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CONTENT ANALYSIS OF JOURNAL OF INNOVATION AND KNOWLEDGE : A STUDY

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Abstract : This is Content analysis of articles published in Journal of Innovation and Knowledge between 2018-2022 in order to the publication trends in the journal total 230 articles were published for the stated period.

Index Terms - Content analysis, Innovation and Knowledge, Authorship Pattern, Degree of Collaboration, Author Productivity,

1 DEFINITIONAL ANALYSIS

1.1 CONTENT ANALYSIS

“Content analysis is a research technique that has quantitative and qualitative characteristics. In the quantitative tradition, it is defined as “the objective, systematic and quantitative description of the manifest content of communication”

1.2. JOURNAL

Many publications issued at stated intervals, such as magazines, or scholarly academic journals, or the record of the transactions of a society, are often called journals. A serial appearing of intended to appear indefinitely at regular or stated intervals generally more frequently than Quarterly, each issue of which is no. or dated consecutively and normally containing separate articles, stories or other writings.

2. Journal of Innovation and Knowledge

The idea of using computers to search for relevant pieces of information was popularized in the article As We May Think by Vannevar Bush in 1945. It would appear that Bush was inspired by patents for a 'statistical machine' - filed by Emanuel Goldberg in the 1920s and '30s - that searched for documents stored on film. The first description of a computer searching for information was described by Holmstrom in 1948, detailing an early mention of the Univac computer. Automated information retrieval systems were introduced in the 1950s: one even featured in the 1957 romantic comedy, Desk Set. In the 1960s, the first large information retrieval research group was formed by Gerard Salton at Cornell. By the 1970s several different retrieval techniques had been shown to perform well on small text corpora such as the Cranfield collection (several thousand documents). Large-scale retrieval systems, such as the Lockheed Dialog system, came into use early in the 1970s.

In 1992, the US Department of Defense along with the National Institute of Standards and Technology (NIST), cosponsored the Text Retrieval Conference (TREC) as part of the TIPSTER text program. The aim of this was to look into the information retrieval community by supplying the infrastructure that was needed for evaluation of text retrieval methodologies on a very large text collection. This catalyzed research on methods that scale to huge corpora. The introduction of web search engines has boosted the need for very large scale retrieval systems even further.

The Information Retrieval Journal features theoretical, experimental, analytical and applied articles. Theoretical articles report a significant conceptual advance in the design of algorithms or other processes for some information retrieval task. Experimental articles detail a test of one or more theoretical ideas in a laboratory or natural setting. Analytical articles report on the results of detailed analysis of searcher behavior and opinions across a range of settings and methodologies, including user studies, surveys and log analysis. Application articles cover successful application of some already established technique to a significant real-world problem involving information retrieval.

3. WHY CONTENT ANALYSIS?

Content analysis is rapidly becoming less of a tool to be used in the experimental manipulation of the communication process. In these instances of experimental studies, systematic changes in content are made and documented through content analysis, and the audiences are observed for the effects of these changes. The specific role to be played by content analysis in organizing for recall the world's store of recorded knowledge. Content analysis appears to have two general and major functions. The first is to provide the descriptive abstract of any document at a level and of such a nature as will indicate what information may be found in it. The second is to provide guidelines in transforming document content from one medium to another and in reducing content for ease of bibliographic access.

4. OBJECTIVES

The main objective of the study is to analyze the content Journal of Innovation and Knowledge and make the quantitative assessment of status of the Journal by way of analyzing the following features of Journal

1. To Year Wise Distribution Of Articles
2. To study year-wise growth of publications
3. To study Geographical distribution of research output,
4. To study the authorship and collaboration pattern in the publication,
5. To study the most productive authors in the field,
6. To study wise distribution of publication,
7. To find out the Use of Various Types of Document
8. To find out the Year wise Productivity of Articles
9. To study the Degree of Collaboration

5. Scope & Limitation of the Study

Scope of study is restricted to the Journal of Innovation and Knowledge published during 2018 to 2022. The papers presented in the Journal are analyzed using content analysis technique.

The present study is limited to the total numbers of 230 papers published during 2018 to 2022.

6. Methodology

This research is based on the analysis of research papers published in 'Journal of Innovation and Knowledge, which is analyzed by using various Content Analysis techniques.

The steps in methodology include:

- a) Data collection;

b) Data analysis and Interpretation

7. Data collection

Data has been collected from all issues of Journal of Innovation And Knowledge . The data was collected on the parameters viz. authors, title of articles, author’s affiliation i.e. Department, institution, place, country, descriptors, volume no, issue no, year of publication, editors of the journal, for the period from 2018-2022.

8. Data analysis and interpretation

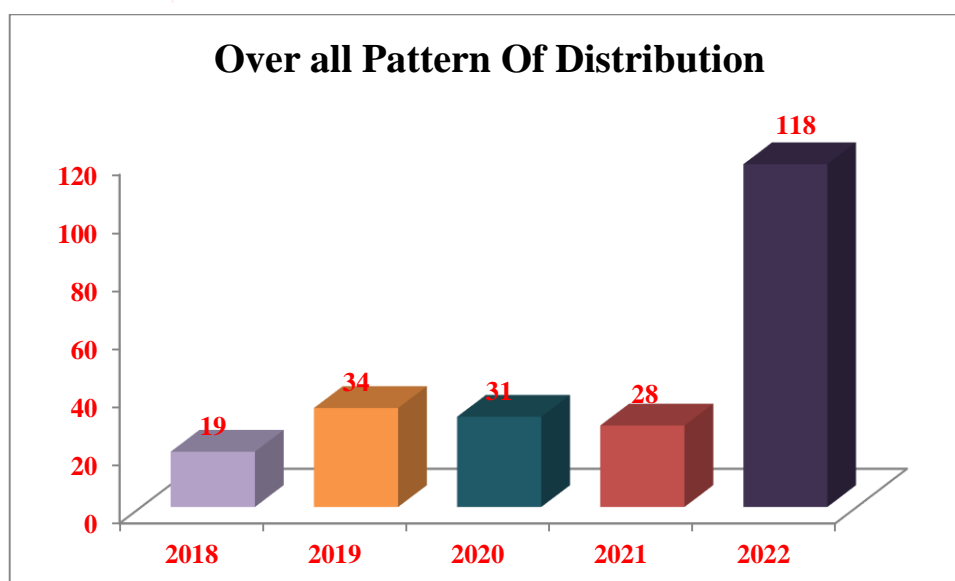
Data is collected from all issues i.e. from 2018-2022 of “Journal of Innovation and Knowledge: Content Analysis” available on internet and data will be analyzed by using statistical parameters. Analysis of the data is the ultimate step in research process. It link between raw data and significant result leading to conclusions. This process of analysis has to be result oriented .Analysis “Leads eventually to summarizing procedures resulting in some sacrifice of details. Frequencies and column are summarized in table as averages and percentages are transformed in to indices or attention scores to be used as a single variable in subsequent analysis” Data analysis is the act of transforming data with the aim of extracting useful information and facilitating

8.1. Overall Pattern of Distribution

The pattern of distribution of articles in Journal of Innovation and Knowledge during the Study period of 2018 to 2022 has been shown in Table 8.1 the percentage and cumulative percentage also calculated and the same is shown in table.

Table No. 8.1: Over all Pattern Of Distribution

Year	Vol.	No. of Articles Issue-wise				No. of Articles	Percentage
		1	2	3	4		
2018	3	5	7	7	0	19	8.26
2019	4	8	8	9	9	34	14.78
2020	5	7	6	6	12	31	13.48
2021	6	7	6	6	9	28	12.17
2022	7	9	22	34	53	118	51.30
Total		36	49	62	83	230	100.00

**Figure No. 8.1 over all Pattern of Distribution**

By making observation of the Table & figure No. 8.1, we can get the basic analysis that investigates the beginning with the study of the overall distribution pattern of the contributions. Total number of 230 contributions have been identified and selected for this research work. The above table shows the overall distribution pattern of contributions and number of contributions for each volume. In the 3 to 7 volumes there are 230 contributions. The number of articles is the highest in volumes 7 accounting 118 articles in the year 2022. The lowest number of articles is published in the volumes 3 accounting 19 in the year 2018, out of the total contribution during the study period. It can be inferred from the data that most of the volumes have the average number of articles. The number of articles is not uniformly increasing or decreasing. There is a fluctuation in the number of publications during the study period.

8.2 Year Wise Distribution of Articles

Year wise distribution of articles published in Journal of Innovation and Knowledge during 2018 to 2022.

Table No. 8.2: Year Wise Distribution of Articles

Year	Total Articles	Cumulative Articles	Percentage	Cumulative Percentage
2018	19	19	8.26	8.26
2019	34	53	14.78	23.04
2020	31	84	13.48	36.52
2021	28	112	12.17	48.70
2022	118	230	51.30	100.00
Total	230		100.00	

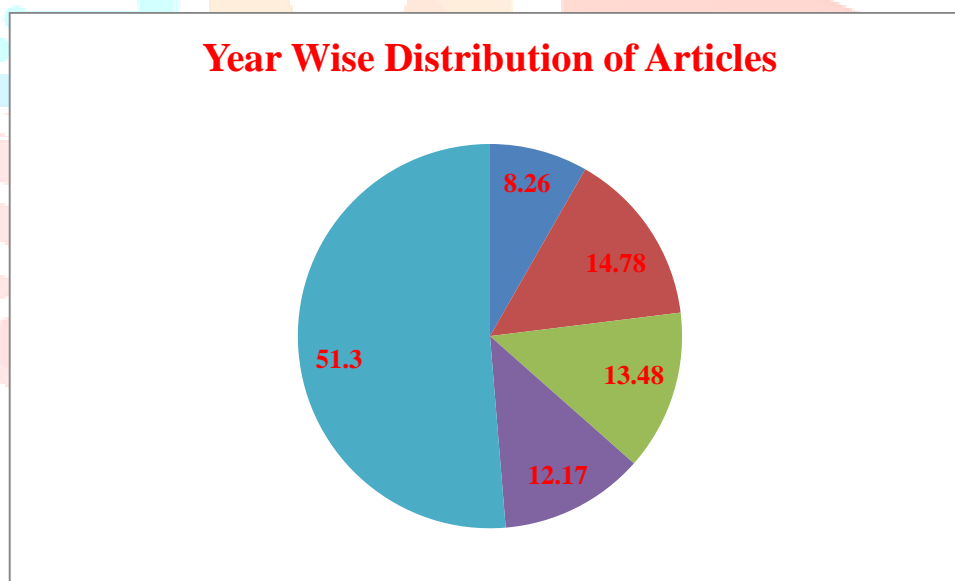


Figure No. 8.2: Year Wise Distribution of Articles

Table & figure No. 8.2 indicates the year wise distribution of the articles during the period 2018-2022, out of 230 total articles, the maximum number of articles were published in the year 2022 with 118 (51.30%) publication, while 34(14.78%) articles published in the year 2019, followed by 31 (13.48%) articles published in the year 2020, 28 (12.17%) articles published in the year 2021.

8.3 Year wise Productivity of Articles

Year wise productivity of the articles of Journal of the Association for Information Science and Technology during 2018-2022 has been given in following table.

Table No. 8.3: Year wise Productivity of Articles

Sr. No	2018	2019	2020	2021	2022	Total
1	3	4	5	1	7	20
2	3	12	15	6	15	51
3	8	9	7	9	35	68
4	1	7	4	8	32	52
5	2	2	0	2	21	27
6	2	0	0	2	7	11
7	0	0	0	0	1	1
Total	19	34	31	28	118	230

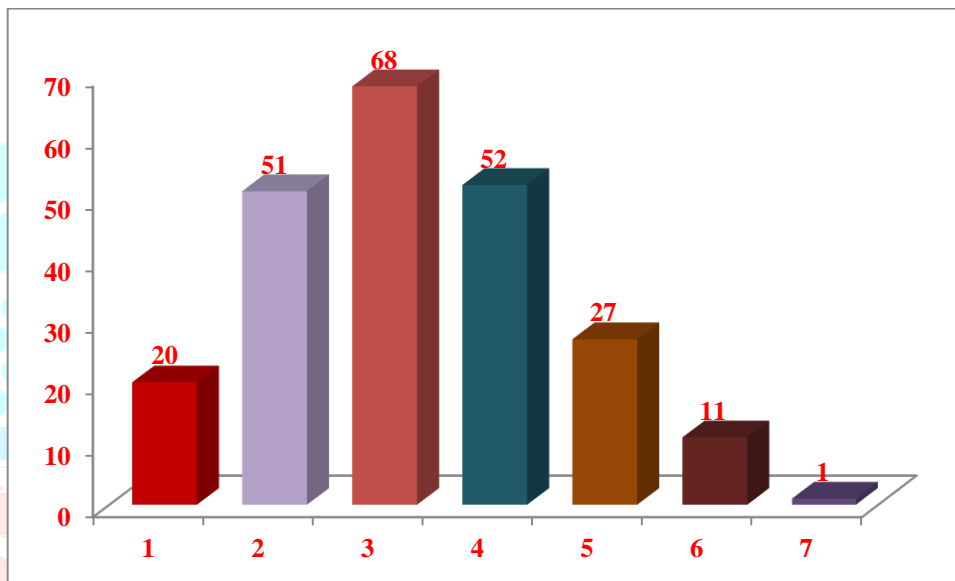


Figure No. 8.3 Year wise Productivity of Articles

Table & figure No. 8.3 indicates the year wise distribution of the articles during the period 2018-2022, out of 230 total articles, the maximum number of articles were published in the year 2022 with 118 (51.30%) publication, while 34(14.78%) articles published in the year 2019, followed by 31 (13.48%) articles published in the year 2020, 28 (12.17%) articles published in the year 2021.

8.4. Distribution of Issues and articles in Respective Years

The table 8.4 shows the Journal wise distribution of issues and articles in respective years of Journal of the Association for Information Science and Technology during 2018 to 2022.

Table No. 8.4: Distribution of Issues and articles in Respective Years

Year	2018	2019	2020	2021	2022	Total
Total Issue	3	4	4	4	4	19
Total Articles	19	34	31	28	118	230
API	6.33	8.5	7.75	7	29.5	12.11

TI= Total Issues, TA= Total Articles, API= Articles per Issue,

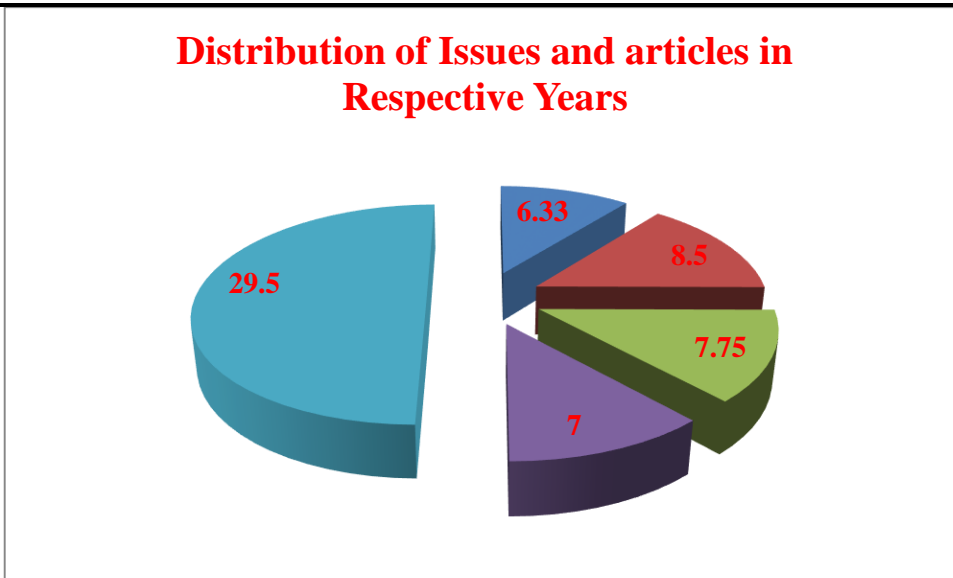


Figure No. 8.4: Distribution of Issues and articles in Respective Years

Table & Figure no. 8.4 reveals that the average articles per issue were highest in 2022 (118 articles) followed by (34 articles), A steady growth in number of articles has been found from 2019 a total 31 articles were published which reached in 2020, the number of articles increased by an average of 28 articles. From 2021 the number of

8.5. Year wise Productivity of Authors

The year wise productivity of 742 authors has been given in the table and figure no. 8.5 during 2018 to 2022

Table No. 8.5: Year wise Productivity of Authors

Year	Authors	Total	Percentage
2018	59	59	7.95
2019	93	93	12.53
2020	72	72	9.70
2021	94	94	12.67
2022	424	424	57.14
Total	742	742	100.00



Figure No. 8.5: Year wise Productivity of Authors

The above table no. figure no.8.5 of the study show that, out of 742 authors the maximum number of authors have contributed in the year 2022 with 424(57.14%) total publication, followed by 2021 with 94(12.67%) authors, 2019 with 93(12.53%) authors, 2020 with 72(9.70%) authors, 2018 with 59(7.95%) authors respectively.

8.6 Distribution wise of Document Type

The table no. 8.6 indicates the journal wise distribution of document type which is used in Journal of Innovation and Knowledge during the period 2018 to 2022 of the study.

Table No. 8.6: Distribution wise of Document Type

Sr. No.	Name of Document	Total	Percentage
1	Article	227	98.70
2	Erratum	2	0.87
3	Editorial	1	0.43
	Total	230	100.00

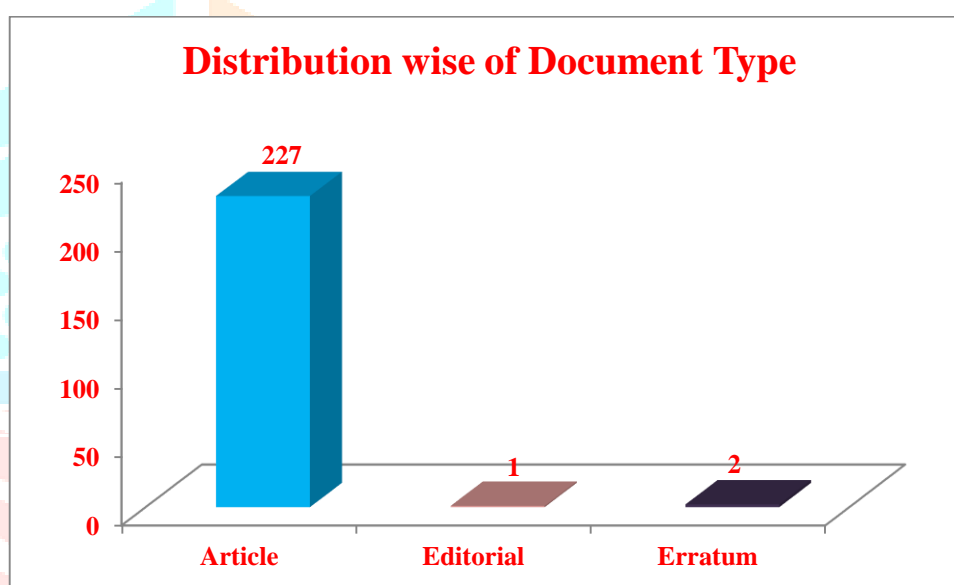


Figure No. 8.6: Distribution wise of Document Type

Table & Figure no. 8.6 of the study focuses on the Journal wise distribution of document type published during the period from 2018-2022. The study reveals that the maximum numbers of document were published as under articles with 227 (98.70%) total number of papers, whereas 2(0.87%) documents were published under Erratum, and the minimum number of papers were published under Editorial with 1(0.43%) papers

8.7. Year wise Distribution of Document Type

The year wise distribution of document type shows in table no. 8.7 during 2018-2022.

Table No. 8.7: Year wise Distribution of Document Type

Year	Article	Editorial	Erratum	Total	Percentage
2018	19	0	0	19	8.26
2019	34	0	0	34	14.78
2020	31	0	0	31	13.48
2021	28	0	0	28	12.17
2022	115	1	2	118	51.30
Total	227	1	2	230	100.00

Table no. 8.7 of the study found that the year wise distribution of document type, out of 230 total articles, the maximum number of paper were published in the year 2022 with 118(51.30%) publication, while 34(14.78%) paper published in the year 2019, followed by 31(13.48%) paper published in the year 2020, 28(12.17%) paper published in the year 2021, 19(8.26%) and the minimum number of paper published in the year 2018,

8.8 Authorship Pattern

The authorship patterns of citation are arranged as single, Two, Three, Four, Five, Six, and Seven authors. The citations are arranged under each category for counted their percentage in authorship pattern for showing the trend so frees arch.

.Table No. 8.8: Authorship Pattern

Sr. No	Author	No of Author	Percentages
1	Single Author	20	2.76
2	Two Authors	102	14.09
3	Three Authors	204	28.18
4	Four Authors	208	28.73
5	Five Authors	135	18.65
6	Six Authors	66	9.12
7	Seven Authors	7	0.97
	Total	742	102.49

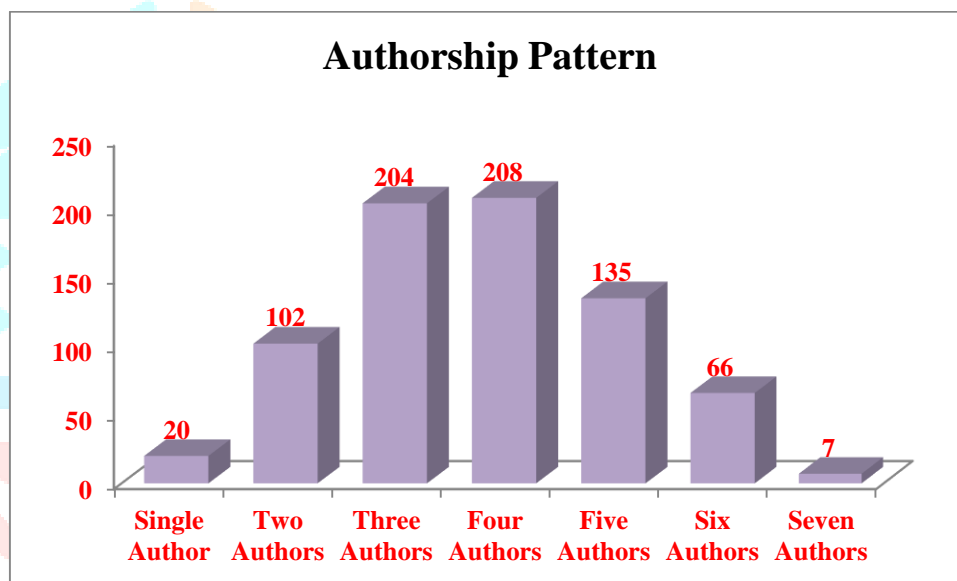


Figure No. 8.7: Authorship Pattern

After the observation form the above table that, out of 742 authors citations, the single authorship is most prominent with 20(2.76%) of total citation, followed by two authors with 102(14.09%) citations, three authors with 204(28.18%) citations, four authors with 208(28.73%) citations, five authors with 135(18.65%) citations, six authors with 66(9.12%) citations and seven authors with 7(0.97%) citations.

8.9. Year wise Authorship pattern

Year wise authorship pattern of the study has given in the table no. 1.9.9 during 2018-2022

Table No. 8.9: Year wise Authorship pattern

Sr No	Author	Year					No. of Article	Percentages	No. of Authors	Percentages
		2018	2019	2020	2021	2022				
1										
2	Single Author	3	4	5	1	7	20	8.7	20	2.7
3	Two Authors	3	12	15	6	15	51	22.17	102	13.75
4	Three Authors	8	9	7	9	35	68	29.57	204	27.49
5	Four Authors	1	7	4	8	32	52	22.61	208	28.03
6	Five Authors	2	2	0	2	21	27	11.74	135	18.19
7	Six Authors	2	0	0	2	7	11	4.78	66	8.89
8	Seven Authors	0	0	0	0	1	1	0.43	7	0.94
		19	34	31	28	118	230	100	742	100

After the observation from the above table that, out of 742 authors citations, the single authorship is most prominent with 20(2.76%) of total citation, followed by two authors with 102(14.09%) citations, three authors with 204(28.18%) citations, four authors with 208(28.73%) citations, five authors with 135(18.65%) citations, six authors with 66(9.12%) citations and seven authors with 7(0.97%) citations.

8.10 . Degree of Collaboration:

An examination of the degree of collaboration, a prominent area of inquiry in bibliometric studies, indicates the trend in patterns of single and co-authorship in the study, as shown in table 1.9.10 The average degree of collaboration is **0.91** during the period of the study.

The extent of collaboration in research can be measured with the help of the formula given by subramanyam.

The formula is as follows:

$$C = \frac{N_m}{N_m + N_s} = ?$$

Where, C= Degree of Collaboration

N_m= Number of Multiple authors

N_s= Number of Single authors

Table No. 8.10: Degree of Collaboration

Authorship	No. of Articles	Percentages	Degree of Collaboration
Single	20	8.70	
Multiple	210	91.30	
Total	230	100.00	0.91

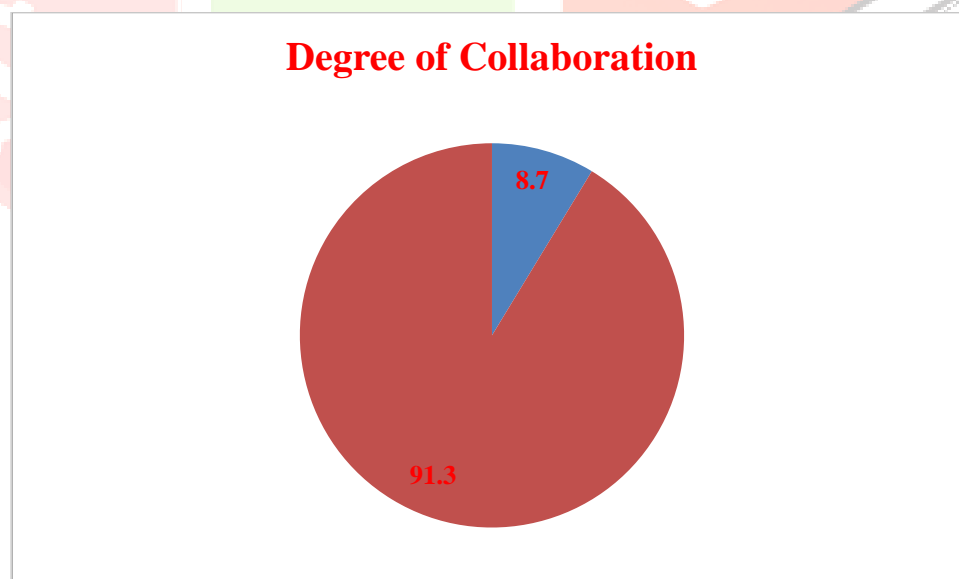


Figure No. 8.8: Degree of Collaboration

In the present study, N_m= 210; N_s= 20. Therefore DC has been calculated as **0.91** which shows that the trend is towards multi authored collaborative approach. In percentage we can say that **91.30%** articles are multi-authored.

8.11 Year wise Degree of Collaboration

Year wise degree of collaboration of both four journals has given in table no. 8.11 during 2018-2022

Table No. 8.11: Year wise Degree of Collaboration

Year	No. of Articles		Total	Degree of Collaboration
	Single Authored Papers	Multiple Authored Papers		
2018	3	16	19	0.84
2019	4	30	34	0.88
2020	5	26	31	0.84
2021	1	27	28	0.96
2022	7	111	118	0.94
Total	20	210	230	0.91

Table no.8.11 of the study shows that degree of collaboration has increased from 0.94 in the year 2022. But in the year 2018 & 2020 that is going on decreased order with 0.84. The highest degree of collaboration was in the year 2021 i.e. 0.96. This indicates that over the years, trend towards multi authorship is increasing in the present study.

8.12. Author Productivity of Article:

Yoshikane calculated Average Author per paper (AAPP) and Productive per Author (PPA) in their paper, which is published in scientometrics journal. The formula is mathematically represented as below:

Average Author per Paper= No. of Authors/No. of Papers

$$\text{Result} = \frac{742}{230} = 3.23$$

Productivity per Author= No. of papers/No. of Authors

$$\text{Result} = \frac{230}{742} = 0.31$$

Table No. 8.12: Author Productivity of Article

Sr. No	Name of Journal	Papers	Authors	Average Author Per Paper	Productivity Per Author
1	JAIST	230	742	2.23	0.31
	Total	230	742	2.23	0.31

The table no. 8.12 shows that the data pertaining to author productivity and average author per paper. It is revealed from table 5 that the overall average number of authors per article is 2.23 for 230 articles published between the periods of the study. The overall average productivity per author for the periods of 2018-2022 is 0.31.

8.13 Year wise Author Productivity of Article:

Year wise author productivity of each journal during 2018 to 2022 has been given in table no. 8.13

Table No. 8.13: Author Productivity of Article

Year	Papers	Authors	Total	Average Author Per Paper	Productivity Per Author
2018	19	59	59	3.11	0.32
2019	34	93	93	2.74	0.37
2020	31	72	72	2.32	0.43
2021	28	94	94	3.36	0.30
2022	118	424	424	3.59	0.28
Total	230	742	742	3.23	0.31

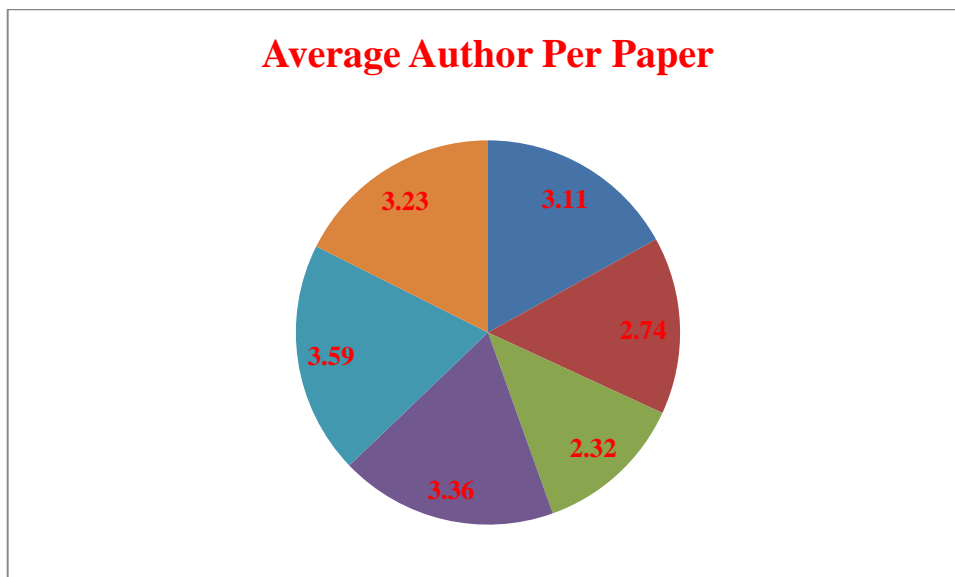


Figure No. 8.9: Average Author Per Paper

Table no. 8.13 & Figure no. 8.9 shows that, the average number of authors per article is 3.23 for 203 articles published during 2018 to 2022. It is also clear from above table that 3.59 is the highest average author per paper recorded in the year 2022. Followed by 2021 that is 3.36, 2018 is 3.11, 2019 is 2.74, and the lowest average author per paper is 2.32 is recorded in the year 2020. The table also shows that, the average productivity per author for the periods of 2018 to 2022 is 0.31 the table reveals that in the year 2020 is highest productivity is 0.43, followed by 0.37 is in the year 2019, 0.32 is in 2018 0.30 is in 2021, and the lowest 0.28 productivity per author has recorded in the year 2022.

8.14. Geographical distribution of Contributors

The geographical distribution of contributors of both four journals has been given in table no. 8.14 during 2018-2022

Table No. 8.14. Geographical distribution of Contributors

Sr. No.	Name of Country	Total	Percentage	Rank
1	China	224	30.19	1
2	Spain	84	11.32	2
3	United States	35	4.72	3
4	Portugal	28	3.77	4
	South Korea	29	3.91	5
5	Italy	23	3.10	6
6	Saudi Arabia	23	3.10	6
7	Germany	22	2.96	7
8	Australia	19	2.56	8
10	Pakistan	15	2.02	9
11	United Kingdom	14	1.89	10
12	Sweden	13	1.75	11
13	Malaysia	11	1.48	12
14	Taiwan	10	1.35	13
15	India	9	1.21	14
16	Finland	8	1.08	15
17	Iran	8	1.08	15
18	Sweden	7	0.94	16
19	Jordan	5	0.67	17
20	Canada	4	0.54	18

21	Czech Republic	4	0.54	18
22	Denmark	4	0.54	18
23	Indonesia	4	0.54	18
24	Poland	4	0.54	18
25	Romania	4	0.54	18
26	Thailand	4	0.54	18
27	Greece	3	0.40	19
28	Hungary	3	0.40	19
29	Qatar	3	0.40	19
30	Two Author Publication 2x13	26	3.50	20
31	Single Author Publication 1x 92	92	12.40	21
	Total	742	100.00	

From the table no. 8.14 it is evident that, there are a total of 742 authors representing 44 different countries. Out of 742 contributions, the highest numbers of authors from China have been contributed 224(30.19%) papers, followed by Spain contributed 84(11.32%) papers, United States contributed 35 (4.72%) papers, Portugal contributed 28(3.77%) papers, Italy & Saudi Arabia contributed 23(3.10%) each papers,

8.15 Ranking of Authors

The collaboration of authors/contributors is important in Scientometrics Study as such the rank Wise distribution of collaborators has been analysed in the table no. 8.15

Table No. 8.15: Ranking of Authors

Sr. No.	Name of Authors	Total	Percentage	Rank
1	Li C.	4	0.54	1
2	Medase S.K.	4	0.54	1
3	Oghazi P.	4	0.54	1
4	Ali M.	3	0.40	2
5	Dwivedi Y.K.	3	0.40	2
6	Franco M.	3	0.40	2
7	Ho K.L.P.	3	0.40	2
8	Huang Y.	3	0.40	2
9	Kraus S.	3	0.40	2
10	Lei S.	3	0.40	2
11	Li H.	3	0.40	2
12	McDowell W.C.	3	0.40	2
13	Miles M.P.	3	0.40	2
14	Patel P.C.	3	0.40	2
15	Shahzad M.	3	0.40	2
16	Sun Y.	3	0.40	2
17	Zhang H.	3	0.40	2
18	Álvarez-Otero S.	2	0.27	3
19	Abbas J.	2	0.27	3
20	Abdul-Basit S.	2	0.27	3
21	Åberg C.	2	0.27	3
22	Adhikari R.	2	0.27	3
23	Akram T.	2	0.27	3
24	Ali I.	2	0.27	3

25	Al-Omoush K.S.	2	0.27	3
26	Bendickson J.S.	2	0.27	3
27	Bonney L.	2	0.27	3
28	DÃaz-Chao Ã.	2	0.27	3
29	Fang Y.	2	0.27	3
30	Guaita MartÃnez J.M.	2	0.27	3
31	Haddad G.	2	0.27	3
32	Haider M.J.	2	0.27	3
33	Hajighasemi A.	2	0.27	3
34	HellstrÃm D.	2	0.27	3
35	Hussain S.T.	2	0.27	3
36	Khan A.	2	0.27	3
37	LÃpez-Cabarcos M.Ã.	2	0.27	3
38	Li J.	2	0.27	3
39	Li P.	2	0.27	3
40	Li Z.	2	0.27	3
41	Liu W.	2	0.27	3
42	MartÃn MartÃn J.M.	2	0.27	3
43	Nguyen C.N.	2	0.27	3
44	Parida V.	2	0.27	3
45	PiÃeiro-Chousa J.	2	0.27	3
46	Revilla-Camacho M.-Ã.	2	0.27	3
47	Rey-Moreno M.	2	0.27	3
48	Ricciardi F.	2	0.27	3
49	Rossignoli C.	2	0.27	3
50	Skare M.	2	0.27	3
51	Tao C.	2	0.27	3
52	Teixeira A.A.C.	2	0.27	3
53	Tian Y.	2	0.27	3
54	Torrent-Sellens J.	2	0.27	3
55	Wang J.	2	0.27	3
56	Wang S.	2	0.27	3
57	Wang Z.	2	0.27	3
58	Woodside A.G.	2	0.27	3
59	Xie X.	2	0.27	3
60	Xu C.	2	0.27	3
61	Xu Y.	2	0.27	3
62	Zhang F.	2	0.27	3
63	Zhang Y.	2	0.27	3
64	Zhao X.	2	0.27	3
65	Zheng Y.	2	0.27	3
66	Zhu Y.	2	0.27	3
67	Single Author Publication 1x590	590	79.51	4
	Total	742	100.00	

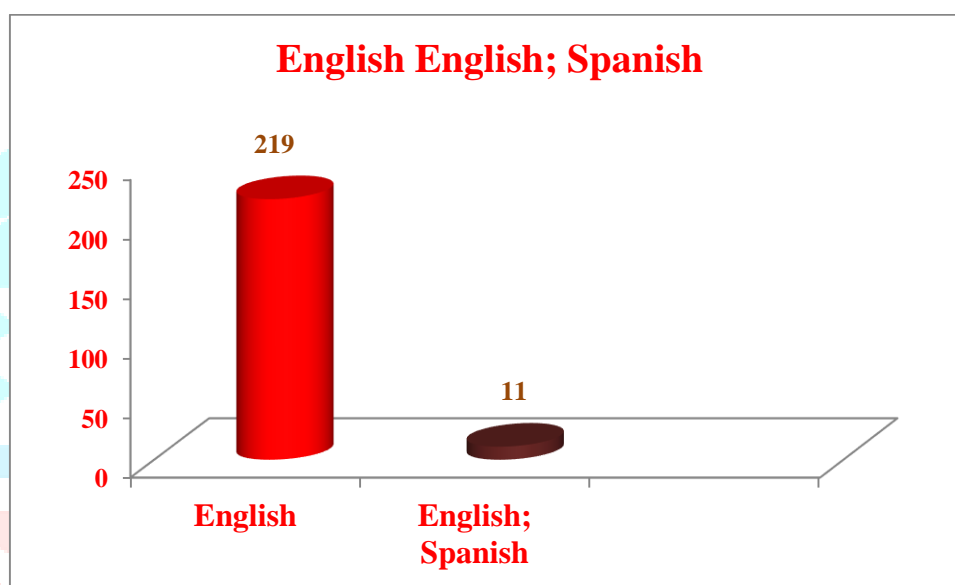
Table no. 8.15 syndicates the ranking of authors/contributors of articles. There are total of 742 authors have contributed from 230 articles. The highest 4(0.54%) number of articles contributed by Li C, Medase S.K. and Oghazi P. each

8.16: Language wise distribution

Language is a one of the important media of communication. Every person expresses his or her opinion with the help of language. Authors convey their thought through publication in a specific language, especially mother tongue.

Table No. 8.16: Language wise distribution

Sr. No.	Language	Total	Percentage
1	English	219	95.22
2	English; Spanish	11	4.78
Total		230	100.00

**Figure no. 8.10: Language wise distribution**

It can be observed from the table no.1.9.16 and figure no. 1.9.10 that, out of the 230 publications, English is the high productive language with 219(95.22%) total publications. English; Spanish being mother tongue, but publication is very few with 11(4.78%) publications.

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