International Journal of Librarianship and Administration
ISSN 2231-1300 Volume 3, Number 2 (2012), pp. 87-94

http://www.ripublication.com/ijla.htm

Scientometric Measures in Scientometric, Technometric, Bibliometrics, Informetric, Webometric Research Publications

[1]Dr. S. Raja, [2]Ram Kumar and [3]Dr. N. Amsaveni

[1]Asst. Librarian, A.U.C.B. Public Library,
Alagappa University, Karaikudi, Tamilnadu, India
E-mail: lisraja1979@gmail.com
[2]Asst. Librarian, AMET University, Chennai-603 112, Tamil Nadu, India
E-mail: ramkumar_pe@yahoo.com
[3]Asst. Prof., DLIS, BDU, Trichy, India
E-mail id: veni032002@gmail.com

Abstract

This study has been carried out to analyze the research field of Scientometrics, technometric, bibliometrics, informetric, webometrics in terms of publication output as per Science Citation Index (1978-2012) from Web of Science. During 1999- 2011 a total of 2325 papers were published by the scientists in the field of scientometrics. The average number of published per year 13 %.The highest number of papers 413 were published in 2011. There were 49 countries involved in the research in this field. USA is the top producing country with 377 publications. The most productive author is Glanzel W with 53 papers dealing with Scientometrics. The most productive Journal is Scientometrics with 560 papers dealing with Scientometrics.

Keywords: Scientometrics, technometric, bibliometrics, informetric, webometrics

Introduction

Now a day the scientometrics, research publications are clearly one of the quantitative measures for the basic research activity in a country. It must be added, however, that what excites the common man, as well as the scientific community, are the peaks of scientific and technological achievement, not just the statistics on publications. Many scientometrics studies have appeared in the literature to focus on the performance of science in the field of scientometrics.

Objectives

The main objective of the study is to present the growth of world literature in scientometrics deposition and make the quantitative assessment of the research in terms of year-wise research output, geographical distribution of research output, characteristics of highly productive institution and the channel of communication used by the scientists.

Methodology

Data was collected from the Science Citation Index (SCI) which is available via the Web of Science (WoS). The WoS is the search platform provided by Thomson Reuters (the former Thomson Scientific emerged from the Institute for Scientific Information (ISI) in Philadelphia). SCI database is one of the very comprehensive databases covering all aspects of science. The study period (1999-2011) is selected as the database is available in machine from since 1982. The search string "Scientometrics, technometric, bibliometrics, informetric, webometrics" in the "Basic search" field of SCI was used for the year s 1999-2011 to download the records on the subjects 'scientometrics'. A total of 2325 records were downloaded and analyzed by using the web of science website application as per the objectives of the study.

Results and discussion

Table 1: Year wise distribution of documents

S.No	Years	Records	Percentage
	2011	413	17.763
	2010	355	15.269
	2009	313	13.462
	2008	234	10.065
	2007	184	7.914
	2006	167	7.183
	2005	140	6.022
	2004	94	4.043
	2003	91	3.914
	2002	83	3.570
	2001	83	3.570
	2000	86	3.699
	1999	82	3.527
	Total	2325	100

During 1999 - 2011 a total of 2325 publications were published in scientometrics by global. The average Number of Publications produced per year was 13.00%. The

highest number of publications 413 was produced in 2011 Table 1 was given year wise growth and collaboration rate in scientometrics. It can be clearly visualized from the table1 that growth of the literature was very low during 1999. It Indicate that research in scientometrics received a major impetus this period.

Table 1(a): Exponential growth rate of publications

S.No	Years	Number of publications	Exponential growth rate
	1999	82	-
	2000	86	1.05
	2001	83	0.97
	2002	83	1.0
	2003	91	1.09
	2004	94	1.03
	2005	140	1.49
	2006	167	1.19
	2007	184	1.10
	2008	234	1.27
	2009	313	1.34
	2010	355	1.13
	2011	413	1.16
	Total	2325	13.82 (1.06)

The above reveals that the exponential growth rate of publication on Scientometric, Technometric, bibliometrics, informetric, webometrics during 13 years (1999 to 2011). An exponential growth in number of publication was observed during 1999 to 2011. The highest growth rate is 1.49 percents found during 2005with 140 publications followed by 1.34 percents at 2009 with 313 publications, 1.27 percents at 2008 with 234 publications. It was found very low growth rate at the year of 2001 with 83 publications. The total exponential growth rate value is 13.82, it is found the average exponential growth rate is 1.06 percents for sample periods.

Table 2: Country wise documents distribution (Top 15)

S.No	Countries/ Territories	Record Count	Total citations	Average Citations per Year	H-Index	Average Citations per Item
	USA	377	3377	241.21	29	8.96
	SPAIN	363	1876	134	20	5.17
	ENGLAND	203	1719	122.79	22	8.47
	GERMANY	163	1170	83.57	17	7.18
	NETHERLANDS	159	2268	162	25	14.26
	BELGIUM	119	1501	107.21	21	12.61

	PEOPLES R CHINA	108	506	42.17	12	4.69
	ITALY	104	579	44.54	14	5.57
	CANADA	91	634	52.83	12	6.97
	FRANCE	82	460	38.33	11	5.61
	AUSTRALIA	81	549	39.21	11	6.78
	TAIWAN	81	412	34.33	11	5.09
	BRAZIL	75	333	27.75	11	4.44
	HUNGARY	72	1219	87.07	20	16.93
	INDIA	69	256	18.29	8	3.71

There were as many as 49 countries carrying out research in the field of Scientometrics and produced 803 authorships. Table 2 provides a list of countries whose research output is more than 15 publications. USA is the top producing country with 377 publications (16.21%)(H-index value 29), Spain with 363 publications (15.61%), England with 203 Publications (8.73%).

Table 3: Top 25 most productive authors with respect to the number of article dealing with Scientometrics: SCI (WoS)

S.No	Author	Record count	Percentage	Total citations	H-index
	Glanzel W	53	2.280	1025	19
	Ho YS	36	1.548	226	9
	Abramo G	26	1.118	119	6
	Van leeuwen TN	26	1.118	422	12
	Bordons M	25	1.075	328	9
	D'angelo CA	25	1.075	119	6
	Van raan AFJ	24	1.032	704	13
	Moed HF	22	0.946	569	14
	Thelwall M	21	0.903	167	7
	Wilson CS	20	0.860	174	6
	Bornmann l	19	0.817	259	9
	Thijs B	19	0.817	265	9
	Aleixandre-benavent R	17	0.731	68	5
	Lewison G	17	0.731	189	8
	Gonzalez-alcaide G	16	0.688	54	5
	Jimenez-contreras E	16	0.688	122	5
	Van eck NJ	16	0.688	142	6
	Rousseau R	15	0.645	196	7
	Schubert A	15	0.645	328	10
	Scutaru C	15	0.645	22	3
	Smith DR	15	0.645	103	5
	Waltman l	15	0.645	141	6

	Willett P	14	0.602	78	4
	Egghe l	13	0.559	255	8
	Franceschini F	13	0.559	46	3

The most productive author is Glanzel W with 53 papers dealing with scientometrics and 2.28% of all papers published in this research field. The authors of the seminal publication on Scientometrics given Table-3, Hoys appear on rank 2 (36 papers) and Abramo G appeared on rank 3 (26 papers), respectively.

Table 4: Top 10 most productive Journal with respect to the number of articles dealing with Scientometrics, Source: SCI (WoS)

S.No	Journal name	Records	Percentage
	Scientometrics	560	24.086
	Journal of the American society for information S&T	125	5.376
	Journal of Informetrics	73	3.140
	Research Evaluation	62	2.667
	Journal of Information Science	32	1.376
	Information Processing Management	28	1.204
	Malaysian Journal of Library Information Science	25	1.075
	Revista Espanola de Documentacion Cientifica	24	1.032
	Journal of Documentation	20	0.860
	Research Policy	19	0.817

The most productive Journal is Scientometrics with 560(24.08 %) papers dealing with Scientometrics followed by (125) 6.88 percent in Journal of the American society for information science and technology,(73) 3.14 percent Journal of Informetrics,(62) 2.66 percent Research Evaluation, (32) 1.37 percent Journal of Information Science.

Table 5: Source wise distribution documents

S. No	Field: Document Types	Record Count	Percentage	Total Citations	Average Citations per Year	h-Index	Average Citations per Item
	ARTICLE	2052	88.258	14699	1049.93	45	7.16
	PROCEEDINGS PAPER	160	6.882	2199	157.07	22	13.74
	REVIEW	114	4.903	989	70.64	16	8.68
	EDITORIAL MATERIAL	73	3.140	391	32.58	11	5.36
	MEETING ABSTRACT	30	1.290	4	0.80	1	0.13
	LETTER	27	1.161	36	2.77	3	1.33
	CORRECTION	10	0.430	4	0.33	1	0.40
	BOOK REVIEW	7	0.301	1	0.50	1	0.14

	BIOGRAPHICAL ITEM	6	0.258	10	1.00	2	1.67
	BIBLIOGRAPHY	4	0.172	5	1.67	1	1.25
	REPRINT	2	0.086	9	1.29	1	4.50

Scientometrics Scientists communicated their research results through a variety of communication channels. Table - 5 provides the distribution of publications in various channels of communication. It was observed that (2052) 88.25 percent of the article was published in Article followed by (160)6.88 percent in Proceedings Paper, (114) 4.90 percent in Review, (73) 3.14 Percent in Editorial material, (30)1.29 percent in Letter, (27) 1.16 percent in Letter, (10) 0.43 percent in Correction,(7) 0.43 Percent Book Review, (6) 0.25 Percent Biographical Item, (4) 0.17 Percent Bibliography and (2) 0.08 Percent Reprint.

Table 6: Language wise distribution documents

S.No	Language	Records	Percentage
	ENGLISH	2037	87.613
	SPANISH	159	6.839
	UNSPECIFIED	41	1.763
	PORTUGUESE	33	1.419
	GERMAN	27	1.161
	FRENCH	12	0.516
	CZECH	4	0.172
	CROATIAN	2	0.086
	RUSSIAN	2	0.086

Table – 6 The Scientometrics have contributed more predominantly in English languages as 2037 (87.61%) publications were in English followed by Spanish as 159 (6.89%) Publications.

Table 7: Institution wise documents distribution (First - 18 Documents)

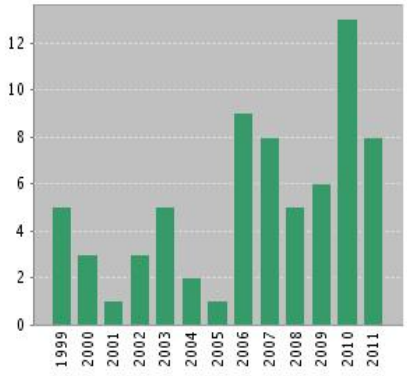
S.No	Institutions	Recs	%	Total Citations	Average Citations per Year	h-Index	Average Citations per Item
	LEIDEN UNIV	83	3.570	1566	111.86	22	18.87
	UNIV GRANADA	74	3.183	470	39.17	12	6.35
	HUNGARIAN ACAD SCI	64	2.753	931	66.50	18	14.55
	KATHOLIEKE UNIV LEUVEN	62	2.667	825	82.50	18	13.31
	CSIC	52	2.237	423	32.54	10	8.13
	UNIV VALENCIA	41	1.763	109	13.62	6	2.66
	ROYAL SCH LIB INFORMAT SCI	31	1.333	371	28.54	11	11.97
	INDIANA UNIV	29	1.247	596	45.85	10	20.55

	UNIV ROMA TOR VERGATA	26	1.118	119	29.75	6	4.58
	ASIA UNIV	25	1.075	106	35.33	6	4.24
	PEKING UNIV	23	0.989	102	20.40	6	4.43
	WOLVERHAMPTON UNIV	23	0.989	200	20.00	9	8.70
	UNIV AMSTERDAM	22	0.946	319	31.90	9	14.50
	UNIV NEW S WALES	22	0.946	175	12.50	6	7.95
	NATL CHENGCHI UNIV	19	0.817	53	7.57	4	2.79

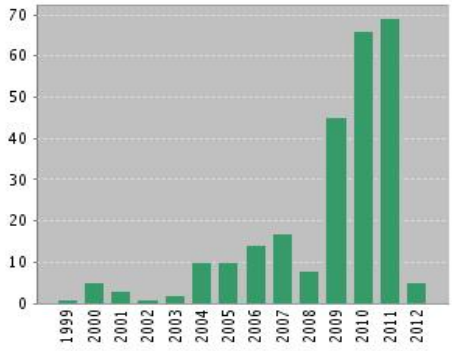
There were 514 institutions involved in research activity in the field of Scientometrics. Table-7 provides publication productivity of top 15 institutions. LEIDEN University topped the list with 83 publications followed by University Granada with 74 publications, Hungarian ACAD SCI with 64 publications, Katholieke University LEUVEN with 62 publications, CSIC with 52 publications, University VALENCIA with 41 publications.

Citation Score and h – index for India

Published Items in Each Year



Citations in each year



Total records found from database	69
Sum of the Times Cited	256
Sum of Times Cited without self-citations	236
Average Citations per Item	3.71
H – index value	8

The above histogram has reveals that the published items in each year from Indian library professionals. Observed form the first graph, the publication growth rate is very highest at the year of 2010 and the lowest growth rate is 2001. Second graph showed that the citation score at each year. It was found from the graph, 2011 having highest citation scores and the year of 1999 having very lowest citation scores. Retried from the database total records is only 69, sum of the times cited by scientist is 256, average citation per records is 3.71 and the country of India's h-index value is 8 among the comprehensive.

Conclusion

In this study the literature on Scientometrics, a promising new material, has been analyzed by scientometric methods. The time evolution of the overall number of citations reveals that the impact increase of the Scientometrics papers is possibly going to outrun the impact increase of the related research fields on Scientometrics. The average Number of Publications produced per year was 13 %. The highest number of publications 413 was produced in 2011. The most productive author is Glanzel W with 53 papers dealing with Scientometrics. Most productive research in country is USA among other 49 countries. The most productive Journal is Scientometrics with 560 papers dealing with Scientometric, technometric, bibliometric, informatric and webometric subjects. Types of documents, the format of Journal article is the highest. Finally, the Scientometrics have more contributed and communicated in English language. Most productive research Institution there are LEIDEN University is topped with 83 publications.

References

[1] Zitt, M., & Bassecoulard, E. (2006). Delineating complex scientific fields by an hybrid lexical-citation method: An application to nanosciences. Information Processing & Management, 42(6), 1513–1531.

[2] Takeda, Y., et al. (2009). Nanobiotechnology as an emerging research domain from nanotechnology: A bibliometric approach. Scientometrics, 80(1), 23–38.

[3] Garg, K. C., et al. (2009). Bibliometrics of global malaria vaccine research. Health Information and Libraries Journal, 26, 22–31.

[4] Bhattacharya, S., & Nath, P. (2002). Using patent statistics as a measure of ‘‘technologies assertiveness’’? A China-India comparison. Current Science, 83(1), 23–29.

[5] Schummer, J. (2007). The global institutionalization of nanotechnology research: A bibliometric approach to the assessment of science policy. Scientometrics, 70(3), 669–692.

[6] Savanur, K., & Srikanth, R. (2010). Modified collaborative coefficient: A new measure for quantifying the degree of research collaboration. Scientometrics, 84, 365–371.

[7] Pouris, A. (2007). Nanoscale research in South Africa: A mapping exercise based on scientometrics. Scientometrics, 70(3), 541–553.

[8] Chen, H., & Roco, M. C. (2009). Mapping nanotechnology innovations and knowledge (p. 330). New York, USA: Springer.

[9] Prathap, G. (2010). The 100 most prolific economists using the p-index. Scientometrics, 84, 167–172.