

Collaboration rate of authors in producing scientific papers in the International Journal of Nonlinear Analysis and Applications(IJNAA) during 2010-2018

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Abstract

In this article, we determine authors' collaboration in The International Journal of Nonlinear Analysis and Applications (IJNAA) for the period of 2010 to 2018. The findings of this survey has shown that a total of 295 articles by 624 people were published. The average number of authors per article was 2.1. The result also denotes that according to affiliation and country, Iran, with 304 articles, ranks first amongst other countries that have papers published in IJNAA followed by India and Morocco with 66 and 45 articles respectively, in following rankings for publishing articles in IJNAA. Findings showed that only 71 articles has single author (from total of 295 articles). The average collaboration coefficient amongst authors of IJNAA is 0.4, which is considered acceptable.

Keywords: Scientometric, The International Journal of Nonlinear Analysis and Applications (IJNAA), Collaboration rate, Authors collaboration coefficient

1. Introduction

The growth of collaborative researches in all scientific areas, will improve the quality and scientific validity of works, and will alleviate the possibility for human errors. Doing such researches

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on collaboration rate in scientific journals will help the editors and chief editors gaining information regarding authorship in journals. A handful of researches on the collaboration rate have been carried out in recent years such as [1], [2], [3], [4], [5] and [7].

The main objective of this article is to survey the rate of collaboration of IJNAA authors in producing scientific articles during the 2014-2018 period. Other objectives of the article are as follows:

- A. Studying the number of articles and authors in IJNAA during the 2014-2018 period.
- B. Determining which countries have most published articles and scientific productions in IJNAA.
- C. Investigating in which years the highest level of collaboration took place across all published articles in IJNAA.
- D. Finding what is the average of the authors' collaboration coefficient in IJNAA.

The Scienometric method has been used in this study. At first all papers of IJNAA has been downloaded from the journal website. The required data collected from 2010 to 2018 were entered in an Excel software spreadsheet. And finally, author's collaboration coefficient was computed using the following formula:

$$cc = 1 - \left\{ \sum_{j=1}^k \left(\frac{1}{j} \right) * \frac{F_j}{N} \right\} \quad (1.1)$$

In this formula:

F_j = the number of j -authored research papers published in a discipline during a certain period of time;

j = the numbers of authors (1 author, 2 authors, 3 authors. . .)

N = the total number of research papers published in a discipline during a certain period of time;

K = the greatest number of authors per paper in a discipline [6].

2. Findings

A. The Number of articles and authors in IJNAA during years 2014-2018

Findings of this research are illustrated in the following tables. As shown in table 1, total of 295 articles by 624 people were published during 2010 to 2018 period.

Table 1: The distribution of the articles and authors of IJNAA

Year	Number of articles	Number of authors	The average of authors per article
2010	18	34	1.9
2011	24	40	1.7
2012	20	50	2.5
2013	20	47	2.4
2014	25	47	1.9
2015	30	68	2.3
2016	59	114	1.9
2017	60	131	2.2
2018	39	93	2.4
Sum	295	624	2.1

It seems that up until 2015, IJNAA had a steady rate for the number of published articles and has published articles with almost low variance. After 2015, the number of articles per volume has increased. The noteworthy point is that the number of authors in IJNAA is almost double the number of articles. Findings showed that the average ratio of authors per article was 2.1.

B. Countries which have most published articles and scientific productions in IJNAA

The distribution of number of published documents in IJNAA based on the country name can be observed in table 2. According to affiliation and country data, Iran, with 304 articles, has the first rank among the other countries which have published papers in IJNAA. India and Morocco with 66 and 45 articles respectively, are in the next ranks for publishing articles in IJNAA.

Table 2: The distribution of number of published documents in IJNAA on the country name and affiliation basis

Country/affiliation	Number of published documents in IJNAA	Country/affiliation	Number of published Documents in IJNAA
Africa	1	Malaysia	2
Albania	2	Mexico	1
Algeria	18	Morocco	45
Australia	2	Nigeria	6
Austria	1	Pakistan	11
Cameron	1	Palestine	5
Canada	1	Poland	1
China	17	Romania	11
Colombia	1	Saudi Arabia	4
Egypt	9	Serbia	7
France	1	South Africa	4
Frane	2	Spain	1
Ghana	1	Thailand	10
Greece	23	Tunisia	1
India	66	Turkey	22
Iran	304	UAE	1
Iraq	3	United Kingdom	1
Jordan	1	USA	16
Korea	15	Venezuela	1
Kosovo	1	Viet Nam	4
Sum	470	Sum	154

C. Highest collaborations amongst authors who published articles in IJNAA, based on the publish year

Distribution of collaborations amongst authors who published articles in IJNAA is available on table 3. Findings showed that only 71 articles have single author (from total of 295 articles which have been published in IJNAA) and 224 articles have 2 authors or more.

Table 3: Distribution of collaboration amongst authors who published articles in IJNAA

Year	Articles					Sum
	1 author	2 authors	3 authors	4 authors	5 authors and more	
2010	5	10	3	0	0	18
2011	11	10	3	0	0	24
2012	1	10	7	2	0	20
2013	3	10	5	1	1	20
2014	8	11	6	0	0	25
2015	8	7	12	2	1	30
2016	19	27	12	1	0	59
2017	10	32	16	1	1	60
2018	6	15	15	3	0	39
Sum	71	132	79	10	3	295

D. The average of the authors' collaboration coefficient in IJNAA

In table 4, collaboration coefficient among the authors of articles which were published in IJNAA is shown for distinct publish years.

Table 4: Authors average collaboration coefficient in IJNAA

Year	Collaboration coefficient
2010	0.4
2011	0.3
2012	0.6
2013	0.5
2014	0.5
2015	0.4
2016	0.4
2017	0.4
2018	0.5
Sum	0.4

The authors' collaboration coefficient is a number between zero and one. When this number is above 0.5, collaboration amongst authors is more evident. And when the number is close to zero, it signifies that lower levels of collective cooperation exists among the authors [6].

The remarkable point is that producing scientific papers on the field of mathematics is not easy and as we see in table 4, the average collaboration coefficient among the authors of IJNAA is 0.4 which is an acceptable value.

3. Conclusions and remarks

The findings of this study and its comparison with similar researches concerning the collaboration among authors in various subject areas, corroborate the assumption that, collaboration amongst

specialists in a subject area is superior to individual efforts.

The findings of this survey showed that in IJNAA, total of 295 articles by 624 authors have been published during 2010 to 2018. The average ratio of authors per article was 2.1. Whereas comparing this number with the results for the average authors in field of Islamic Law and Jurisprudence (1.9) shows slight advantage [2]. Although, comparing with other researches such as Marefat et al. [3] in the clinical psychology (3.35) and also Marefat et al. [3] in Iranian Journal of Psychiatry and Clinical Psychology (3.2), denotes a smaller figure.

Apparently after 2015, the number of articles per volume has increased in IJNAA. The notable point is that the number of authors in IJNAA is almost double the number of articles, whereas in other articles and for different years ([2] and [3]), the number of articles and authors are uncorrelated, and there's no relationship between the number of articles and authors.

Result also shows that according to affiliation and country, Iran, with 304 articles, ranks first amongst other countries that have papers published in IJNAA followed by India and Morocco with 66 and 45 articles respectively, in following rankings for publishing articles in IJNAA. In the case of determining the collaboration amongst authors, the findings of the research showed that the superiority is for group articles so that only 71 articles has single author (from total of 295 articles) and at least 224 articles have been created in groups (by more than one author). Also according to the Ajiferuke [6], the coefficient of cooperation among authors has been a little lower than average (0.4). Although the collaboration coefficients among the authors, separated by years (excluding 2011 which is 0.3) indicates values in range of 0.4 and 0.6. According to Gaud et al. [9] highest modified collaboration coefficient was 0.54 and Marefat & Arabian [8] reported the collaboration coefficient of Gas hydrates authors average 0.4, while Verma et al. [10] determined 0.34, the average coefficient of collaboration amongst authors of IJNAA is 0.4 which is an acceptable value.

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