RESEARCH PRODUCTIVITY ON MANUSCRIPTS IN THE FIELD OF SOCIAL SCIENCE (2010-2020). SCOPUS DATABASE

PRODUCTIVIDAD INVESTIGADORA SOBRE MANUSCRITOS EN EL CAMPO DE LAS CIENCIAS SOCIALES (2010-2020). BASE DE DATOS SCOPUS

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ABSTRACT

The study aimed to assess and analyze the research productivity on manuscripts in the field of social science on a set of quantitative and qualitative metrics to discover underlying research trends at global, national, organizational and individual level. The study is based on 11 years' global research data (N=1136) on the topic sourced from Scopus database for the time span 2010-2020. The scientometric analysis used to assess the research productivity. The research productivity on manuscripts registered 17.21 per cent annual average growth and 6.36 per cent compound annual growth rate with an average citation impact of 1.42 citations per paper. The average number of authors per paper was 1.29 and the average productivity per author was 0.79. The resultant data indicates that the degree of collaboration ranges between 0.13≥0.24 and the overall degree of collaboration was 0.17. The Pearson correlation analysis inferred a significant and positive relationship (r = 0.889, N = 11, p =0.000) between number of articles and the number of authors.
KEYWORDS: Research Productivity, Authorship Metrics, Manuscripts, Scientometric, Social Science

RESUMEN

El estudio tuvo como objetivo evaluar y analizar la productividad de la investigación sobre manuscritos en el campo de las ciencias sociales en un conjunto de métricas cuantitativas y cualitativas para descubrir las tendencias de investigación subyacentes a nivel global, nacional, organizacional e individual. El estudio se basa en datos de investigación global de 11 años (N=1136) sobre el tema extraídos de la base de datos Scopus para el período 2010-2020. El análisis cienciométrico utilizado para evaluar la productividad de la investigación. La productividad de la investigación en manuscritos registró un crecimiento promedio anual del 17,21 % y una tasa de crecimiento anual compuesto del 6,36 % con un impacto promedio de citas de 1,42 citas por artículo. El número medio de autores por artículo fue de 1,29 y la productividad media por autor fue de 0,79. Los datos resultantes indican que el grado de colaboración oscila entre 0,13≥0,24 y el grado general de colaboración fue de 0,17. El análisis de correlación de Pearson infirió una relación significativa y positiva (r = 0,889, N = 11, p = 0,000) entre el número de artículos y el número de autores.

PALABRAS CLAVE: productividad de la investigación, métricas de autoría, manuscritos, cienciometría, ciencias sociales

INTRODUCTION

The term 'manuscript' is originated from the medieval Latin word '*manuscriptus*', equivalent to '*manu*' meaning 'by hand' and '*scriptus*' meaning 'to write' (Agarwal, 1984, *as cited by* Raval, 2016). Hence, the 'manuscript' implies handwritten and unpublished documents, in fact, many recent personal papers in special collections also contain unique materials produced by typewriter or personal computer. Therefore, the terms archival collections or the manuscript collections refer to historically valuable unique, unpublished materials created and accumulated for their own purposes by an organization, individual, or family and preserved with other records from the same creator that document the same activities (Daizadeh, I. 2021; Reymond, D.2020; IFLA, 2020).

The manuscripts are considered the primary sources, often unique ones, upon which the writing of history may be based. They provide evidence of human activity, and as such, are generated naturally during the course of an individual's or an organization's life (Library of Congress). Manuscripts are found in different kinds of repositories ranging from museums, archives and institutions of learning to private homes and houses of worship (NMM, Government of India).

Over the past 11 years, the scope of manuscripts has been continuing to broaden, therefore, in light of its increasing relevance, it is important to analyze and compile the existing literature on manuscripts that published during the recent years. To the authors' mind, there is no evidence of scientometric studies analyzing manuscripts. Henceforth, the present study aimed to assess and analyze global research productivity on manuscripts in the field of social science at global level using scientometric assessment of publications from 2010-2020 on a set of quantitative and qualitative metrics.

Research Objectives

The present study seeks to examine the quantitative and qualitative analysis of global research productivity on manuscripts as indexed in SCOPUS collection database for the time span 2010-2020, that

is, 11 years. The study looks at annual publications growth, authors' productivity on the topic, degree of collaboration, its distribution by source type, as well as its global publications share. The study also seeks to analyze the leading countries, organizations, journals publishing literatures on manuscripts and to identify prolific authors and to know the Average Productivity Per Author (APPA) on the topic.

MATERIAL AND METHODOLOGY

The scientometric analysis is used to explore the global research productivity on manuscripts in the field of social science. To carry out the present study, the Scopus database was used as a tool to retrieve the potential documents on the topic, since Scopus is the largest abstract and citation databases with a wide global coverage of scientific journals. Total 5661 documents were retrieved as recall value through the search string "TITLE (manuscripts) AND PUBYEAR > 2009 AND PUBYEAR < 2021". To precise the result, the search query was modified as "TITLE (manuscripts) AND PUBYEAR > 2009 AND PUBYEAR < 2021 AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO(SUBJAREA, "SOCI")) AND (LIMIT-TO(DOCTYPE, "ar"))" to find the most refined and potential datasets. Precisely, 1136 documents were retrieved suitable for the study. The data between 2010 and 2020 were downloaded on 2nd July, 2021 for analysis based on the preset query sets. The global search output was subsequently analyzed by using the analytical provisions available in the Scopus database. Data in the retrieved document was exported to Microsoft Excel for mathematical and statistical analysis. The retrieved document from Scopus database was also exported to VOSviewer program for creating the network visualization maps.

RESULTS AND DISCUSSION

Research output and citation counts

The global research output on manuscripts in the field of social science consisted one thousand three hundred thirty-six (N=1136) publications during the study period from 2010-2020 with an average of 103 articles per year. Pandya, Joorel and Solanki, 2021 opined that the impact of research publication can be measured with the citation received for a research paper. Therefore, the year-wise citation, mean citation per article and mean citation per year were gathered. The retrieved documents received a total of one thousand six hundred ten (n=1610) citations with a mean citation impact of 1.42 citations per article. Of the publications retrieved, it was found that the year 2020 recorded the highest annual output with a proportion of 11.97 per cent (n=136) articles and citations accounting for 19.69 per cent (n=317). The lowest annual output was recorded in the year 2010 with a proportion of 6.07 per cent (n=69) articles and 0.62 per cent citations (n=10) (Table 1).

Table 1: Research output and citation counts

Year	Number of articles	Number of citations	Mean citations per article	Mean citations per year	Citable years
2010	69 (6.07)	10 (0.62)	0.15	0.11	11
2011	79 (6.96)	38 (2.36)	0.48	0.05	10
2012	110 (9.68)	62 (3.85)	0.56	0.06	9

Year					
2013	81 (7.13)	68 (4.22)	0.84	0.11	8
2014	104 (9.16)	98 (6.09)	0.94	0.13	7
2015	93 (8.19)	102 (6.34)	1.09	0.18	6
2016	90 (7.92)	170 (10.56)	1.89	0.38	5
2017	124 (10.92)	217 (13.48)	1.75	0.44	4
2018	125 (11.00)	257 (15.96)	2.06	0.69	3
2019	125 (11.00)	271 (16.83)	2.17	1.09	2
2020	136 (11.97)	317 (19.69)	2.33	2.33	1
Total	**1136 (100)**	**1610 (100)**	**14.26**	**5.57**	**--**
Std. Deviation	**47.376**	**105.044**	**--**	**--**	**--**
Mean	**103**	**146**	**1.42**	**--**	**--**

*The figures within the parenthesis indicate the percentage (%)

Author productivity

Of the retrieved documents, it has been inferred from the data that the average number of authors per paper (AAPP) was 1.29 and the average productivity per author was 0.79. For calculation of the author productivity over the study time period, the formula suggested by Yoshikane, Nozawa, Shibui, and Suzuki (2009) was applied:

Average author per paper = Number of authors / Number of papers
Productivity per author = Number of papers / Number of authors

It revealed from the data that the highest number of author's productivity 136 (0.86) was registered in the year 2020 (Table 2).

Table 2: Author productivity

Year	Number of Articles	Number of Authors	Average Author Per Paper (AAPP)	Productivity Per Author
2010	69	74	1.07	0.93
2011	79	103	1.30	0.77
2012	110	129	1.17	0.85
2013	81	115	1.42	0.70
2014	104	127	1.22	0.82
2015	93	124	1.33	0.75
2016	90	147	1.63	0.61
2017	124	159	1.28	0.78
2018	125	159	1.27	0.79
2019	125	160	1.28	0.78
2020	136	159	1.17	0.86
Total	**1136**	**1456**	**14.14**	**8.64**

Mean	103	132	1.29	0.79

Degree of collaboration

To evaluate the collaborative authors on manuscripts in the field of social science using the Degree of Collaboration, the formula given by Subramanyam (1983) was applied:

Degree of Collaboration(C) = Nm / Nm + Ns
Where,
C = Degree of collaboration
Nm = Number of multiple-authored research papers
Ns = Number of single-authored research papers

The resultant data indicates that the degree of collaboration ranges 0.13≥0.24 and the mean value of collaboration was 0.17. It has been inferred from the data that the DC was maximum in the year 2018 with 0.24 (Table 3).

Table 3: Degree of collaboration

Year	Single Authors (Ns)	Multiple Authors (Nm)	Total (Ns + Nm)	Degree of Collaboration (C)
2010	63	11	74	0.15
2011	87	16	103	0.16
2012	112	17	129	0.13
2013	97	18	115	0.16
2014	111	16	127	0.13
2015	104	20	124	0.16
2016	128	19	147	0.13
2017	127	32	159	0.20
2018	121	38	159	0.24
2019	127	33	160	0.21
2020	127	32	159	0.20
Total	**1204**	**252**	**1456**	**1.87**
Mean	**109**	**22**	**132**	**0.17**

Growth rate of publications

The fluctuations in publication pattern of articles were considered throughout the period of study 2010-2020. A total of 1136 articles published with an annual average growth rate of 17.21 per cent and compound annual growth rate of 6.36 per cent (Table 4).
The following formula has been applied for calculating the average growth rate:

r = P1 – P0   x 100

$$\overline{}$$
$$P0$$

Where,
r = Publication growth in percentage
P0 = Number of publication in the base year
P1 = Number of publication in the present year

And the formula suggested by Pandya, Joorel and Solanki (2021) used to calculate the compound average growth rate:

$CAGR = (V_{final} / V_{begin})^{1/t} - 1$

Where,
CAGR = Compound Annual Growth Rate
V_{begin} = Beginning Value
V_{final} = Final Value
t = Time in Years

Table 4: Growth rate of publications

Year	Number of Articles	Average Growth Rate (%)
2010	69	100
2011	79	14.49
2012	110	39.24
2013	81	-26.36
2014	104	28.39
2015	93	-10.57
2016	90	-03.22
2017	124	37.78
2018	125	0.81
2019	125	00
2020	136	08.80
Total	**1136**	189.36
Std. Deviation	**47.376**	--
Mean	**103**	**17.21**
Compound average growth rate	**6.36**	

Correlation between number of articles and number of authors

Pearson correlation analysis was conducted to evaluate the correlation between number of articles and the number of authors. The resultant data inferred significant and positive relationship (r = 0.889, N = 11, p =0.000). As the p-value is <0.05, therefore, the result is highly significant and correlation was strong in strength (Table 5).

Table 5: Correlation between number of articles and number of authors

		Number of Articles	Number of Authors
Number of Articles	Pearson Correlation		0.889
	Sig. (2-Tailed)		0.000
	N	11	11
Number of Authors	Pearson Correlation	0.889	
	Sig. (2-Tailed)	0.000	
	N	11	11

*Correlation is significant at the 0.01 level

Top productive authors

It is imperative that the contributions by authors on manuscripts relates to social science have been spanned across the globe. It revealed that one thousand four hundred fifty-six (n=1456) authors contributed unevenly in global research productivity on manuscripts. The top ten author's productivity varied 3≥7 publications per author and in combined manner shared a proportion of 4.04 per cent (n=46) papers of the total publication and accounting for 20.56 per cent (n=331) citations with a proportion of citation impact of 7.19 citations per paper (CPP). The analysis denotes that it is necessary for the authors to collaborate for strengthening the international co-authorship patterns. The resultant data shows that among the top 10 productive authors, Bornmann L (h-Index = 52), Max Planck Society, Germany with a proportion of 0.62 per cent (n=7) produced the highest number of articles and accounting for 9.26 per cent citations (n=149). Other authors with papers ranging 3≥6 were actively participated. Mapping of co-authorship patterns in the manuscripts related literature for the top 10 active authors yielded 5 clusters with 1 links and total link strength 6, where cluster indicates the group of closely collaborating authorship (Figure 1; Table 6).

Table 6: Top ten productive authors

Top Productive Authors	Affiliation	TNP	TNC	CPP	h-Index
Bornmann L	Max Planck Society, Germany	7(0.62)	149(9.26)	21.29	52
Daniel HD	University of Zurich, Switzerland	6(0.53)	149(9.26)	24.83	28
Dolbeau F	Institut de France, France	6(0.53)	2(0.12)	0.33	4
Gneuss H	Universität München, Germany	6(0.53)	6(0.37)	1.00	6
Witkam JJ	Leiden University, Netherlands	5(0.44)	6(0.37)	1.20	3
Mirzaeva SV	Kalmyk Scientific Center of the Russian Academy of Sciences, Russian Federation	4(0.35)	3(0.19)	0.75	2
Baranov VA	Kalashnikov Izhevsk State Technical University, Russian Federation	3(0.26)	2(0.12)	0.67	1
Chardonnens LS	Radboud University Nijmegen, Netherlands	3(0.26)	10(0.62)	3.33	3
Delsaux O	Université Saint-Louis - Bruxelles, Belgium	3(0.26)	4(0.25)	1.33	2

Klein K	Andréstr, Germany	3(0.26)	00	00	1
Share of top 10 productive authors		**46(4.04)**	**331(20.56)**	**7.19**	**--**
Global Productivity		**1136(100)**	**1610(100)**	**1.42**	**--**

*TNP= Total Number of Papers; TNC= Total Number of Citations; CPP= Citations Per Paper. ** The figures within the parenthesis indicate the percentage (%).

Figure 1: Network visualization map of co-authorship pattern (created by VOSviewer)
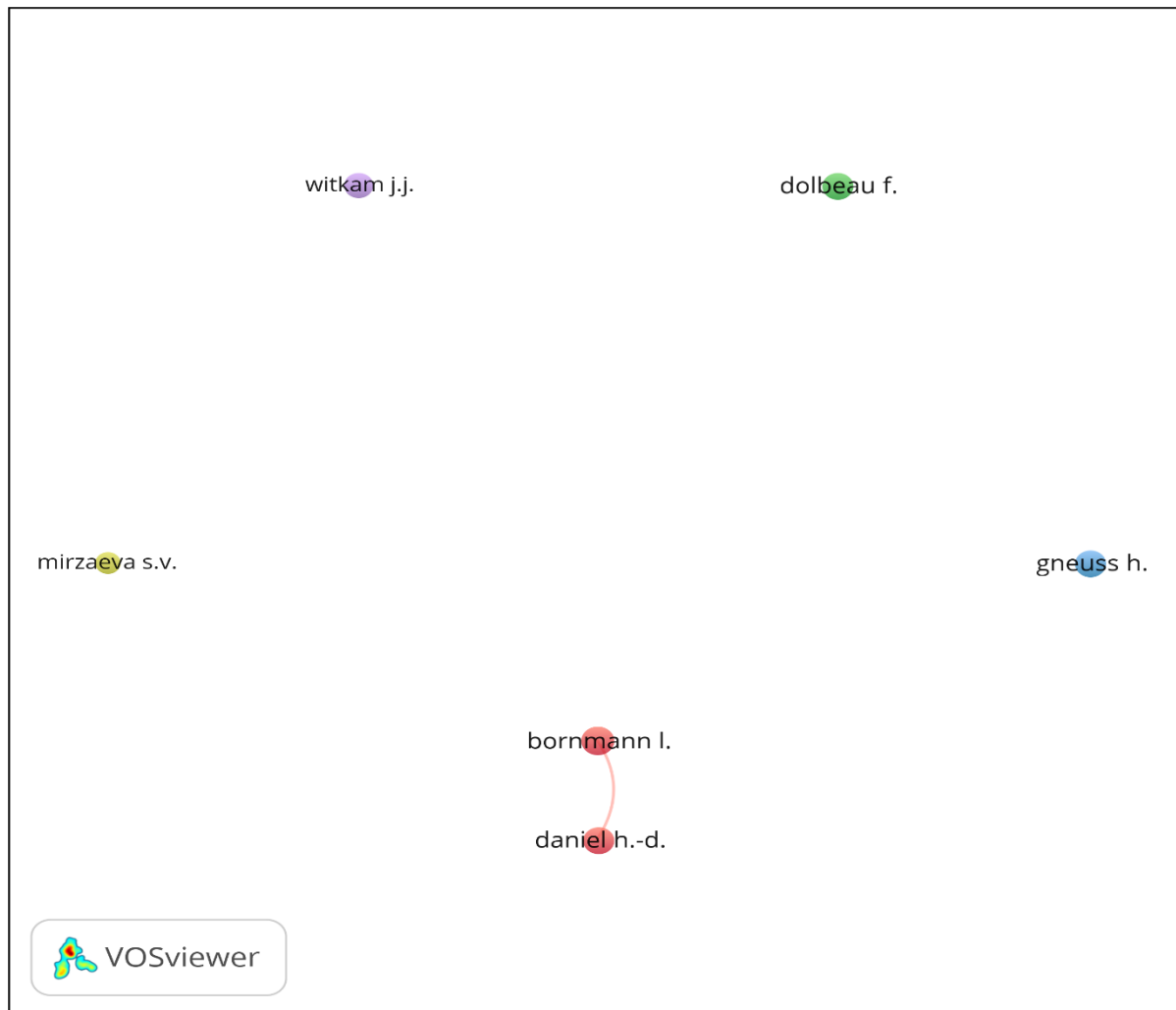
Top productive countries

It was found that ninety-nine (*n*=99) countries contributed unevenly in global research productivity on manuscripts in the field of social science. The countries were ranked according to the descending order of their total articles. It has been inferred from the data that United States has the highest number of publications with a total of 163 articles accounting for 14.35 per cent of the total publications in this field.

It revealed that United States of America (USA) is the bellwether in research productivity on manuscripts in the field of social science. The top 10 productive countries in a combined manner contributed with a proportion of 58.87 per cent (*n*=646) of the total publications denotes increasing in the collaborative research. A large number of publications by the top 10 productive countries denote that these countries have the greater advantages than the others. The countries/territories having the relative citation impact (RCI) less than one (*n*=1) indicates that the research output was not proportional with their impact. Mapping of research collaboration for the top 10 active countries yielded 4 clusters with 23 links and total link strength 49 (Figure 2; Table 7).

Table 7: Top ten productive countries

Top Productive Countries	TNP	%TNP	TNC	%TNC	CPP	RCI
United States	163	14.35	419	26.03	2.57	1.81
United Kingdom	105	9.24	187	11.61	1.78	1.26
Germany	78	6.87	147	9.13	1.89	1.33
Spain	61	5.37	81	5.03	1.33	0.94
Russian Federation	60	5.28	21	1.30	0.35	0.25
France	53	4.67	95	5.90	1.79	1.27
Italy	49	4.31	80	4.97	1.63	1.15
Netherlands	28	2.47	75	4.66	2.68	1.89
Switzerland	25	2.20	203	12.61	8.12	5.73
Belgium	24	2.11	49	3.04	2.04	1.44
Share of top 10 productive countries	**646**	**58.87**	**1357**	**84.28**	**2.10**	**1.44**
Global Productivity	**1136**	**100**	**1610**	**100**	**1.42**	**1.00**

*TNP= Total Number of Papers; TNC= Total Number of Citations; CPP= Citations Per Paper; RCI=Relative Citation Impact.

Top productive organizations

One thousand two hundred twenty-one (*n*=1221) organizations unevenly contributed in global research productivity on manuscripts in the field of social science. The organizations were ranked according to the decreasing order of their productivity. The results indicate that the top ten productive organizations share ranging 3≥6 publications. It has been inferred from the data that the top ten productive organizations in a combined manner contributed a proportion of 3.16 per cent (*n*=36) global share with receiving of 3.17 per cent citations (*n*=51). The analysis shows that Universidad De Granada, Spain dominated in research productivity on manuscripts with a proportion of 0.53 per cent (*n*=6) articles and accounting for 0.67 citations per paper (CPP). At the second position was Russian Academy of Sciences, Russian Federation with a proportion of 0.44 per cent publications (*n*=5). The resultant data shows that these organizations are the important research productive centre for manuscripts in the field of social science. The organizations having relative citation impact (RCI) less than one (*n*=1) indicates that the research output was not proportional with their impact (Table 8).

Table 8: Top ten productive organizations

Top Productive Organizations	TNP	%TNP	TNC	%TNC	CPP	RCI

Universidad De Granada, Spain	6	0.53	4	0.25	0.67	0.47
Russian Academy of Sciences, Russian Federation	5	0.44	2	0.12	0.40	0.28
University of Melbourne, Australia	4	0.35	1	0.06	0.25	0.18
Bar-Ilan University, Israel	3	0.26	3	0.19	1.00	0.71
Harvard University, United States	3	0.26	21	1.30	7.00	4.94
Hebrew University of Jerusalem, Israel	3	0.26	4	0.25	1.33	0.94
Institute of Oriental Studies, Russian Federation	3	0.26	0	00	00	0
Leiden University, Netherlands	3	0.26	6	0.37	2.00	1.41
Medrang Inc., Seoul, South Korea	3	0.26	6	0.37	2.00	1.41
Universidad De Murcia, Spain	3	0.26	4	0.25	1.33	0.94
Share of top 10 productive organizations	**36**	**3.16**	**51**	**3.17**	**1.41**	**1.00**
Global Productivity	**1136**	**100**	**1610**	**100**	**1.42**	**1.00**

*TNP= Total Number of Papers; TNC= Total Number of Citations; CPP= Citations Per Paper; RCI=Relative Citation Impact.

Top productive journals

Of the total publications (*n*=1136) retrieved, majority of articles (n=1083) published in journals, whereas, 49 articles published in book series and 4 numbers of articles were published in trade journals. As per the Bradford's Law, the journals were ranked according to the decreasing order of their productivity. The most productivity journal was *Journal of Islamic Manuscripts* with a proportion of 2.73 per cent articles (n=31) and 2.67 per cent citations (n=43) with citation impact of 1.39 citations per paper. At the second position was *Scriptorium* followed by *Zeitschrift Fur Deutsches Altertum Und Deutsche Literatur* with 24 articles each. The top 10 productive journals in a combined manner contributed with a proportion of 13.55 per cent (*n*=154) articles of the total. According to the analysis of the data, the top 10 productive journals received citations with a proportion for 20.38 per cent (*n*=328) of the total citations (*n*=1610) with an average citation impact of 2.13 citation per paper. The journals having relative citation impact (RCI) less than one (*n*=1) implies that the research output was not proportional with their impact (Table 9).

Table 9: Top ten productive sources

Top Productive Source	TNP	%TNP	TNC	%TNC	CPP	RCI
Journal of Islamic Manuscripts	31	2.73	43	2.67	1.39	0.98
Scriptorium	24	2.11	15	0.93	0.63	0.44
Zeitschrift Fur Deutsches Altertum Und Deutsche Literatur	24	2.11	2	0.12	0.08	0.06
Scientometrics	13	1.14	142	8.82	10.92	7.71
Heritage Science	11	0.97	84	5.22	7.64	5.39
Library Philosophy and Practice	11	0.97	9	0.56	0.82	0.58
Sefarad	11	0.97	17	1.06	1.55	1.09
Eikasmos	10	0.88	6	0.37	0.60	0.42
Notes and Queries	10	0.88	7	0.44	0.70	0.49

Analecta Bollandiana	9	0.79	3	0.19	0.33	0.24
Share of top 10 productive source	**154**	**13.55**	**328**	**20.38**	**2.13**	**1.50**
Global Productivity	**1136**	**100**	**1610**	**100**	**1.42**	**1.00**

*TNP= Total Number of Papers; TNC= Total Number of Citations; CPP= Citations Per Paper; RCI=Relative Citation Impact.

Figure 2: Network visualization map of research collaboration of top 10 productive countries (created by VOSviewer)

Important Keywords
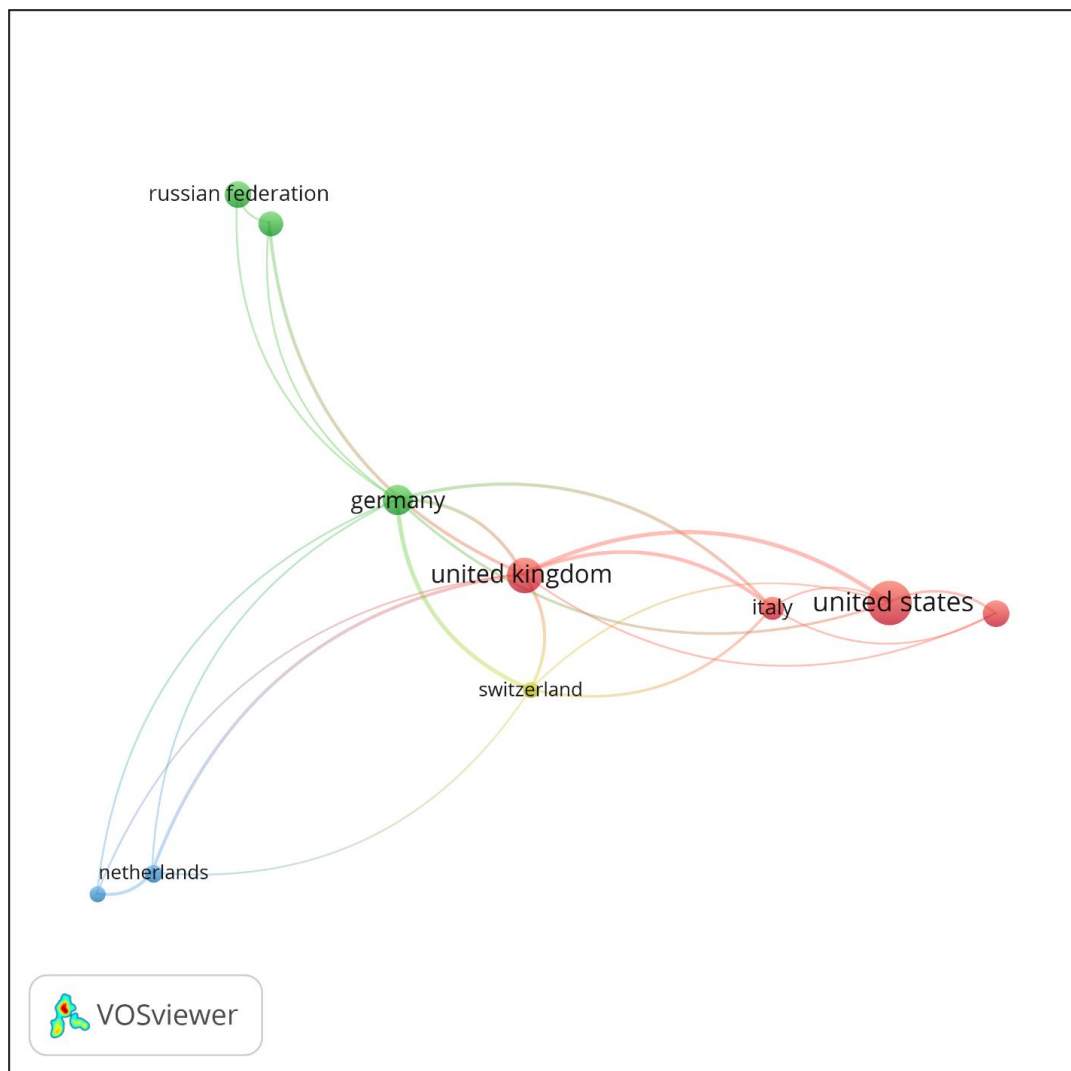
Keywords are considered as important indicators towards understanding research trends in the concerned area. Of the total 2881 keywords, 29 meet the threshold with minimum 5 occurrences yielded 6 clusters with 69 links and 112 total link strengths. The 29 identified keywords reflect the core contents of global publications on manuscripts and are represented in decreasing frequency of their occurrence in literature

during 2010-2020. It revealed that manuscripts (*n*=67), manuscript (*n*=48) and codicology (*n*=15) have been seen as the most productive keywords (Figure 3; Table 10).

Figure 3: Network visualization map of important keywords (created by VOSviewer)

Table 10: Important Keywords
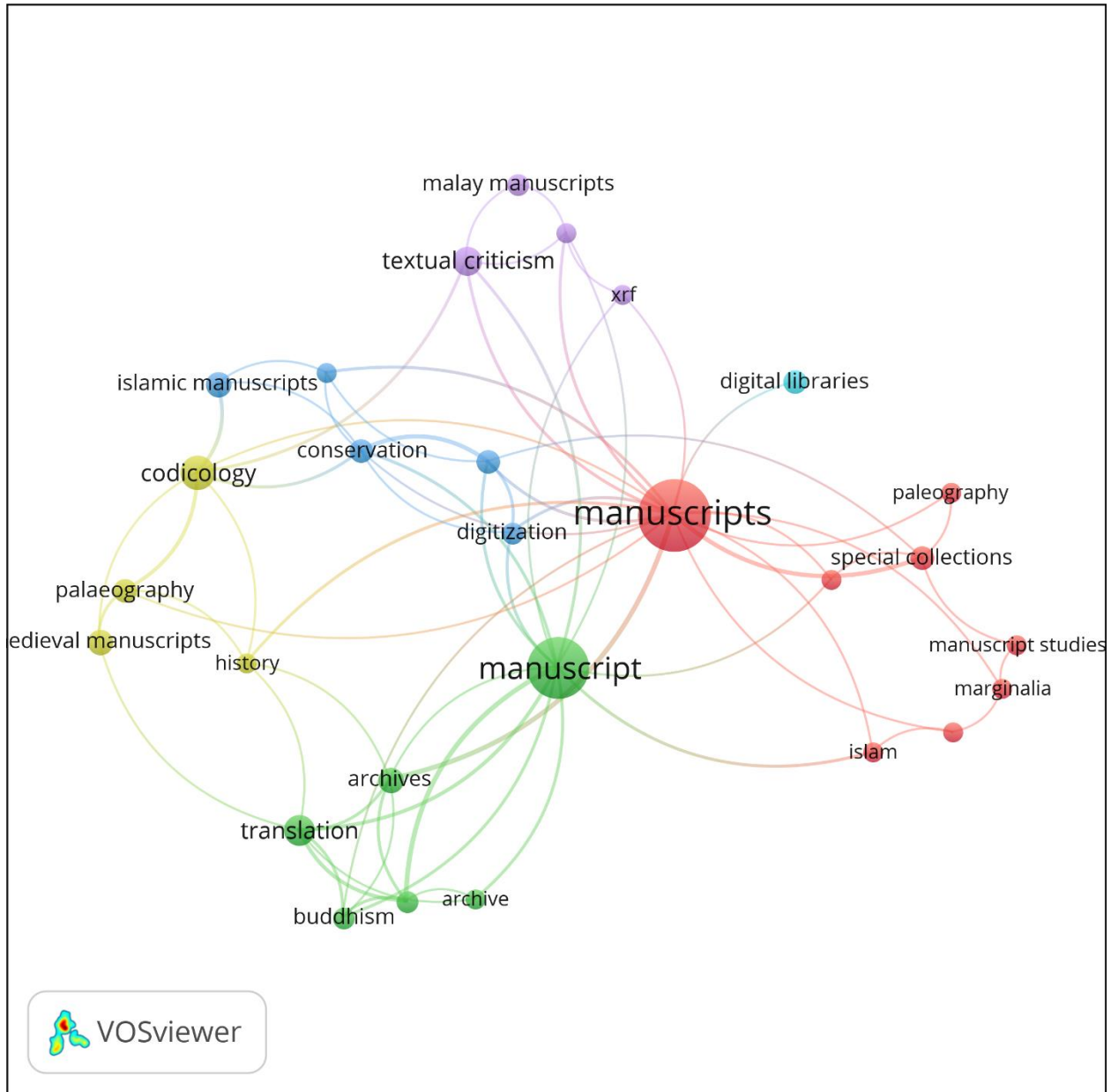
Keywords	Frequency	Total Link Strength
Manuscripts	67	32
Manuscript	48	26
Codicology	15	13
Translation	12	13
Textual Criticism	11	8
Islamic Manuscripts	9	5

Arabic Manuscripts	8	0
Archives	8	12
Medieval Manuscripts	8	4
Conservation	7	12
Digital Libraries	7	1
Palaeography	7	7
Preservation	7	12
Special Collections	7	8
Buddhism	6	8
Digitization	6	7
Illuminated Manuscripts	6	0
Malay Manuscripts	6	2
Tuva	6	13
Archival Materials	5	3
Archive	5	4
Education	5	5
History	5	6
Illumination	5	6
Islam	5	4
Manuscript Studies	5	2
Marginalia	5	3
Ottoman Empire	5	3
Xrf	5	3

Research Trends

The present study provides a quantitative and qualitative assessment of global research productivity on manuscripts in the field of social science. The study is based on 11 years' global research data (*n=1136*) on the topic sourced from Scopus database for the time span 2010-2020.

- The research productivity on manuscripts registered 17.21 per cent annual average growth and 6.36 per cent compound annual growth rate with an average citation impact of 1.42 citations per paper.
- The average number of authors per paper was 1.29 and the average productivity per author was 0.79.
- The resultant data indicates that the degree of collaboration ranges between 0.13≥0.24 and the overall degree of collaboration was 0.17.
- The Pearson correlation analysis inferred significant and positive relationship (r = 0.889, N = 11, p =0.000) between number of articles and the number of authors.
- The top ten author's productivity in combined manner shared a proportion of 4.04 per cent (*n=46*) papers of the total publication and accounting for 20.56 per cent (*n=331*) citations with a proportion of citation impact of 7.19 citations per paper. Bornmann L (h-Index = 52), Max Planck

Society, Germany with a proportion of 0.62 per cent (*n*=7) produced the highest number of articles and accounting for 9.26 per cent citations (*n*=149).

- It revealed that United States of America (USA) is the bellwether in research productivity on manuscripts in the field of social science with a total of 163 articles accounting for 14.35 per cent. The top 10 productive countries in a combined manner contributed with a proportion of 58.87 per cent (*n*=646) of the total publications denotes increasing in the collaborative research.

- It has been inferred from the data that the top ten productive organizations in a combined manner contributed a proportion of 3.16 per cent (*n*=36) global share with receiving of 3.17 per cent citations (*n*=51). The Universidad De Granada, Spain dominated in research productivity on manuscripts with a proportion of 0.53 per cent (*n*=6) articles and accounting for 0.67 citations per paper.

- The most productivity journal was *Journal of Islamic Manuscripts* with a proportion of 2.73 per cent articles (n=31) and 2.67 per cent citations (*n*=43) with citation impact of 1.39 citations per paper.

- Manuscripts (*n*=67), manuscript (*n*=48) and codicology (*n*=15) have been seen as the most productive keywords.

CONCLUSION

The study has provided a comprehensive macroscopic overview of global research trends concerning manuscripts in the field of social science. It revealed that there exhibits a significant growth in the research productivity during the recent years, in fact, it is necessary for the authors to collaborate for strengthening the international co-authorship patterns. The analysis denotes that there is an increase in the collaborative research work, therefore, the countries and organizations should increase the investments in research for promoting global research collaborations.

The outcome of the study may be used as useful baseline by the archivists, conservators, stakeholders and others who are interested in the manuscript collections for future research in the untouched domain of manuscripts.

Research limitations

The analysis relies on the metadata information extracted from the Scopus database in the field of social science; however, other valuable literatures on manuscripts relates to other disciplines have been excluded owing to the inherent challenge of topic search.

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