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Authorship Distribution and Collaboration in LIS Open Access Journals: A Scopus based analysis during 2001 to 2015

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Abstract: The present study is a bibliometric analysis of some selected open access Library and Information Science (LIS) journals indexed in Scopus database during the period 2001 to 2015. The study has covered 10 LIS open access journals with 5208 publications to establish an idea about the pattern of authorship, research collaboration, collaboration index, degree of collaboration, collaboration coefficient, author's productivity, ranking of prolific authors etc. of said journals. Lotkas's inverse square law has been applied to know the scientific productivity of authors. Results show that, the covered LIS open access journals are dominant with single authorship pattern. The value of Collaborative Index (0.73), Degree of Collaboration (0.72), and Collaboration Coefficient (0.29) do not show the trend of collaboration. Lotka's law of author's productivity is fitting to the present data set. The country wise distribution of authorship based on the country of origin of the corresponding author shows that 83 countries across the Globe are active in publication of their research in LIS open access journals. United States of America (USA) is the leader country producing of 2822(54.19%) authors alone.

Keywords: Open Access, Bibliometrics, Collaboration Index, Degree of Collaboration, Collaboration Coefficient, Lotka's law.

Introduction

Scientific publishing is undergoing significant changes due to immense growth of online publications and increases in the number of open access journals. Most leading publishers like Elsevier, Taylor and Francis, Springer and others have introduced open access journals in a big way and their acceptance among authors for publishing articles has also increased. Open access journals are gaining its popularity because of free availability of articles on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles. As the numbers of open access journals are growing in a big way, it's a challenge for the authors to identify the best journals for their research and publications. So, the present study entitled "Authorship Distribution and Collaboration in LIS Open Access Journals: A Scopus based analysis during 2001 to 2015" is an attempt to analyzed the authorship pattern, collaboration index, degree of collaboration, collaboration coefficient, author productivity, and ranking of prolific authors of LIS open access journals

covered in the study during the period 2001 to 2015. The study will be a useful for the authors and researchers in the field of Library and Information Science to be aware about the ongoing trend of authorship, research collaboration, author's productivity of LIS open access journals.

Literature Review

The author have referred so many research papers and articles related to authorship studies of LIS journals to have a clear understanding of ongoing trend of authorship studies and to find out some possible ways to carry out the present study smoothly in a qualitative way.

Parameswaran and Smitha (2001) examine the 60 issues of Library and Information Science Abstracts (LISA), published from 1994-1998, and reveal that single authors publications were greater in number than collaborative work as covered by LISA. Tiew, Abdullah and Kaur (2001) carry out a bibliometric examination of all the journal articles published in the Malaysian Journal of Library & Information Science from 1996-2000 and reveal that the percentage of multi-authored papers is slightly higher at 52.6%. Bharvi, Garg and Bali (2003) analyze the 1317 papers published in first fifty volumes during 1978 to 2001 of the international journal of Scientometric and show that the journal is dominated by the single authored papers; however, multi authored papers are gaining momentum. Similar pattern has been observed for domestic and international collaboration. Uzun (2004) identifies an increase in the share of collaborative papers contributed by authors in JASIST, Journal of Documentation, Journal of Information Science (JIS), and Information Processing & Management (IP&M). Mittal, Sharma & Singh (2006) present in their study of 536 papers covering to library and information science education from 1995 to 2004 and reveal that most of the papers are contributed by single authors (72.8%) contribution and only less numbers of papers are collaborated by two and more authors. Verma, Rajnish and Priyanka (2007) reveal that most of the contributions of the journal Annals of Library and Information Studies are contributed by single author. Mukherjee (2009) reveals the collaborative authorship pattern of the Journal of the American Society for Information Science and Technology (JASIST) during the period 2000 to 2007. Park (2010) studies the authorship characteristics of journal D-Lib Magazine and reveals that the source journal is dominated by single author contributions with 77% of papers. Pradhan and Chandrakar (2011) find in their study that Indian LIS authors' contribution to scholarly publication is moving towards single to two authors as 75.88 % articles covered in the study are contributed by two authors. Thanuskodi (2011) presents the authorship pattern of the journal Library Herald for the period 2006 to 2010 and reveals that out of 138 articles covered in the study single author contributions are 72 (52.17%) articles and rest 66 (47.83%) articles are contributed by joint authors. Warraich and Ahmad (2011) analyze Pakistan Journal of Library and Information Science (PJLIS) during 1995 to 2010 and reveal that the authors' collaboration is clearly visible in the journal PJLIS. Ardanuy (2012) analyzes the level of co-authorship of Spanish research in Library and Information Science (LIS) until 2009 and found a significant increase in all co-authorship, including publications in English and those involving international collaboration. Priya and Khaparde (2012) elucidate the trends of authorship pattern and authors' collaborative research

in their study covering with a sample of 12263 LIS articles that single authored contributions are dominant in the journal Library Management. Thanuskodi (2012) shows the authorship pattern of DESIDOC Journal of Library and Information Technology covering to a total of 199 articles published in the journal and finds that 116 articles, out of 199 articles are contributed by joint authors while the rest 83 articles are contributed by single author. Yank and Lee (2012) assess the research patterns and trends of library and information science (LIS) in Korea and find an increasing trend for research collaboration among LIS authors. Ardanuy (2013) shows the scientific output of Library and Information Science in Spain during 2006-2010 and reveal that the authorship pattern of published works indicates towards multi authorship. Barik and Jena (2013) analyse the authorship patterns of journal Trends in Information Management and reveal that the source journal is dominant by joint authorship pattern. The degree of authors' collaboration is not so strong in the journal. However, the journal constitutes 28% of foreign authors' contributions. Khaparde (2013) reveals in the study E- Journals in Library and Information Science: A bibliometric study that joint authorship has dominated the research where male authors have the dominance over gender with (66.28%) of total publications and collaborative research with (64.11%) publications. Khurshid (2013) measures the quality of articles published in foreign LIS journals by Pakistani authors and reveals that the authorship patterns show a shift from single-authorship to collaborative authorship. Pandita (2013) undertakes a bibliometric study of Annals of Library and Information Studies (ALIS) journal during the last decade and finds that 65.81% articles of the journal are contributed on co-authorship pattern. Swain, Swain and Rautaray (2013) examine the scholarly communications in Library Review (LR) from 2007 to 2011 and to reveal that single authored articles occupy the prominent position indicating the supremacy of solo research in Library Review. The degree of collaboration in the publications of this journal is found to be 0.36. Satpathy, Maharana and Das (2014) investigate the scholarly communications in open access journals of Library & Information Science and show that single authored papers are found to be the highest (40.48 percent), followed by two-authored and then three-authored papers. The degree of collaboration is found to be between 0.33 and 0.8. Singh and Chander (2014) explore the authorship pattern of the journal Library Management, and highlight that the journal has produced majority of the contributions by single authors during the period 2006-2012. Swain (2014) shows the authorship patterns of International Information and Library Review from 2004 to 2013 and highlights that majority of papers are published in single authorship mode followed by two-authorship mode. It is seen that contributions in three-authorship and more than three-authorship mode are quite less. The degree of collaboration is found to be 0.45, indicating less intensity of collaborative trend of research. Das (2015) highlights the authorship pattern and research collaboration in the area of Informetrics based on 420 scholarly communications appeared in the Journal of Informetrics during 2007 to 2013. Study illustrates various significant aspects like types and trends of authorship, author productivity, degree of collaboration, collaborative index, geographical diffusion and institutional diversification of authorship. Swain (2015) shows the authorship patterns of Library Hi Tech from 2004 to 2013 and highlights that the majority of papers are produced in single authorship mode followed by two-authorship mode. The degree of collaboration (DC) in Library Hi Tech

publications is found to be 0.519 indicating less intensity of collaborative trend of research. Verma, Sonkar and Gupta (2015) show the authorship pattern of Library Philosophy and Practice from 2005 to 2014 and reveal that single authorship is leading authorship trend in the journal and the rate of degree of collaboration is 0.51. Vellaichamy and Jeyshankar (2015) analyse the 158 papers published in the journal Webology during the period 2004-2013 and reveal that single authorship possess a lead role in the journal. Zakaria (2015) studies the authorship pattern of Arab Librarians who published in Library and Information Science journals. The study analyses the journal research publications in Library and Information Science journals by professional librarians from 1981 to 2010. Single-author articles are found to be highly followed by two and three authored articles. The average degree of collaboration between authors in Library and Information Science journals is 9.64% (only 19 journal articles written by at least two or three authors). Khan (2016) explores the bibliometric analysis of the LIBRI: International Journal of Libraries and Information Services during the period of 2011-2015. The result shows that out of 140 research articles 63(45%) articles are contributed by single authored whereas, 77(55%) articles were contributed by multi-authored. The average degree of author collaboration was 0.55 which ranges from 0.57 to 0.58. Shukla and Moyon (2017) analyze the bibliometric analysis of Indian open access LIS journal for five years from 2011 to 2015 covering 218 publications and reveal that two authorship patterns is prevelant with 0.66 degree of collaboration. Suresh (2017) examines authorship pattern of 556 papers published in Journal of Documentation during 2003 to 2015 and finds that almost half of the total publications published by single authors.

Objectives of the study

The main objectives of the present study are;

- To establish an idea on yearly distribution of publications of LIS open access journals,
- To know the journal wise distribution of authorship pattern,
- To identify the strength of Single Vrs Collaborative authorship,
- To identify the Collaborative Index (CI), Degree of Collaboration (DC), and Collaborative Coefficient (CC) of authors,
- To study the author's productivity,
- To trace authorship patterns by country of authors, and most prolific authors

Scope & Limitations

The scope of the present study is limited to only open access journals published in the field of Library and Information Science and indexed in Scopus database. The study is to focus on the journals which are only registered under Directory of Open Access Journals (DOAJ) and indexed for a period of 15 years uninterruptedly. The period of study is to cover from the year 2001 to 2015. The source journals are identified by consulting the Scopus database pertaining to the following criterion to avoid unnecessary influence and ambiguity in selecting the journals. The criterion followed are: i) The journal must have published in an open access platform and registered in Directory of Open Access Journals (DOAJ; ii) The journal must

have indexed in Scopus database for a period of 15 years continuously from the year 2001-2015 and there must not be discontinuation of any year; iii) Publication status of journal must be showing Active as on 31st December, 2015.

Based on the aforesaid criterion for selecting of journals, the study found 10 numbers of Scopus indexed open access Library and Information Science journals fitting to the study. The journals covered in the study with their abbreviation are; i) College and Research Libraries (LRL), ii) D-Lib Magazine (D-Lib), iii) Information Research (IR), iv) Information Technology and Libraries (ITL), v) Informing Sciences (IS), vi) Journal of the Medical Library Association (JMLA), vii) LIBER Quarterly (LIBERQ), viii) Library and Information Science Research (LISR), ix) Libres (LIBRES), x) School Library Media Research (SLMR).

Methodology

The publications of selected 10 journals were searched individually one by one ranging from the year 2001 to 2015 in the Scopus database. The required data were exported in an excel spreadsheet and analyzed using some statistical methods like average, mean, percentage etc. The gathered data were tabulated for final presentation of the results.

Results & Discussions

Year wise Distribution of LIS Open Access Publications

Table 1 depicts the year wise distribution of 10 LIS open access journals covered in the study. During the period 2001 to 2015, a total numbers of 5208 publications are indexed in Scopus database. The year wise distribution of publications show that in the year 2002, a highest number of 433(8.31%) publications were witnessed followed by the year 2003 with 416(7.99%) publications, and 2006 with 405(7.78%) publications. The year 2013 has witnessed a very low numbers of publications with 285(5.47%).

It is observed in the study that, the year wise distribution of journals do not show any increasing trend, however the cumulative numbers of distribution shows a steady growth of publications. Further it is seen that, not a single journal is strict to a constant numbers of publications by its issues or by its volumes. Every journal has a distribution of random numbers of publications in each year. Figure 1 shows the year wise distribution of publications.

Table 1: Year wise Distribution of Publications

Sl No	Publication Year	CRL	D-LIB	IR	ITL	IS	JMLA	LIBERQ	LISR	LIBRES	SLMR	Total	Percentage (%)	Cumulative	Cumulative Percentage (%)
1	2001	34	191	47	24	14	2	37	26	6	6	387	7.43	387	7.43
2	2002	40	178	28	25	19	67	42	24	5	5	433	8.31	820	15.75
3	2003	28	157	23	33	23	68	45	26	10	3	416	7.99	1236	23.73
4	2004	18	115	51	21	8	75	44	29	11	2	374	7.18	1610	30.91
5	2005	28	79	40	29	15	83	31	30	8	6	349	6.70	1959	37.62
6	2006	35	106	48	32	14	83	41	33	7	6	405	7.78	2364	45.39
7	2007	34	63	52	24	15	81	28	32	9	8	346	6.64	2710	52.04
8	2008	32	59	35	28	15	58	49	34	12	5	327	6.28	3037	58.31
9	2009	42	74	41	31	6	62	12	33	8	6	315	6.05	3352	64.36
10	2010	37	42	52	34	7	61	31	36	7	7	314	6.03	3666	70.39
11	2011	39	44	56	32	4	52	16	43	6	11	303	5.82	3969	76.21
12	2012	38	41	52	32	3	60	37	40	1	14	318	6.11	4287	82.32
13	2013	40	43	52	26	7	53	8	41	7	8	285	5.47	4572	87.79
14	2014	46	58	52	19	2	51	18	28	11	7	292	5.61	4864	93.39
15	2015	63	67	46	27	7	62	13	45	7	7	344	6.61	5208	100.00
Total		554	1317	675	417	159	918	452	500	115	101	5208	100.00	-	-

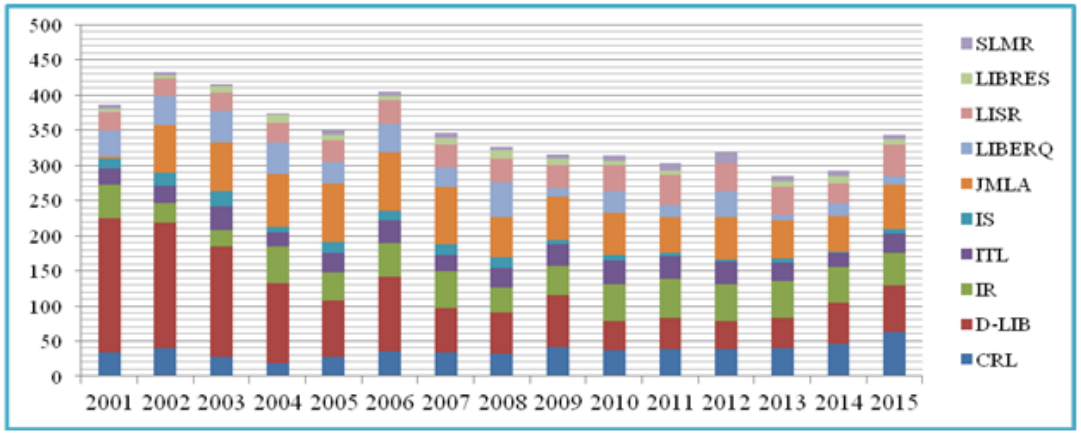

Figure 1: Year wise Distribution of Publications

Distribution of Authorship Pattern

Table 2 shows the authorship pattern of the LIS open access journals covered in the study. During the period 2001 to 2015, single authorship contribution is dominant with highest 2791(53.59%) publications, followed by two authorship contribution with 1209(23.21%) publications, and three authorship contribution with 627(12.04%) publications. The data set shows that, there are no such established research groups in this area or the researchers are not interested to publish their research by collaborative authorship. Further, the study throws light in the journal wise authorship pattern and finds that, JMLA is the only LIS open access journals having ≥2 mean authorship while other journals have ≥1 mean authorship. The average mean of authorship has found to be 1.93. This means the authorship pattern of LIS open access journals clearly indicates towards single authorship publications.

Further it is observed that D-Lib has produced highest 2579(25.59%) authorship followed by JMLA with 2322(23.04%) authorship and IR with 1230(12.21%) authorship. The lowest percentage of authorship has been contributed by the journal SLMR with 173(1.72%). Figure

2 illustrates the authorship pattern and mean of authorship of the LIS open access journals covered in the study.

Table 2: Distribution of Authorship Pattern

Sl No	Source Journal (abbreviated)	Distribution of Authorship Pattern											Total Papers	Total Author ship	Mean of Author ship	% of Author ship
		One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten	> Ten				
1	CRL	240	201	68	30	4	5	5	1	0	0	0	554	1059	1.91	10.51
2	D-LIB	773	230	152	68	37	27	9	8	9	0	4	1317	2579	1.96	25.59
3	IR	422	79	103	42	16	7	2	1	1	2	0	675	1230	1.82	12.21
4	ITL	270	86	39	13	6	1	2	0	0	0	0	417	661	1.59	6.56
5	IS	72	57	16	11	3	0	0	0	0	0	0	159	293	1.84	2.91
6	JMLA	352	210	145	95	55	26	13	10	5	3	4	918	2322	2.53	23.04
7	LIBER	347	77	16	6	5	0	0	1	0	0	0	452	606	1.34	6.01
8	LISR	192	216	56	24	7	1	0	1	1	1	1	500	967	1.93	9.60
9	LIBRES	68	29	13	3	2	0	0	0	0	0	0	115	187	1.63	1.86
10	SLMR	55	24	19	2	1	0	0	0	0	0	0	101	173	1.71	1.72
	Total	2791	1209	627	294	136	67	31	22	16	6	9	5208			
	Percentage (%)	53.59%	23.21%	12.04%	5.65%	2.61%	1.29%	0.60%	0.42%	0.31%	0.12%	0.17%	100.00	**10077**	**1.93**	100.00

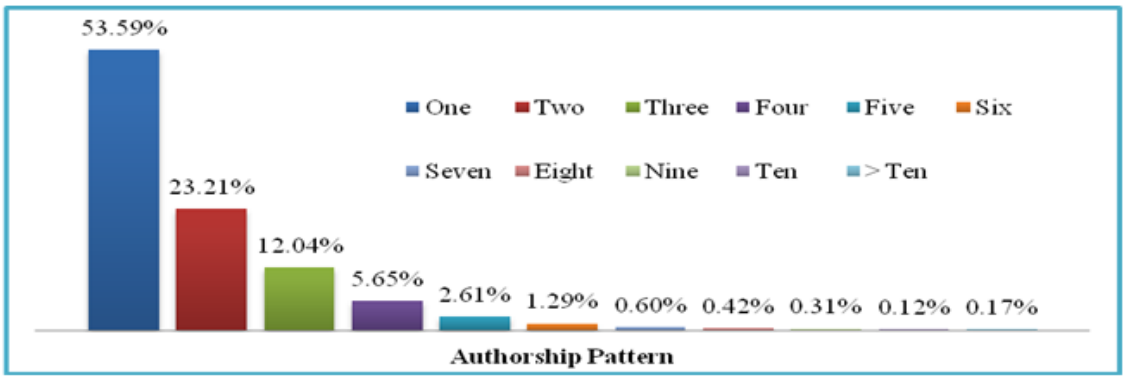

Figure 2: Authorship Pattern

Single Authorship Vrs Collaborative Authorship

In the present study, table 3 shows the number of single vrs collaborative authored publications. Single authored publications have shown an increasing trend throughout the period of study except the years 2009, 2010, 2011, 2013, and 2014. Out of 5208 publications highest 2791(53.59%) publications were contributed with Single Authorship and only 2417(46.41%) publications were contributed by Collaborative Authorship contribution. Further it is seen that a total of 10077 authorship have been counted for 5208 publications. The mean of authorship per publication is seen at 1.95 which is less than 2 or far from collaboration. So, the present dataset shows that LIS open access journals do not favor collaborative research. The year wise Single authorship Vrs Collaborative authorship is depicted in figure 3.

Table 3: Single Authorship Vrs Collaborative Authorship

Sl No	Publication Year	Total Publications	Single Authored		Collaborative Authored		Total Authorship	% of Authorship	Mean of Autorship per Publication
			No.	%	No.	%			
1	2001	387	249	64.34	138	35.66	616	6.11	1.59
2	2002	433	298	68.82	135	31.18	710	7.05	1.64
3	2003	416	237	56.97	179	43.03	773	7.67	1.86
4	2004	374	193	51.60	181	48.40	703	6.98	1.88
5	2005	349	213	61.03	136	38.97	650	6.45	1.86
6	2006	405	225	55.56	180	44.44	794	7.88	1.96
7	2007	346	188	54.34	158	45.66	683	6.78	1.97
8	2008	327	174	53.21	153	46.79	609	6.04	1.86
9	2009	315	136	43.17	179	56.83	645	6.40	2.05
10	2010	314	156	49.68	158	50.32	605	6.00	1.93
11	2011	303	147	48.51	156	51.49	622	6.17	2.05
12	2012	318	168	52.83	150	47.17	640	6.35	2.01
13	2013	285	114	40.00	171	60.00	650	6.45	2.28
14	2014	292	95	32.53	197	67.47	708	7.03	2.42
15	2015	344	198	57.56	146	42.44	669	6.64	1.94
	Total	5208	2791	53.59	2417	46.41	10077	100.00	1.93
Percentage (%)		100.00%	53.59%		46.41%			**6.67**	**1.95**

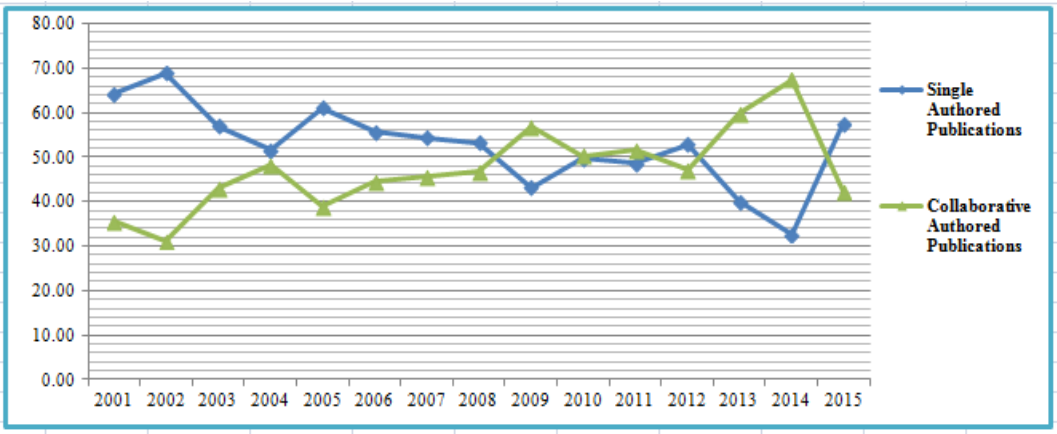

Figure 3: Single Authorship Vrs Collaborative Authorship

Collaborative Index (CI), Degree of Collaboration (DC), and Collaborative Coefficient (CC) among authors

The Collaborative Index (CI), Degree of Collaboration (DC), and Collaborative Coefficient (CC) among authors in LIS open access journals covered in the study are shown in table 4. Collaborative Index is a mean number of authors per publication. The formula used to identify Collaborative Index of authors per publication is; ***CI= (total publications)/ (total collaborative authors)***. The CI mean value in the present study shows to be 0.73 which is so weak at its label.

For analysis of Degree of Collaboration among authors, the study has applied the Subramanian's equation of $C= (N_m/ N_m+N_s)$ where; C= degree of collaboration, N_m= number of multi-authored work, and N_s= number of single-authored works to examine the extent of

research collaboration among LIS authors and prominent area of inquiry indicating the patterns of single and joint authors' publication. It is observed that, the DC value has ranged up and down from minimum 0.58 to maximum 0.87 which shows a weak intensity of author's collaboration at 0.72. Correspondingly, the Collaboration Co-efficient value which measures the extent and strength of collaboration among the authors shows at 0.29 which is also so weak at its level. This implies that, the LIS open access journals are far from collaborative research. Figure 4 clearly shows the graphical presentation of CI,DC, and CC values of LIS open access journals.

Table 4: Collaborative Index (CI), Degree of Collaboration (DC), and Collaborative Coefficient (CC)

Sl No	Publication Year	Year wise Authorship Distribution											Total Publications	Total Authorship	CI	DC	CC
		1	2	3	4	5	6	7	8	9	10	More than 10					
1	2001	249	91	30	5	6	3	0	2	0	0	1	387	616	1.05	0.60	0.20
2	2002	298	56	47	19	6	3	1	1	1	0	1	433	710	1.05	0.58	0.19
3	2003	237	112	32	15	7	5	3	2	0	1	2	416	773	0.78	0.69	0.25
4	2004	193	105	42	16	9	4	2	1	1	1	0	374	703	0.73	0.73	0.29
5	2005	213	56	35	23	14	2	3	2	1	0	0	349	650	0.80	0.67	0.25
6	2006	225	87	47	20	9	6	4	2	2	2	1	405	794	0.71	0.72	0.28
7	2007	188	72	44	22	11	4	2	0	1	0	2	346	683	0.70	0.72	0.28
8	2008	174	89	31	19	7	3	0	1	3	0	0	327	609	0.75	0.71	0.28
9	2009	136	91	49	25	7	5	1	1	0	0	0	315	645	0.62	0.79	0.34
10	2010	156	89	39	17	5	5	0	0	2	0	1	314	605	0.70	0.74	0.30
11	2011	147	73	44	18	9	6	4	2	0	0	0	303	622	0.64	0.76	0.32
12	2012	168	58	53	21	10	0	3	3	2	0	0	318	640	0.67	0.74	0.30
13	2013	114	92	30	19	14	6	3	5	1	1	0	285	650	0.53	0.82	0.37
14	2014	95	91	48	31	13	9	3	0	0	1	1	292	708	0.48	0.87	0.42
15	2015	198	47	56	24	9	6	2	0	2	0	0	344	669	0.73	0.70	0.27
	Total	2791	1209	627	294	136	67	31	22	16	6	9	5208	10077	0.71	0.72	0.29
Percentage (%)		53.59%	23.21%	12.04%	5.65%	2.61%	1.29%	0.60%	0.42%	0.31%	0.12%	0.17%	100.00		Mean (0.73)	Mean (0.72)	Mean (0.29)

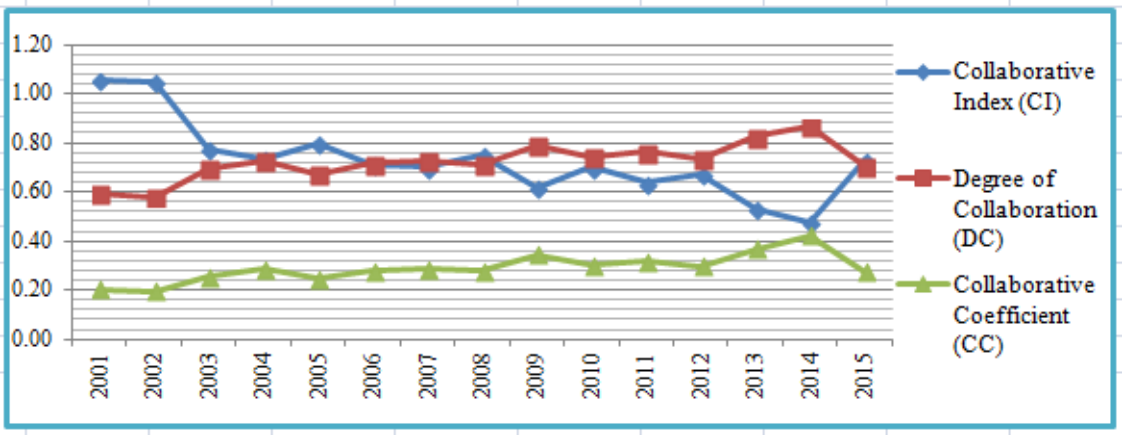

Figure 4: CI, DC & CC of authors

Author's Productivity and Applicability of Lotka's Law

Lotka's inverse square law of scientific productivity is a widely used law for bibliometric mapping of research outputs and authors' productivity in any discipline of knowledge. Lotka's law states that the number of authors making *n* contributions is about $1/n^2$ of those making one; and the proportion of all contributors, that make a single contribution, is about 60 percent. This means that out of all the authors in a given field, 60 percent will have just one publication, and 15 percent will have two publications, 7 percent of authors will have three publications and so on. Table 5 shows the author's productivity and applicability of Lotka's law to the following data set. The study finds that with one article contribution 2791 (53.59%) authors are both observed and expected. Whereas for two articles contribution 1209 (23.21%) authors are observed and 1223 (23.48%) authors expected. Again for three articles contribution 627(12.04%) authors observed and 755(14.50%) authors expected. So, in this following data set it is found that the numbers of authors observed are somehow equal with the numbers of authors expected. So, the study fits to Lotka's law of scientific productivity. Figure 5 shows the authors observed and authors expected value for the present data set.

Lotk'a formula for scientific productivity of authors has been applied in the present study as $\mathbf{X^nY= C}$ and $\mathbf{Y= C/X^n}$ Where, X= number of publications, Y= relative frequency of authors with 'X' publications, and C= constants depending on the specified field.

Putting the value of X= 1 and Y= 2791, the calculation obtained is;
1n.2791= C
=> C=2791
Again putting the value of X= 2 and Y= 1209 and C= 2791 the calculation obtained is;
2n.1209= 2791
=> 2n= 2791/1209
=> nlog2= log2.308
=> n(0.301)= 0.361
=> n= 2.30/0.301
=> n=1.19

Table 5: Authors observed and authors expected

No. of Contributions "X"	*No. of Authors observed "Y"*	*Percentage (%)*	*No. of Authors expected (n=2)*	*Percentage (%)*	*No. of Authors expected (n=3)*	*Percentage (%)*	*No. of Authors expected (n=1.19)*	*Percentage (%)*
1	2791	53.59	2791	53.59	2791	53.59	2791	53.59
2	1209	23.21	698	13.40	349	6.70	1223	23.48
3	627	12.04	310	5.95	103	1.98	755	14.50
4	294	5.65	174	3.34	44	0.84	536	10.29
5	136	2.61	930	17.86	22	0.42	411	7.89
6	67	1.29	78	1.50	13	0.25	331	6.36
7	31	0.60	57	1.09	8	0.15	275	5.28
8	22	0.42	44	0.84	5	0.10	235	4.51
9	16	0.31	34	0.65	4	0.08	204	3.92
10	6	0.12	28	0.54	3	0.06	180	3.46
11	3	0.06	23	0.44	2	0.04	161	3.09
12	-	0.00	19	0.36	2	0.04	145	2.78
13	2	0.04	17	0.33	1	0.02	132	2.53
14	1	0.02	14	0.27	1	0.02	121	2.32
15	-	0.00	12	0.23	0	0.00	111	2.13
16	1	0.02	11	0.21	0	0.00	103	1.98
17	-	0.00	10	0.19	0	0.00	95	1.82
18	1	0.02	9	0.17	0	0.00	90	1.73
19	-	0.00	8	0.15	0	0.00	84	1.61
20	-	0.00	7	0.13	0	0.00	79	1.52
21	-	0.00	6	0.12	0	0.00	74	1.42
22	-	0.00	6	0.12	0	0.00	71	1.36
23	-	0.00	5	0.10	0	0.00	67	1.29
24	-	0.00	5	0.10	0	0.00	64	1.23
25	-	0.00	4	0.08	0	0.00	61	1.17
26	1	0.02	4	0.08	0	0.00	58	1.11

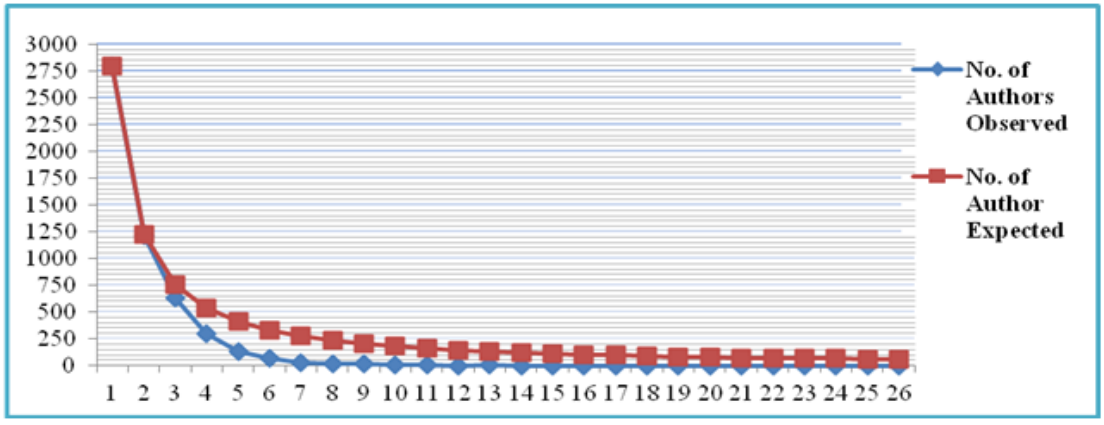

Figure 5: Authors observed and authors expected

Testing of K-S Goodness-of-Fit for Author's Productivity

The K-S (Kolmogorov- Smirnov) test is a statistical method to test the applicability of Lotka's Law to a set of data. The K-S test determines the maximum deviation of D, where

D= Max [Fo(x)-Sn(x)]

Fo(x)= Theoretical cumulative frequency function

Sn(x)= Observed cumulative frequency function of a sample of n observations.

At a 0.01 level of significance, the K-S statistics is equal to 1.63/√n. If D is greater than the K-S statistics, then the sample distribution does not fit the theoretical distribution. In the present study, table 6, shows the value of D is -0.0067 which is lesser than the K-S statistics i.e. 1.63/√5208= 0.0225. The value of D is lesser than 0.0225, and therefore Lotka's generalized formula with exponent value "n"= (1.19), somehow fit to the LIS open access publications.

Table 6: K-S Goodness-of-Fit for Author's Productivity

No. of Contributions "X"	*Observed Authors*			*Expected Authors*			**Deviation D=Fo(x)-Sn(x)**	**DMax [Fo(x)-Sn(x)]**
	No. of Authors "Y"	*Cumulative Frequency*	*Relative Frequency {Sn(x)}*	*No. of Authors (n= 1.19)*	*Cumulative Frequency*	*Relative Frequency {Fo(x)}*		
1	2791	2791	0.5359	2791	2791	0.3300	-0.2059	
2	1209	4000	0.7680	1223	4014	0.4746	-0.2934	
3	627	4627	0.8884	755	4769	0.5639	-0.3245	
4	294	4921	0.9449	536	5305	0.6273	-0.3176	
5	136	5057	0.9710	411	5716	0.6759	-0.2951	
6	67	5124	0.9839	331	6047	0.7150	-0.2688	
7	31	5155	0.9898	275	6322	0.7475	-0.2423	
8	22	5177	0.9940	235	6557	0.7753	-0.2187	
9	16	5193	0.9971	204	6761	0.7995	-0.1977	
10	6	5199	0.9983	180	6941	0.8207	-0.1775	
11	3	5202	0.9988	161	7102	0.8398	-0.1591	
12	0	5202	0.9988	145	7247	0.8569	-0.1419	
13	2	5204	0.9992	132	7379	0.8725	-0.1267	**-0.0067**
14	1	5205	0.9994	121	7500	0.8868	-0.1126	
15	0	5205	0.9994	111	7611	0.9000	-0.0995	
16	1	5206	0.9996	103	7714	0.9121	-0.0875	
17	0	5206	0.9996	95	7809	0.9234	-0.0762	
18	1	5207	0.9998	90	7899	0.9340	-0.0658	
19	0	5207	0.9998	84	7983	0.9440	-0.0559	
20	0	5207	0.9998	79	8062	0.9533	-0.0465	
21	0	5207	0.9998	74	8136	0.9620	-0.0378	
22	0	5207	0.9998	71	8207	0.9704	-0.0294	
23	0	5207	0.9998	67	8274	0.9784	-0.0214	
24	0	5207	0.9998	64	8338	0.9859	-0.0139	
25	0	5207	0.9998	61	8399	0.9931	**-0.0067**	
26	1	5208	1.0000	58	8457	1.0000	0.0000	
	5208			8457				
K-S statistics=1.63/$\sqrt{(n = 5208)}$								**0.0225**

Ranking of Prolific Authors

The study have identified 10077 authorship for publication of 5208 papers across the 83 countries (excluding unidentified countries) of the world during the period 2001 to 2015. It is observed that in the rank of 20 most prolific authors, there are 108 authors have been identified. Out of these 108 authors 82 from United States, 7 from UK, 4 each from Canada and Italy, 3 from Australia, 2 each from Israel and Netherlands, and 1 each from Austria, Finland, Germany, and South Korea. Wilson, B. of Corporation for National Research Initiatives, Reston, United States has contributed maximum 74(1.42%) papers and ranked top amongst all contributing authors. The other most prolific authors are Hernon, P. of Simmons

College, Boston, United States with 62(1.19%) papers, followed by Schwartz, C. of Simmons College, Boston, United States with 55(1.06%) papers, Wilson, T of USA with 45(0.86%) papers, and Lannom, L. of Corporation for National Research Initiatives, Reston, United States with 35(0.67%). A detailed list of prolific authors is depicted in table 7.

Table 7: Ranking of Prolific Authors

Sl No	*Author*	*Country*	*No. of Publications in the Source Journals*										*Total (n=5208)*	*Percentage (%)*	*Rank*
			CRL	*D-LIB*	*IR*	*ITL*	*IS*	*JMLA*	*LIBER*	*LISR*	*LIBRE*	*SLMR*			
1	Wilson, B.	USA		74									74	1.42%	1
2	Hernon, P.	USA	7							55			62	1.19%	2
3	Schwartz, C.	USA								55			55	1.06%	3
4	Wilson, T.	USA			45								45	0.86%	4
5	Lannom, L.	USA		35									35	0.67%	5
6	Plutchak, T.S.	USA						21					21	0.40%	6
7	Savolainen, R.	UK			11					8			19	0.36%	7
8	Wilson, T.D.	USA			19								19	0.36%	7
9	Giuse, N.B.	USA						18					18	0.35%	8
10	Nelson, M.L.	USA		17									17	0.33%	9
11	Morris, C.M.	USA		16									16	0.31%	10
12	Bakker, T.	USA							15				15	0.29%	11
13	Truitt, M.	Canada				15							15	0.29%	11
14	Walter, S.	USA	15										15	0.29%	11
15	Starr, S.	USA						14					14	0.27%	12
16	Brooks, T.A.	USA			13								13	0.25%	13
17	Julien, H.	Canada			3					10			13	0.25%	13
18	Van De Sompel, H.	USA		13									13	0.25%	13
19	Ayris, P.	Germany							12				12	0.23%	14
20	Williamson, K.	Australia			4					6		2	12	0.23%	14
21	Angevaare, I.	Netherlands							11				11	0.21%	15
22	Dekeyser, R.	USA							11				11	0.21%	15
23	Dilevko, J.	Canada	3							8			11	0.21%	15
24	Eldredge, J.D.	USA						11					11	0.21%	15
25	Epstein, B.A.	USA						11					11	0.21%	15
26	Lagoze, C.	USA		11									11	0.21%	15
27	Tennant, M.R.	USA						11					11	0.21%	15
28	Thelwall, M.	UK			4					6	1		11	0.21%	15

29	Branin, J.	USA	10										10	0.19%	16
30	Castelli, D.	Italy		8					2				10	0.19%	16
31	Gill, T.G.	USA					10						10	0.19%	16
32	Jerome, R.N.	USA						10					10	0.19%	16
33	Rauber, A.	Austria		10									10	0.19%	16
34	Shipman, J.P.	USA						10					10	0.19%	16
35	Alpi, K.M.	USA						9					9	0.17%	17
36	Gross, M.	USA	2							6		1	9	0.17%	17
37	Jaeger, P.T.	USA				4				5			9	0.17%	17
38	King, D.W.	USA		9									9	0.17%	17
39	Manghi, P.	Italy		9									9	0.17%	17
40	Stvilia, B.	USA								9			9	0.17%	17
41	Webb, J.	USA				9							9	0.17%	17
42	Aharony, N.	Israel	3							5			8	0.15%	18
43	Allard, S.	USA		3	2					3			8	0.15%	18
44	Ankem, K.	USA			2			2		3	1		8	0.15%	18
45	Bertot, J.C.	USA				5			1	2			8	0.15%	18
46	Byrd, G.D.	USA						8					8	0.15%	18
47	De Groote, S.L.	USA						8					8	0.15%	18
48	Fox, E.A.	USA		8									8	0.15%	18
49	Gerrity, B.	Australia				8							8	0.15%	18
50	Knoth, P.	UK		8									8	0.15%	18
51	Luo, L.	USA								7	1		8	0.15%	18
52	McClure, C.R.	USA				3				4	1		8	0.15%	18
53	Murphy, S.A.	USA	2					6					8	0.15%	18
54	Shenton, H.	UK							8				8	0.15%	18
55	Shultz, M.	USA						8					8	0.15%	18
56	Anderson, T.D.	Australia			7								7	0.13%	19
57	Bronstein, J.	Israel			5					2			7	0.13%	19
58	Dutcher, G.A.	USA						7					7	0.13%	19
59	Given, L.M.	Canada								6	1		7	0.13%	19
60	Harnad, S.	UK		7									7	0.13%	19
61	Koonce, T.Y.	USA						7					7	0.13%	19
62	Kwon, N.	USA	2		2					3			7	0.13%	19
63	Lipscomb, C.E.	USA						7					7	0.13%	19
64	Maggio, L.A.	USA						7					7	0.13%	19
65	McClure,	USA						7					7	0.13%	19

	L.W.														
66	McGowan, J.J.	USA						7					7	0.13%	19
67	Sathe, N.A.	USA						7					7	0.13%	19
68	Shedlock, J.	USA						7					7	0.13%	19
69	Small, R.V.	USA										7	7	0.13%	19
70	Sumner, T.	USA		7									7	0.13%	19
71	Tanner, S.	UK		7									7	0.13%	19
72	Tannery, N.H.	USA						7					7	0.13%	19
73	Tenopir, C.	USA		4						3			7	0.13%	19
74	Vaughan, J.	USA				7							7	0.13%	19
75	Winston, M.D.	USA	3							4			7	0.13%	19
76	Wood, F.B.	USA						7					7	0.13%	19
77	Blecic, D.D.	USA	4					2					6	0.12%	20
78	Candela, L.	Italy		6									6	0.12%	20
79	Choudhury, G.S.	USA		6									6	0.12%	20
80	Cogdill, K.W.	USA						6					6	0.12%	20
81	Connaway, L.S.	USA	3							3			6	0.12%	20
82	Crane, G.	USA		6									6	0.12%	20
83	Cyzyk, M.	USA				6							6	0.12%	20
84	Dehmlow, M.	USA				6							6	0.12%	20
85	DiLauro, T.	USA		6									6	0.12%	20
86	Dorsch, J.L.	USA						6					6	0.12%	20
87	Fisher, K.E.	USA			4					2			6	0.12%	20
88	Fulda, P.O.	USA						6					6	0.12%	20
89	Hickey, T.B.	USA		6									6	0.12%	20
90	Huber, J.T.	USA						6					6	0.12%	20
91	Järvelin, K.	Finland			6								6	0.12%	20
92	Kim, S.	South Korea			3			3					6	0.12%	20
93	Kronenfeld, M.R.	USA						6					6	0.12%	20
94	Markey, K.	USA	2	4									6	0.12%	20
95	Marmion, D.	USA				6							6	0.12%	20
96	Martin, E.R.	USA						6					6	0.12%	20
97	Miller, P.	UK		6									6	0.12%	20
98	Montiel-Overall, P.	USA								4		2	6	0.12%	20
99	Oh, S.	USA			2					4			6	0.12%	20
100	Olney, C.A.	USA						6					6	0.12%	20

101	Pagano, P.	Italy		6								6	0.12%	20
102	Rethlefsen, M.L.	USA						6				6	0.12%	20
103	Scherrer, C.S.	USA						6				6	0.12%	20
104	te Boekhorst, P.	USA							6			6	0.12%	20
105	Van Veen, T.	Netherlands		6								6	0.12%	20
106	Warner, S.	USA		6								6	0.12%	20
107	Weller, A.C.	USA	2					4				6	0.12%	20
108	Wessel, C.B.	USA						6				6	0.12%	20
2991 Authors with range of 5-1 publications each												4043	77.63%	-

Most cited Authorship

Table 8 shows the most cited authorship of LIS open access journals during the period 2001 to 2015. Amongst the 10077 authorship across the 83 countries, the most cited authors have been identified based on their citations count. Wilson T.D. is in top among all the authors with 407(0.94%) citations followed by Hammond T., Hannay T., Lund B., Scott J. with 294(0.68%) citations, Levy Y., Ellis T.J. with 277(0.64%) citations and so on. It is seen that among the top 100 highly cited authorship, there are 37 highly cited authorship are from single authorship contribution and 63 are from collaborative contribution. So, the trend shows that collaborative contributions are highly cited by LIS authors and researchers. Table 9 shows the detailed list of most cited authorship.

Table 8: Most cited Authors

Sl No.	***Most Cited Authorship***	***Total Citations***	***Percentage (%)***	***Cumulative Citations***	***Percentage (%)***	***Rank***
1	Wilson T.D.	407	0.94	407	0.94	1
2	Hammond T., Hannay T., Lund B., Scott J.	294	0.68	701	1.61	2
3	Levy Y., Ellis T.J.	277	0.64	978	2.25	3
4	Saha S., Saint S., Christakis D.A.	269	0.62	1247	2.87	4
5	Borlund P.	225	0.52	1472	3.39	5
6	Savolainen R.	219	0.5	1691	3.89	6
7	Harnad S., Brody T.	216	0.5	1907	4.39	7
8	Case D.O., Andrews J.E., Johnson J.D., Allard S.L.	198	0.46	2105	4.85	8
9	Guy M., Tonkin E.	188	0.43	2293	5.28	9
10	Glanville J.M., Lefebvre C., Miles J.N.V., Camosso-Stefinovic J.	177	0.41	2470	5.69	10
11	Heinström J.	173	0.4	2643	6.09	11
12	Wong S.S.-L., Wilczynski N.L., Haynes R.B.	168	0.39	2811	6.47	12
13	Knight S.-A., Burn J.	162	0.37	2973	6.85	13

14	Duval E., Hodgins W., Sutton S., Weibel S.L.	160	0.37	3133	7.21	14
15	Hildreth P.M., Kimble C.	157	0.36	3290	7.58	15
16	Gross M., Latham D.	153	0.35	3443	7.93	16
17	Coumou H.C.H., Meijman F.J.	150	0.35	3593	8.27	17
18	Foster N.F., Gibbons S.	147	0.34	3740	8.61	18
19	Bates M.J.	135	0.31	3875	8.92	19
20	Whitmire E.	134	0.31	4009	9.23	20
21	Jansen B.J.	131	0.3	4140	9.53	21
22	Davis P.M.	129	0.3	4269	9.83	22
23	Charnigo L., Barnett-Ellis P.	124	0.29	4393	10.12	22
24	Smith M., Bass M., McClellan G., Tansley R., Barton M., Branschofsky M., Stuve D., Walker J.H.	124	0.29	4517	10.40	22
25	Ankem K.	123	0.28	4640	10.69	23
26	Choo C.W.	120	0.28	4760	10.96	24
27	Björk B.-C.	114	0.26	4874	11.22	25
28	Connaway L.S., Dickey T.J., Radford M.L.	114	0.26	4988	11.49	25
29	Lewis D.W.	114	0.26	5102	11.75	25
30	Johnson C.A.	113	0.26	5215	12.01	26
31	Shill H.B., Tonner S.	112	0.26	5327	12.27	27
32	Iannella R.	107	0.25	5434	12.51	28
33	Lynch C.A., Lippincott J.K.	107	0.25	5541	12.76	28
34	Hartley J.	106	0.24	5647	13.00	29
35	Aharony N.	104	0.24	5751	13.24	30
36	Bauer K., Bakkalbasi N.	102	0.23	5853	13.48	31
37	Bouthillier F., Shearer K.	102	0.23	5955	13.71	31
38	Van De Sompel H., Beit-Arie O.	101	0.23	6056	13.95	32
39	Davis P.M., Connolly M.J.L.	100	0.23	6156	14.18	33
40	Virkus S.	100	0.23	6256	14.41	33
41	Frazier K.	99	0.23	6355	14.63	33
42	Spink A., Cole C.	99	0.23	6454	14.86	33
43	Dee C., Stanley E.E.	98	0.23	6552	15.09	34
44	Grimes D.J., Boening C.H.	96	0.22	6648	15.31	35
45	Jaeger P.T., Thompson K.M.	96	0.22	6744	15.53	35
46	Cullen R.J.	95	0.22	6839	15.75	35
47	Maughan P.D.	95	0.22	6934	15.97	35
48	Plutchak T.S.	95	0.22	7029	16.19	35
49	Hall H., Davison B.	94	0.22	7123	16.40	35
50	Lynch B.P., Smith K.R.	94	0.22	7217	16.62	35
51	Cogdill K.W.	91	0.21	7308	16.83	36
52	Antelman K., Lynema E., Pace A.K.	90	0.21	7398	17.04	37
53	Thelwall M.	89	0.2	7487	17.24	38
54	Hsieh-Yee I.	88	0.2	7575	17.44	39

55	Majid S., Foo S., Luyt B., Zhang X., Theng Y.-L., Chang Y.-K., Mokhtar I.A.	88	0.2	7663	17.65	39
56	Järvelin K., Ingwersen P.	87	0.2	7750	17.85	40
57	Tenopir C., King D.W., Boyce P., Grayson M., Zhang Y., Ebuen M.	84	0.19	7834	18.04	41
58	McGowan J., Sampson M.	83	0.19	7917	18.23	42
59	Shultz M.	83	0.19	8000	18.42	42
60	Björk B.-C., Roos A., Lauri, M.	82	0.19	8082	18.61	43
61	George C., Bright A., Hurlbert T., Linke E.C., St. Clair G., Stein J.	82	0.19	8164	18.80	43
62	Hernon P., Powell R.R., Young A.P.	82	0.19	8246	18.99	43
63	Kuh G.D., Gonyea R.M.	82	0.19	8328	19.18	43
64	Evans D.	81	0.19	8409	19.36	43
65	Julien H., Barker S.	81	0.19	8490	19.55	43
66	Lund B., Hammond T., Flack M., Hannay T.	81	0.19	8571	19.74	43
67	Tenopir C., King D.W., Bush A.	81	0.19	8652	19.92	43
68	Holley R.	79	0.18	8731	20.11	44
69	Shank J.D., Dewald N.H.	79	0.18	8810	20.29	44
70	Järvelin K., Wilson T.D.	76	0.18	8886	20.46	45
71	Kwon N.	76	0.18	8962	20.64	45
72	Sollaci L.B., Pereira M.G.	75	0.17	9037	20.81	46
73	Van De Sompel H., Nelson M.L., Lagoze C., Warner S.	75	0.17	9112	20.98	46
74	Andrews J.E., Pearce K.A., Ireson C., Love M.M.	74	0.17	9186	21.15	47
75	Ponzi L.J., Koenig M.	74	0.17	9260	21.32	47
76	Burkell J.	73	0.17	9333	21.49	48
77	Agosto D.E., Hughes-Hassell S.	72	0.17	9405	21.66	49
78	Kim K.-S.	72	0.17	9477	21.82	49
79	Mackey T.P., Jacobson T.E.	72	0.17	9549	21.99	49
80	Agosto D.E.	71	0.16	9620	22.15	50
81	Chua A.Y.K., Goh D.H.	71	0.16	9691	22.32	50
82	De Groote S.L., Dorsch J.L.	71	0.16	9762	22.48	50
83	Dervin B.	71	0.16	9833	22.64	50
84	Johnson R.K.	71	0.16	9904	22.81	50
85	Booth A.	70	0.16	9974	22.97	51
86	Herring S.D.	70	0.16	10044	23.13	51
87	Marchionini G., Geisler G.	70	0.16	10114	23.29	51
88	Tabatabai D., Shore B.M.	70	0.16	10184	23.45	51
89	Van De Sompel H., Payette S., Erickson J., Lagoze C., Warner S.	70	0.16	10254	23.61	51
90	Foley M.	69	0.16	10323	23.77	52
91	McGillis L., Toms E.G.	68	0.16	10391	23.93	53
92	Hayslett M.M., Wildemuth B.M.	66	0.15	10457	24.08	54

93	Hendrix D., Chiarella D., Hasman L., Murphy S., Zafron M.L.	66	0.15	10523	24.23	54
94	Nesset V., Large A.	66	0.15	10589	24.39	54
95	Shah C., Oh S., Oh J.S.	66	0.15	10655	24.54	54
96	Xie H.	65	0.15	10720	24.69	55
97	Nisonger T.E., Davis C.H.	65	0.15	10785	24.84	55
98	Urquhart C., Light A., Thomas R., Barker A., Yeoman A., Cooper J., Armstrong C., Fenton R., Lonsdale R., Spink S.	65	0.15	10850	24.99	55
99	Dorsch J.L., Aiyer M.K., Meyer L.E.	64	0.15	10914	25.13	56
100	Fisher K.E., Marcoux E., Miller L.S., Sánchez A., Cunningham E.R.	64	0.15	10978	25.28	56
101-3188	Other 3088 authorship	32446	74.72	43424	100.00	-
TOTAL		**43424**	**100**	**-**	**-**	**-**

Country wise Authorship Distribution

The country wise distribution of authorship has been counted based on the country of origin of the corresponding author. Authors from 83 countries (excluding unidentified countries) across the world are active in publication of their research in LIS open access journals. Amongst them authors from America and Europe are the leaders. Table 9 shows that United States of America (USA) is the top country producing of 2822(54.19%) authors alone followed by United Kingdom (UK) with 372(7.14%) authors, Canada with 242(4.65%) authors, Australia with 176(3.38%) authors and so on. United States of America alone contributes more than fifty percent of authorship to the LIS open access journals. Amongst the Asian countries China, Singapore and Taiwan are much ahead of India. The developing countries like India should give more emphasis on their authors to aware them for open access publications.

Table 9: Country wise Authorship Distribution

Sl No	***Country***	***No. of Publications in the Source Journals***										***Total (n=5208)***	***Percentage (%)***	***Rank***
		CRL	***D-LIB***	***IR***	***ITL***	***IS***	***JMLA***	***LIBERQ***	***LISR***	***LIBRE***	***SLMR***			
1	United States of America (USA)	441	621	163	320	71	755	15	300	45	91	2822	54.19	1
2	United Kingdom (UK)		191	80	1	9	23	37	27	4		372	7.14	2
3	Canada	25	27	44	28	4	49	3	52	10		242	4.65	3
4	Australia	4	38	50	5	20	11	1	29	13	5	176	3.38	4
5	Germany		69	2	2	5		24	1			103	1.98	5
6	Spain	3	13	59	10		6	2	6			99	1.90	6

7	Netherlands		42	8		5	7	25	1			88	1.69	7
8	Finland			53		1		6	18			78	1.50	8
9	Sweden	1	4	41	1	6	1	1	1			56	1.08	9
10	Italy		40	2	2	2	1	5	2	1		55	1.06	10
11	New Zealand		20	11	1	5	3		1		1	42	0.81	11
12	China	5	13	11	1		2		9			41	0.79	12
13	France		13	6		1	8	10	1			39	0.75	13
14	South Africa	1	4	11	2	8			4	7		37	0.71	15
15	Singapore	1	5	11			1		8	9		35	0.67	16
16	Greece		20	3	2			1	7	1		34	0.65	17
17	Austria		24	2		1		2		2		31	0.60	18
18	Denmark		6	14		1		8	1	1		31	0.60	18
19	Norway		5	4		7		6	9			31	0.60	18
20	South Korea		3	10	1				15	1		30	0.58	19
21	Israel	3		10		5	1	1	9			29	0.56	20
22	Belgium		16	2			1	6	2	1		28	0.54	21
23	Taiwan	1		11	1		1		5	1		20	0.38	22
24	India		6	1	2	1		2	4	2		18	0.35	23
25	Japan		7	5			3		2	1		18	0.35	23
26	Ireland		3	3	3	4		1	2			16	0.31	24
27	Portugal		6	7				3				16	0.31	24
28	Hong Kong	3	3	2			2		4		1	15	0.29	25
29	Brazil	1	2	8			2			1		14	0.27	26
30	Iran			5			2		4	1		12	0.23	27
31	Poland		5	3	1			1	1			11	0.21	28
32	Switzerland		5	1	2		1	1	1			11	0.21	28
33	Malaysia			4					3	3		10	0.19	29
34	Czech Republic		4			1		3	1			9	0.17	30
35	Mexico			5	1	1	1		1			9	0.17	30
36	Turkey			3				4	2			9	0.17	30
37	Slovenia			5	1		1	1				8	0.15	31
38	Hungary		2	1		1	1	1	1			7	0.13	32
39	Iceland			6					1			7	0.13	32
40	Lithuania			6		1						7	0.13	32
41	Nigeria				1		1		1	4		7	0.13	32
42	Chile			6								6	0.12	33
43	Finland		6									6	0.12	33
44	Uganda			3					1	2		6	0.12	33
45	Pakistan						2		1	2		5	0.10	34
46	Kuwait			2					1	1		4	0.08	35
47	Slovakia		1	3								4	0.08	35

48	United Arab Emirates	1				1			1	1		4	0.08	35
49	Argentina		1	2								3	0.06	36
50	Colombia			1			1	1				3	0.06	36
51	Croatia		1	1					1			3	0.06	36
52	Cuba			2						1		3	0.06	36
53	Estonia			2				1				3	0.06	36
54	Russian Federation		1		2							3	0.06	36
55	Serbia				2	1						3	0.06	36
56	Thailand									3		3	0.06	36
57	Botswana								1	1		2	0.04	37
58	Ecuador							2				2	0.04	37
59	Latvia			2								2	0.04	37
60	Macedonia		1			1						2	0.04	37
61	Netherlands Antilles						1	1				2	0.04	37
62	Qatar		1						1			2	0.04	37
63	Trinidad and Tobago						1			1		2	0.04	37
64	Zambia						2					2	0.04	37
65	Aruba						1					1	0.02	38
66	Bahrain					1						1	0.02	38
67	Bangladesh							1				1	0.02	38
68	Bulgaria					1						1	0.02	38
69	Costa Rica						1					1	0.02	38
70	Cyprus							1				1	0.02	38
71	Fiji									1		1	0.02	38
72	Ghana		1									1	0.02	38
73	Honduras								1			1	0.02	38
74	Iraq		1									1	0.02	38
75	Kazakhstan	1										1	0.02	38
76	Kenya									1		1	0.02	38
77	Panama						1					1	0.02	38
78	Peru			1								1	0.02	38
79	Saudi Arabia				1							1	0.02	38
80	Swaziland		1									1	0.02	38
81	Togo		1									1	0.02	38
82	Uruguay			1								1	0.02	38
83	Venezuela					1						1	0.02	38
84	Unidentified	70	224	58	33	3	53	287	7	5	3	743	14.27	-

Key Findings

The key findings of the study are presented as under:

- During the period 2001-2015, it is observed in the study that, the year wise distribution of journals do not show any increasing trend, however the cumulative numbers of distribution shows a steady growth of publications.
- The authorship pattern of LIS open access journals shows that single authorship contribution is dominant with highest 2791(53.59%) publications.
- The Collaborative Index mean value in the present study shows to be 0.73 which is so weak at its label. The Degree of Collaboration value shows a weak intensity of author's collaboration at 0.72. Correspondingly, the Collaboration Co-efficient value shows at 0.29 which is also so weak at its level. This implies that, the LIS open access journals do not favour for collaborative research.
- The value of D is lesser than 0.0225, and therefore Lotka's generalized formula with exponent value "n"= (1.19), somehow fit to the LIS open access publications.
- Wilson, B. of Corporation for National Research Initiatives, Reston, United States has contributed maximum 74(1.42%) papers and ranked top amongst all contributing authors. Based on the citations count Wilson T.D. is in top among all the authors with 407(0.94%) citations.
- Authors from 83 countries across the world are active in publication of their research in LIS open access journals. Amongst them authors from America and Europe are the leaders, and United States of America (USA) is the top country producing of 2822(54.19%) authors alone

Conclusion

The present day research is fast embracing open access platforms because of greater visibility of publications with considerable impact and influence. As it has posed tough challenges for LIS researchers, academicians and librarians to select specific journals that promise quality and impact, some front line open access journals have proved their mettle to be chosen as the right channel of publications to follow suit. Contextually, the present study has rightly addressed the trends of authorship, research collaboration, author's productivity, prolific authors, geographical distribution of authors of 10 selected open access LIS journals that have gained immense popularity with high reputation. Geographically scattered contributors and the quantum of citations received by different articles published in these open access journals indicates the quality of publications brought out by these journals. This in fact, will motivate the LIS researchers, academicians and librarians to bank on open access journals to insure academic and research excellence in different parts of the world.

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