

Real Scientific Index (RSI): A Totally New Approach in Quantifying the Real Academic Value of an Author in the Contemporary Literature

Masoud Nashibi¹, Amin Nashibi², Seyed Amir Javadi³, Zahid Hussain Khan⁴

¹ Department of Anesthesiology and Critical Care, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

² School of Industrial Engineering, Iran University of Sciences and Technology, Tehran, Iran

³ Department of Neurosurgery, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran

⁴ Department of Anesthesiology and Critical Care, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran

Customarily, an author's credibility is assessed by an h-index, which reflects, in fact, the citations to his/her publications (1).

In order to overcome the evaluation of quality, which is highly subjective, we offer a formula that correctly evaluates the qualitative status of an author by employing quantitative indices. This makes the task easier for an evaluator as the quantitative assessment is always correct and unbiased.

In a Scientific Index (SI) (2) for instance, the total number of articles and total citations are taken into consideration to evaluate an author's scientific value as depicted in the formula:

$$SI = (\text{Total citations} \times \text{Total articles}) / 1000$$

Both of the above methods are easy to assess but fail to exactly pinpoint the potential value of a published paper and the scientific place of an author in the literary circles.

We suggest a Real Scientific index (RSI), which in fact, covers all aspects related to the author's ranking and his/her entire published papers.

In order to measure this index, it is essential to

calculate a Scientific Score (SS). In the SS, all aspects pertaining to the author and the published article such as type of the paper, type of the journal and its Impact Factor (IF), the place of the author among the authors appearing in the list, number of citations if any, and the total number of publications attributed to the author are taken into consideration. We estimate that such a formula would pave the way for academicians in universities to have an unbiased verdict regarding the potential place of a faculty member. The new formula is:

$$SS = (\text{Modified citations} \times R \times A \times \text{Modified IF}) / 100.$$

To clarify further, the terms used in the formula are elaborated as:

$$\text{Modified citations} = 1 + \text{citations}.$$

If the citations of a person are zero (0), and as a result, the nominator and the SS reach a value of zero, the phrase modified citation is being utilized in the above-mentioned formula.

Again "R"=Real Author Ranking, wherein the author real position in the publication is calculated in table 1.

Table 1. Real author ranking related to authors' position in the article

Authors' Position	"R" Score
First author	2
Corresponding author	2
2 nd author	1.5
3 rd and subsequent authors	1.2
1 st author who happens to be a corresponding author	3
2 nd author who happens to be a corresponding author	2.5
3 rd and subsequent authors who happen to be corresponding authors	2.2

R: Real

The type of article is being depicted as "A" in the formula, and the scores allocated for the types of articles appear in table 2.

Randomized clinical trials (RCTs) and their results have evidently an enormous impact on the management

of patients and should be given due consideration. A trial designed with several biases that are correctly reported should preferably receive a high-quality score. An RCT or a systematic review with a level 1 evidence should have the same score as appears above.

Corresponding Author: Z. Hussain Khan

Department of Anesthesiology and Critical Care, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran
Tel: +98 21 61192637, Fax: +98 21 66581537, E-mail address: kxanzh51@yahoo.com

Table 2. Articles' types and scores obtained A: Article

Articles' Type	"A" Score
Level one evidence Randomized Clinical Trial (RCT)	4
Systematic review / meta-analysis on the basis of level 1 evidence RCT	4
Quasi Randomized Clinical Trial (RCT)	3
Cohort Study	2.5
Case-Control Study	2.5
Case Series	2
Ordinary systematic review or Narrative review	2
Case Report	1.5
Letter, Ideas, Editorial, Opinion, Commentary,	1

A; : Article

In order to evaluate a journal's value, Impact Factor (IF) is taken into consideration in the formula. As some journals do not possess an IF and receive a zero score in the formula, SS score will be zero for the author, a modified IF for such cases has been suggested as follows:

$$\text{Modified IF} = 1 + \text{IF}$$

An SS provides us with the scientific credibility of an author and could be of enormous value. We have tried to assess the scientific value of an author by carving out the RSI of an author as:

$$\text{RSI} = \text{Summation Of total SS}$$

To elucidate the proposed formula, we quote an example of an anonymous author who has three publications as follows:

In the first publication, the author is the first author (R=2), type of article being systematic review (A=4), IF of the journal is 2 (Modified IF=3), and it has 5 citations (Modified Citation=6). Thus the SS₁ calculated as :

$$\text{SS}_1 = 6 \times 2 \times 4 \times 3 / 100 \rightarrow \text{RSI}_1 = 144 / 100 \rightarrow \text{SS}_1 = 1.44$$

The situation of his/her second publication will be

as:

In this case, the author is a corresponding author (R=2), it is a cohort study (A=3), with a journal's IF of 4 (Modified IF=5), and those who had cited it was 3 (Modified Citation=4). Thus in this particular case, the calculated SS₂ will be as follows:

$$\text{SS}_2 = 4 \times 2 \times 3 \times 5 / 100 \rightarrow \text{SS}_2 = 120 / 100 \rightarrow \text{SS}_2 = 1.2$$

The same author had a third publication with its particulars as follows:

The author here was both the first author and the corresponding author (R=3); it was a randomized clinical trial (A=3.5), with the journals IF as zero (Modified IF=1) with no citation, so far (Modified Citation=1). Thus, the RSI calculated for this particular publication would be as:

$$\text{SS}_3 = 1 \times 3 \times 3.5 \times 1 / 100 \rightarrow \text{SS}_3 = 10.5 / 100 \rightarrow \text{SS}_3 = 0.105$$

The RSI for this anonymous author who had three publications would be calculated as:

$$\text{RSI} = \text{SS}_1 + \text{SS}_2 + \text{SS}_3$$

$$\text{RSI} = 1.44 + 1.2 + 0.105 = 2.745 \text{ as depicted table 3.}$$

Table3. Anonymous author's publications, SS and RSI

No.	Anonymous Author		RSI
	Title	SS	
1	1 st publication	1.44	2.745
2	2 nd publication	1.20	
3	3 rd publication	0.105	

Having adequately addressed and incorporated all the items pertinent to the academic credibility and status of the researcher in the newly evolved mathematical index, we conclude and honestly feel that the RSI would pave the way for academicians to correctly gauge a researcher's scientific status.

References

1. Hirsch JE. An index to quantify an individual's scientific research output. Proc Natl Acad Sci 2005;102:16569-72.

2. Khan ZH, Nashibi M, Javadi SA. Scientific index: a complementary scale for the h-index. BMJ Evid Based Med 2018;23:118.