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SCIENTOMETRIC ANALYSIS OF ADVANCES IN NATURAL SCIENCES: NANO SCIENCE AND NANO TECHNOLOGY: AN INTERNATIONAL JOURNAL

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Abstract

A scientometric study of Journal of Advances in Natural Sciences: Nano Science and Nano Technology from the year 2012 to 2016 is carried out to find out the growth in Nano science literature, authorship pattern, citation pattern of authors, authors' affiliation of institutions and geographical distribution of authors. The data reveals that regarding publication of articles year 2014 leads with 82 articles. With respect to issue wise distribution of article June issues has more number of articles than other issues. With regard to authorship pattern joint authorship articles are more than single authorship articles and especially five or more authors' contribution are very high compared to other authorship articles. The contributors of Advances in Natural Sciences: Nano Science and Nano Technology refer journals more than other forms of literature for their knowledge output. Regarding authors' affiliation authors who are working in Universities contribute more than research institutions.

***Keywords**: Scientometrics, Bibliometrics, Nano Science.*

Introduction

The field of Library and Information Science (LIS) has developed several quantitative methods to study the various aspects of subjects. The metrics of LIS are increasing day by day starting from Librametrics, Bibliometrics, Scientometrics, Informetrics, Webometrics, Netometrics to Cybermetrics. The origin of the term scientometrics goes back to the year 1969, when two Russian scientists Nalimov and Mulechenko coined the Russian term naukometriya the Russian equivalent of scientometrics (Nalimov and Mulechenko, 1969). However, the advent of scientometrics as a discipline was in 1978, when the journal Scientometrics was founded by Tibor Braun in 1978. Scientometrics defines its content as "Scientometrics includes all quantitative aspects of the science of science, communication in science, and science policy." (Wilson, 1999) The focus of scientometrics is the measurement of science and is therefore concerned with the growth, structure, interrelationship and productivity of scientific disciplines. Tague-Sutcliffe defines "Scientometrics is the study of the quantitative aspects of science as a discipline or economic activity. It is part of the sociology of science and has application to science policy-making. It involves quantitative studies of scientific activities, including, among others, publication, and so overlaps bibliometrics to some extent." (Tague -Sutcliffe,1992). In this paper, an attempt has been made to analyze the contributions to Journal of Advances in Natural Sciences: Nano Science and Nano

Technology during the year 2012 – 2016, in order to explore the authorship pattern, production of articles year wise and issue wise, authors affiliation of institution, authors affiliation of countries of origin. This study covers the 398 articles of 20 issues published.

Need and Significance of the Study

Advances in Natural Sciences: Nano science and Nanotechnology *is an international, peer-reviewed, open-access journal publishing articles on all aspects of nano science and nanotechnology*. Scientometric studies have increasingly been used over the last few years. These studies are useful to understand the evolution of literature or trends in particular fields or within a geographical area. However, in Nano Science field scientometrics have barely been used. In addition Nano Science is emerging area which needs more attention. Hence with this is back up the researcher made this attempt to study the trends in Nano Science with Scientometric back up.

Review of Literature

Mohammad - Hossein Biglu et al. in their study, Scientometric Analysis of Nanotechnology in MEDLINE showed that the research activities in the field of nanotechnology have been increased steadily through the period of study. The number of publications in 2010 was ~ 84 times greater than those in 2001. English language consisting of 98% of total publications was the most dominant language of publications. Based on Bradford's scattering's law the journal of "*Advances in Natural Sciences: Nanoscience and Nanotechnology*" distributing 12.8% of total publications was the most prolific journal. In an another study Robert et. al. (2007) has studied the growth of sleep science literature over a period of 30 years (1974 -2004). They have found that the literature in this area has increased four times while the overall literature has only doubled. It was also found that USA, Japan, UK, Germany, France and Italy have been the most productive countries during these three decades and regional distribution remained stable over this time. Karisiddappa et. al. (2001) analyzed the distribution of productivity of authors in the specialty of Theoretical Population Genetics (TPG) based on 100 year data (1881-1990) from two different approaches. First, the time cross-sectional approach that studied the internal dynamics of the TPG specialty affecting the distribution of the productivity of authors, and second, the cohort approach is focusing on the productivity distribution of authors in ten-year blocks and in three phases of development (1921-50, 1951-65, and 1966-80).

Objectives of the Study

The objectives of this study are

- to map distribution of articles by year
- to map distribution of articles by issue wise
- to examine the authorship pattern

- to examine forms of documents cited by contributor
- to identify Institutional affiliation of authors
- to identify authors' Geographical affiliation

Scope and Methodology

The present study tries to find out the year wise production of articles, issue wise production of articles, the authorship pattern, forms of documents cited by contributors, Institutional affiliation of authors, authors Geographical affiliation. The data are retrieved from five volumes of Journal of *Advances in Natural Sciences: Nanoscience and Nanotechnology* published between 2012 and 2016 containing 20 issues have been taken into consideration to the present study. A datasheet was prepared in MS-Excel to record the data and then the data was entered manually into it from the journal itself. The details regarding number of papers, nature of author, keywords and length of papers are collected to fulfill the objectives of the present study. The collected data was analyzed and presented.

Limitations

This study is limited to research papers published between 2012 and 2016 only. It restricted its analysis to a single journal called journal of *Advances in Natural Sciences: Nanoscience and Nanotechnology*.

Analysis

Table 1 Year Wise Distribution of Articles

Year	Vol. No.	No. of Issues	No. of Contribution	Percentage
2012	3	4	75	18.85
2013	4	4	81	20.35
2014	5	4	82	20.60
2015	6	4	80	20.10
2016	7	4	80	20.10
Total		20	398	100.00

Table 1 indicates that regarding year wise production of articles year 2014 dominates with 82 (20.60%) articles, which is followed by 2013 with 81 articles, 2015 & 2016 with 80 articles, 2012 with 75 articles. Overall analysis shows that almost uniform publication of articles except in the year 2012.

Table 2 Issue wise Distribution of Articles

Month	Volume Number						
	3	4	5	6	7	Total	Percentage
March	18	20	20	20	20	98	24.63
June	19	21	21	20	20	101	25.38
September	18	20	21	20	20	99	24.87
December	20	20	20	20	20	100	25.12
Total	75	81	82	80	80	398	100.00

Table 2 reveals that regarding issue wise production of articles quarterly issue of June leads with 101(25.38%) articles, which is followed by December issue with 100 articles, September issue with 99 articles, and March issue with 98 articles.

Table 3 Authorship Pattern

Authorship	Total	Percentage
Single	19	4.77
Double	57	14.32
Three	58	14.57
Four	64	16.09
Five or more	200	50.25
Total	398	100.00

Table 3 shows that regarding authorship pattern joint authorship articles are more than single authorship articles. It also shows that five or more authorship articles are leads with 200 articles, four authorship articles come second with 64 articles, three authorship articles comes in third with 58 articles, double authorship articles come fourth with 57 and it is followed by single authorship articles with 19 articles.

Table 4 Citation Pattern of Documents

Forms of Document	Total No. of Citation	Percentage
Journals	9561	88.93
Books	1156	10.75
Websites	34	0.32
Total	10751	100.00

Table 4 citation patterns of documents infers that among the documents cited Journals citations are high with 88.93%, followed by books with 10.75% and web literature with 0.32%.

Table 5 Distribution by Institutional Affiliation

Institution	No. of Articles	Percentage
Research Institutions	779	41.59
Universities	1077	57.50
Others	17	0.91
Total	1873	100.00

Above table indicates that regarding author affiliation, authors who are working in universities contribute more with 57.50%, followed by research institutions with 41.59%, others with 0.91%.

Table 6 Geographical Distribution of Indian and Foreign Contributions

Institution	No. of Articles	Percentage
India	241	12.87
Foreign	1632	87.13
Total	1873	100.00

Table 6 shows that with respect to origin of author foreign contributors are more with 87.87% and Indian contributors are minimum with 12.13%.

Findings and Conclusions

The study on Scientometric analysis of Journal *Advances in Natural Sciences: Nanoscience and Nanotechnology* clearly indicates that the growth of literature in Nano science is in a healthy trend. It also gives the overall picture about authorship pattern, author's affiliation with regard to institution and geographical location, forms of documents referred more to make effective contribution in physics. Following are the findings which are given by this study. Regarding publication of articles year 2014 leads with 82 articles. With respect to issue wise distribution of article June issues has more number of articles than other issues. With regard to authorship pattern joint authorship articles are more than single authorship articles and especially five or more authors contribution are very high compared to other authorship articles. The contributors of Nano Science refer journals more than other forms of literature for their knowledge output. Regarding author's affiliation authors who are working in Universities contribute more than research institutions.

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