

# A Bibliometric Analysis of Authorship Productivity and Collaborative Research in Blogosphere

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**Abstract** - An analysis of 718 publications published by social area on Blogosphere during 2002-2018 and indexed by web of science online Database indicates that the publication output in the Global Research Publications. The highest numbers of papers were published during the year 2010 and 2013 with 76 records, the followed by 72 papers in 2009, 69 papers in 2015 and 67 records of the publication in the year 2011. The least number of publication in the years 2002, 2003 and 2004 with only one record of the publications due to the initial stage of web developments. Overall, 1368 authors contributed 520 publications in the journal and institutions with 668 records of the articles. Contribution of journals, ranking of authors, preference of publication and frequency of keywords were also analysed in this paper.

**Keywords:** Blogosphere, Sphere, Blogs, Bibliometrics

## I. INTRODUCTION

Blogosphere is part of blog on the internet as a whole. This blog encompasses the blogosphere is the social space created by online entities using web log publishing platforms. Simply form of the blogosphere is a vernacular term for all the blogs on the webs. The blogosphere is often compared to grassroots journalism in that each member is able to post on any topic that catches their personal interest. The blogosphere is very powerful social media network in that most popular bloggers have an audience dignified in millions. However, the blogosphere is also very miscellaneous, so it does not characterize a combined group unit – even though some of the collective sub-groups within the blogosphere are Post-based messaging services like Twitter are often considered part of the blogosphere despite the shorter length of the posts.

The present study aims at analysing the bibliometric analysis of authorship productivity and collaborative research in blogosphere. The major focus of the study is to apply the bibliometric analysis with a view to analyse the evaluation and performance of research output in blogosphere. The study related to authors, their productivity; collaborative patterns and other aspects is important and useful to understand the mechanism underlying the growth of knowledge of a discipline. This study also to analyses the performance and evaluation of blogosphere research output in terms of its content and coverage growth rates and relative growth rate, doubling time source wise research output, authorship pattern and degree of collaboration output.

## II. DEFINITION OF BLOGOSPHERE

Blogosphere is a term some writers have used to describe the grassroots and interactive journalism made possible by participants in blogs (logs or journals maintained on the Internet) and the symbiotic relationship between bloggers and traditional journalists.

## III. OBJECTIVES OF THE STUDY

The main objective of this study was to use A Bibliometric Analysis of Authorship Productivity and Collaborative Research in Blogosphere with special reference to research activities at global level:

1. To identify and analyze the rate of growth of research productivity;
2. To examine the Year wise distribution of publications;
3. To examine the effectiveness of various sources of research publications in blogosphere research.
4. To analyze the scientific productivity of authors and authorship pattern of blogosphere research.
5. To test the applicability of Lotka's law to the scientific productivity of authors in blogosphere Research literature
6. To identify the geographical distribution of zonal Levels.

## IV. STATEMENT OF THE PROBLEM

The present study aims at analyzing the research performance of Blogosphere. Therefore, it is through publication, the scientists receive professional recognition and esteem as well as promotion, advancement, and funding for future research. Publication is so central to productivity in research that the work becomes 'a work' only when it takes a conventional, physical (that is published) form, which can be received, assessed and acknowledged by the professionals.

It could be seen clearly from the above discussion that Bibliometric analysis is an important tool in analyzing any science and social science discipline. By keeping this view in mind, the researcher intends to undertake the study on "A Bibliometric Analysis of authorship productivity and collaborative research in Blogosphere".

## V. METHODOLOGY

The data for the study were retrieved from web of science database which is a scientific and indexing service maintained by Thomson Reuters. The present study aims at analyzing the research output of Researchers in the field of blogosphere literature. It brings into focus the distribution of research output by following bibliographic details such as related growth of output and doubling time, authorship pattern, and language of publications, forms of publications, country affiliations, and core journals and so on. Quick, easy and comprehensive, web of Science provides superior support of the literature research process. Besides statistical tools like trend analysis, correlation analyses and time series analyses were used to predict the future in blogosphere literature research. The data were downloaded from web of science database. A total of 718 records were downloaded and analysed by using the Histcite which is a software package used for bibliometric analyzed and tabulated for making observations as per the objectives of the study. The study explores the research concentration in blogosphere literature and journal priority in publishing blogosphere literature articles.

## VI. TOOLS AND TECHNIQUES

Blogosphere literature is used in the present study. The total of 718 records was published in blogosphere literature at global level. The research output was analyzed using various Bibliometric indicators. The date was examined with the software name as Histcite. Histcite software is designed to assist a user in analyzing bibliographic data, or any data of a textual nature formatted in a similar manner.

### A. Blogosphere Research Output during 2002-2018

It reveals that the brief description about the Blogosphere literature research output during the sample period from the web of science database, the total time span is 17 years, 718 records were downloaded. Among those records were earned 5729 global citation scores, 538 local citation scores, 163 local references scores, 19475 global references scores and 19638 all cited references scores of the publications. Overall 7 different type of language were produced through 11 different types of document were produced the sample records, among those 1368 authors contributed 520 publications in the journal articles and 52 countries' were contributed through 668 different type of Institutions about the Blogosphere literature research output.

### B. Yearly Wise Distribution of the Publications

To analyze the year wise publication of research on Blogosphere Literature research the data has been presented in Table I. The table depicts the research output in the global level. From the below table, It could clearly see that during the period 2002-2018 a total of 718 publications were published. In the present study the research output on Blogosphere Literature publication is taken as a tool to evaluate the performance at various levels.

TABLE I YEAR WISE DISTRIBUTION OF PUBLICATIONS

S. No.	Publication Year	Recs	Percent	TLCS	TGCS	ACPP
1	2002	1	0.1	0	1	1.00
2	2003	1	0.1	0	0	0.00
3	2004	1	0.1	8	31	31.00
4	2005	8	1.1	18	67	8.38
5	2006	17	2.4	25	220	12.94
6	2007	24	3.3	49	311	12.96
7	2008	44	6.1	109	984	22.36
8	2009	72	10.0	70	602	8.36
9	2010	76	10.6	69	729	9.59
10	2011	67	9.3	55	803	11.99
11	2012	66	9.2	54	760	11.52
12	2013	76	10.6	22	474	6.24
13	2014	49	6.8	17	291	5.94
14	2015	69	9.6	31	305	4.42
15	2016	60	8.4	6	86	1.43
16	2017	56	7.8	4	52	0.93
17	2018	31	4.3	1	13	0.42
	Totals	718	100	538	5729	7.98

The highest publication is 76 in 2010 and 2013, the followed by 72 papers in 2009, 69 papers in 2015 and 67 records of the publication in the year 2011. The least number of publication in the years 2002, 2003 and 2004 with only one record of the publications due to the initial stage of web developments.

So, over all records calculating Average citation per paper 7.98 times covered the out of the 718 records of the publications. The highest Average citation per paper 31 times covered the 1 records of the publication in the year 2004 and the following year 2008 with 44 records of the publication covered the 22.36 times of the Average citation per paper of the publications. It also shows that got highest 984 global citations against 44 publications in the year 2008, followed in the 2011 with 803 global citations against 67 publications, third year 2012 with 760 global citations against 66 publications and 729 global citations for 76 records of the publications in the year 2010 and rest as well as follows.

### C. Document Wise Distribution of the Publications

The highest global citation 4597 got Article with 437 papers, the next score of global citation is 310 got Proceeding Paper with 201 papers and 216 global citation got Editorial Material with 22 papers of the publication of the documents and very low i.e. only one citation of the publication got Software Review and rest Articles with only one papers of the publications.

TABLE II DOCUMENT WISE DISTRIBUTION OF THE PUBLICATIONS

S. No.	Document Type	Recs	Percent	TLCS	TGCS
1	Article	437	60.9	411	4597
2	Proceedings Paper	201	28.0	63	310
3	Editorial Material	22	3.1	25	216
4	Book Review	14	1.9	1	4
5	Review	14	1.9	28	423
6	Article; Proceedings Paper	12	1.7	10	169
7	News Item	7	1.0	0	1
8	Letter	5	0.7	0	5
9	Meeting Abstract	4	0.6	0	0
10	Correction	1	0.1	0	3
11	Software Review	1	0.1	0	1

#### D. Author Wise Distribution

##### 1. Ranking of Authors Based on Publications

Table III indicates ranking of authors by number of publications. Authors Kozlak J and Zygmunt A published

highest number of articles for the study period with 13 records; next authors Berger P, Gliwa B, Henig P and Meinel C published next highest number of articles for the study period with 10 records, Kim SW published eight records and as well as follows.

It is found from the analysis that LOTKAS law may not be applicable with regard to author productivity in proliferation of research in Bibliometric. It also shows that author Agarwal N has got highest 59 global citations against 5 publications, followed by the author Zygmunt A with 58 global citations against 13 publications and third one is with more citations by Kozlak J and Jung JJ having 57 global citations for 13 and 5 publications.

Among the top 20 authors, author Zygmunt A has append 28 references for its 13 publications which is followed by the authors Gliwa B with 26 cited references for its 10 publications and the authors Agarwal N with 21 cited references for its five publications. There are only four authors having more than 50 global citations, three authors having more than 40 global citations and two authors having more than 30 global citations and rest as the follows.

TABLE III AUTHOR WISE DISTRIBUTION OF THE PUBLICATIONS

S. No.	Author	Rec s	Percent	TLCS	TLCS x	TGCS	TLCR
1	Kozlak J	13	1.8	29	0	57	21
2	Zygmunt A	13	1.8	30	0	58	28
3	Berger P	10	1.4	0	0	11	2
4	Gliwa B	10	1.4	20	0	44	26
5	Hennig P	10	1.4	0	0	11	2
6	Meinel C	10	1.4	0	0	11	2
7	Kim SW	8	1.1	9	5	44	6
8	Brodka P	6	0.8	18	0	36	7
9	Kazienko P	6	0.8	18	0	36	7
10	Singh VK	6	0.8	4	0	10	10
11	Agarwal N	5	0.7	6	4	59	2
12	Jung JJ	5	0.7	2	2	57	2
13	Koltsova O	5	0.7	2	0	10	4
14	Abdelzaher T	4	0.6	2	0	13	2
15	Astrom J	4	0.6	3	1	6	11
16	Baumann S	4	0.6	6	5	8	2
17	Chen Y	4	0.6	6	6	48	1
18	George J	4	0.6	2	0	13	2
19	Giridhar P	4	0.6	2	0	13	2
20	Kaplan L	4	0.6	2	0	13	2

Table IV shows that the highest number of the publications on 268 records in one author productivity, the next followed by the two author's productivity with 186, the

third author's productivity with 116 and the fourth author's productivity with 79 records of the publications respectively and followed by other patterns.

TABLE IV AUTHOR WISE DISTRIBUTIONS OF THE PUBLICATIONS

Year	1	2	3	4	5	6	7	9	14	Records
2002	1	0								1
2003	1	0								1
2004	1	0								1
2005	5	2		1						8
2006	12	2	1	2						17
2007	13	3	6	0	2					24
2008	19	15	7	2	0	1				44
2009	26	15	14	9	5	2	1			72
2010	25	19	11	14	6	0	0	1		76
2011	21	17	18	7	3	1	0	0		67
2012	24	22	6	9	4	1	0	0		66
2013	28	16	13	10	4	4	1	0		76
2014	15	14	5	9	5	1	0	0		49
2015	28	17	10	7	2	3	2	0		69
2016	19	20	11	4	3	1	1	1		60
2017	18	15	9	5	4	1	3	1		56
2018	12	9	5		4	0	0	0	1	31
Totals	268	186	116	79	42	15	8	3	1	718
Mean square	5642	3048	1284	687	176	35	16	3	1	43308
Mean	15.76	10.94	6.82	4.65	2.47	0.88	0.47	0.18	0.06	42.24
V	331.02	178.88	75.37	40.34	10.33	2.06	0.94	0.18	0.06	2541.36
S.D	18.19	13.37	8.68	6.35	3.21	1.43	0.97	0.42	0.24	50.41

TABLE V SHOWS THAT AUTHORSHIP PATTERN OF BLOGOSPHERE

Authorship Pattern	No. of Contribution	Percentage of Authors	Cumulative Percentage
1	268	37.33	37.33
2	186	25.91	63.24
3	116	16.16	79.4
4	79	11.00	90.4
5	42	5.85	96.25
6	15	2.09	98.34
7	8	1.11	99.45
9	3	0.42	99.87
14	1	0.14	100
Total	268	37.33	37.33

The authorship pattern shows that the collaboration trend is dominant as only 37.33 percent are contributed by single authors. The highest productivity of publications output 268 from one authors. This is followed by two authors' contribution (25.91%).

It is inferred from the table VI that at the aggregate level, the degree of collaboration is of 0.63 during the study period 2002 to 2018 that is out of total 718 literatures published, 63% of them or published under the joint author of publications in "Blogosphere Literature" research output. This brings out clearly the high level of prevalence of collaborative research in Blogosphere Literature.

TABLE VI SHOWING YEAR WISE DISTRIBUTION OF DEGREE OF COLLABORATION

Year	Single Authors		Multiple Authors		Total	Degree of Collaboration
	No. of Output	%	No. of Output	%		
2002	1	0.14	0	0.00	1	0.00
2003	1	0.14	0	0.00	1	0.00
2004	1	0.14	0	0.00	1	0.00
2005	5	0.70	3	0.42	8	0.38
2006	12	1.67	5	0.70	17	0.29
2007	13	1.81	11	1.53	24	0.46
2008	19	2.65	25	3.48	44	0.57
2009	26	3.62	46	6.41	72	0.64
2010	25	3.48	51	7.10	76	0.67
2011	21	2.92	46	6.41	67	0.69
2012	24	3.34	42	5.85	66	0.64
2013	28	3.90	48	6.69	76	0.63
2014	15	2.09	34	4.74	49	0.69
2015	28	3.90	41	5.71	69	0.59
2016	19	2.65	41	5.71	60	0.68
2017	18	2.51	38	5.29	56	0.68
2018	12	1.67	19	2.65	31	0.61
Totals	268	37.33	450	62.67	718	0.63

TABLE VII PATTERN OF CO-AUTHORSHIP INDEX

Year	Single Authors		Multiple Authors		Total
	No. of Output	CAI	No. of Output	CAI	
2002	1	2.68	0	0.00	1
2003	1	2.68	0	0.00	1
2004	1	2.68	0	0.00	1
2005	5	1.67	3	0.60	8
2006	12	1.89	5	0.47	17
2007	13	1.45	11	0.73	24
2008	19	1.16	25	0.91	44
2009	26	0.97	46	1.02	72
2010	25	0.88	51	1.07	76
2011	21	0.84	46	1.10	67
2012	24	0.97	42	1.02	66
2013	28	0.99	48	1.01	76
2014	15	0.82	34	1.11	49
2015	28	1.09	41	0.95	69
2016	19	0.85	41	1.09	60
2017	18	0.86	38	1.08	56
2018	12	1.04	19	0.98	31
Totals	268	1.00	450	1.00	718

It is observed from the Table VII, the CAI for single authors is declined from 2.68 in the year 2002, 2003 and 2004 to 1.89 in the year 2006. On the other hand, the CAI for

Multiple authors is enhanced from 1.09 in the year 2016 and 2014 to 1.08 in the year 2017, which indicates the

pattern of co-authorship is increasing among the contributions of the journal.

*E. Lotka’s Law of Author Productivity*

Generally author productivity is determined on the basis of

number of papers contributed by the Blogosphere literature in a specific field. It is quite relevant to study the impact of Lotka’s Law in examining the author productivity in blogosphere literature research. Table VIII presents the results of author productivity based on Lotka’s Law.

TABLE VIII LOTKA’S LAW OF AUTHOR PRODUCTIVITY

No. of authors	Observed Number of authors with ‘n’ or (an) or (f)	Observed percentage of authors 100 x an/a1	Expected number of authors (an=an/n <sup>2</sup> ) or (p)	Expected percentage of authors	(F-P) <sup>2</sup> /P
1	268	100.00	268.00	100.00	105.31
2	186	69.40	46.50	17.35	11.28
3	116	43.28	12.89	4.81	71.68
4	79	29.48	4.94	1.84	121.97
5	42	15.67	1.68	0.63	116.53
6	15	5.60	0.42	0.16	64.41
7	8	2.99	0.16	0.06	48.77
9	3	1.12	0.04	0.01	31.63
14	1	0.37	0.01	0.00	26.55
Total	268	267.91	334.63	X <sup>2</sup>	598.12

Further the Lotka’s Law is also tested with application of scientific productivity Chi-square model in relation to the number of authors who contributed n number of publications.

It is observed from the Table VIII that the calculated chi-square value (598.12) is lesser than the table value at 0.05 growth level of significance. Therefore the growth of ‘Blogosphere literature’ does fit with the lower pattern and the analysis of quantum of productivity theoretically validated Lotka’s findings.

From the above analysis, it is inferred that Lotka’s Inverse Square Law does not apply to the ‘Blogosphere literature’ research output studied. However it is to be mentioned that Lotka’s Law to be treated as general and theoretical estimate of productivity not as precise statistical distribution.

**VII. COLLABORATIVE INDEX IN DIGITAL LEARNING RESEARCH**

It can be observed that the result of highest value to lowest in the year 2017 had index value 2.70, for 2018 and 2014 the index value is 2.55, 2010 has an index value of 2.51; 2013 the index value is 2.50, 2009 had index value 2.47 and 2016 has an index value of 2.42.

Results from the table IX shows, the trend in authorship pattern and collaborative measures. The ‘Collaborative Index’ for universal level is 2.37 which show the popularity towards collaborative research pattern than single author research in chosen field of Blogosphere Literature research output.

TABLE IX COLLABORATIVE INDEX IN DIGITAL LEARNING RESEARCH

Year	No. of articles	No. of authors	CI
2002	1	1	1.00
2003	1	1	1.00
2004	1	1	1.00
2005	8	13	1.63
2006	17	27	1.59
2007	24	47	1.96
2008	44	84	1.91
2009	72	178	2.47
2010	76	191	2.51
2011	67	158	2.36
2012	66	148	2.24
2013	76	190	2.50
2014	49	125	2.55
2015	69	162	2.35
2016	60	145	2.42
2017	56	151	2.70
2018	31	79	2.55
	718	1701	2.37

**VIII. CONCLUSION**

The present study could review that there are 718 numbers of publications indexed by web of science databases under the subject category of Blogosphere Literature research for the study period 2002-2018. There are 520 number of journals were published the research on Blogosphere Literature, which has published by 1368 number of authors

from 668 number of institutions, located in 52 number of countries. It is also found that the publications on Blogosphere Literature have got 5729 numbers of Global Citations and 538 numbers of Local citations. Bibliometric and /or scientometric analysis is a reliable tool to evaluate the development and quality of scientific production. The study quantitatively identified the Blogosphere Literature pattern and trends. The data suggest that there was a significant research activity in the field of Blogosphere during the study period. The analysis shows that there is common set / nucleus zone of journals publishing Blogosphere research output, which is scattered among many sources of publishing. The preference of the academics seems to be the journals with a broader scientific scope, that attract wider readership and high impact factor, rather than the journals with focused fields of specialization. The journals distributions in Blogosphere Literature conform to the Bradfords's Law of Scattering. In case of Lotka's law validation, the chi-square method is closer to the observed values of Blogosphere Literature research as compared with Maximum likelihood. Blogosphere Literature presents reduced cost of course production, large scope of expansion of potential market, quality

improvement and several other benefits. It has also given an opportunity to all field develop their, procure e-resources in place of print resource. These challenges can be overcome by the application of emerging concepts in virtual environment of World Wide Web. Blogosphere Literature is the concepts being adopted by the world to provide seamless content of digital information resources to its growing community of users.

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