



BIBLIOMETRICS STUDY ON THE JOURNAL PROCEEDINGS OF MATHEMATICAL SCIENCES 2001-2010

DURAIPANDI, R.

Research Scholar, Department of Library and Information Science, Bharathidasan University, Tiruchirappalli,
Tamil Nadu, India.

Abstract

Bibliometrics is a study to measure the research productivity and it is the vital area of research to cover the micro level subjects, institutions and individuals etc. It is a journal study deals with the Proceedings of Mathematical Sciences during 2001-2010 been carried out carefully and observed its performances. The trend of publications such as the year wise distribution of articles, authorship pattern, and average length of articles were also observed. The year 2009 found as top with highly produced research articles 62(13.93%). Most productive research articles among the countries by Indian authors 195(43%) and topped the rank. Almost all the papers 270(61%) are from Universities and a very few papers 7(2%) are from non-academic institutions. The citations demonstrated that individual research 192(43%) is much lower than collaborative research 253(57%). The journal maintains all the features in terms of content, structure, citations, credibility of authorship, etc. Finally, this study gains the insights and progress of the journal towards distinction among researchers.

Keywords: Journal Research Productivity; Bibliometric Study; Authorship Pattern, Degree of Collaboration; Journal Proceeding Mathematical Sciences.

Introduction

Bibliometrics is coined from two words “biblio” and “metrics” and derived from the combination of a Latin and Greek word biblion-means a book or paper, metrics indicates the science of metre i.e. measurement. This study focuses the performances analyses of the Journal Proceedings of Mathematical Sciences during 2001–2010 been carried out and carefully observed. Bibliometrics is a set of methods used to study or measure texts and information. Citation analysis and content analysis are commonly used in bibliometric methods and most often used in the field of library and information science as got popular recently. Bibliometrics uses mathematical and statistical methods to analyse and measure the output of scientific publications. Modern bibliometrics has been largely inspired by Derek de Solla Price and the seminal work was carried out by him in the middle of the last century.

Literature Review

In order to trace the literatures in various journals of bibliometric studies previously and presented a few research reviews pertaining to this study. Tiew, Abdullah and Kaur (2002) have explored the *Malaysian Journal of Library & Information Science* for a five year period from 1996 to 2000 and revealed that the average number of references per article was 22.5 and the average length was 41.2 pages which were purely tentative. The most popular subject was scientific and

professional publishing. Most of the contributions were from Malaysian academics and single-authored articles were found from the governing places. Again, the same journal been studied by Bakri and Willet (2008), during the period of 2001-2006 and compared the results with the earlier study to conclude that, the number of publications was increased statistically and the significant changes occurred in types of articles, number of references per article and length of the articles, the two-authored articles were greater in number and the major contribution was from Malaysian authors. Warraich and Mahmood (2011) have studied the *Pakistan Journal of Library and Information Science* for a six year period of time 1995-2011 and summarized that, most of the authors i.e. 72 (85.71%) contributed single papers and alone dominated as 54 (48.65%), belongs to the University of the Punjab, Lahore. Majority of the publications were research papers and 70% authors preferred as English language and 60% of papers“ length ranges between 6-20 pages, the average length of papers was 8.84 pages. The literature of *D-Lib Magazine* have examined by Park (2010) scientifically performed thirteen years since July 1995 to May/June 2008. The findings proved that, two and more author’s contributed as highest with a ratio of 57% and most of the authors had contributed as single; the ratio of male authors as predominated with 74% than female authors; the authors of the United States as contributed 70% of the articles and the average number of references

per article as 15.

Objectives

- ✓ To know year wise growth rate of publication;
- ✓ To study the average length of papers;
- ✓ To study the authorship pattern;
- ✓ To calculate degree of collaboration among co – authors;
- ✓ To study distribution of authors by geographical location.

Materials and Method

The required data for this study have been collected from the Springer print version journal for the period of 10 years from 2001-2010 and there were 445 publications such as articles, book reviews, conference papers, editorials, etc. have scanned the data relating to subject, author, author affiliation, geographic distribution, and the number of pages were extracted. Then it exported in to excel sheet for data separation, tabulation and analyses the parameters with bibliometrics

techniques to bring under the result systematically.

Analysis and Discussions

This study has intended to analyses and discusses the parameters like year wise growth rate per issue, authorship pattern, degree of collaboration, average length of article, institutional distribution and geographical distribution to know the performance of the Journal Proceedings of Mathematical Sciences during 2001-2010.

1. Year wise Growth Rate

The table -1 & figure -1 shows the year wise growth rate per issue of mathematical proceeding for the period of 10 years from 2001 – 2010. Out of 445 articles, majority of the article 62 were published in the year of 2009 whereas 34 articles were published in the year 2001 and the year wise growth of publication trend has increased from 2001 to 2010. The figure- 1 also shows the same with diagrammatically illustrated.

Table – 1:Year wise Growth Rate per Issue of Mathematical Sciences Proceeding

Year	volume	No. of issues	Number of Articles/ Contributions					No of article published	% of article
			I issue	II issue	III issue	IV issue	V issue		
2001	111	4	8	9	8	9		34	7.65
2002	112	4	18	9	9	12		48	10.78
2003	113	4	8	11	9	7		35	7.86
2004	114	4	11	11	5	9		36	8.08
2005	115	4	9	9	11	15		44	9.88
2006	116	4	8	8	9	14		39	8.76
2007	117	4	9	13	13	10		45	10.11
2008	118	4	8	17	11	12		48	10.78
2009	119	5	12	12	13	13	12	62	13.93
2010	120	5	14	12	9	11	8	54	12.13
Total								445	

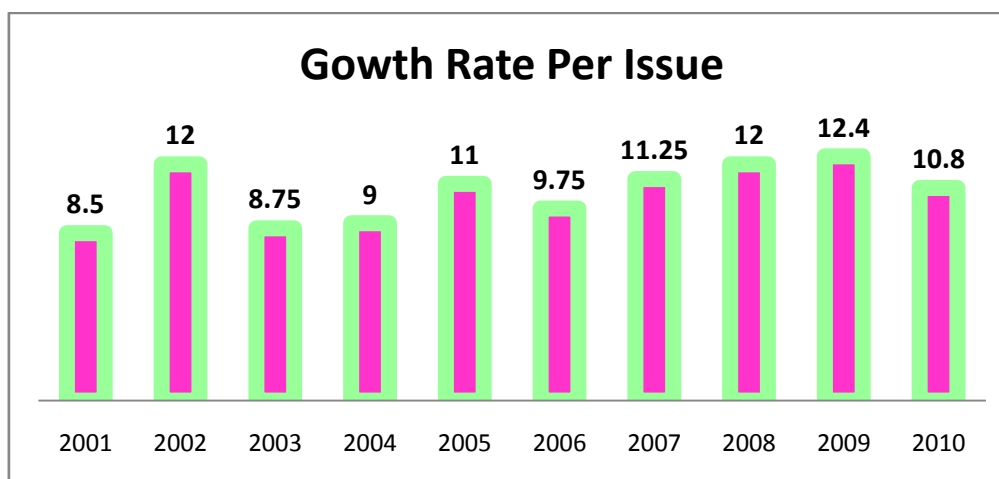


Figure -1:shows Year wise Growth Rate per Issue of Mathematical Sciences Proceeding

2. Authorship Pattern

To measure the authorship pattern is an important aspect in bibliometrics. The below table-2 shows that the highest number of papers, i.e., 207(68.7%) are by Joint(Two) authors. Single author contributions count is 192(43.14%)

followed by three authors 44(9.88%) respectively. The number of joint contributions by four or more authors is found to be 2 (0.45%). It is evident that, over the years level of collaboration is very high in the case of publications in the Proceedings of Mathematical Sciences during the study period.

Table-2: Authorship Pattern of Proceeding of Mathematical Sciences

Year	Single Author	Two Author	Three Author	More than three Author	Total
2001	19	15	-	-	34
2002	21	25	2	-	48
2003	16	17	2	-	35
2004	19	14	3	-	36
2005	19	21	4	-	44
2006	16	21	2	-	39
2007	13	26	6	-	45
2008	24	15	9	-	48
2009	21	31	10	-	62
2010	24	22	6	2	54
Total	192 (43.14%)	207 (46.51%)	44 (9.88%)	2 (0.45%)	445

3. Degree of Collaboration

Table-3 and figure-2 shows that the degree of collaboration is highest in volume 117(2007) and lowest in volume 111 (2001). It can be seen that the degree of collaboration in the journal "Proceeding of Mathematical Sciences" is 0.57 and it brings out clearly the prevalence of team research in Mathematical science field and graphically explained the same with the trends of Multi-Authors and Single Authors during 2001- 2010. The extent of collaboration in research can be

measured with the help of multi authored papers using the formula given by Subramanyan.

Degree of Collaboration $C = Nm / Nm + Ns$

C = Degree of collaboration

Nm = Number of Multiple authors

Ns = Number of Single authors

Accordingly the degree of collaboration has been calculated for the year 2001 is as follows

$$C = 15 / 34$$

$$C = 0.44$$

Table – 3: Degree of Collaboration Proceeding of Mathematical Sciences

Year	With Single Author		With Multi Authors		Total	Degree of Collaboration
	Number of Contributions	Percentage	Number of Contributions	Percentage		
2001	19	9.89	15	5.92	34	0.44
2002	21	10.93	27	10.67	48	0.56
2003	16	8.33	19	7.50	35	0.54
2004	19	9.89	17	6.71	36	0.47
2005	19	9.89	25	9.88	44	0.57
2006	16	8.33	23	9.09	39	0.59
2007	13	6.77	32	12.64	45	0.71
2008	24	12.5	24	9.48	48	0.5
2009	21	10.93	41	16.20	62	0.66
2010	24	12.50	30	11.85	54	0.56
Total	192 (43.14%)		253 (56.85%)		445	0.57

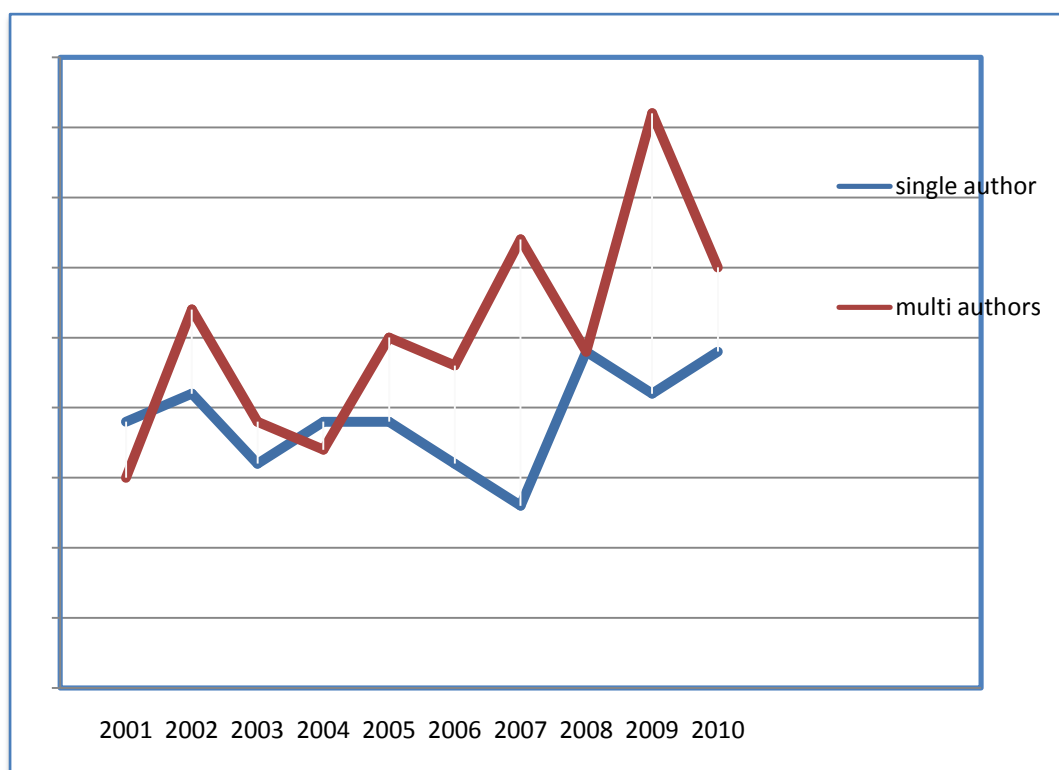


Figure – 2: Degree of Collaboration Proceeding of Mathematical Sciences

4. Average Length of Article

Table 4 shows that the minimum average length of article is 11.27 pages which reported for the cumulative issues of 2009 while, the maximum average page of the article is 15.6 pages for the

year 2003. Taking all the issues from 2001 to 2010 into account, it is found that Mathematical Sciences proceeding Journal has accommodated on an average 13 pages per article.

Table – 4: Average Length of Article in Mathematical Sciences Proceeding 2001-2010

Year	No of article	Cumulative total of article	pages	Cumulative total of pages	Average page per article
2001	34	34	508	508	14.94
2002	48	82	654	1162	13.63
2003	35	117	456	1618	15.6
2004	36	153	422	2040	11.72
2005	44	197	517	2557	11.75
2006	39	236	541	3098	13.87
2007	45	281	574	3672	12.76
2008	48	329	635	4307	13.23
2009	62	391	699	5006	11.27
2010	54	445	629	5635	11.65

5. Institutional Distribution of Article

Table-5 and figure-3 shows the papers emanating from different organizations. The highest number of papers totaling 270(60.68%) has emanated from universities, 152 (34.15%) from

research institute, 16 (3.60%) from colleges, non-academic institutions/organizations have also accounted for 7 (1.57%) papers.

Table – 5: Institution wise Distribution of Mathematical Sciences Journal Proceeding

Institution	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total	%
Research Institute	15	20	20	15	12	15	10	18	16	11	152	34.15
University	18	28	12	20	27	23	32	29	42	39	270	60.68
College	1	-	2	1	3		2		4	3	16	3.60
Others		-	1		2	1	1	1		1	7	1.57
total	34	48	35	36	44	39	45	48	62	54	445	100%

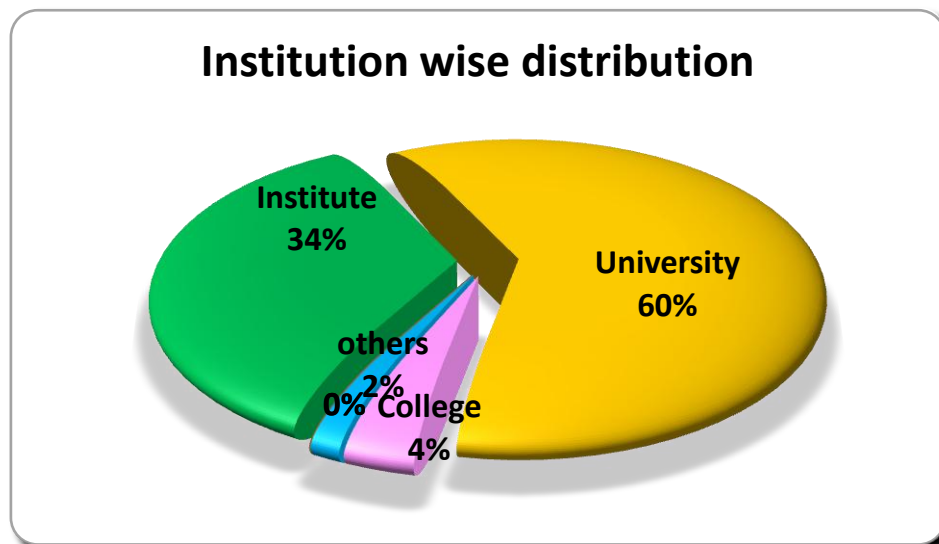
**Figure –3: Institution wise Distribution of Mathematical Sciences Proceeding****6. Geographical Distribution of Article**

Table-6 and figure-4 depict the geographical distribution of contributions of the journal under study. Out of 445 contributions, the highest number i.e. 195 (43.82%) has been

contributed by India followed by China, Iran, USA and Turkey are on second, third, fourth and fifth place having 56(12.84%), 30 (6.74%), 26(5.84%) and 25(5.61%) contributions respectively.

Table – 6: Geographical Distribution of Article (Country wise) in the Proceeding of Mathematical Sciences

Country	Quantum of Contribution	Rank	%
India	195	1 st	43.82
China	56	2 nd	12.84
Iran	30	3 rd	6.74
USA	26	4 th	5.84
Turkey	25	5 th	5.61
Spain	16	6 th	3.59
Germany	13	7 th	2.92
France	11	8 th	2.47
Korea	8	9 th	1.79
Romania	8	10 th	1.79
Italy	6	11 th	1.34
Poland	6	12 th	1.34
Japan	5	13 th	1.12
Denmark	5	14 th	1.12
UK	4	15 th	0.89

Serbia, Malaysia, Deutschland, Greece, Chile, Russia, Azerbaijan. (Note : Each Country Contributed 2)	$7 * 2 = 14$	16 th	$7 * 0.44 = 3.14$
Africa, South Africa, Saudi Arabia, Switzerland, Pakistan, Bulgaria, Lithuania, Mexico, Egypt, Slovenia, Kuwait, Canada, Ukraine, Tunisia, Nigeria, Brazil, Israel. (Note : Each Country Contributed 1)	$17 * 1 = 17$	17 th	$17 * 0.22 = 3.82$
Total	445		100%

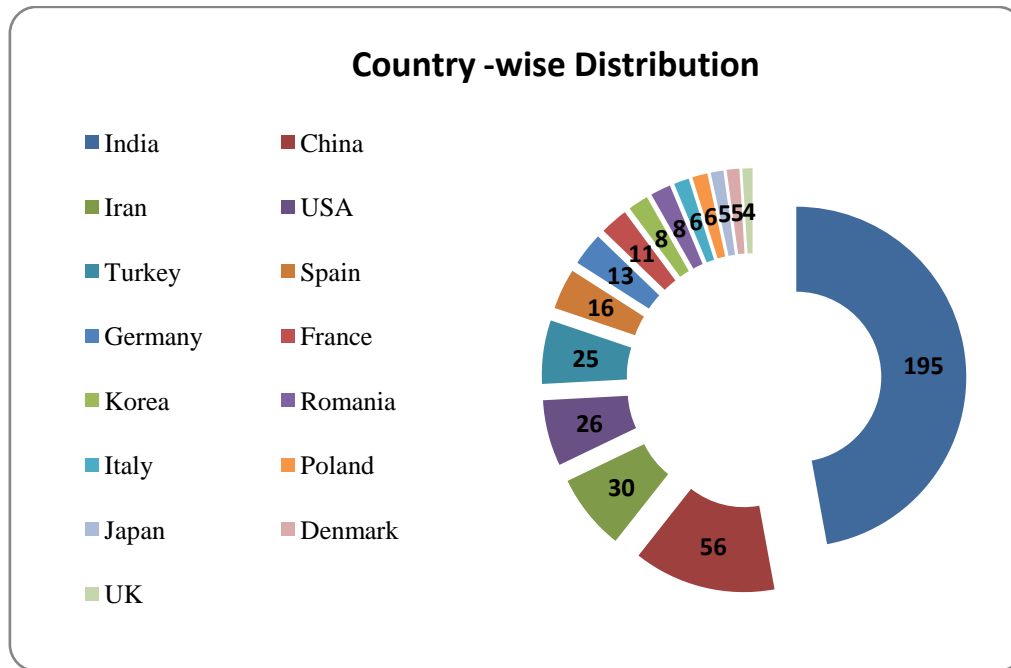


Figure -4: shows the Geographical (country wise) Distribution of Article

Finding and results

The findings of the study could be summarized as follows:

- ✓ The number of papers in the journal is not consistent and varies from volume to volume;
- ✓ The papers have an average length of 13 pages, which more or less conform to the International practice;
- ✓ India where from the journal originates accounts for the highest number of papers;
- ✓ The journal publishes articles only in English;
- ✓ Most of the papers have emanated from academic institutions;
- ✓ Almost all papers included a brief abstract and keywords.

Conclusion

This study has concludes via findings to confirm that the Proceeding of Mathematical

Sciences journal is very clear with its true sense as the papers are contributed by authors across the world and peer reviewed publications. It has maintained the status of an international journal in the area of Information Literacy and proved logically. The acceptance rate 44% shows again witnessed that strict reviewing process with subject experts and assured quality. It is suggested that the journal to be start the indexing services in order to enhance its visibility, usability and impact.

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