

Authorship Pattern and Degree of Collaboration in Librarianship Topic

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The professional field of librarianship integrates both theoretical and practical domain knowledge. It is a distinctive profession that deals with knowledge. The function and duty of each author on a research project or paper is currently being defined in the field of research. With a sample of 1538 documents downloaded between the years of 2002 and 2022, the current study describes the topic of librarianship in detail and reveals trends in authorship patterns and author's collaborative research across all publications on the subject as represented in the Web of Science database. There are 1.76 authors on average per article. The degree of collaboration (DC) in the study throughout the course of the entire 21 years (2002-2022) is 0.39. Over the duration of the 21-year period, single-author publications have outnumbered multi-author publications. According to the study, group or team research is more appealing to librarianship scholars than solo inquiry.

Introduction

Everyone is aware that librarianship is a human-centered profession. It is a librarian's responsibility to support people in their information literacy and assist them to develop their reading skills. Librarians strive for excellence in the profession by enhancing their knowledge skills. The goal of any work in the library industry is to make knowledge accessible and usable in the shortest amount of time possible. Thus, librarianship is currently a specialized technical career that deals with library resources, which can include both print and electronic resources (Thavamani, 2015, pp. 2009–2014). The library is an essential component of any organizational system in the twenty-first century, including those that are non-educational organization. Professional librarians oversee these libraries. Thus, the library professional is crucial to the library's development and reputation for quality service. According to P.N. Kaula "Librarianship developed as practice; as a body of techniques evolved from certain adhoc assumptions about how people use books"(Varalakshmi, 2017). According to Danton "Librarianship is that branch of learning which has to do with recognition, collection, organization, preservation and utilization of graphic and printed material"(Varalakshmi, 2017). Authorship studies also descriptive bibliometric studies focused on authorship patterns (Mahajan & Patil, 2001, pp. 2001–2010). They discuss the characteristics of the authors, the authors of the papers, and the level of collaboration among a particular set of authors. An authorship study's selection of articles served as its foundation. The idea of authorship developed during the 20th century and has continued to this day. A study project that is being carried out by at least two people in a collaborative manner involves both their mental and physical labour. Compared to the humanities, it is quite widespread in the sciences.(Karisiddappa et al., n.d.).

2. Review of Related Literature

Based on authorship patterns and collaborative research, the authors discovered numerous papers in various disciplines as part of their review of linked literature. Before beginning the current investigation, the authors have reviewed some of the related literature. The study made by Pradhan, P (Pradhan et al., 2011) on the Indian chemistry literature published between 2000 and 2009 using data retrieved from the Web of Science database, describes, several parameters, such as publication growth, degree of collaboration, and various patterns of authorship. (Khaparde & Pawar, 2013) investigated the information technology's authorship pattern. 17917 published data was gathered over the course of ten years from 12 volumes and 132 issues of the LISA and evaluated in their analysis. According to this research, the average number of publications is 1.80, and the degree of collaboration is 0.71. (Cunningham & Dillon, 1997) In this study, the authorship patterns of five worldwide publications were analyzed, including the Journal of Systems Management, Information Systems Research, Strategic Information Systems, Management Information Systems Quarterly, and Decision Support Systems. Co-authored papers' co-authorship distribution, co-authored articles, average number of co-authors per work, the region, and many other factors are described. Mani analyzed (Mani, 2014) 279 publications included in the 38 issues of the Malaysian Journal of Library and Information Science from the years 1996 to 2012. The primary topics of this study are Authorship Patterns, Prolific Contributors, and Degree of Collaboration. (Velmurugan, 2013) This paper highlights the 203 publications made by Annals of Library and Information Studies, one of the top journals in the area of library science from 2007 to 2012. According to the study, the top and lowest rated articles are from 2010 and 2012 (43 and 27 respectively); the degree of collaboration is 0.53; and, in terms of authorship patterns, single writers have the greatest average score (35.46) when compared to other patterns.

3. Objective of the Study

- ❖ To measure the number of materials and citations related to librarianship.
- ❖ To determine the librarianship's data on document types.
- ❖ To analyze the language-wise distribution of documents.
- ❖ To evaluate the year-wise increase and dissemination of Librarianship topic.
- ❖ To define multiple authorship patterns in the area of librarianship.
- ❖ To identify Authorship connection and Degree of Collaboration on the Librarianship topic.
- ❖ To gauge the level of cooperation on the issue of librarianship.
- ❖ Data visualization using the VOS viewer application.

4. Scope and Limitations of the Study

This study's focus was on the volume of research on the topic of librarianship that had been put into the Web of Science (WoS) database as of July 29, 2022. There were no papers evaluated in the present study that were not included in the Web of Science database.

5. Methodology

The study looked at all of the publications on the topic of librarianship from 2002 to 2022. To extract data using a simple search and a topic field, we use the Web of Science database. Further to explain, we use the R Bibliometrix software and Microsoft Excel to extract, retrieve, integrate, and analyses all related publications. The study also makes use of the open-source VOSviewer application to visualize the author's network structures.

6. Data Analysis

6.1 Year wise Documents Publication

An effort was made to compute the number of scientific publications from the years 2002 to 2022. Table 1 shows the number of publications and citations indexed in the Web of Science database by year. There have been 1538 publications and 8908 citations overall. On the topic of librarianship, 73.23 publications were published on average each year. There has been a slow but steady increase in publications on librarianship-related themes. According to the study, out of 1538 documents, 102 (6.63%) were published in 2020 and obtained the top ranking, followed by 97 (6.31%) in 2021, and so on. Additionally, out of 8908 citations, 768 (8.62%) citations were received for the documents published in 2006, and 763 (8.57%) citations received for documents published in 2013 and so on.

Table 1: Year wise documents publication

Sl. No.	Year	Number of Documents	Percentage (%)	Citations	Percentage (%)
1	2002	45	2.93	254	2.85
2	2003	45	2.93	324	3.64
3	2004	35	2.28	401	4.50
4	2005	60	3.90	521	5.85
5	2006	53	3.45	768	8.62
6	2007	60	3.90	677	7.60
7	2008	95	6.18	654	7.34
8	2009	97	6.31	620	6.96
9	2010	63	4.10	507	5.69
10	2011	72	4.68	398	4.47
11	2012	72	4.68	557	6.25
12	2013	74	4.81	763	8.57
13	2014	93	6.05	465	5.22
14	2015	76	4.94	446	5.01

15	2016	96	6.24	376	4.22
16	2017	76	4.94	287	3.22
17	2018	87	5.66	295	3.31
18	2019	82	5.33	235	2.64
19	2020	102	6.63	246	2.76
20	2021	97	6.31	94	1.06
21	2022	58	3.77	20	0.22
	Total	1538	100.00	8908	100.00

6.2 Document Types Publication on Librarianship Topic

The term “librarianship” is broad. The number of document types used in this study is mentioned in table 2 below. The document type mentioned in the Web of Science for the retrieved results are: Article, Bibliography, Biographical Item, Book Review, Correction, Editorial Material, Letter, Meeting Abstract, News Item, Reprint, and Review. Out of 1538 documents, it is evident that the document type Articles accounts for the largest percentage (65.02%) of the total (1000 documents), followed by Book Review (276 documents), Editorial Material (95 documents), and so forth.

Table 2: Document types

Sl. No.	Docs Type	No. of Doc	Percentage
1	Article	1000	65.02
2	Article; Early Access	20	1.30
3	Article; Proceedings Paper	43	2.80
4	Bibliography	1	0.07
5	Biographical-Item	15	0.98
6	Book Review	276	17.95
7	Correction	4	0.26
8	Editorial Material	95	6.18
9	Letter	3	0.20
10	Meeting Abstract	9	0.59
11	News Item	2	0.13
12	Reprint	1	0.07
13	Review	66	4.29
14	Review; Early Access	3	0.20
	Grand Total	1538	100.00

6.3 Language wise Publication Data

Ten (10) languages, including Afrikaans, English, French, German, Japanese, Portuguese, Slovak, Slovene, Spanish, and Turkish, were identified as scholarly presentation languages in the current study. With 1422 documents, English makes up the majority of the documents. Portuguese and Spanish come next with 44 documents each. The languages of expression and the number of papers is clearly displayed in Table 3. (Other language: Afrikaans, Slovak, Slovene, Turkish)

Table 3: Language

Year	English	French	German	Japanese	Portu-guese	Spa-nish	Other Languages	Total
2002	45	0	0	0	0	0	0	45
2003	44	0	1	0	0	0	0	45
2004	34	1	0	0	0	0	0	35
2005	60	0	0	0	0	0	0	60
2006	52	0	1	0	0	0	0	53
2007	58	0	1	0	0	0	1	60
2008	85	0	1	2	3	4	0	95
2009	85	0	1	0	9	2	0	97
2010	58	0	1	1	2	1	0	63
2011	60	0	4	0	2	5	1	72
2012	64	0	1	0	3	4	0	72
2013	67	0	0	0	4	3	0	74
2014	85	1	1	0	1	5	0	93
2015	71	0	1	0	1	2	1	76
2016	86	0	1	1	3	5	0	96
2017	70	0	0	0	5	1	0	76
2018	76	0	1	0	4	6	0	87
2019	77	0	2	0	2	1	0	82
2020	96	0	1	0	3	2	0	102
2021	92	0	0	0	2	2	1	97
2022	57	0	0	0	0	1	0	58
Total	1422	2	18	4	44	44	4	1538

6.4 Authorship Pattern

Table 4 displays the overall documents' authorship distribution. The analysis shows that the 1538 publications were written by a total of 2709 authors. Consequently, we discovered that there are 1.76 authors on average for each document. 1538 documents were written, of which 924 (60.08%) were written by a single author and 345 (22.43%) by two authors. This table depicts that of the total 1538 papers, single-authored documents make up the biggest percentage (60.08%), followed by two-authored documents (22.43%). The distribution of authors between single authors and multiple authors is strikingly different, according on the authorship pattern. There are fewer articles published by multiple authors; on average, 60% of articles are produced by a single author, while 40% are authored by multiple authors.

Table 4: Authorship pattern

Author	Count of Article Title	No. of Author Articles	Percentage of Author	Percentage of	Cum. Percentage of Articles
Single Author	924	924	60.08	34.11	60.08
Two Author	345	690	22.43	25.47	82.51
Three Author	138	414	8.97	15.28	91.48
Four Author	58	232	3.77	8.56	95.25
Five Author	34	170	2.21	6.28	97.46
Six Author	15	90	0.98	3.32	98.44
Seven Author	11	77	0.72	2.84	99.15
Eight Author	9	72	0.59	2.66	99.74
Nine Author	2	18	0.13	0.66	99.87
Eleven Author	2	22	0.13	0.81	100.00
Total	1538	2709	100.00	100.00	

6.5 Year Wise Authorship Pattern

The total numbers of documents' authorship patterns are shown in Table 5 by year. The table demonstrates the paper authorship trend by year. Most documents with a single author were published in 2008 and 2009. This table merely describes the authorship data year-by-year.

Table 5: Year wise authorship pattern

Years	Single Author	Two Author	Three Author	Four Author	Five Author	>5 Author	Total
2002	36	6	2	0	1	0	45
2003	40	3	2	0	0	0	45
2004	24	9	2	0	0	0	35
2005	50	6	2	1	1	0	60
2006	40	12	1	0	0	0	53
2007	47	10	2	1	0	0	60
2008	67	15	7	2	1	3	95
2009	67	19	5	3	2	1	97
2010	36	13	10	2	0	2	63
2011	48	13	4	4	1	2	72
2012	37	18	8	3	4	2	72
2013	40	22	4	5	2	1	74
2014	64	15	8	4	2	0	93
2015	42	18	8	3	4	1	76
2016	52	27	9	6	1	1	96
2017	43	19	7	3	3	1	76
2018	48	19	6	4	5	5	87
2019	43	26	7	2	1	3	82
2020	43	36	15	4	1	3	102
2021	36	22	19	8	3	9	97
2022	21	17	10	3	2	5	58
Total	924	345	138	58	34	39	1538

6.6 Document Wise Authorship Pattern

Table 6 displays the overall document authorship distribution per document type. The study shows that across all document categories, articles have the highest number of publications with single authors (507), followed by those with two authors (278), three authors (116), four authors (50), and so on. The second-highest document category is a book review, followed by single-author publications (269), two-author

publications (05), four-author publications (01), and five-author publications (01), as well as editorials, reviews, articles, proceedings papers, and other sorts of papers.

Table 6: Document wise authorship pattern

Docs Type	Single Author	Two Author	Three Author	Four Author	Five Author	>5 Author	Total
Article	507	278	116	50	24	25	1000
Article; Early Access	2	8	7	1	0	2	20
Article; Proceedings Paper	26	14	0	1	2	0	43
Bibliography	1	0	0	0	0	0	1
Biographical-Item	12	3	0	0	0	0	15
Book Review	269	5	0	1	1	0	276
Correction	2	0	1	0	1	0	4
Editorial Material	66	16	5	0	3	5	95
Letter	2	1	0	0	0	0	3
Meeting Abstract	7	2	0	0	0	0	9
News Item	2	0	0	0	0	0	2
Reprint	1	0	0	0	0	0	1
Review	27	16	9	4	3	7	66
Review; Early Access		2	0	1	0	0	3
Total	924	345	138	58	34	39	1538

6.7 Authorship Pattern in Language

The authorship patterns of the various languages are shown in Table 7 that define the ten (10) languages in this table, together with the order of publication and authorship. Afrikaans, Slovak, and Turkish have the lowest publishing rates for the topic of librarianship, whereas English has the greatest. However, in terms of authorship patterns, English has the biggest number of publications (865), followed by Spanish, Portuguese, German, Japanese, and other languages. There are only 345 publications with two authors, and of those, 310 are in English, 19 are in Portuguese, and 11 are in Spanish. As a result, this table shows that the study's most publications were in the English language and by a single author.

Table 7: Authorship Pattern in Language

Language	Single Author	Two Author	Three Author	Four Author	Five Author	>5 Author	Total
Afrikaans	0	1	0	0	0	0	1
English	865	310	122	56	32	37	1422
French	2	0	0	0	0	0	2
German	14	4	0	0	0	0	18
Japanese	3	0	0	0	0	1	4
Portuguese	15	19	9	1	0	0	44
Slovak	1	0	0	0	0	0	1
Slovene	0	0	1	0	0	0	1
Spanish	23	11	6	1	2	1	44
Turkish	1	0	0	0	0	0	1
Total	924	345	138	58	34	39	1538

6.8 Degree of Collaboration

Different approaches have been put out to figure out the degree of research collaboration. The formula suggested by Subramanyam (1983) was employed in this investigation. (Subramanyam, 1983, as cited in Nayak et al., 2021)

The degree of collaboration (DC): $DC = \frac{Nm}{Nm + Ns}$

Where,

DC = Degree of collaboration in a Topic

Ns = Number of single documents in the Topic

Nm = Number of multi authored documents in the Topic

So, As per our Formula

$$Ns = 924$$

$$Nm = 614$$

$$DC = \frac{614}{614 + 924} = 0.39$$

Thus, **0.39** represents the degree of collaboration (DC) on the topic of librarianship from 2002 to 2022.

Table 8: Degree of collaboration

Years	Single Author (Ns)	Multiple Authors (Nm)	Ns+Nm	Degree of collaborations (DC)
2002	36	9	45	0.20
2003	40	5	45	0.11
2004	24	11	35	0.31
2005	50	10	60	0.17
2006	40	13	53	0.25
2007	47	13	60	0.22
2008	67	28	95	0.29
2009	67	30	97	0.31
2010	36	27	63	0.43
2011	48	24	72	0.33
2012	37	35	72	0.49
2013	40	34	74	0.46
2014	64	29	93	0.31
2015	42	34	76	0.45
2016	52	44	96	0.46
2017	43	33	76	0.43
2018	48	39	87	0.45
2019	43	39	82	0.48
2020	43	59	102	0.58
2021	36	61	97	0.63
2022	21	37	58	0.64
Total	924		1538	

6.9 Top 10 Journals of Librarianship Topic

The Table 9 shows top Ten (10) Journals which published maximum number of documents from all over the world. Amongst them, Journal of Academic Librarianship published maximum number of works and ranked first with 135 publications followed by Health Information and Libraries Journal which ranked second with 92 publications. Journal of The Medical Library Association journal ranked third with 91 publications, Library Trends (81) and so on. In this study total 137 Journal included.

Table 9: Top 10 Journals of Librarianship Topic

Sl	Journal Name	Publications
1	Journal of Academic Librarianship	135
2	Health Information and Libraries Journal	92
3	Journal of The Medical Library Association	91
4	Library Trends	81
5	Journal of Librarianship and Information Science	78
6	Library Quarterly	77
7	College & Research Libraries	70
8	Law Library Journal	57
9	Portal-Libraries and The Academy	55
10	Journal of Documentation	44

6.10 Top 10 Publisher of Librarianship Topic

The Table 10 shows top Ten (10) publishers who published maximum number of journal articles of researchers. Amongst them, Elsevier published maximum number of works and ranked first with 162 publications followed by both Johns Hopkins University Press with 127 publications. Emerald Group Publishing Ltd. publisher ranked third, and Sage Publications Ltd., Medical Library Associations, University Chicago Press, Routledge Journals, Taylor & Francis Ltd., Wiley, Association’s College Research Libraries, American Library Association so on.

Table 10: Top 10 Publisher of Librarianship Topic

Sl	Publisher Name	Publications
1	Elsevier Science Inc.	162
2	Johns Hopkins University Press	127
3	Emerald Group Publishing Ltd.	102
4	Sage Publications Ltd.	101
5	Medical Library Associations	91
6	University Chicago Press	78
7	Routledge Journals, Taylor & Francis Ltd.	77
8	Wiley	76
9	Association’s College Research Libraries	70
10	American Library Association	53

6.11 Co-Authorship Author

There were 2223 co-authors in total during the research period. This section determines the overall strength of those co-authorship connections for each of the 2223 authors. In Fig. 1, these authors are depicted graphically and in great detail with Total Link Strength (TLS). In respect of all documents, with 19 papers, Murphy, Jeannette has the most (56 citations and 20 TLS), followed by Johnson, Ian M. with 16 documents, 17 citations, and so on. Lindsay has the highest citation for Glynn, 250, followed by Williams, Christine I has 151, and so on.

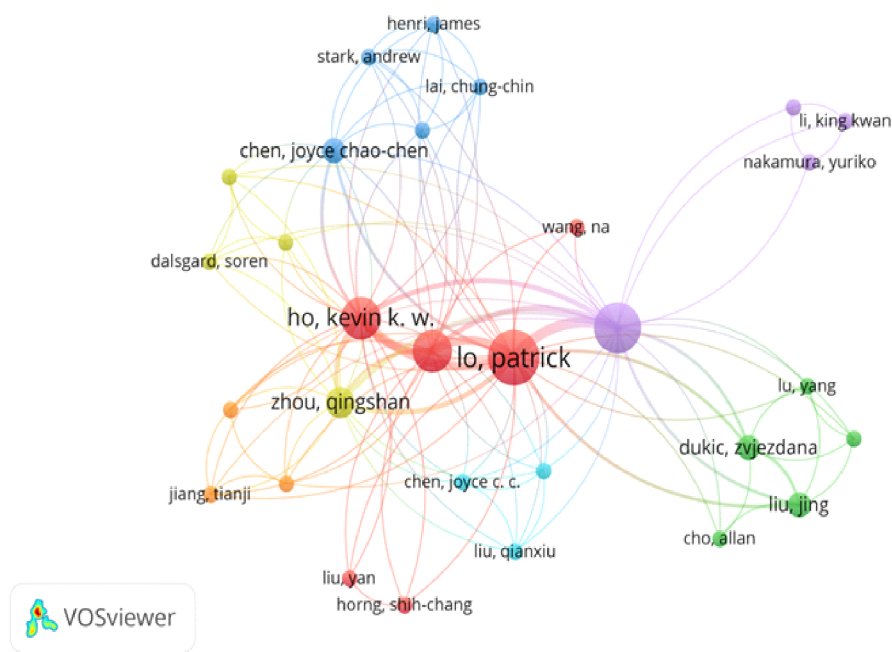


Figure 1: Co-Authorship author

6.12 Co-Authorship with Organization

Figure 2 is an intricate graphic that shows the co-authorship with the organisation clearly. The total number of organisations found here is 1032, and for each of those 1032 organisations, the strength of their co-authorship ties will be calculated. The University of Illinois leads with 52 documents and 289 citations, followed by the Universities of Sheffield (31, 426), UCL (22, 50), and so on.

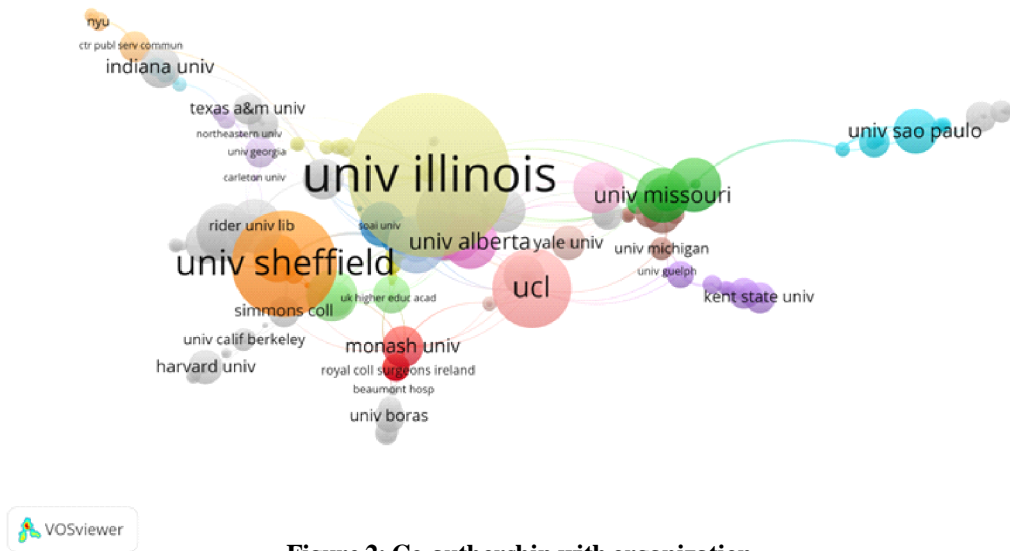


Figure 2: Co-authorship with organization

6.13 Author Keywords Co-Occurrence

The overall strength of the co-occurrence links with other keywords are calculated for each of the 2038 author keywords that are discovered to be employed in the study’s librarianship themes. Specifically, we observed that under the study librarianship keywords appear the most frequently (177 times), followed by academic libraries (55), libraries (51), librarians (43), and so on.

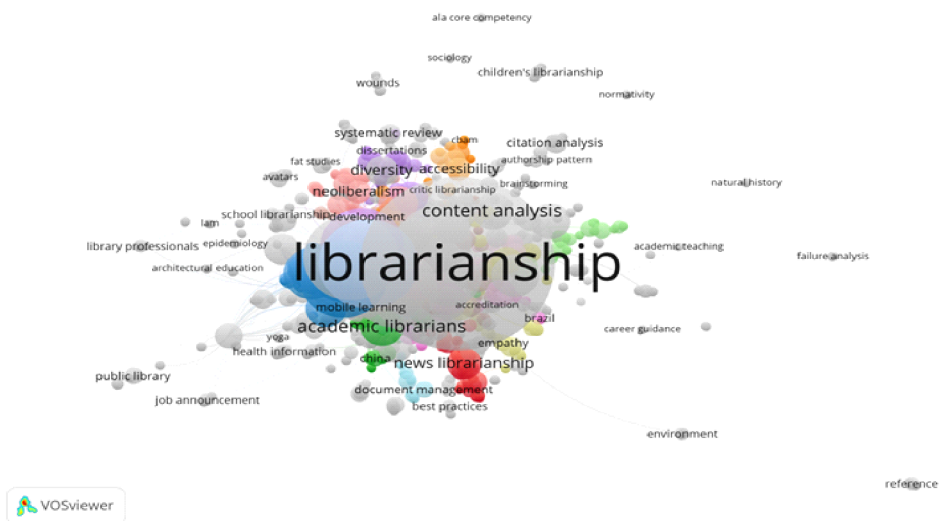


Figure 3: Author keywords co-occurrence

6.14 Co-Authorship with Country

Figure 4 shows that the 73 countries included in the study's concept of co-authorship, including the USA, England, Canada, Australia, Brazil, and many others, are included. The overall strength of the co-authorship ties between each of the 73 countries will be determined. USA is the only country with highest documents and the citations which are 771 and 4997 respectively. England is next with 120 and 863, Canada with 92 and 1131 documents and citations respectively, and so forth.

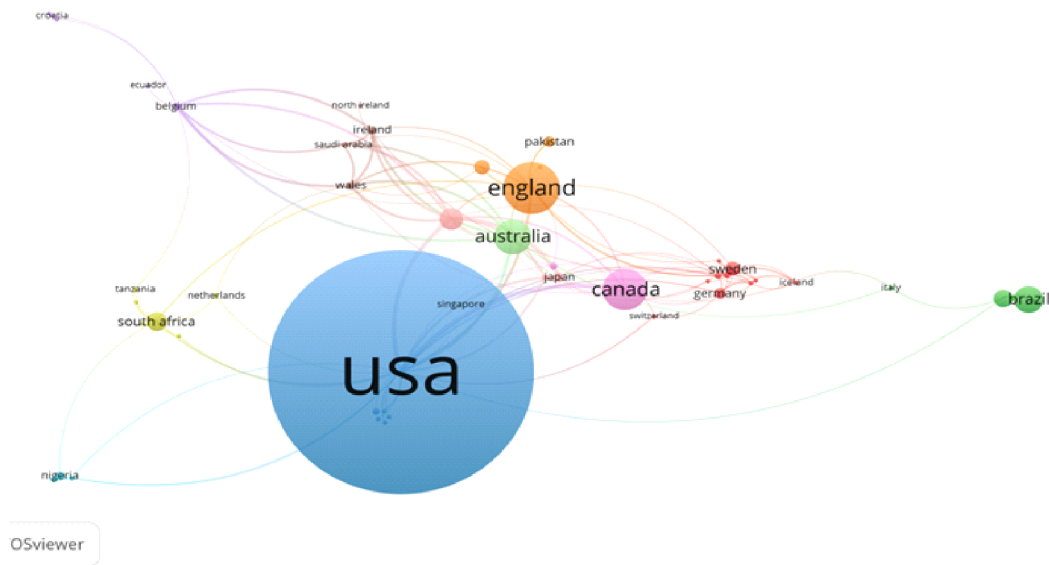


Figure 4: Co-authorship with Country

7 Conclusion

The authors looked at the trend in authorship and the level of collaboration, as well as the year-by-year increase of world wide scholarly production in the field of librarianship. It is evident that the overall research output in librarianship is gradually increasing. There are 1.76 authors on average per article. Collaboration has averaged 0.39 for the past 21 years. The number of papers published by a single author is unusually high (924 documents, or over 61.00% of all publications). The distribution of authors between single authors and multiple authors is strikingly different, according on the authorship pattern. Additionally, we use visualization techniques to expound on the co-occurrence of author keywords, author bibliography coupling, and co-authorship authors.

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