INDIAN JOURNAL OF PURE AND APPLIED PHYSICS: A SCIENTOMETRICS ANALYSIS

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ABSTRACT

Scientometric analysis of 640 analysis articles published in the Indian Journal of Pure & Applied Physics has been dispensed. 5 Volumes of the journal containing 60 problems from 2010 – 2014 are considered for the current study. The quantity of contributions, authorship pattern and author's productivity, average citations, average length of articles, average keywords and cooperative papers have been analyzed. Out of 640 contributions, only 55 are single authored and rest are multi authored with degree of collaboration is 0.92 and week collaboration among the authors. Pattern of co-authorship exhibited the rising trend of co-authored papers. The study discovered that author productivity is 71.87 and dominated by the Indian authors.

KEYWORDS: Scientometrics, Bibliometrics, Indian Journal of Pure & Applied Physics, Publication, Author Productivity, Collaborationpattern

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INTRODUCTION

Scientometrics may be a discipline that analyses scientific publications to explore the structure and growth of science. The bibliometrics / scientometrics / infometrics techniques won't analyze varied quantitative or qualitative aspects of a publication. It's a scientific field that studies the evolution of science through some quantitative measures of scientific data, because of the variety of scientific articles revealed in a given amount of your time, their citations impact, etc. The history of science and technology, philosophy of science and social science of knowledge domain square measure the connected fields of Scientometrics. The term Scientometrics is commonly used with the means becausebibliometrics originated in Russia. The appliance of quantitative ways to the history of Scientometrics is that the science involves tally artifacts to the assembly & use of knowledge and incoming conclusion from the counts. Bibliometrics / Scientometrics analysis includes studies associated with the scattering & growth of literature, author productivity, degeneration of documents, distribution of scientific literature by country, by language, etc, that helps to observe the expansion & pattern of analysis.Pritchard (1969) delineate thatBibliometrics because of the application of arithmetic and applied mathematics to books and different media. Scientometric analysis is dedicated to quantitative studies of science and technology – in step with A.F.J.VanRaan(1997).Scientometrics applies the bibliometrics techniques to science and examines the event of the sciences. Main square measureas of Scientometrics are individual scientific documents, authors, educational journals and regional aspects of science. In this paper, an endeavor has been created to investigate the contributions to Indian Journal of Pure & Applied Physics revealed throughout the year 2010 – 2014, so as to explore the author pattern, cooperative analysis, keywords and length of the paper among the contributions. This study covers the 640 articles of sixty problems revealed.

SOURCE JOURNAL

Launched in 1963, this journal publishes Original analysis Contribution as full papers, notes and reviews on classical and physical science, relativity theory and gravitation; applied mathematics physics and thermodynamics; specific instrumentations and technique of general use in physics, elementary particles and fields, nucleonic, atomic and molecular physics, elementary space of philosophy, optics, acoustics and fluid dynamics, plasmas and electrical discharges, condensed

matter and structural, mechanical and thermal properties, electronic, structure, electrical magnetic and optical properties, cross-disciplinary physics and connected areas of science and technology, geophysics, urology and physical science. It additionally includes latest findings within the subject underneath News Scan.

LITERATUREREVIEW

Serenko, et al. (2010) within the scientometricsanalysed of data management and intellectual capital tutorial, literature addressed variety of analysis queries bearing on country, institutional and individual productivity, co-operation patterns, publications frequency. From the findings of their study, several implications emerged that improve one's understanding of the identity of Data Management as a definite scientific field. Davarpanah (2010) reveals that the variations in ranking for measures of publication output, citation distribution, and mean ascertained citation rate are huge, which justifies the utilization of the scientific power index. Repanovici(2011) depicts the results of a scientometrics study created at the Transilvania University of Brasov relating to the H-Index of {the tutorial|thetutorial|the educational} employees and analyzes the analysis performances achieved by Brasov academic community. Dutt&Nikam (2013) analysed analysis publications within the field of electric cell analysis in Republic of India indexed in internet of Science for a Span of twenty years from 1991 to 2010. The study found that tutorial establishments have contributed 1/2 the entire output. Electric cell analysis by Indian Scientists is well connected to international analysis trends within the field. Brij Mohan Gupta,et al. (2013) studied the globe Cataract analysis publications lined within the Scopus information throughout the amount of 2002 to 2011. Their study confirmed associate exponential growth of publications from 2025 papers in 2002 and 3080 papers in 2011, witnessing associate annual average rate of four.89 %The study analysed the authorship pattern, citation impact of most efficient countries, differing types of cataract analysis, subject-wise cut, connection of varied diseases to cataract analysis, analysis output by completely different population age teams. In recent years, the analysis of growth rates in terms of articles or patents is of interest to researchers round the world (Elango, Rajendran and Manickaraj2013;Milanez, et al. 2013; Chou dynasty and Bornmann 2015).Collaborative analysis has become the norm, and collaboration across national boundaries has typically magnified, as mirrored in international co-authorship of analysis articles (National Science Board2012).To the simplest of our information, there has been no indicator to

match the expansion rate and share of international cooperative papers of a selected country during a particular fundamental measure common to all countries.

SCOPE AND OBJECTIVES OF THESTUDY

The study covered the period from2010-2014. This critically analyses 640articles published in the inaugural five volumes of IJPAP with 60 issues. In order to achieve this, the following objectives were formulated for the present study:

- To analyse year wise distribution ofpapers
- To examine the authorship pattern & authorproductivity
- To determine the degree ofcollaboration
- To discover average length ofpapers
- To study the averagekeywords
- To identify geographical pattern

METHODOLOGY

The present study tries to search out the literature growth, authorship and collaboration pattern, average length of articles and average keywords within the supply journal. 5 volumes (Vol. No.48 to 52) of Indian Journal of Pure & Applied Physics, between 2010 and 2014 containing sixty problems are taken for the current study. An information sheet was ready in MS-Excel to record the information and then the data was entered manually from the journal itself. The main points relating to range of papers, nature of author, keywords and length of papers were collected to satisfy the objectives of the current study.

RESULTS ANDDISCUSSION

Year wise distribution of Researchpapers

Table 1 shows the distribution of analysis articles printed in Indian Journal of Pure & Applied Physics analysis throughout 2010 – 2014. The overall 640 analysis articles were printed with a mean of 128 articles per annum. Out of 640 articles, the very best of analysis articles were printed within the year 2012 with 149 analysis articles (23.3 articles per issue) followed by a

hundred and forty articlesin 2010,2013; 124 articles, 2011 ; 121 articles and therefore the lowest quality articles were printed the year 2014 with 106 articles (16.5 articles per issue). The average variety of papers per annum is 128 throughout the study period and therefore the similar kind of result has been drawn by Umamaheswari S within the Indian Journal of Scientific Agriculture.

Table 1 – Year wise distribution of Research papers

Year	Vol. No.	No. of Issues	Total Research Papers	% of Research Papers
2010	48	12	140	21.9
2011	49	12	121	18.9
2012	50	12	149	23.3
2013	51	12	124	19.4
2014	52	12	106	16.5
Total		60 issues	640	100

Year wise distribution of Authorship Pattern

The data pertaining to authorship pattern year wise is given in the Table No.2. Regarding single authored contributions, the year2012 hasthe highest contributions with 16 and the lowest in 2014. Regarding double authored contributions, the year 2012 has the highest contributions with 42. The year 2013 has the highest contributions with 43 percentage to three authors. The year 2010 has the highest contribution of four & five authored with25, 18 respectively. The year 2011 has the highest contribution of multi authored (more than five authors) with17 articles.

Table 2 – Year wise distribution of Authorship Pattern

Year	# Authors					
	1	2	3	4	5	>5
2010	10	33	37	25	18	17
2011	11	37	42	17	8	6
2012	16	42	37	24	18	12

2013	10	26	43	23	14	8
2014	8	30	32	18	11	7
Total	55	168	191	107	69	50

Contribution of AuthorsProductivity

The data relating to author productivity given in Table 3 shows that the full average range of authors per paper is 2.93 for the 640 articles. The year 2014 hascomparatively the most average range of authors per article in comparison to the full average range of authors per article. The typical productivity per author is 0.34 throughout the year 2011 - 2014. The year 2011 has the utmost productivity per author in comparison to the typical productivity. Productivity has been calculated with the subsequent formulae.

Average Authors per Paper = No. of Authors / No. of Papers

Productivity per Authors = No. of Papers / No. of Authors

Table 3 – Contribution of AuthorsProductivity

Year	Total Number ofPapers	Total Number ofAuthors	AAPP	Productivity per Author
2010	140	405	2.89	0.34
2011	121	321	2.65	0.37
2012	149	429	2.88	0.35
2013	124	384	3.09	0.32
2014	106	339	3.19	0.31
Total	640	1878	2.93	0.34

Degree ofCollaboration

In order to determine the strength of Collaboration (DC), the following formula suggested by Subramaniyam K has beenemployed.

$$DC = \frac{Nm}{Nm + Ns}$$

Where,DC = Degree ofCollaboration

Nm = Number of Multiple Authored Papers

Ns = Number of Single AuthoredPapers

The Degree of Collaboration author's year wise is presented in Table 4. The degree of collaboration ranges from 0.89 to 0.93. The average degree of collaboration is 0.92 during the period 2010 – 2014 and it clearly brings out that there exists a higher level of collaboration in the journal.

Table 4- Degree ofCollaboration

Year	Single	Multiple	DC
2010	10	130	0.93
2011	11	110	0.91
2012	16	133	0.89
2013	10	114	0.92
2014	8	98	0.92
Total	55	585	0.92

Page wise Distribution of articles

Table 5 shows that 640 papers published with a total page of 4381 (average 6.85 pages per article) during the year 2010 – 2014. It is observed that the average length of the articles varied from a minimum of 5.89 pages to a maximum of 8.01 pages. The year 2014 has highest average page per paper with 8.01 pages while theyear 2010 has the lowest average page per paper with6.44.

Table 5 – Page wise Distribution of articles			
Year	No. ofArticles	TotalPages	Average pages perArticle
2010	140	901	6.44
2011	121	840	6.94
2012	149	928	5.89
2013	124	862	6.79
2014	106	850	8.01
Total	640	4381	6.85

Distribution of Keywords Average per Article

Table 6 reveals that 2438 keywords have been appended to 640 papers. It is observed that the average keyword of the paper varied from a minimum of 3.64 to a maximum of 4.12 during the year 2010 – 2014. The year 2014 has the highest average keyword per paper with 4.12 keywords per paper while the year 2011 has the lowest average keywords per paperwith 3.64. The overall average keywords per article are 3.81.

Table 6 – Distribution of Keywords Average perArticle			
Year	No. ofArticles	Total Keywords	Average keywords per papers
2010	140	511	3.65
2011	121	441	3.64
2012	149	572	3.83
2013	124	477	3.85
2014	106	437	4.12
Total	640	2438	3.81

Geographical Distribution of Authors

Table 7 shows that out of 640 articles, 460 (71.87%) articles revealed by Indian authors followed by International authors with 164 Articles (25.63%). Only 16 (2.5%) articles revealed collaboration Indian Authors with international authors seems.

Table 7- Geographical Distribution of Authors

Geographical	Contributions	%
IndianAuthors	460	71.87
Indian Authors with Foreign Collaboration	16	2.5
ForeignAuthors	164	25.63
Total	640	100

CONCLUSION

The analysis explores that the bulk of papers by multi authors and Indian authors. There was poor international collaboration by Indian authors. The typical page is 6.85 and it's the best for analysis papers. The Degree of collaboration using (Subramaniyam formulas) indicates that there exists a high degree of collaboration. The typical Co-Authorship Index for all the authors reflects the globe average within the journal and rising trend of co- authored papers. The study discovered that the journal appears to be fashionable among the international analysis community with around twenty fifth of papers.

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