ISSN 2349-6193
Impact Factor (PIF): 2.243

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International Journal OF Engineering Sciences & Management Research

AUTHORSHIP PATTERN ON ANNALS OF LIBRARY AND INFORMATION STUDIES OUTPUT DURING 2005–2014: A BIBLIOMETRIC STUDY

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Keywords: Bibliometrics, Degree of Collaboration, Authorship pattern, Collaborative Coefficient, Modified Collaborative Coefficient, Time Series Analysis.

ABSTRACT

Authorship Pattern or Productivity is one of the important aspects in the bibliometrics analysis. Bibliometric is the type of research method; it is an emerging area of research in the Library and Information Science field. This paper therefore focuses on the journal from Webology. This study covers the total number of 57 articles studied only the one journal with five years (2010 to 2014). This paper discusses on authorship pattern, citation analysis, Publication Efficiency Index, length of articles, relative growth rate, Distribution of year wise citation analysis, degree of collaboration, country wise distribution of publications, and time series analysis of total authored papers also. This study provides the insights and development of the journal towards excellence. Hence, the present study encouraged the authors will help for produce more publications.

INTRODUCTION

Bibliometric is the type of research method; it is an emerging area of research in the Library and Information Science field. The term "bibliometrics" is coined from two words "biblio" and "metrics". The word biblio is 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. The study of Authorship Pattern or Productivity is one of the important aspects in the bibliometrics analysis. In the year 1954, East while INSDOC launched Annals of Library Science assists first publications and Dr..R. Ranganathan was its first Editor. The journal title was expanded to Annals of Library Science and Documentation in 1964 and again renamed in 2001 as Annals of Library and Information Studies. Into its 59th volume in 2012, Annals of Library and Information Studies is the oldest LIS Indian Journals. ALIS is a leading library science journal being published by the National Institute of Science Communication and Information Resources (NISCAIR).

REVIEW OF LITERATURE

Mohammed Nazin and Moin Ahmad (2008)[3] aimed to offer an overview of research trends in the field of nanotechnology and characterized its most important aspects, such as growth of literature, authorship pattern, most productive journals, authors, countries, etc. A total of 2675 articles for the period of 1991-2006 were collected from the web of science especially via the Science Citation Index. Authorship pattern and core journals were examined using Lotka's law and Bradford's law of scattering respectively. Their yearly analysis showed that there was a rapid growth of nanotechnology research from the beginning of the 21st century.

Krishnamurthy et al (2009)[1] made an attempt to analyze the Diabetes literature, indexed in the MEDLINE database for the period 1995-2005. They found out that the maximum number of records (13244) was during 2003, followed by 12690 in 2002 and 11061 in 2001. In their findings, Relative Growth Rate (RGR) was decreasing year wise. During their study, they identified that the USA was the largest contribution of literature on diabetes research.

Kirti Joshi, Avinash Kshitij, Garg (2010)[5] studied the field of forest mycology indicates that the number of publications has increased significantly during the year 2004 – 2008. A total 3313 publications scattered 619 journals title from 50 countries and 839 institutions highest rate of annual growth of published articles.

Srinivasa Ragavan, Surulinathi and Neelakandan (2012)[4] depict the scientometric parameters for Medical Plant research during the period 1973-2009, a total of 1265 publications were published at the national level.

Gomathi P (2014)[2] the present study is to analyze the SERLS journals of information management (2013) a Bibliometrics study. The bibliometrics is a set of methods to quantitatively analyze academic literature; citation analysis and content analysis are commonly used bibliometrics methods. Although bibliometrics methods are

ISSN 2349-6193
Impact Factor (PIF): 2.243

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most often used in the field of Library and Information Science. This paper discusses on authorship pattern, institution wise, subject wise, length of articles, number of keywords used and country wise publications.

OBJECTIVES OF THE STUDY

- ✓ To find out the year wise distribution of article, distribution of year wise Citation
- ✓ To study the Authorship Pattern, collaborative coefficient, Modified Collaborative Coefficient
- ✓ To determine the Degree of Collaboration, ranking of authors
- ✓ To identify the geographical distribution of contributions, determine the year wise length of articles
- ✓ To study the Authorship Productivity, Exponential Growth Rate
- ✓ To identify the Relative Growth Rate and Doubling Time for research output
- ✓ To find out the Time Series analysis of single authors articles.

RESEARCH METHODOLOGY, LIMITATION OF THE STUDY

The methodology followed for this study consisted of studying in the nature and the Authorship pattern on Annals of Library and Information Studies (2005 -2014) in the field of Library and Information Science. To collect the required data was about in all the study of Library and Information Science study of the Annals of Library and information studies journals. 10 years have been taken into a spreadsheet. The collected data have been analyzed with the Manual, Microsoft Excel Sheet and presented in the form of tables.

SCOPE OF THE STUDY

The main purpose of the study is to find out the current citation trends of the Authorship Pattern on Annals of Library and Information Studies.

Indicators used

The following indicates having been used the analysis of data

i) Relative Growth Rate

In order to identify the relative growth rate, the researcher has adopted a model developed by mahapatra. The relative growth rate is the increase in the number of publications per unit of time. The mean relative growth rate, R-(1-2) over a specified period of interval can be calculated from the following equation.

R (1-2) = W2- W1/T2-T1

Where,

R (1-2) = Mean Relative Growth Rate over the Specified Period interval;

W1= log w1 (Natural log of initial number of publications)

W2 = log w2 (Natural log of initial number of publications)

T2-T1= the unit Difference between the initial time and final time.

R (a) = Relative Growth Rate per unit publication per unit of time (Year)

ii) Doubling Time

Doubling Time for publications can be calculated by the following formula:

Doubling time for publications Dt (a) = 0.693/ R (a)

iii) Degree of Collaboration

In order to identify the degree of collaboration, the researcher or has adopted

K. Subramanyam's Formula. The formula is C = NM / (Nm+Ns)

Where,

C = Degree of collaboration in a discipline

NM = Number of Multiple Authored papers

NS = Number of Single Authored Papers

iv) Relative Research Effort (Publication Efficiency Index- PEI)

Relative to research efforts being measured by the Publication Efficiency Index (PEI) and it is based on references appended to the research articles by the authors. PEI is calculated by using the formula derived from the Activity Index suggested by Price (1981).

$$PEI = \frac{TNCi / TNCt}{TNPi / TNPt}$$

Where, TNCi = Total No.of references in a year,

TNCt = Total No.of references for all the years

TNPi = Total No.of papers in a year

TNPt = Total No.of papers for all the years

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v) Collaborative co-efficient

To measure the extent and strength of collaboration among the researchers in online Journals of Library and Information Science, an index called Collaborative Co – efficient (CC) suggested by Ajiferuke (1988) and adopted by Karki and Garg (1997), Sevuan, Nagarajan, and Sharma (2007) was employed. This can be mathematically expressed as

$$CC = 1-\sum_{j=1}^{j=k}(1/J)fj/N$$

Where fj = is the number of J authored papers published in a discipline during a certain period of time;
N = is the total number of research papers published in a discipline during a certain period of time;
And, K = is the greatest number of authors of authors per paper in a discipline

vi) Planned measure of Modified Collaborative Coefficient

The derivation of the new measure is almost the same as that of Collaborative Coefficient (CC), as given in Ajiferuke et al. Imagine that each paper carries with it a single credit, this credit being shared among the authors. Thus, if a paper has a single author, the author receives one credit; with 2 authors, each receives 1/2 credits and, in general, if we have X authors, each receives 1/X credits (this is the same as the idea of fractional productivity defined by the Solla Price and Beaver as the score of an author when he is assigned 1/n of a unit for one item for which n authors have been credited.) Hence, the average credit awarded to each author of a random paper is E [1/X], a value that lies between 0 and 1. Since we wish 0 to correspond to single authorship, we define the Modified Collaborative Coefficient (MCC), k, as:

$$MCC = \frac{A}{A-1} + \{1-\frac{\sum_{j=1}^{A}(\frac{i}{j})fj}{N}\}$$

Where, A is a normalization constant to be determined. Setting A = 1 yields the measure CC. The requirement that j = 0 for single authorship does not restrict. The above equation is not defined for the trivial case when A = 1, which is not a problem since collaboration is meaningless unless at least two authors are available. CC approaches MCC only when A → ∞, but is otherwise strictly less than Modified Collaborative Coefficient by the factor 1-1/A.

vii) Exponential Growth Rate

This examines the Exponential Growth Rate to calculate the rate of population growth and the nuances to calculate exponential growth rate. There are two types of growth rate such as, exponential growth rate and linear growth rate. Exponential growth rate gives the relative growth rate of the population as it depends upon the current population. Linear growth rate, on the other hand, does not depend upon the current growth rate, and hence, calculating the exponential growth rate is preferred. The Exponential growth rate can be used to predict future population of any species of animals. It is used globally to predict human population. With the knowledge of the periodic rate, i.e., number of years through which the growth rate is to be calculated for the original population, calculation of the exponential growth rate can be done with ease. The formula for calculating exponential growth is given as:

$$N_{(t)=}\, N_{(o)}\, e^{\pi}$$

Where,
N (t) is the population when the time elapsed is "t" years
N (0) is the initial population
R - Growth rate
T - Number of years
e - Natural base of logarithms whose value is 2.711828

viii) Time Series Analysis of Authorship Trend

The time series analysis implements to the authorship pattern for knowing the growing trend in future come years. Here the researcher has taken single authored contribution and collaborative author's contribution of this series analysis.

The straight Line equation is applied to arrive at estimates for future growth under the Time Series analysis.
Straight Line equation Y C= a + bX; Since $\sum_X = 0$

$$a = \frac{\sum Y}{N} \qquad b = \sum XY/\sum x^2$$

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DATA ANALYZING AND INTERPRETATION

Table-1 Year wise and Volume wise Distribution of Articles

Year	Volume	Issue No	No. of. Articles	Articles Year wise	%
2005	52	1 (March)	5	23	7.10
		2 (June)	6		
		3 (September)	6		
		4 (December)	6		
2006	53	1 (March)	6	26	8.02
		2 (June)	6		
		3 (September)	7		
		4 (December)	7		
2007	54	1 (March)	6	28	8.64
		2 (June)	9		
		3 (September)	6		
		4 (December)	7		
2008	55	1 (March)	9	35	10.80
		2 (June)	10		
		3 (September)	9		
		4 (December)	7		
2009	56	1 (March)	7	34	10.49
		2 (June)	8		
		3 (September)	9		
		4 (December)	10		
2010	57	1 (March)	9	43	13.27
		2 (June)	9		
		3 (September)	15		
		4 (December)	10		
2011	58	1 (March)	10	36	11.11
		2 (June)	10		
		3 (September)	9		
		4 (December)	7		
2012	59	1 (March)	6	27	8.33
		2 (June)	6		
		3 (September)	8		
		4 (December)	7		
2013	60	1 (March)	9	37	11.42
		2 (June)	9		
		3 (September)	9		
		4 (December)	10		
2014	61	1 (March)	9	35	10.80
		2 (June)	8		
		3 (September)	11		
		4 (December)	7		
Total			**324**	**324**	**100**

Table - 1and Figure 1.1 Shows that the selected period taken for this analysis of Annals of Library and Information studies is from 2005 to 2014. The above table 1 has revealed that the year wise publications. The years of 2005 and 2014 were having the highest number of publications of 2010 (43), followed 2013 (37), and 2011 (36) were having highest publications. The year of 2005 and 2014 has the lowest publications among the ten years of study. 2006 (26) and 2005 (23) are having highest citation scores among the ten years.

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Figure- 1.1 Year wise Distribution of Articles

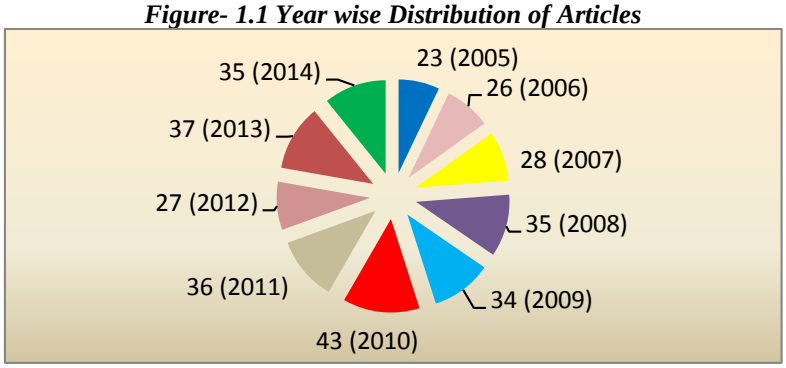

Table - 2 Distribution of year wise citations

Citation Range	Years										No. of. Articles	%
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
1-9	11	11	11	8	13	8	2	6	5	7	82	25.30
10-19	5	9	8	16	17	14	18	12	12	9	114	35.2
20-29	4	4	5	6	6	12	11	6	8	10	72	22.22
30-39	3	-	2	4	-	2	2	3	12	6	34	10.49
40-49	-	2	1		1	3	1	-	-	-	6	1.85
Above 50	-	-	1	1	2	4	2	-	-	3	7	4.94
Total	**23**	**26**	**28**	**35**	**34**	**43**	**36**	**27**	**37**	**35**	**324**	**100**

Table -2 and Figure 2.1 shows that the citation range distribution of publications. It is found that most of the contributions are 10-19 citation range, I. e. 114 (35.2%) and lowest contributions are in the 40-49 citation, i.e., 6 (1.85%).

Figure- 2.1 Distribution of Citations by Year

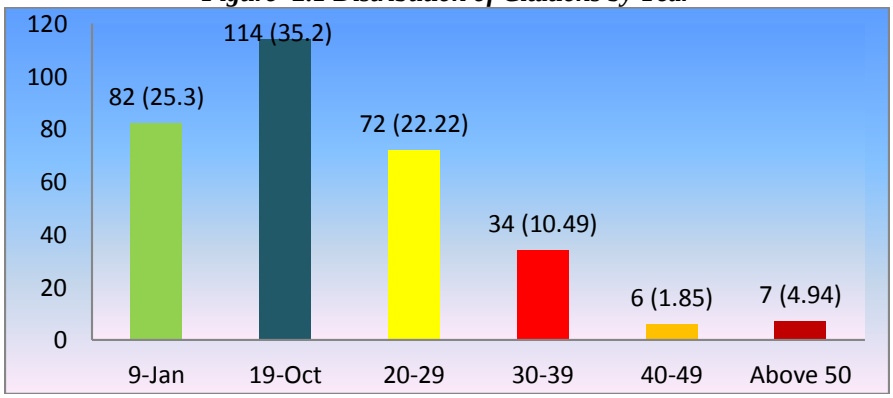

Table- 3 Authorship Pattern

Authorship Pattern	Years										No. of. Articles	%
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
Single Authors	9	6	12	12	6	17	13	10	12	13	108	33
Two Authors	8	13	10	17	20	18	15	12	18	18	150	46
Three Authors	5	6	6	6	7	8	7	5	4	4	58	18
Four Authors	-	-	-	-	1	-	-	-	3	-	5	2
Five Authors	-	1	-	-	-	-	1	-	-	-	2	0.6
More than Five Authors	1	-	-	-	-	-	-	-	-	-	1	0.3
Total	**23**	**26**	**28**	**35**	**34**	**43**	**36**	**27**	**37**	**35**	**324**	**100**

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The extent of research contributions by the authors is explained under authorship pattern table 3 indicates that out of 324 articles. Maximum number of articles 150 (46%) were published by two authors. Followed by the Single author had contributed only 108 (33%). Followed by the Three authors had contributed 58 (18%), followed by the four authors had contributed 5 (2%), followed by the five authors had contributed 2 (0.6%) And then the lowest number of articles 1 (0.3%) were published by the more than five.

Collaborative Coefficient

Table based on the data presented in table 4, the Collaborative Coefficient (CC) using equation calculated. The overall value of collaborative coefficient comes to 0.38 for the period of study. This indicates that the Annals of Library and information studies is fairly collaborative.

Table- 4 Collaboration indices in ALIS output

Year	1A	2A	3A	4A	5A	5+A	No. of Articles	Collaborative Coefficient	MCC
2005	9	8	5	-	-	1	23	0.35	0.36
2006	6	13	6	-	1	-	26	0.43	0.44
2007	12	10	6	-	-	-	28	0.32	0.33
2008	12	17	6	-	-	-	35	0.35	0.36
2009	6	20	7	1	-	-	34	0.45	0.46
2010	17	18	8	-	1	-	43	0.33	0.34
2011	13	15	7	-	-	-	36	0.36	0.37
2012	10	12	5	-	-	-	27	0.34	0.35
2013	12	18	4	3	3	-	37	0.36	0.37
2014	13	18	4	-	-	-	35	0.33	0.34
Total	**108**	**150**	**58**	**5**	**2**	**1**	**324**	**3.62**	**3.72**

MCC – Modified Collaborative Coefficient

Table 4 shows that the distribution of year wise Collaboration Coefficient (CC) and Modified Collaborative Coefficient (MCC) has been presented in the table. It is seen from the table that the value the collaboration coefficient (CC) has been calculated with minimum of 0.32 (28) in the year 2007 and maximum of 0.45 (34) in the year of 2009. And Modified collaborative coefficient has been calculated with minimum of 0.33 (28) in the year 2007 and maximum of 0.46 (34) in the year of 2009.

Table - 5 Degree of Collaborations

Year	Single Author (NS)	Multiple Authors (NM)	Total (Ns+Nm)	Degree of Collaboration C (Nm/Ns+Nm=C)
2005	9	14	23	0.61
2006	6	20	26	0.77
2007	12	16	28	0.57
2008	12	23	35	0.66
2009	6	28	34	0.82
2010	17	26	43	0.60
2011	12	24	36	0.67
2012	10	17	27	0.63
2013	11	26	37	0.70
2014	13	22	35	0.63
Total	**108 (33.33)**	**216 (66.66)**	**324**	**0.67**

Table 5 shows the degree of author collaboration in the studies. It was calculated using Subramanian's formula:

C = NM / (NM + NS)

Where C = degree of collaboration,
Nm=Number of multi-authored works,
Ns= Number of single-authored works.

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Impact Factor (PIF): 2.243

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It is found that the degree of author collaboration in the Annals of library and information ranged from 0.61 to 0.63 during the period under study. In comparison, Where C = degree of collaboration 324 (0.67%), Nm=Number of multi-authored works 216, Ns= Number of single-authored works 108.

Table- 6 Ranking of Authors

S.NO	Rank	Authors	No. of. Articles	%
1	1	Prasand chand	19	3.2
2	2	Senk. B.K	18	3.0
3	3	Natarajan. M	17	2.8
4	3	Jayashakari	17	2.8
5	4	Sujita. M.P	13	2.2
6	5	Ragavan. K.S	12	2.0
7	5	Sampath Kumar	12	2.0
8	6	Suresh Kumar	11	1.8
9	6	Kademani.	11	1.8
10	7	Rajendra. P	9	1.5
11	8	Gupta. B.M	8	1.3
12	9	Gain sigh	7	1.2
13	10	Vijay. K.R	6	1.0
14	10	Parihar. V.S	6	1.0
15	11	Kumbar.S.S	5	0.8
16	12	Others	431	71.6
Total			**602**	**100**

Table -6 depicts ranking of authors by number of contribution publications. The first rank of the top authors Prasand Chand published highest number of articles for the study period with 19 records. Second ranking author Senk, B.K. 18 records, and third rank of authors Natarajanan.M and Jayashankari published of a number of articles for the study period with 17 records.

Table- 7 Geographical wise distribution of contributions

Rank	Name of Country	No. of. Authors	%
1	New Delhi	57	9.5
2	West Bengal	55	9.1
3	Tamil Nadu	50	8.3
4	Orissa	49	8.1
5	Punjab	45	7.5
6	Bangalore	38	6.3
7	Kerala	35	5.8
8	Karnataka	30	5.0
9	Kanpur	29	4.8
10	Kolkata	26	4.3
11	Lucknow	24	4.0
12	Mumbai	22	3.7
13	Manipur	20	3.3

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14	Madhya Pradesh	18	2.9
15	Maharashtra	17	2.8
16	India	15	2.5
17	Aligarh	13	2.2
18	Assam	12	1.9
19	Amritsar	8	1.3
20	Chennai	5	0.8
21	Others	34	5.6
Total		**602**	**100**

Table 7 reveals shows that the annals of library and information studies, research of top during the period from 2005 to 2014. The top country of New Delhi was published 57 (9.5%) contribution of publication is first rank and followed by the second rank of West Bengal contribution 55 (9.1%) records. Among world countries the analysis shows Kanpur, Kolkata is in the middle, and the bottom of Amristar 8 (1.3%), Chennai 5 (0.8%) and others 34 (5.6%).

Table - 8 Year wise length of articles

No. of. Pages	**Years**										**No. of. Articles**	**%**
01-05	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
06-10	8	8	10	3	3	10	1	5	5	6	59	18.20
11-15	13	13	16	24	25	23	26	15	29	21	205	63.27
16-20	2	5	1	7	5	8	9	5	3	7	52	16.05
21-25			1	1	1	1		1			5	1.54
26-30						1				1	2	0.61
31-35								1			1	0.30
%	7.10	8.02	8.64	10.80	10.49	13.27	11.11	8.23	11.42	10.80		
Total	**23**	**26**	**28**	**35**	**34**	**43**	**36**	**27**	**37**	**35**	**324**	**100**

Table- 8 shows that the page wise distribution of publications. It is found that the most of Contribution are 11-15 pages, i.e. 205 (63.27%) and lowest contribution are in the 31-35 i.e. 1 (0.30%)

Table –VII. 9 Authors Productivity

S.No	**Year**	**Total No.of.Papers**	**Total No.of. Authors (%)**	**AAPP**	**Productivity per Authors**
1	2005	23	46 (7.641)	2.000	0.5
2	2006	26	51 (8.471)	1.961	0.509
3	2007	28	50 (8.305)	1.785	0.56
4	2008	35	66 (10.963)	1.885	0.530
5	2009	34	60 (9.966)	1.764	0.566
6	2010	43	77 (12.790)	1.790	0.558
7	2011	36	68 (11.295)	1.888	0.529
8	2012	27	49 (8.139)	1.814	0.551
9	2013	37	74 (12.292)	2.000	0.5
10	2014	35	61(10.132)	1.742	0.573
Total		**324**	**602 (100)**	**18.629**	**5.376**

Notes: *Average Authors Per Paper (AAPP) = Number of authors/Number of papers. Productivity per author = Number of papers/Number of authors.

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Table-VII.9 show the data related to author's productivity. The total average number of authors per paper is 18.629 and the average productivity per author is 5.376. The highest number of author's productivity 77 (0.558%) was in 2013. The minimum number of author's productivity 46 (7.641%) was in 2005.

VII.10 - Exponential Growth Rate

S.No	Year	Publications	Exponential Growth rate
1	2005	23	-
2	2006	26	1.13
3	2007	28	1.08
4	2008	35	1.25
5	2009	34	0.97
6	2010	43	1.26
7	2011	36	0.84
8	2012	27	0.75
9	2013	37	1.37
10	2014	35	0.95
Total		**324**	**9.6**

Table- VII-10 shows that the Exponential Growth Rate of publications in Annals of Library and Information Studies during the period of 2005 to 2014 (10 years). The highest growth rate 1.37 was found during 2013 with 37 Publications. It is also found that the Exponential Growth Rate was found to be 9.6.

Table –VII. 11 Relative Growth Rate and Doubling Time of Annals of Library and Information Studies Publications

Year	No.of.Publications	Cumulative No.of. Publications	W1	W2	R (a) (W1-W2)	Mean R (a) 1-2	Doubling Time	M Dt(a)1-2
2005	23	23		3.14				
2006	26	49	3.14	3.89	0.75		0.92	
2007	28	77	3.89	4.34	0.45	0.33	1.54	3.2
2008	35	112	4.34	4.72	0.38		1.82	
2009	34	146	4.72	4.78	0.06		11.55	
2010	43	189	4.78	5.24	0.46		1.50	
2011	36	225	5.24	5.42	0.18		3.85	
2012	27	252	5.42	5.53	0.11	0.2	6.30	7.6
2013	37	289	5.53	5.75	0.22		3.15	
2014	35	324	5.75	5.78	0.03		23.10	
Total	**324**					**0.26**		**5.4**

Table –VII.11 indicates that the relative growth rates of articles output and also doubling time of the publication. It could be observed that the relative growth rates of all sources of research output have decreased from 0.75 in 2006 to 0.03 in 2014. The mean relative growth rates for the periods 2005-2014. The study period has witnessed a mean relative growth rate of 0.26. The doubling time for publication have increased from 0.92 in 2006 to 23.10 in 2014. The mean doubling time for publications for the periods of 2005-2014 was 5.4.

Table- VII.12 Time series analysis of single authored articles

Year	No. of. Publication	X	X^2	XY
2005	9	-4	16	-36
2006	6	-3	9	-18
2007	12	-2	4	-24
2008	12	-1	1	-12
2009	6	0	0	0
2010	17	1	1	17

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2011	12	2	4	24
2012	10	3	9	30
2013	11	4	16	99
2014	13	5	25	65
Total	**108**		**85**	**80**

Table VII -12 show that the Straight line equation is applied to arrive at estimates for future growth under the time series analysis.

Straight line equation Y c= a+ bX; Since ∑x=0

a= ∑Y/ N = 108/ 10 =11 b=∑XY / $\sum x^2$=80 / 85 = 0.9

Estimated literature in 2020 is when X= 2020 - 2009 = 11

=11+0.9*11

=11+9.9

=20.9

Estimated literature in 2025 is when X 2025 – 2009 = 16

=16+0.9*16

=16+14.4

=30.4

On the application of the formula of time serious analysis and subsequently, from the results obtained separately, for the years 2020 and 2025, it is found that the future trend of growth in single authored research literature output may take an increasing trend during the years to come.

FINDING AND CONCLUSION

- This study finds that the years of 2005 and 2014 were having the highest number of publications of 2010 (32). The most of the contributors are 10-19 citation range, I. e. 114 (35.2%).
- The extent of research contributions by the authors is explained under authorship pattern that out of 324 articles. Majority number of articles 150 (46%) were published by two authors. The collaborative coefficient comes to 0.38 for the period of study.
- It is found that the C = degree of collaboration 324 (0.67%), Nm=Number of multi-authored works 216, Ns= Number of single-authored works 108.
- Ranking of authors by number of contributions. The first rank of the top authors Prasand Chand published highest number of articles for the study period with 19 records. The top country of New Delhi was published the 57 (9.5%).
- The page wise distribution of publications. It is found that most of the contributors are 11-15 pages, i.e. 205 (63.27%).
- The total average number of authors per paper is 18.629 and the average productivity per author is 5.376.
- The study period has witnessed a mean relative growth rate of 0.26. The mean doubling time for publications for the periods of 2005-2014 was 5.4.
- The time series analysis of Estimated literature in 2020 is when X= 2020 - 2006 = 11. Estimated literature in 2025 is when X 2025 – 2009 = 16.

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ISSN 2349-6193
Impact Factor (PIF): 2.243

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