

A Study of Authorship Pattern and Degree of Collaboration in Business Research during 1998-2017

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ABSTRACT

The study aims to find out the authorship pattern and degree of collaboration in business research with 89259 publications and 180226 authorships during 1998 to 2017 extracted from SCOPUS database. An average author per paper is 2.18. Bibliometric methods are used to get the results. It reveals the dominance of multi authorship over single authorship since 2005. The degree of collaboration during the study period is 0.6 and it has been increasing over the study period. Researchers in this area are showing their interest in collaborative/ team/ group research than solo research.

KeyTerms: Bibliometrics, Authorship Pattern, Degree of Collaboration, Author Collaboration, Business Research Collaboration

INTRODUCTION

Evaluation of academic publication in a subject area leads to the development of research in a particular domain. Now a day's study of authorship pattern and their productivity is of greater importance. Increasing collaboration is generally found in scientific and technical research and low in humanities where the authors solely create many scholarly papers. The degree of collaborations varies among various disciplines and years. Research shows a strong association between collaboration and publication productivity and between collaboration and monetary aid for the work. Usual methods like survey and observations cannot find out the degree of collaboration so easily. Bibliometric methods offer various ways to study research collaborations.

Collaboration is defined as "where two or more people or organizations work together to realize or achieve something successfully". Collaboration can be found in trade, organization, industry, music, learning community, business, education, entertainment, publishing, science, technology, arts etc. There is collaborative writing where written works are created by more than one people jointly or collaboratively, rather than individually². It has been used since two decades in educational research and business.

Studies on authorship express authorship pattern and degree of collaboration among a group of authors. The study aims to analyse the authorship pattern and degree

of collaboration in business research.

Significance

The significance of bibliometrics as a research area and research method is increasing day by day. Few bibliometric types of research on authorship studies are found. The study will encourage conducting more researches in this area of study.

OBJECTIVES

- Year-wise growth of publications and authors
- Authorship pattern in business research
- A proportion of single vs multi authored papers in the business literature
- The degree of collaborations in business research

LITERATURE REVIEW

No advancement of knowledge is possible without the support of prior knowledge. Various studies on authorship pattern and degree of collaboration have been conducted. Like, Price in 1963 is the first who studied authorship pattern and viewed that multi authored papers are growing reducing single authored papers³. Thavamani, K. tried to find out the type of authorship and collaborations in librarianship from 2009 to 2014, analysing 223 papers with 343 authorship⁴. The study focuses on growth of publications and authors, global view of authorship pattern, prolific authors and degree of

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collaborations. An average number of authors per paper is 1.538 and average collaboration of authors is 0.354. The trend of collaborative study is found in librarianship. Navaneethakrishnan, S. put forward the same effort towards Sri Lanka in Social Sciences and Humanities publication with 1795 papers by 3521 authors from 1960-2012 as reflected in Scopus database⁵. Using bibliometric methods the study explores the continuous increase of collaboration. Notable collaborators are from the United States. Velmurugan, C. studied Annals of Library and Information Studies from 2007-2012⁶. Highest publications are by two authorships which are 43%, whereas single authorship papers are 35%. This clearly shows collaborative work. Khaparde, V. & Pawar, S. examined the field of IT with 17917 papers of LISA for the period 2000 to 2009⁷. The study found multi authored papers are dominating which indicate preference of IT researchers towards team research. Jeyasekar, J. J. & Saravanan, P. intends to find out author collaboration in Indian forensic science during 1975-2012 using Scopus database⁸. The study marked relation between International collaborations and higher citation impact. Zafrunnisha, N. conducted authorship study of Prabandhan, the management journal for the period 2008 to 2011⁹. It shows that multi authorship papers (54%) are dominating over single authorship (46%) papers. The degree of collaboration found is 0.54.

METHODOLOGY

The present study is dealing with authorship pattern and degree of collaboration in business research. For the sample of 89259 publications from 1998 to 2017 as indexed in the Scopus database of Elsevier is used. Data was collected on 3rd Nov 2017 for 1998-2016 and on 11th Jan 2018 for 2017. As and when data is required for each particular year, that year is only selected". Total 89259 publications are found which are exported in CSV Excel format to get complete bibliographic details for further analysis. The software MS Excel is used for tabulation and analysis of data. Bibliometric methods are applied and findings are displayed. For the degree of author collaborations, the formula suggested by K. Subramanyam¹⁰.

DATA ANALYSIS

Year-Wise Growth of Publications and Authors

Table 1: Growth of Number of Publications and Authors per Year

Year	Total papers	Papers with Author Information (P)	Total Authors (A)	Authors per Paper (A/P)	Papers per author (P/A)	Highest Auth Combination
1998	1657	1562	2595	1.66	0.6	12
1999	1543	1431	2452	1.71	0.58	9
2000	2210	1876	3125	1.66	0.6	9
2001	2835	1936	3532	1.82	0.54	43
2002	2881	2153	3835	1.78	0.56	15
2003	3048	2665	4889	1.83	0.54	15
2004	3320	2858	5398	1.88	0.52	12
2005	4489	3821	7396	1.93	0.51	14
2006	4344	3934	7922	2.01	0.49	16
2007	4950	4510	9269	2.05	0.48	16
2008	5130	4772	10435	2.18	0.45	48
2009	5287	5100	11299	2.21	0.45	22
2010	5912	5695	12776	2.24	0.44	24
2011	6035	5814	13125	2.25	0.44	25
2012	5808	5548	12699	2.28	0.43	15
2013	6264	6010	13689	2.27	0.43	22
2014	6079	5868	13727	2.33	0.42	107
2015	5960	5785	13936	2.4	0.41	14
2016	6178	5983	14907	2.49	0.4	33
2017	5329	5124	13220	2.58	0.38	40
Total	89259	82445	180226	2.18	0.45	--

Table 1 shows growth of publications as well as authors by year. Publications range from 1657 to 5329 and total publication is 89259 during the period. In 2013 there is highest publication output (6264) while in 1999 there is a lowest publication (1543). But in Scopus database for 82445 publications author details are mentioned taking which analysis has been made. Total 180226 authors published 82445 papers during 1998-2017. In 2016 the highest number of authors (14907) with 5983 papers and in 1999 lowest number of authors (2452) with 1431 papers is found. An average author per paper is 2.18 and average Papers per author is 0.45 for the whole period. Over the study period, highest author combination in a group or team research is 107 per one paper is found in 2014. Instead of some fluctuations regularity in growth is observed in business research publications.

Authorship Patterns in Business Research

Table 2: Authorship Pattern in Business Research

Authorship	Papers	%age	Authors	%age
1	32284	39.2	32284	17.9
2	23066	28	46132	25.6
3	15679	19	47037	26.1
4	6858	8.3	27432	15.2
5	2624	3.2	13120	7.3
6	1013	1.2	6078	3.4
7	420	0.5	2940	1.6
8	210	0.3	1680	0.9
9	82	0.1	738	0.4
10	65	0.1	560	0.3
10<	144	0.2	2225	1.2
Total	82445	100	180226	100

Table 2 shows the authorship pattern of business research publication. Here single authored papers are ranked 1 with 39.2%, two authored papers hold rank 2 with 28% then three authored papers ranked 3 with 19% of the total publication during the period and so on. We can mark that as the number of authorship type increases, the number of papers decreases up to authorship type 10. More than 10 authored papers have 0.2% contribution. Hence a decreasing trend of the number of authors in a group or team research in business is found.

Proportion of Single vs Multi Authored Papers in the Business Literature

Table 3: Single vs Multi-Authorship in Business Literature

Year	Single-Auth Papers	%age	Multi-Auth Papers	%age	Total
1998	895	57.3	667	42.7	1562
1999	799	55.8	632	44.2	1431
2000	1107	59	769	41	1876
2001	1038	53.6	898	46.4	1936
2002	1211	56.2	942	43.8	2153
2003	1403	52.6	1262	47.4	2665
2004	1442	50.5	1416	49.5	2858
2005	1821	47.7	2000	52.3	3821
2006	1754	44.6	2180	55.4	3934
2007	1999	44.3	2511	55.7	4510
2008	1848	38.7	2924	61.3	4772
2009	1866	36.6	3234	63.4	5100
2010	2050	36	3645	64	5695
2011	2103	36.2	3711	63.8	5814
2012	1900	34.2	3648	65.8	5548
2013	2178	36.2	3832	63.8	6010
2014	1993	34	3875	66	5868
2015	1802	31.1	3983	68.9	5785
2016	1672	27.9	4311	72.1	5983
2017	1403	27.4	3721	72.6	5124
Total	32284	39.2	50161	60.8	82445

Table 3 shows year-wise comparative picture of single-authored and multi-authored papers in Business research. Single-authored papers range from 895 (57.3%) in 1998 to 1403 (27.4%) in 2017. The highest contribution of single-authored 2178 publications and lowest contribution of multi-authored papers 632 publications. For the total study period, multi-authored papers have 60.8% and single-authored papers have 39.2% contribution. From 2005 dominance and gradual growth of multi-authorship over single or solo research started and continued to the last study period. Thus we can say that group or team or collaborative research is preferred by business researchers.

○ Degree of Collaborations in Business Research

Table 4: Degree of Author Collaboration

Year	Single Auth Papers (Ns)	Multi Auth Papers (Nm)	Total (Nm+Ns)	The degree of Collaboration (C)
1998	895	667	1562	0.42
1999	799	632	1431	0.44
2000	1107	769	1876	0.4
2001	1038	898	1936	0.46
2002	1211	942	2153	0.43
2003	1403	1262	2665	0.47
2004	1442	1416	2858	0.49
2005	1821	2000	3821	0.52
2006	1754	2180	3934	0.55
2007	1999	2511	4510	0.55
2008	1848	2924	4772	0.61
2009	1866	3234	5100	0.63
2010	2050	3645	5695	0.64
2011	2103	3711	5814	0.63
2012	1900	3648	5548	0.65
2013	2178	3832	6010	0.63
2014	1993	3875	5868	0.66
2015	1802	3983	5785	0.68
2016	1672	4311	5983	0.72
2017	1403	3721	5124	0.72
Total	32284	50161	82445	0.6

Table 4 shows year wise multi-authored papers as well as their degree of Collaboration. For this, a formula of the degree of collaboration (C) recommended by K. Subramanyam in 1983 has been used to find out the degree of collaboration in business research¹⁰. It brings out the ratio of multi authored papers in a subject during a year to the whole publication in the subject over the same period. The formula is as follows:

$$\text{Degree of Collaboration } C = N_m / (N_m + N_s)$$

Where, C =degree of collaboration in a subject,

N_m = number of multiple-authored papers in the subject published throughout a year,

N_s - number of single-authored papers in the subject published throughout the same year.

Here, N_m = 50161, N_s = 32284, C = 50161 / (50161+32284) = 0.6

Hence, the degree of Collaboration is 0.6. Here it is found that degree of Collaboration over 20 years of study (1998-2017) is 0.6. The average collaboration is 0.56. Up to 2004 year wise degree of Collaboration is less than 0.5 and from 2005 onwards collaborations supersede the solo research. It indicates the trend of collaborative research. Highest collaboration is found in 2016 and 2017. Collaborative/multi authorship trend is increasing year by year in business research due to the collaborative effort of researchers. The

table witnesses changing research trend. The hypothesis is found to be justified.

CONCLUSION

The study focused on year-wise growth of publications and authors, authorship pattern, single vs multi-authorship and degree of collaboration in business research. It is revealed that out of 82445 publications during 1998-2017, 82445 papers have author information which has been analysed. In all total 180226 authors contribute 82445 publications. In 2013 there is highest (6264) publications while in 1999 there is a lowest (1543). An average author per paper is 2.18 and an average paper per author is 0.45. A decreasing trend of the number of authors in group research in business is found. In 2000 single-authored papers have 18% more contributions; whereas in 2017 reverse is the case. The degree of collaboration in business research is 0.6. From 2005 dominance and gradual growth of multi-authorship over single or solo research started and continuing which indicate collaborative research is preferred by business researchers.

Collaboration increases the productivity of researchers. The growth of publication and collaboration is found in business research. The study marked an upward trend of author collaboration in business research. This increasing trend may be due to multi disciplinary nature of research.

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