GLOBAL PLAGIARISM OUTPUT IN THE 21ST CENTURY: A BIBLIOMETRIC STUDY

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Plagiarism which can be viewed as stealing of others work without proper citation is one of the leading problems in this scholarly world. The problems related to plagiarism have been escalating more quickly around the globe. Many scholars and academics have elevated their concern about the rapid growth of plagiarism. The study was made to recognize the total growth of publications written on plagiarism by worldwide authors, most productive country, highly prolific authors etc. The data was extracted during the period of 2000-2018 from Web of Science database. A total of 2561 documents based on plagiarism were found and calculated. Most of the documents on plagiarism were published in the year 2017. Wiwanitkit, V was the highly prolific author by published 24 articles. 32 papers were produced by anonymous authors. English was the most preferred language for publication and the average author per paper is 0.51. The Single authored papers are predominant during the study period and it was also observed that most of the literature are in closed access platform.

Keywords: Plagiarism, Bibliometrics, Global Output, Citation Count, Co-authorship, Degree of Collaboration

INTRODUCTION

In the recent years plagiarism has become a stern problem among the research fraternity. The Oxford English Dictionary describes plagiarism as "literary theft." The verb "to plagiarize" defined as "to take the thoughts, writings, or creations of another person and use as one's own" and "to copy other's literary work or views without acknowledgement." In other words, plagiarism is the adoption of another person's ideas without giving proper credit (Velmurugan and Radhakrishnan, 2015). The virus of plagiarism has been escalating quickly around the globe. It has become one of the most serious aspects among the academic fraternity. The presence of plagiarism was found thousands of years back ago (Chauhan, 2018). Wager (2014) investigated about the existence of plagiarism in. AD 80 and informed that a Roman poet Martial claimed that his work was recited by other as his own. Fox (1946) also stated that the issues related to plagiarism had come into existence about two thousand years ago and it rapidly increased with the use of printing. Martinson et al. (2015) stated that plagiarism or scientific misconduct is a rising concern, not only among

the research but also among the society as a whole. Maurer et al.,(2016) stated that plagiarism has arisen historically as long as humans have been creating science and research. Cunha (2018) defines plagiarism as, if anyone steal from one author, it is plagiarism; if he/she steal from many, it's called research.

Bibliometric study is the only available technique to measure the research output of an author, institute, nation or a specific subject area. In this study, an effort is made here to measure the worldwide research output on 'plagiarism' by using the concept of bibliometrics.

LITERATURE REVIEW

Heitman and Litewka (2011) studied the international perspective on plagiarism regarding the institutional trainees in US. The study reveals that in the US, half of the international trainees are from India, Japan, China etc. They are lagging behind from the US standards due to their language problem which encourages the trainees for committing plagiarism in their writings. Anderson and Steneck (2011) explored the problem of plagiarism. The authors opined that the researchers should acknowledge all the works they referred to take proper safety measures & also emphasized that without acknowledging of the original sources it is the misinterpretation of other's ideas and is a severe violation of norms of science. Singh and Guram (2014) analyzed the knowledge and attitude of dental professionals of North India towards plagiarism. The authors noticed the absence of knowledge of plagiarism in developing minds of growing children, so authors have an opinion that they should be made aware of such unethical and immoral act in their school time to curb plagiarism at its root. Juyal et al. (2015) investigated about plagiarism and its

egregious effect of misconduct. The authors opined that publishing scholarly articles is a vibrant tool for the academic fraternity for their promotion and career advancement & explored about the types of plagiarism like technical plagiarism, self-plagiarism etc. and concluded that to the researchers plagiarism is a peril and is deplorable in any form. Velmurugan and Radhakrishnan (2015) carried out bibliometric study on the articles indexed in Web of Science during 2010-2014. The authors retrieved 795 records and observed that the year 2013 was the most productive year with 182 papers and the most favored journal was Current Science. Of the total publication, USA published 200 articles and ranked at the top of the list. Kokol, et al. (2016) researched the issue of self-plagiarism through a bibliometric analysis. The authors undertook 313 records of information sources written in English language during 1946-2015.The Study revealed that USA was the most productive country with 84 publications, followed by United Kingdom (30).The authors observed a trivial decrease in the records containing self-plagiarism after 2012. Chauhan (2018) studied research on plagiarism in India during 2002-2016. The author found a total of 385 publications all over India. The highest average citation per publication i.e. 4.7 was seen during the period 2007-2011 & single authored papers were most predominant. The trend of multi authored papers increased with every passing year.

RESEARCH GAP

The related works carried out in this subject matter are very much important but no study has been undertaken to envisage the productive publishers who published most of the works related to plagiarism as well as the global prolific

authors with the citations received by them who are inclined towards writing on this subject matter. This work will also highlight the accessibility of the literature based on plagiarism which will prove to be a new finding in this research work.

OBJECTIVES OF THE STUDY

The objectives of the study are to:

1. visualize the year-wise research publication on plagiarism in the 21st century;

2. recognize the form of documents;

3. examine the most prolific authors in terms of publication and citations received;

4. identify the authorship pattern and degree of collaboration;

5. rank the top 10 productive journals according to publications;

6. envisage the productive publishers who published most of the works on plagiarism;

7. discover the geographic distribution of publications;

8. explore the language wise distribution of works on plagiarism;

9. understand the accessibility of the literatures based on plagiarism i.e. whether open or closed access.

SCOPE AND METHODOLOGY

The bibliographic data on plagiarism was collected on 21st March 2019 from Web of Science (WOS) core collection provided by Clarivate Analytics which was formerly the Intellectual Property and Science division of Thomson Reuters. The study covered a time span of 19 years from 2000-2018. The related publications were extracted by executing the search term plagiarism on topic field (TS=plagiarism) and the refined data has exported for further analysis. Microsoft Excel 2016 was used for analysis and to identify and visualize the co-authorship pattern, bibliometric software VOS viewer (Van Eck and Waltman, 2010) was used to visualize the co-authorship pattern.

ANALYSIS AND DISCUSSIONS

Year wise growth of literature on Plagiarism

During the period of study, a total of 2561 articles have published on plagiarism with an average of 135 articles per year. The table.1 exposes that in the year 2000 only 24 articles have published on plagiarism after that an upward slopping has found in this research area. This finding also clearly depicts that 2017 was the most productive year with 284 publications, followed by the year 2018 (265), 2016 (245) and so on.

Table 1: Year wise growth

| Year	Publications	Cumulative Growth	Contributions in Percentile
2000	24	24	0.94
2001	31	55	1.21
2002	72	127	2.81
2003	47	174	1.84
2004	59	233	2.30
2005	79	312	3.08
2006	76	388	2.97
2007	91	479	3.55
2008	127	606	4.96
2009	130	736	5.08
2010	130	866	5.08
2011	151	1017	5.90
2012	181	1198	7.07
2013	174	1372	6.79
2014	152	1524	5.94
2015	243	1767	9.49
2016	245	2012	9.57
2017	284	2296	11.09
2018	265	2561	10.35
Total	2561	2561	100.00
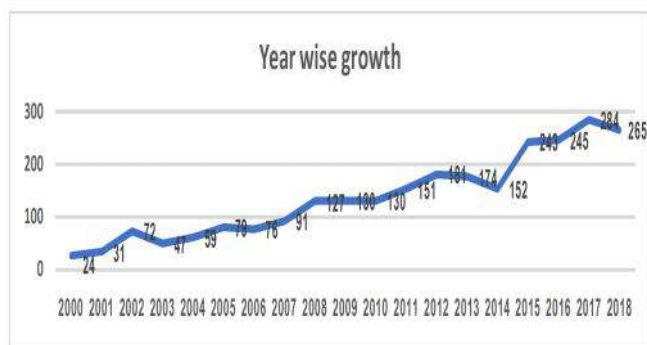
Fig. 1: Year wise distribution

Form of literatures

Out of 2561 literature published on plagiarism, it seems that majority of the authors are interested to publish their writings in the form of articles i.e. 59.74%. 17.65% of the publications are in the form of Editorial Material, followed by Letter (8.16%), Book Review (5.43%), Review (2.69%) etc.

Table 2: Form wise distribution of publications

Document type	No. of literature
Article	1530
Editorial Material	452
Letter	209
Book Review	139
Review	69
Conference Proceedings	60
News Item	48
Meeting Abstract	24
Correction	13
Note	5
Retraction	4
Biographical-Item	2
Poetry	2
Reprint	2
Book Chapter	2

Top 5 prolific authors: publication wise

Figure 2 shows that 32 articles are published by Anonymous authors and Wiwanitkit, V was the most productive author with 24 articles and ranked 1st position, followed by Roig, M with 13 articles and Joob, B. with 8 articles. Shi, L., Landau, JD and Hu, GW have published 6 articles each and grabbed 2nd to 5th position
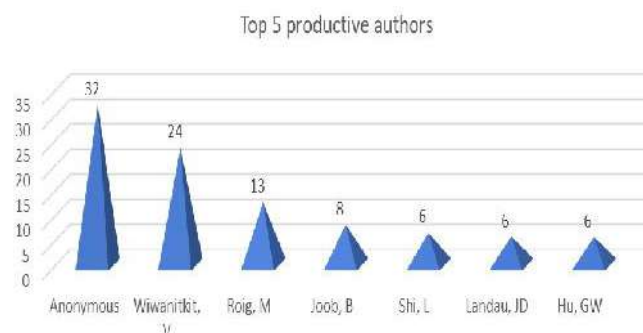

Fig. 2: Top 5 Productive authors

Prolific authors according to citations received

The study depicts that though the author Roig, M is in the second position according to the publications but in terms of citation received by the authors, he is in top of the list by which it can be interpreted that the author has made more qualitative works. He has received 289 citations followed by Shi, L. (282), Green, SP (278), Li, YY (268). Hu, GW is in 5th position with 261 citations. But on the contrary if we calculate in terms of citation per article, then it is clearly visible that Green, SP was in the top list by receiving 278 citations for only one article.

Table 3: Most prolific authors- citation wise

Name of author	No. of articles	Citations received	Citation per article	Rank
Roig, M	13	289	22.23	1st
Shi, L	6	282	47	2nd
Green, SP	1	278	278	3rd
Li, YY	5	268	53.6	4th
Hu, GW	6	261	43.5	5th

Figure-2: Growth of Average citations/w

Authorship pattern of publications

It is observed that in the field of plagiarism, 4986 authors have contributed 2529 literature. The average author per paper was 0.51. Majority of the papers were contributed by single authored (i.e. 1372), followed by two authored papers (537). The next place was recorded by three authored papers (301), followed by four authored papers (158). Least number of publications (80) were published by more than five authors. It indicates that solo research was predominant in the field of plagiarism. It should be noted that there were 32 papers published by anonymous authors that is why their authorship pattern is unknown, and these papers were excluded for this calculation.

Table 4: Authorship pattern

Year	P*	Type of Authorship						TO*	AA**
		1	2	3	4	5	>5		
2000	24	6	10	4	0	1	3	62	0.39
2001	31	9	9	5	5	2	1	78	0.40
2002	72	44	13	7	6	0	2	127	0.57
2003	45	29	3	9	1	2	1	82	0.55
2004	58	31	11	10	6	0	0	107	0.54
2005	79	40	13	13	4	5	4	174	0.45
2006	75	33	14	10	12	2	4	176	0.43
2007	91	45	25	11	3	3	4	180	0.51
2008	127	48	35	20	12	5	7	306	0.42
2009	127	63	31	16	7	5	5	268	0.47
2010	129	65	30	22	5	3	4	255	0.51
2011	147	70	33	17	9	12	6	329	0.45
2012	177	94	41	23	12	4	3	343	0.52
2013	172	111	30	21	1	4	5	300	0.57
2014	151	97	26	13	8	2	5	268	0.56
2015	240	152	46	18	11	6	7	434	0.55
2016	242	122	46	29	20	16	9	516	0.47
2017	279	165	57	25	19	4	9	519	0.54
2018	263	148	64	28	17	5	1	462	0.57
Total	2529	1372	537	301	158	81	80	4986	0.51

P* = Publications; TO* = Total Occurrences;
AA** = Average authorship

Research Collaboration

The degree of authorship collaboration is determined by applying a mathematical formula given by Subramanyam (1938). The following formula was considered:

$$DC = Nm / (Nm + Ns)$$

Here, DC replicates the degree of author collaboration, Nm is the number of Multiple authored papers and Ns represents the number of single authored papers.

Degree of Collaboration (DC) =

$$1157/ (1157+1372) =0.46$$

The articles by anonymous author are not included in degree of collaboration because of their unknown authorship.

Table 5: Collaboration of research

| Year	Total	Single	Two authors	More than two authors	Degree of Collaboration
2000	24	6	10	8	0.75
2001	31	9	9	13	0.71
2002	72	44	13	15	0.39
2003	45	29	3	13	0.36
2004	58	31	11	16	0.47
2005	79	40	13	26	0.49
2006	75	33	14	28	0.56
2007	91	45	25	21	0.51
2008	127	48	35	44	0.62
2009	127	63	31	33	0.50
2010	129	65	30	34	0.50
2011	147	70	33	44	0.52
2012	177	94	41	42	0.47
2013	172	111	30	31	0.35
2014	151	97	26	28	0.36
2015	240	152	46	42	0.37
2016	242	122	46	74	0.50
2017	279	165	57	57	0.41
2018	263	148	64	51	0.44
Total	2529	1372	537	620	0.46
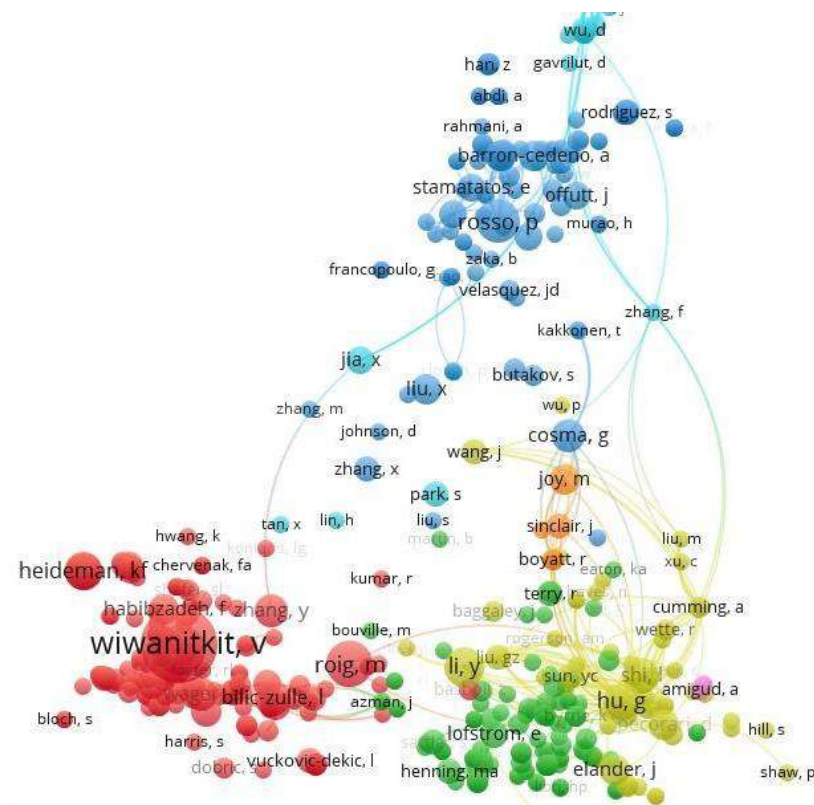
Fig. 3: Co-authorship pattern

Top ten productive journals

It displays the highly productive journals based on number of literatures published therein. The journal named *Nature and Science and Engineering Ethics* both have the maximum number of publications i.e. 45 which proves that the authors chose these journals for publishing their articles on this subject area. *Current Science* which published 28 articles ranked in the 2ⁿᵈ position. Third position is occupied by *Ethics & Behavior* and *Journal of Second Language Writing*. Both published 27 articles each. The journal *Lancet* has published only 14 records and ranked in the 10th position.

Table 6: Journals according to publications

| Name of the Journals	No. of Publications	Rank
Nature	45	1
Science and Engineering Ethics	45	1
Current Science	28	2
Ethics & Behavior	27	3
Journal of Second Language Writing	27	3
Journal of Academic Ethics	25	4
Assessment & Evaluation in Higher Education	22	5
Science	22	5
Accountability in Research-Policies and Quality Assurance	18	6
Journal of English for Academic Purposes	17	7
Studies in Higher Education	17	7
Computers & Education	16	8
IEEE Transactions on Education	16	8
American Journal of Roentgenology	15	9
International Journal for Educational Integrity	15	9
Lancet	14	10
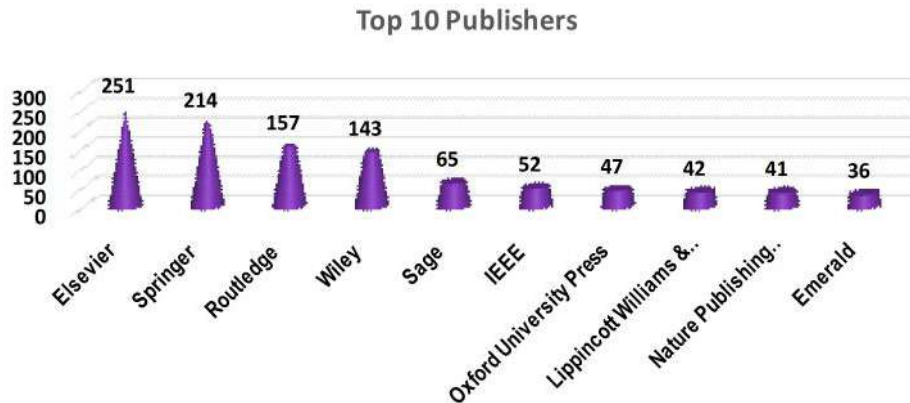
Fig. 4: Top 10 publishers

In total there are 663 publishers who have published 2561 papers based on plagiarism. Amongst them, the first position is taken by Elsevier with 251 papers followed by Springer (214), Routledge (157), Wiley (143). Out of the top ten publishers, Emerald has published only 36 papers and is in bottom of the list.

Geographic distribution

The table 7 portrays the country-wise distribution of plagiarism research productivity in the worldwide. The United States of America is the highly productive country with 981 papers, followed by England (628), Netherlands (214), Germany (81) etc. The share of India in the global research output was 71 papers and stands in the 5th position and rest of the countries have contributed less than 50 papers.

Languages used by the authors

The table 8 shows the global research output on plagiarism was scattered among 22 languages. Out of which English was the most favored language by the authors. 88.25% of the total literature was published in English, 3.36% in Spanish, 2.15% in French, 1.75% in German etc. There is only one article published in each of the language like Afrikaans, Chinese, Czech and Japanese.

Table 7: Top 10 countries

Name of the country	No. of literatures	Rank
USA	981	1
England	628	2
Netherlands	214	3
Germany	81	4
India	71	5
Spain	48	6
France	47	7
Canada	43	8
Brazil	42	9
Croatia	31	10

Table 8: Preferred languages

Language	No. of publications	Language	No. of publications
English	2260	Catalan	3
Spanish	86	Croatian	3
French	55	Hungarian	2
German	45	Korean	2
Russian	29	Lithuanian	2
Portuguese	22	Rumanian	2
Italian	14	Slovene	2
Turkish	12	Afrikaans	1
Polish	7	Chinese	1
Dutch	6	Czech	1
Slovak	5	Japanese	1

Accessibility of Literatures

The table 9 demonstrates that out of 2561 documents published on plagiarism worldwide, majority of the documents i.e.1897 (74.07%) were not available in open access platforms. Only 664 (25.93%) documents were available in open access platform which reveals that the research fraternity is inclined more towards closed access publications probably because of the impact factor of the journals and their reputation in publications. Also reputed publishers have very less open access policy and therefore authors are bound to publish in closed access platform.

Table 9: Open vs. Closed access

Accessibility	No. of literatures
Closed Access	1897
DOAJ Gold	274
Bronze	182
DOAJ Gold, Green Published	72
Green Published	46
Other Gold	28
Green Accepted	16
Other Gold, Green Published	14
Green Published, Other Gold	11
Bronze, Green Published	8
Bronze, Other Gold	5
Green Published, Bronze	4
Green Accepted, Bronze	2
Bronze, Green Accepted	1
Green Accepted, Green Published, Bronze	1

CONCLUSION

This work concludes as an outcome of findings of the research output on Plagiarism in global scenario. A total of 2561 articles have been published on this subject area with an average of 135 articles per year and a significant upward slopping has found throughout the years. The year 2017 can be regarded as the most productive year with huge number of publications. Majority of the authors are interested to publish their writings in the form of articles (59.74 %). The finding also shows that 32 of the publications are published by Anonymous authors and Wiwanitkit, V is the most productive author with 24 articles and ranked 1st position. But in terms of citation received by the authors, Roig, M is in top of the list by which it can be interpreted that the author has made more qualitative works though ranked 2nd in terms of publications made. But again, on the contrary if we calculate in terms of citation per article, then it is clearly evident that Green, SP will be in the top list by receiving 278 citations in only one article. A total of 4986 authors have contributed 2529 literature and the average author per paper is 0.51. The total number of articles during this study period is 2561 but the authorship of 32 articles are unknown as these are written by anonymous authors and these are excluded in case of authorship calculation. Majority of the papers were contributed by single authors which indicates that solo research is more predominant in this area of work and the degree of collaboration is 0.46. The journals named 'Nature' and 'Science and Engineering Ethics' are the highly productive journals by publishing maximum number of articles which proves that the authors chose these journals for publishing their articles on this subject area. It displays the highly productive journals based on number of literature published therein. The journal named 'Nature' and 'Science and Engineering Ethics' both have the maximum number of publications i.e. 45 which proves that the authors chose these journals for publishing their articles on this subject area. Most of the publications on this topic

are done by popular publishers like Elsevier, Springer, Routledge, Wiley, Sage etc. It is also observed that the United States is the highly productive country in the world with 981 papers and the share of India in this global research output is very minimal i.e. 71 papers and stands in the 5th position when compared to other countries. These research outputs on plagiarism is scattered among 22 languages, out of which English is the most favored language by the authors. Finally, the present study accomplishes that majority of the faculty members are inclined towards publishing in closed access platform due to the journal policy laid down by the high impact factor journals from reputed publication houses. This type of study thus helps the research fraternity to discover research output in any of the subject area as well as the noteworthy publications.

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