

CITATIONS ANALYSIS OF PH. D THESES ON STATISTICS SUBMITTED TO DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD (MAHARASHTRA) INDIA

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Abstract

The present paper focuses on bibliographical entries listed at the end of the 75 Ph.D. theses 5784 citations on Statistics submitted to Dr. Babasaheb Ambedkar Marathwada University Aurangabad. It discusses on form-wise distribution of citations, chronological distribution of citations, authorship pattern of citations, ranking of authors, ranking of publishers, geographical distribution of citations, Indian and foreign distribution of citations, language-wise distribution of citations, ranking of journals and ranking of books.

Keywords: - Bibliometrics, Scientometrics, Citation, Citation analysis, Ph. D theses, Statistics

Introduction

Citation analysis is one of the methodology adopted by libraries for evaluating their collection as well as a tool for building an effective journal collection. Citation analysis is useful for librarians, teachers, researchers and information scientists to represent the relationship which exist between the cited and citing document, the technique of citation analysis involve the process of collection, counting and analysis given in various types of literature. Therefore citation analysis is important study for any discipline of pure sciences and social sciences.

Survey of Literature

Citations analysis and citation impact analysis satisfy ‘useful purposes’ in supporting the interests of the research environment (Wormell, 1998), Citation analysis has many critics, and some have focused their criticism on the idea that citation analysis could be used as an input into the RAE –Research Assessment Exercise process (Norris and Oppenheim, 2003), Citation analysis is an effective but somewhat neglected technique of collection development and Evaluation. The method of Citation analysis consists of counting and ranking the number of times documents are cited in bibliographies footnotes, and/or indexing tool (Baker and Lancaster, 1991), citation analysis permits the researcher to comprehend current developments in subject fields, the properties of bibliographical usage, and research trends (Chen,2004), citation analysis can be used to study the nature and characteristics of literature cited in the different discipline (Balasubramanian and Bhaskar, 1984).The review of literature shows the usefulness of citation analysis study to the librarians and researchers in the various disciplines.

Khparde V S (2011) she studied the pattern of information use by researcher in the field of library and information science. It is based on the references appended to International Journal of “Library Hi Tech” during 2005-2009. The present study is based on 3876 references appended to 247 articles contributed by the authors Library Hi Tech. In Authorship pattern it was found that Solo Research is Predominant than Collaborative Research. The degree of research collaboration was calculated and it was found that the single authorship trend increased gradually in Library Hi Tech. Khparde V S (2011) stated in study “Bibliometric Study of Electronic Journal of Academic and Special Librarianship.” that single author contributions have dominated the journal with 47.95% of contributions, and in geographical based distribution of articles India have occupied the top position with 28.41% publications. Jadhav V.S.; Khparde V.S. and Shelke S.M. (2011) studied Citation analysis of all the journal articles published in the journal ‘University News’ from January 2004 to December 2008 is carried out in 5 volume and 261 issues in its 1949. The citations taken for the study are 5968. The maximum number of citations were referred in 2007 to 2008 that is 2950 (50.6%), the most cited type of document is book 1549 (26.39%), the maximum number of citations were from India that is 3675 (62.61%), in authorship pattern single author citations are dominant that others that is 3011 (51.30%). Khparde V S (2013) her paper conducted the Bibliometric Analysis of Research Publication of Department of Chemistry, Dr. Babasaheb Ambedkar Marathwada University, from 1975 to 2012. 774 research publications were analysed from 144 journals. The study examines year-wise distribution of papers, authorship pattern, journal in which author published. Ranveer V B (2014) Scientometrics analysis of 110 articles published in the international journal The Collection Building during the year 2005 – 2009 are taken to observe the distribution of contributions , authorship pattern , geographical distribution of contributions and the number of pages used in each volume. Result indicate that highest numbers of papers have been written by single authors, Fawaz Alhamdi and Vaishali Khparde (2015) Analyzed Authorship pattern in cloud computing research in LISTA . They collect 108 articles during the year 2009 to 2013. In this study the number of contributions found to be the highest is 24 in the year of 2012. The rate of growth of publication highly decreased from the rate of 0.693 in 2010 to 0.193 .in 2013 whereas the corresponding the Doubling time for different years gradually increased from 1 in 2010 to 3.95 in 2013.

Objectives of the study

1. Form-wise distribution of citations
2. Chronological distribution of citations
3. Authorship pattern of citations
4. Ranking of Authors
5. Ranking of Publishers
6. Geographical Distribution of Citations
7. Indian and Foreign distribution of citations.
8. Language-wise distribution of citations.
9. Ranking of Journals
10. Ranking of Books

Data Analysis

1.1 Form Wise Distributions of Citations

A total number of 5784 citations of 75 Ph.D. Theses are distributed in different sources as shown in table No. 1.1

Table No. 1.1 Form wise Distributions of Citations

Sr. No.	Documents	Citations	Rank	Percentage
1	Journals	3482	1	60.20
2	Books	1376	2	23.79
3	Review	93	3	1.61
4	Report	85	4	1.47
5	Thesis	82	5	1.42
6	Bulletin	58	6	1.00
7	Conference	51	7	0.88
8	Symposium	39	8	0.67
9	Paper	28	9	0.48
10	Handbook	21	10	0.36
11	Other forms	208		3.60
12	Not Mention	261		4.51
	Total	5784		100.00

The frequency distribution of different forms of literature used by researcher in Statistics heavily depend on periodicals sources for their studies. Only top ten form of literature is shown in table No.1.1 it was found that the journal are the major form of media used with citation count, of 3482 (60.20%) of total literature used, where as remaining sources account for 2302 (39.79%) therefore periodicals are the first hand original and latest information in the subject and are most preferred channel of information use. Amongst citations of non-periodical sources book occupy 1376 (23.79%) of citations, while the

review occupy 93 (1.61%) remaining 208(3.60%) documents are other documents and 261 documents not mentioned their form.

1.2 Chronological Distributions of Citations

A total number of **5784** citations of **75** Ph.D. these are distributed among the different groups of years as shown in table No.1.2 and figure No. 1.1.

Table No. 1.2 Chronological Distribution of Citations

Sr. No	Year	No of Citations	Percentage	Cumulative %
1	1768 – 1777	1	0.02	0.02
2	1778 – 1787	0	0	0.02
3	1788 – 1797	0	0	0.02
4	1798 – 1807	0	0	0.02
5	1808 – 1817	0	0	0.02
6	1818 – 1827	0	0	0.02
7	1828 – 1837	0	0	0.02
8	1838 – 1847	0	0	0.02
9	1848 – 1857	0	0	0.02
10	1858 – 1867	2	0.03	0.05
11	1868 – 1877	0	0	0.05
12	1878 – 1887	10	0.17	0.22
13	1888 – 1897	14	0.24	0.46
14	1898 – 1907	10	0.17	0.63
15	1908 – 1917	16	0.28	0.91
16	1918 – 1927	43	0.74	1.65
17	1928 – 1937	56	0.97	2.62
18	1938 – 1947	148	2.56	5.18
19	1948 – 1957	509	8.8	13.98
20	1958 – 1967	998	17.25	31.23
21	1968 – 1977	1238	21.4	52.63
22	1978 -1987	1056	18.26	70.89
23	1988 – 1997	993	17.17	88.06
24	1998 – 2007	436	7.54	95.6
25	2008 – 2012	68	1.18	96.78
	Year Not Mention	186	3.22	100
	Total	5784	100	

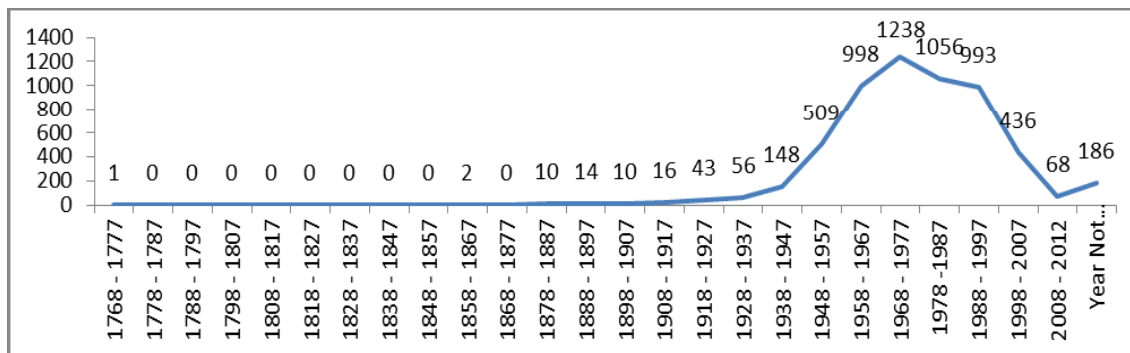


Figure No. 1.1 Chronological Distribution of Citations

The period-wise distribution of citations was measured by number of year which elapsed between the publications of a cited document. The whole time span of the documents used was divided into period groups, each of 10 years duration. The table 1.2 and figure 1.1 shows that the maximum number of citations are covered during the period of 1968 - 1977 accounting to 1238 (21.40%), followed by year 1978 – 1987 accounting to 1056 (18.26%), and in the period of 1958 - 1967 accounting to 998 (17.25%) citations. Least number of citations followed by the year 1768-1777 accounting to 01 (0.02%) respectively.

1.3 Authorship Pattern of Citations

The total number of 5784 citations of 75 Ph.D. theses are cited by single author, two authors, three authors, four authors, five authors, six authors, seven authors and some citations have not mention their authors, which is shown in the table No. 1.3 and figure No. 1.2.

Table No. 1.3 Authorship Pattern of Citations

Sr. No.	No. of Authors	Citations	Percentage
1	Single Author	3307	57.17
2	Two Author	1746	30.19
3	Three Author	582	10.06
4	Four Author	99	1.71
5	Five Author	23	0.40
6	Six Author	7	0.12
7	Seven Author	1	0.02
8	Authors not mention	19	0.33
	Total	5784	100

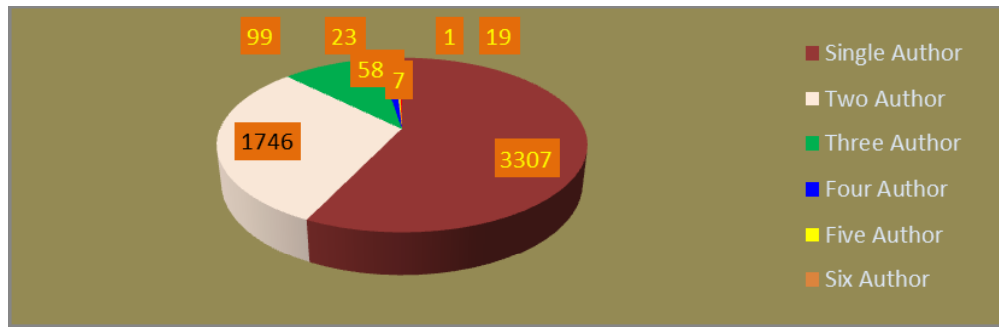


Figure No 1.2. Authorship Pattern of Citations

The characteristics of any subject literature include not only the basic publishing pattern but that of authors themselves so the authors were analyzed to determine the percentage of single author, two authors, three authors, four authors, five authors, six authors, seven authors and authors are not mentioned in some citations. In order to have a clear picture the result of analysis of authors are presented. The table No 1.3 and figure No. 1.2 indicates that out of total number of 5784 citations 3307 (57.17%) are by single author, followed by 1746 (30.19%) citations by two authors, 582 (10.06%) citations have three authors. The finding also shows that the least citations are by seven authors i.e. 01 (0.02%) citations respectively.

1.4 Ranking of Authors

A total number of 5784 cited documents of 75 Ph.D. theses are shown in table No. 1.4. Out of that 5765 citations have mentioned their authors and 19 citations have not mentioned their authors. The author ranking is shown in table No. 1.4.

Table No. 1.4 Ranking of Authors

Sr. No.	Author' Name	Citation	Rank	Percentage
1	Prabhu Ajaonkar S.G	84	1	0.92
2	Pachpatte B.G	49	2	0.54
3	Dantzig George B	43	3	0.47
4	Maiti M	35	4	0.38
5	Charnes A	33	5	0.36
6	Heady E.O	32	6	0.35
7	Herdan Gustav	32	6	0.35
8	Zimmerman H.J	32	6	0.35
9	Cochran W.G	31	7	0.34
10	Hadley G	31	7	0.34
11	Remaining 8683 Authors are coming less than 31 Times	8683		95.38
12	Author not mention	19		0.21
	Total	9104		100.00

The author who is most preferred by researchers, that document is most important to keep in the library for that purpose author ranking is essential to librarians as well as researchers. The author which is 31times or more than 31 times has been considered in the above table. “Prabhu Ajgaonkar S.G.” scores the top position with 84 (0.92%) citations; second rank goes to “Pachpatte B.G.” with 49 (0.54%) citations, followed by “Dantzig George B.” with 43 (0.47%) citations respectively.

1.5 Ranking of Publishers

The publishers are the most important in finding the information source where it is surely available. The researcher of Statistics used various forms of information sources which are published by various kinds of publishers. The ranking of publishers is arranged on the basis of the number of times it was referred.

Table No. 1.5 Ranking of Publishers

Sr. No.	Name of Publishers	Citations	Rank	Percentage
1	John Wiley and sons	162	1	2.80
2	Tata McGraw Hill Publishing Co, Ltd	115	2	1.99
3	Academic Press	76	3	1.31
4	Wiley	72	4	1.24
5	Prentice Hall Englewood Cliff's.	49	5	0.85
6	Springer-Verlag	49	5	0.85
7	Cambridge university press	41	6	0.71
8	Princeton University Press	41	6	0.71
9	Wiley Eastern Limited	36	7	0.62
16	Other publication	736		12.72
17	publisher not mention	4407		76.19
	Total	5784		100.00

Table No. 1.5 shows the bibliography of publishers. The publisher “John Wiley and Sons.” scores the top position with 162 (2.80%) citations, second rank goes to “Tata McGraw Hill Publishing Co, Ltd” With 115 (1.99%) citations, followed by “Academic Press” with 76 (1.31%) citations respectively.

1.6 Geographical Distributions of Citations

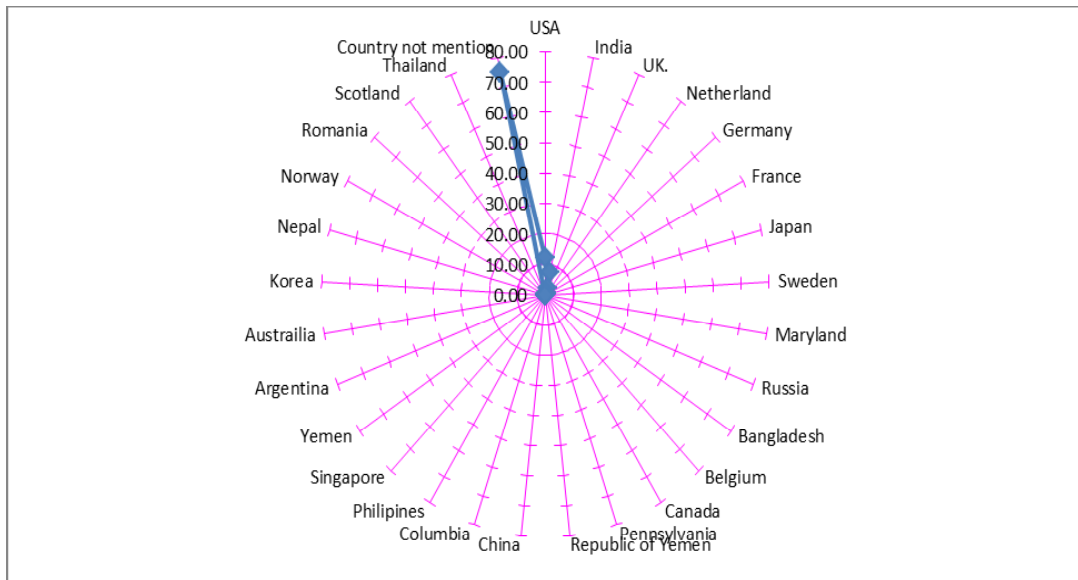
The total number of 5784 cited documents in 75 Ph.D. theses are distributed in different geographical areas as shown in table No. 1.6 and figure No. 1.3 Geographical distribution of citations provides information of the rank of countries active in the particular subject field and their relative contributions.

Table No. 1.6 Geographical Distributions of Citations

Sr. No.	Country	Citations	Rank	Percentage
1	USA	712	1	12.31
2	India	443	2	7.66
3	UK.	141	3	2.44
4	Netherland	43	4	0.74
5	Germany	25	5	0.43
6	France	12	6	0.21
7	Japan	12	6	0.21
8	Sweden	10	7	0.17
9	Maryland	9	8	0.16
10	Russia	6	9	0.10
11	Bangladesh	4	10	0.07
12	Belgium	4	10	0.07
13	Canada	4	10	0.07
14	Pennsylvania	3	11	0.05
15	Republic of Yemen	3	11	0.05
16	China	2	12	0.03
17	Columbia	2	12	0.03
18	Philippines	2	12	0.03
19	Singapore	2	12	0.03
20	Yemen	2	12	0.03
21	Argentina	1	13	0.02
22	Australia	1	13	0.02
23	Korea	1	13	0.02
24	Nepal	1	13	0.02
25	Norway	1	13	0.02
26	Romania	1	13	0.02
27	Scotland	1	13	0.02
28	Thailand	1	13	0.02
29	Country not mentioned	4335		74.95
	Total	5784		100

The table No.1.6 and figure No.1.3 shows that USA Scored the top position with 712 (12.31%) citations, second rank goes to India with 443 (7.66%) citations, followed by UK with 141 (2.44%) citations respectively.

Figure No. 1.3 Geographical Distributions of Citations

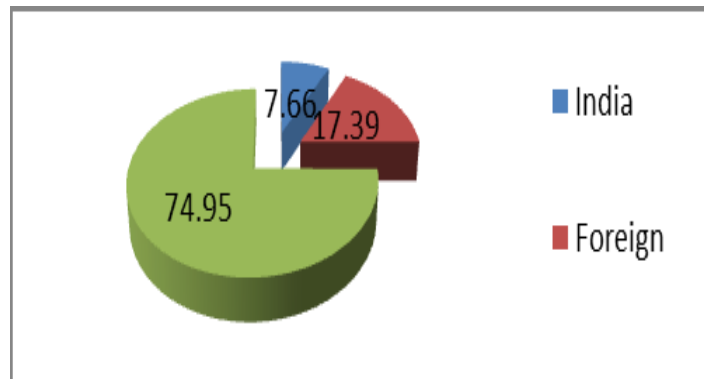


1.7 Use of Indian and Foreign Literature

Table No 1.7 Use of Indian and Foreign Literature

Sr. No.	Geographical Area	Citations	Percentage
1	Indian	443	7.66
2	Foreign	1006	17.39
3	Place not mention	4335	74.95
	Total	5784	100

Figure No 1.4 Use of Indian and Foreign Literature



The table No. 1.7 and figure No.1.4 show the geographical distribution of Indian and Foreign countries coverage. Out of 5784 citations, Indian citations are 443 (7.66 %) and remaining 1006 (17.39%) citations are foreign citations whereas in 4335 (74.95%) citations place is not mentioned.

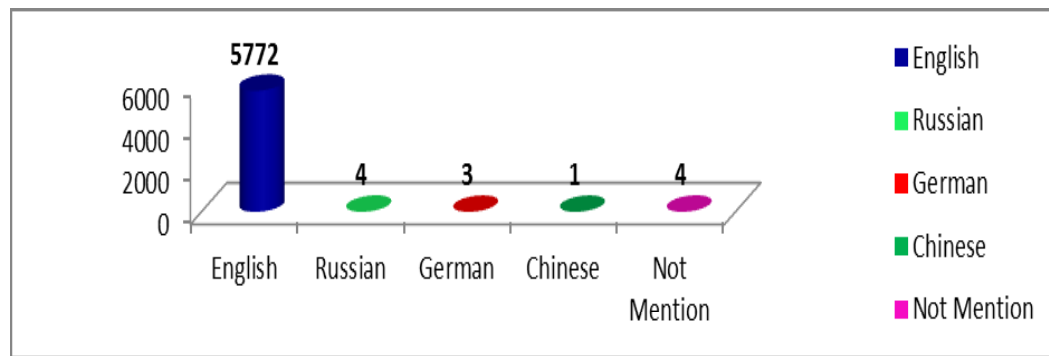
1.8 Language-Wise Distribution of Citations

The total number of 5784 citations of 75 Ph. D. theses is distributed among 4 different languages as shown in table No 1.8 and figure No. 1.5.

Table No 1.8 Language Wise Distributions of citations

Sr. No.	Language	Citations	Rank	Percentage
1	English	5772	1	99.79
2	Russian	4	2	0.07
3	German	3	3	0.05
4	Chinese	1	4	0.02
5	Not Mention	4	3	0.07
	Total	5784		100

Figure No 1.5 Language Wise Distributions of citations



It was seen that the citations appeared in Multilanguage. The table shows that 5772 (99.79%) documents were cited in English language whereas 4 (0.07) documents were cited in Russian; 3(0.05) in German; 1(0.02) in Chinese and in 4 documents language is not mentioned.

1.9 Ranking of Journals

The total number of 5784 citations of 75 Ph. D. theses, of which 3482 citation are journal citations. The journal ranking is shown in the table No. 1.9

Table No. 1.9 Ranking of Journals

Sr.No	Journal Title	Citations	Rank	%
1	Operation Research	148	1	4.25
2	Journal of The American Statistical Association	147	2	4.22
3	European Journal of Operational Research	144	3	4.14
4	Journal of Fuzzy sets and systems	117	4	3.36
5	Journal of Biometrika	113	5	3.25
6	Journal of Indian Society of Agricultural Statistics	98	6	2.81
7	Journal of The Operational Research Society	95	7	2.73
8	Journal of Management Science	93	8	2.67
9	Sankhya-The Indian journal of statistics	91	9	2.61
10	Annals of Mathematical Statistics	88	10	2.53
11	Less than 88 times	2348		67.43
	Total	3482		100.00

The rank list of journals is essentially a practical tool designed to help the librarian and research scientist to select the journals of maximum utility in relation to their coverage of new and important literature in particular subject area. The journals are most preferred publication used by the researcher in their study. The journals which are cited 88 times and more than 88 times have been considered in the above table. "Operation Research" scores the top position with 148 (4.25%) citations; second rank goes to "Journal of The American Statistical Association" with 147 (4.22%) citations, followed by "European Journal of Operat

1.10 Ranking of Books

As books are the most reliable medium for communications and spread of knowledge. The researchers of Statistics used books as source of studies. Out of 5784 citations, 1376 citations are book citations. The ranking of the particular books are arranged on the basis of the number of times it was referred.

Table No 1.10 Ranking of Books

Sr.No	Book Title	Citations	Rank	Percentage
1	Operation Research	52	1	3.78
2	An Introduction to Linear Programming	47	2	3.42
3	An Introduction to probability theory and its application	16	3	1.16
4	Linear programming methods and applications	15	4	1.09
5	An introduction to the theory of statistics	13	5	0.94
6	Sampling theory of surveys with applications	13	5	0.94
7	Fuzzy set theory and applications	12	6	0.87

8	Advanced statistical methods in biometric research	11	7	0.80
9	Biometrika tables for statisticians.	11	7	0.80
10	Linear Programming and Extension	11	7	0.80
11	Less than 11 time	1175		85.39
	Total	1376		100.00

Table No. 1.10 shows the ranking of popular books in Statistics. The books which have been cited eleven and more than eleven times have been given in the table. The book “Operation Research” scores the top position with 52 (3.78%) citations, second rank goes to “An Introduction to Linear Programming” with 47(3.42%) citations, followed by “An Introduction to probability theory and its application” with 16(1.16%) citations respectively.

Conclusion

Journals are the major form of document; maximum numbers of citations are covered during the period of 1968 -1977, single author citations are maximum compared to multiple, in author ranking “Prabhu Ajgaonkar S.G.” scores the top position, In ranking of publishers John Wiley and Sons scores the top position compared to others, Geographical distribution of citations country wise in Statistics USA scored the top position, language wise distribution shows that the English is an predominant language, in journal ranking “Operation Research “Scores the top position compared to other journals, in book ranking “Operation Research “ scores the top position compared to other books.

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