

Proposed Mathematical equations for evaluation the quality of scientific author outputs

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Abstract

Scientific publications at national and international levels are an important approach to gain recognition as experts or scientists in a specific field . The aims of the current work to illustrate new methods or ideas for evaluations of scientific authors quality, this work will illustrate the current methods used for author quality evaluations such as total citations, H-index, g-index, no. of publications, journal impact factor ----etc, However, the benefits and *limitations of these methods will be discuss in details in addition to illustrate new equations as suggestions for calculate the quality of authors as a whole using all his scientific activities such as no. of publications (with Scopus, ISI and others), H-index, the nature of publication (Local, regional and international), citations (from scopus and other databases) ---etc, the obtained results recommended to use Whole scientific author activities equation for calculate the total authors activities (TAA) which included sum impact factor (SIF), E. index (as alternative method for H-index), in addition to maxpub (the total no. of published articles calculated from the obtained equation in the current manuscript).*

Key-Words: Author quality, Journal Quality, SIF, E.index, maxpub

معادلات رياضية مقترحة لتقييم جودة مخرجات الباحث العلمي

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الملخص:

المنشورات العلمية على المستويين الوطني والدولي هي نهج مهم لاكتساب الاعتراف كخبراء أو علماء في مجال معين. أهداف العمل الحالي هو توضيح طرق أو أفكار جديدة لتقييم جودة المؤلفين العلميين ، سيوضح هذا العمل الأساليب الحالية المستخدمة في تقييمات جودة المؤلف مثل إجمالي الاستشهادات ، H-index ، g-index ، no. المنشورات ، عامل تأثير المجلة - إلخ ، ومع ذلك ، ستتم مناقشة فوائد وقيود هذه الأساليب بالتفصيل بالإضافة إلى توضيح المعادلات الجديدة كاقتراحات لحساب جودة المؤلفين ككل باستخدام جميع أنشطته العلمية مثل رقم المنشورات (مع Scopus و ISI وغيرها) ، H-index ، طبيعة النشر (محلي ، إقليمي ودولي) ، الاستشهادات (من scopus وقواعد البيانات الأخرى) - إلخ ، وفي هذا السياق قد تم استحداث مؤشرات رياضية جديدة لتقييم جودة المخرجات البحثية ومنها معادلة لحساب إجمالي أنشطة المؤلفين (TAA) والتي تضمنت عامل التأثير الكلي (SIF) ، والفهرس E. (كطريقة بديلة لمؤشر H) ، بالإضافة إلى maxpub (العدد الإجمالي للمقالات المنشورة المحسوبة من المعادلة التي تم الحصول عليها في المخطوطة الحالية).

الكلمات الرئيسية: جودة المؤلف ، جودة المجلة ، SIF ، E.index ، maxpub

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Introduction

Citation number serves as an indicator of research quality in economics as well as in many other fields (1).

The H-index is considered from most indicators which reflect the author quality and their scientific activities. H-index defined as the maximum value of h such that the given author/journal has published h papers that have each been cited at least h times (2). Various suggestions to modify the h-index in order to emphasize different features have been made (3, 4, 5, 6, 7 and 8) As the variants have proliferated.

Journal impact factor (JIF) of an academic journal is a scientometric index that measure the average number of citations (JC) that articles published in the last 2 years for each indexed journals. IF indicator was devised by Eugene Garfield, the founder of the Institute for Scientific Information (ISI). IF are calculated yearly starting from 1975 for journals listed in the Journal Citation Reports (JCR). ISI was acquired by Thomson Scientific & Healthcare in 1992 (9).

Author activities standards

The standards for estimation of quality of author

1- Total no. of published articles (Maxpub)

Most of indicators used for estimation the author quality and activities not calculate the total number of publications as main indicator for author quality, in this regard, I suggest for divide the journals to international (for article published in ISI journals) and regional (for article published in scopus database) and local (for articles published in other ISI and scopus databases). The calculation of Maxpub depending on relative weight for each type of publication as the following:

$$\text{Maxpub} = \text{No. of published article in ISI journals} \times 3 + \text{No. of published article in Scopus journals} \times 2 + \text{No. of published article in other journals} \times 1$$

2- E. index

H-index from the important indicators for estimate the quality of author depending on the his cited articles (in different database such as web of sciences, Scopus and google scholar), However, this indicators calculate only the cited articles and forget the remaining articles (not cited) and some cited articles not calculated due to the h-index bind the no. of cited papers with no. of citations

We suggest E.index instead of H-index by dividing the total number of citations and total number of published articles as the following:

$$\text{E.index} = \text{Total numbers of citations} / \text{total number of published articles}$$

3- Sum impact factor (SIF)

Each database included specific journals and equation for calculate the impact factor such as ISI, Scopus and others this led to some conflict when recorded the impact factor for author journals in addition to the conflict related to the impact

factor of publication year of specific articles and last year impact factor report, we suggest the following equation for calculate the impact factor of author journals as:

$$\text{SIF} = \text{JIF for each ISI journals} + \text{JIF for each Scopus journals}$$

Where, JIF refer to Average impact factor

4- Total author activities (TAA)

This indicator describes the whole author activities in scientific publication and citation in addition to performance levels as the following:

$$\text{TAA} = \text{Maxpub} + \text{E.index} + \text{SIF}$$

The performance levels:

Weak performance: less than 50

Acceptable performance: 50 to less than 100

Good performance: 100 to less than 200

V.Good performance: 200 to 300

Excellent performance: More than 300

Conclusion

From the mentioned proposal, I can conclude that some modified methods and standard can be used for estimation the overall quality of scientific author to avoid any conflict or uncalculated practices and I recommended to use the E.index instead of H.index and SIF instead of IF and use TAA for whole author contributions in publications of scientific materials.

Competing interests

The authors declare that they have no competing interests.

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