Angle, A New Indicator For Scientific Evaluation: Case Study of Quantity and Qualify On IIEES Publications

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ABSTRACT: *The purpose of the current research is to present a new indicator for evaluating scientific production (quantitative and qualitative) over time. Recent research aims to study the quantity and quality of the International Institute of Earthquake Engineering and Seismology (IIEES). This paper is an illustration of applied research using the Scientometric approach. The current study introduced a new indicator in Scientometrics that is called Angle. It examines the growth of scientific quality over several years. The results showed the trend of document production of IIEES, which had experienced rising and falling. Still, the direction of obtaining citations other than the first few years of life and 2007 has constantly been growing.*

1. Introduction

Many systems are developing their mechanism for evaluating research institutes. More attention is paid to these systems in evaluating research institutes focused on the scientific production indexed in databases. These evaluation systems, which are nowadays highly valued, by two critical factors in the number of scientific papers that have been indexed, and citations received known. The purpose of the current research is to present a new indicator for evaluating scientific production (quantitative and qualitative) over time. Recent research aims to study the quantity and quality of the International Institute of Earthquake Engineering and Seismology (IIEES). In addition, it investigates whether the rate of IIEES publications has been increased along with their quantity.

2. Methodology

This is applied research using the Scientometric approach. The research population consisted of 955 items published and indexed in Scopus from 1993 to 2019, with at least one author affiliated with the IIEES in Earth Science, Seismology, and Earthquake Engineering. A new index was calculated in the name of angle to evaluate the quality of scientific works. The angle indicator indicates that if the average citation angle is higher than 45 degrees, the citation has a favorable growth. According to the Scopus chart, the average scientific production angle was 52.83, and the mean censorship angle was 57.93.

3. Literature Review

Several studies have been carried out on the Scientometric indices. Some of the most relevant include:

Vinkler (1988) stated that Indicators could be classified as publication and citation ones which may refer to the impact and quantity of publication activity of researcher(s), teams, institutes, or countries. Considering the possible reference standards, the indicators are classified as simple, specific, balanced, distribution, and relative. In order to evaluate publication activity both qualitatively and quantitatively, relative citation indicators can be recommended, which relate citations received to the sum of impact factors of the journals where the papers were published or give a comparable measure of the average fitness of documents related to that of articles in journals in a similar subfield. WolfgangGlänzel (2010) gave an overview of the opportunities of probabilistic models in Scientometric. Four examples from different topics are used to shed light on some essential aspects of the reliability and robustness of indicators based on stochastic models. Limitations and future tasks are discussed as well.

Wolfgang Glänzel and Henk F. Moed (2013) paper aims to contribute to the ongoing discussion about building and applying bibliometric indicators. It sheds light on their properties and requirements concerning six different aspects: deterministic versus probabilistic approach, application-related properties, time dependence, normalization issues, size dependence, and network indicators.

Erfanmanesh and Hosseini (2017), in their paper, aim to study the quality of international research outputs of the University of Isfahan using various indicators during the last ten years. Findings showed that the quality performance of the University of Isfahan in the production of research outputs in metrics of "citedness rate," "international scientific collaboration," and "publication in high-quality journals" was higher than the country's average. Conversely, the quality of the University of Isfahan's scholarly output based on "citations per publication," "views per publication," "field-weighted citation impact," and "highly-cited papers" was less than the country's average. Conclusion: The research results might be helpful to the managers and policymakers of the University of Isfahan to be aware of the current level and plans to improve the quality of research output of the university.

Chhatar (2018), in research, found that one can see that there isn't generally a single parameter that is perfect for surveying the sensible yield and its impact on built-up specialists. Every parameter has its particular exceptional relationship of factors of interest and limitations. Besides these indicators, there is such a gigantic assortment of authentic contemporary markers, i.e., h-index,i-index, g-index, which are in like manner being used to inspect the intelligent effect and consistent yield of an individual expert independently. The study coordinates absolutely to the expert about the theoretical examinations and practical implications of Scientometricpointers in estimating the consistent yield. Several studies have been carried out on the Scientometricindices.

Sab, M. C., Kumar, P. D., & Biradar, B. S. (2018,) in their paper, "Assessment of Chemical Science Research Output Using Scientometric Indicators" studied the growth of research output andcitations, relative growth rate, and doubling time, sub-discipline wise distribution of publications and citations, activity index, citation index, national and international collaboration, highly productive institutions, highly productive authors, highly preferred journals and highly cited journals. India has produced 1,31,212 papers and received 12,70,317 citations during the period 2002to -201; in the same manner,r world has produced 24,04,444 publications in chemical science and has increased its publications from 1,14,912 in 2002 to 1,93,822 in 2016.

In their paper, Zainab, T., &Wani, Z. A. (2019) stated that to quantify science and handle the scientific information, various methods are used. Researchers and scientists use varied techniques for fundamental concepts, which are more or less auxiliary and corresponding to a certain extent concerning their applications. Scientometrics, in this context, is a novel scientific field joining science and technology with information science and expanding numerous mathematical, statistical, and data mining techniques. Procedures to measure and quantify scientific information. The focus of scientometrics as a discipline is science and technology literature. The chapter thus aims to discuss the concept of Scientometric and its indicators employed to assess the quality of scholarly content. Further, the chapter also discusses the pros and cons of prominent Scientometric indicators currently used in evaluating the performance of an individual researcher, institution, or country.

4. Findings

Findings revealed that the scientific production of the IIEES has risen since 2002, with the most significant scientific output available for 2017, 2013 and 2018.
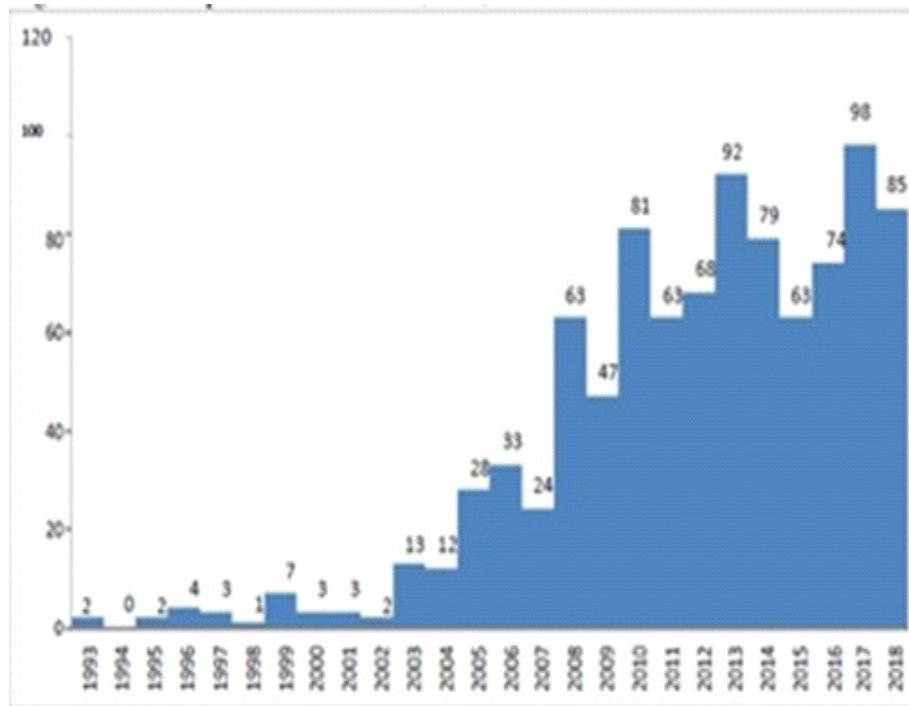
Figure 1. Number of produced documents by IIEES scholars during 1993-2018

Figure 2 shows the number of citations received from IIEES scientific production during the years 1993 to 2018. From this chart it appears that by 2002 the received citations were very weak and low, but since 2003 it has been growing. In 2018, it received the most citations.
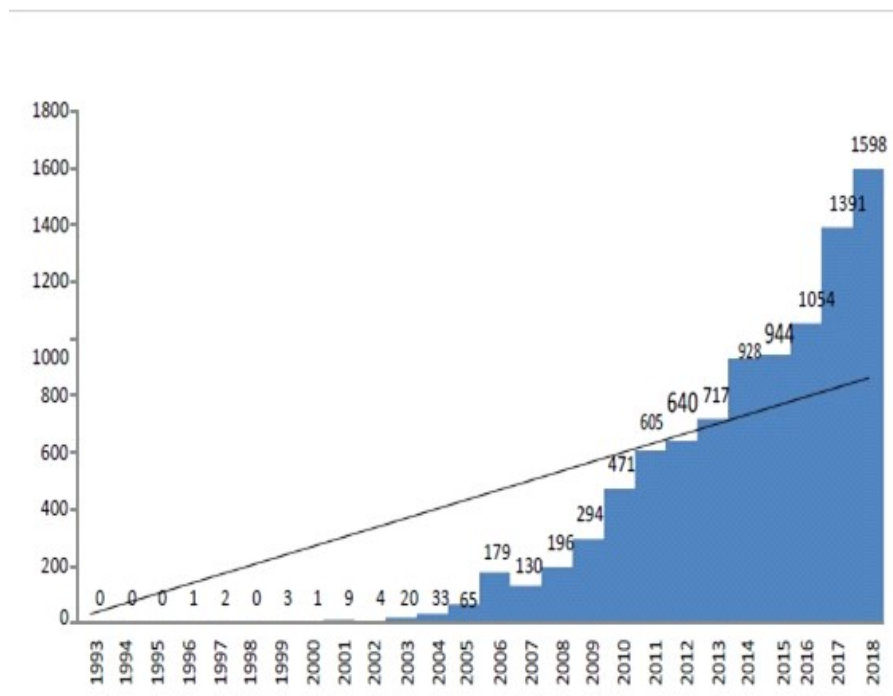

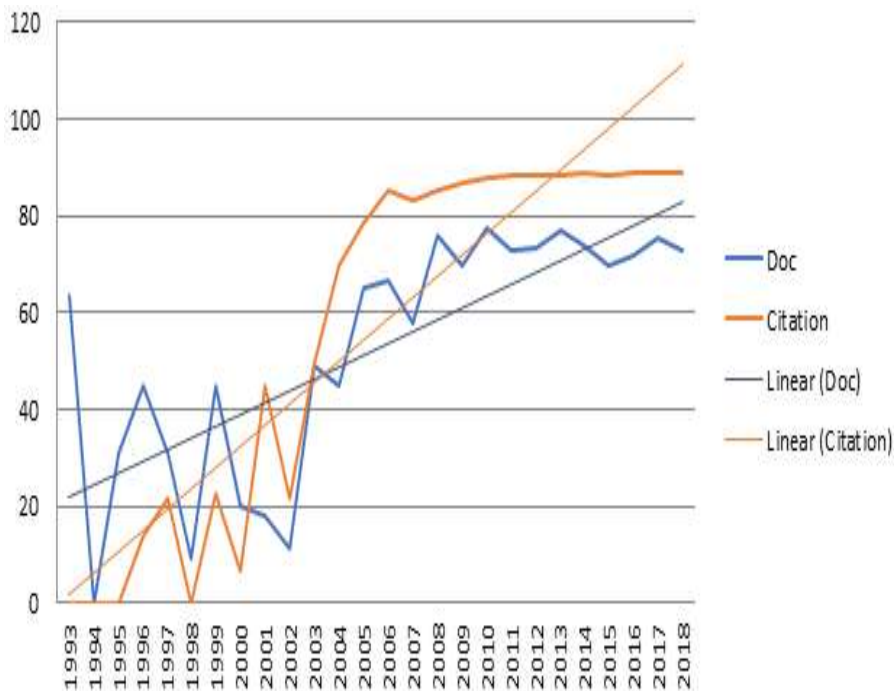Figure 2. Citation rate of produced documents by IIEES scholars during 1993-2018

Figure 3. Angle of produced documents and citation resaved by IIEES Scholars during 1993-2018

5. Conclusion

The current study introduced a new indicator in Scientometrics that is called Angle. It examines the growth of scientific quality over several years. The results showed that the trend of document production of IIEES had been faced with rising and falling, but the direction of obtaining citations other than the first few years of life and 2007 has constantly been growing. Meanwhile, the year's average scientific publication angle and the average scientific citation angle were 52.83 and 57.93. The findings indicate that the growth of IIEES scientific production quality is more than its quantity.

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