318	62.72
3	3	Multi	116	22.88	434	85.60
4	4	Single	73	14.40	507	100.00

Table 5 – Ranking of contributors of articles

S. No.	Rank	Contributor	No. of contribution
1	1	G K Tyagi	38
2	2	S M Ishtiaque	35
3	3	K R Salhotra	33
4	4	A Mukhopadhyay	29
5	=4	V K Kothari	29
6	5	S Dhamija	19
7	6	M L Gulrajani	18
8	=6	R C D Kaushik	18
9	7	A Das	17
10	8	B K Behera	14
11	9	D P Chattopadhyay	13
12	=9	R Chattopadhyay	13
13	10	I C Sharma	12
14	=10	K N Chatterjee	12
15	11	H T Deo	11
16	=11	P K Banerjee	11
17	=11	R B Chavan	11
18	12	A K Samanta	10

Ranking of Contributors of Articles

Table 5 shows the ranking of authors / contributors of articles. In the rank list the contributors who have contributed more than 10 articles or more are taken into account to avoid a long list. There are a total of 1359 of

contributors for 507 articles. G K Tyagi has contributed 38 articles and followed by S M Ishtiaque contributing 35 articles. K R Salhotra contributed 33 articles. Others have contributed less than 30 articles during the period of study. In the analysis it has been observed that most

Table 6 – Average length of articles

Year	No. of articles	Cumulative total of articles	Pages	Cumulative total of pages	Average page per article	Cumulative average no. of pages
1996	41	41	275	275	6.71	6.71
1997	46	87	359	634	7.80	7.29
1998	49	136	278	912	5.67	6.71
1999	58	194	304	1216	5.24	6.27
2000	54	248	323	1539	5.98	6.21
2001	57	305	413	1952	7.25	6.40
2002	65	370	414	2366	6.37	6.39
2003	69	439	446	2812	6.46	6.41
2004	68	507	458	3270	6.74	6.45

of the ranked contributors are from Indian Institute of Technology, Delhi and The Technological Institute of Textile and Sciences, Haryana.

Length of articles

The average length of articles and the total pages of the articles are shown in the Table 6. The table shows that the average length of articles is 6.45 pages. Further, it has been observed that the average length of articles varied from a minimum of 5.24 pages to a maximum of 7.80 pages.

Time lag

The time lag is the time taken between the date of receipt of a paper for publication and the date of actual publication of the same paper. All the articles published in the journal (except the Vol 21, no 01, 1996, Vol 22, no 4, 1997 and Vol 26, no 1 & 2, 2001) contain the information about the date of receipt of article and the date of acceptance of articles. The Tables 7(a), 7(b) and 7(c) represent the average time taken between the receipt of article to the acceptance of article, acceptance of article to the publication of article and receipt of article to the publication of article respectively. From the said tables it has been found that the average time taken between date of receipt of article and date of acceptance is 5.89 months, acceptance to publication is 11.31 months and from receipt to publication is 17.20 months. Further it has been observed that from the date of receipt to the date of acceptance, minimum time is less than 1 month and maximum time is 20 months, from the date

of acceptance to the date of publication of article minimum time is 03 months and maximum time is 20 months and from the date of receipt to the date of publication minimum time is 5 months and maximum time is 31 months.

Geographical distribution of contributors

From the Table 8 it is found that there are a total of 1359 contributors for 507 articles. During the analysis it has been observed that most of the articles are prepared/contributed by joint authors from different places. From the analysis it has been observed that the highest numbers of contributors are from India with 1167 articles and the percentage is 85.87. The numbers of foreign contributors is less than 2 %. Authors from 6 countries contribute more than 1 % but less than 2 %. The contributors from 15 countries are less than 1 %.

As maximum contributions are from India, the geographical spread of contributions from India was studied. From the Table 8(a) it has been found that Delhi contributed highest number of contributors (342, 29.31%) followed by Haryana with 229 contributors (29.31%). West Bengal contributed 139 articles with a percentage of 11.91 and occupied third position. Maharashtra had 121 contributors with a percentage of 10.37 and occupies fourth position. Other states have contributed less than 100 contributors and the percentage is less than 10 % to the total contributors. During the analysis it was observed that due to the presence of some reputed Institutions in the states of Delhi, Haryana, West Bengal and Maharashtra the number of contributors is higher than the other states.

Table 7(a) – Time lag

Year	Average time taken from receiving to the acceptance of article (in months)	Minimum time taken (in months)	Maximum time taken (in months)
1996	4.74	< 01	14
1997	5.77	01	13
1998	5.98	< 01	19
1999	5.72	< 01	18
2000	6.78	< 01	13
2001	9.88	< 01	17
2002	5.83	< 01	20
2003	5.30	< 01	17
2004	4.62	< 01	11
	5.89		

Table 7(b) – Time lag

Year	Average time taken from acceptance to publication of article (in months)	Minimum time taken (in months)	Maximum time taken (in months)
1996	7.26	03	12
1997	7.97	03	17
1998	10.86	03	18
1999	10.03	04	18
2000	10.20	03	19
2001	14.66	05	19
2002	13.45	08	19
2003	13.35	09	20
2004	11.24	05	16
	11.31		

Table 7(c) – Time lag

Year	Average time taken from receiving to the publication of article (in months)	Minimum time taken (in months)	Maximum time taken (in months)
1996	12.00	05	20
1997	13.73	09	19
1998	16.84	09	26
1999	15.76	07	24
2000	16.98	06	26
2001	24.53	08	28
2002	19.28	12	28
2003	18.65	12	31
2004	15.85	07	26
	17.20		

Table 8 – Geographical distribution of contributors of articles

S. No.	Country	No. of contributors	Cumulative number of contributors	Percentage of contributors	Cumulative percentage of contributors
1	India	1167	1167	85.87	85.87
2	China	25	1192	1.84	87.71
3	Egypt	23	1215	1.92	89.40
4	U K	21	1236	1.55	90.95
5	USA	20	1256	1.47	92.42
6	Bangladesh	15	1271	1.10	93.52
7	Turkey	15	1286	1.10	94.63
8	Iran	13	1299	0.96	95.58
9	Germany	11	1310	0.81	96.39
10	Spain	10	1320	0.74	97.13
11	Japan	6	1326	0.44	97.57
12	Pakistan	6	1332	0.44	98.01
13	Taiwan	6	1338	0.44	98.46
14	Nigeria	5	1343	0.37	98.82
15	Serbia	4	1347	0.29	99.12
16	Korea	3	1350	0.21	99.34
17	Australia	2	1352	0.15	99.48
18	Portugal	2	1354	0.15	99.63
19	Yugoslavia	2	1356	0.15	99.78
20	Belgium	1	1357	0.74	99.85
21	Israel	1	1358	0.74	99.93
22	Sweden	1	1359	0.74	100.00

Table 8(a) – Geographical distribution of contributors of articles within different states of India

S. No.	Country	No. of contributors	Cumulative number of contributors	Percentage of contributors	Cumulative percentage of contributors
1	Delhi	342	342	29.31	29.31
2	Haryana	229	571	19.62	48.93
3	West Bengal	139	710	11.91	60.84
4	Maharashtra	121	831	10.37	71.21
5	Tamil Nadu	82	913	7.03	78.23
6	Gujarat	63	976	5.40	83.63
7	Uttar Pradesh	54	1030	4.63	88.26
8	Rajasthan	40	1070	3.43	91.69
9	Karnatak	31	1101	2.66	94.34
10	Assam	13	1139	1.11	97.60
11	Andhra Pradesh	13	1139	1.11	97.60
12	Himachal Pradesh	9	1148	0.77	98.37
13	Madhya Pradesh	8	1156	0.69	99.06
14	Orissa	6	1162	0.51	99.57
15	Punjab	4	1166	0.34	99.91
16	Kerala	1	1167	0.09	100.00

Table 9 – Subject trends of articles

S. No.	Subject	No. of articles	Percentage of articles
1	Production and Properties of Yarns	144	28.40
2	Chemical and Finishing Process	123	24.26
3	Production and Properties of Fabrics	96	18.93
4	Production and Properties of Natural and Synthetic Fibres	58	11.44
5	Analysis, Testing and Quality Control	43	8.48
6	Industrial Engineering	14	2.76
7	Fibre Reinforced Composites	11	2.17
8	Physics and Chemistry of Fibre forming Polymers	8	1.58
9	Application of Microprocessors	5	0.99
10	Garment Technology	4	0.79
11	Instrumentation	1	0.20
	Total	507	100.00

Subject trends of the articles

The details of the subject wise analysis of the articles are shown in the Table 9. The subject 'Production and Properties of Yarns' constituted the highest number of articles i.e., 144 articles during the period 1996-2004. 'Chemical and Finishing Process' constituted 123 numbers of articles (24.26%) followed by 'Production and Properties of Fabrics' having 96 of articles (18.93%). The fourth highest articles belonged to the subject 'Production and Properties of Natural and Synthetic Fibres' totaling 58 articles (11.44%). Other headings constituted less than 50 articles.

Findings

From the study the major findings are:

1. The contribution of articles to each volume is not consistent rather it shows an increasing trend from the year 1996.
2. The average citations per article are 16.00.
3. Regarding the bibliographical distribution of citations it has been found that the use of journal form is predominant i.e., 73.92 % of total citations are journals.
4. In the case of authorships three authored papers were highest followed by joint authored and then multi-authored papers. These three types of authorship constitute 85.60 % of total articles. It shows that collaborative research is prominent in this field.
5. The articles have an average length of 6.45 pages.
6. There is a considerable time gap between the date of receipt and acceptance of articles (05.89 months) and between the acceptance and the publication of articles (11.31 months). From the receipt of articles to the publication of articles the time gap is 17.20 months, which shows that considerable time is taken to publish the articles.
7. Geographical distribution of contributors shows that maximum contribution is from India totaling 85.87% of the total contributors. Further analysis shows that Delhi, Haryana, West Bengal and Maharashtra combinedly contributed 71.21 %.

8. The subject analysis shows that the articles are concentrated mostly in the areas of Production and Properties of Fibres, Yarns and Fabrics and their Chemical Process.

Conclusion

Indian Journal of Fibre and Textile Research is a reputed journal in the field of textile Technology. Analysis of contributions of 9 volumes of the journal shows that it covers contributions related to nearly all aspects of textile technology. The increasing trend in the number of contributions in the journal from year to year shows that the journal is a respected primary publication by researchers in the area. The journal is popular among

Indian researchers in the area of textile technology. The journal should strive to reduce the time lag between the date of receipt and date of publication of the articles.

References

1. Cole F J & Eales N B, The history of comparative anatomy. Part -1: A Statistical analysis of literature, *Science Progress*, 11 (1917) 578-596.
2. Pritchard A, Statistical bibliography or bibliometrics, *Journal of Documentation*, 25 (4) (1969) 348-349.
3. Roy P M, Towards a theory of citing in citation analysis studies, in *Developing horizons in Library and Information Science*, Vol 1, by C D Sharma and Kailas Vyas (Print Well, Jaipur), 1983, p. 223-35.
4. Sengupta I N, Ghosh B N & Sengupta K N, Role of bibliometry in journal selection and management, *IASLIC Bulletin*, 25 (2) (1980) 87-92.