Editorial

Quality and Impact Measures of Scientific Journals

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The indexation of a journal is believed to be an indication of its quality. The number of abstracting and indexing services that cover a journal is a measure of its stature. While comparing indexed journals to non-indexed journals, indexed journals are thought to be of a higher scientific calibre. An ordered list of referenced manuscripts, each including a list of citing manuscripts, is referred to as an indexing or citation list. The cited manuscripts are designated as references, and the citing manuscripts are designated as the source. An abstracting and indexing service is a product that a publisher sells or makes it available. The journal contents are searchable using subject headings (keywords, author's names, title, and abstract) in the available database.[1] A crucial component for a scientific journal's success is to be included in the proper online abstracting and indexing services. Eugene Garfield defined citation and citation index as, Citations are the formal, clear connections between writings that have certain characteristics in common. Around these relationships, a citation index is created. It identifies the sources of the citations and lists the articles that have been cited. Just by knowing one that has been cited, anyone conducting a literature search can uncover one too many additional manuscripts on a topic. Additionally, each discovered manuscript offers a list of fresh citations that can be used to expand the search. The simplicity of citation indexing is one of its main strong point.[2]

Index Medicus was the first index of scientific journal articles initiated by the US National Library of Medicine (NLM), in print form, between 1879 and 2004. The NLM began computerizing indexing work in 1960 and called it MEDLARS (MEDical Literature Analysis and Retrieval System), a bibliographic database, which later became MedLine in 1971. The MedLine evolved into Entrez and later PubMed in 1996, as the electronic presentation of MedLine's contents.

Some of the indexation services are Index Medicus, SCI and SCI-Expanded, Web of Science (SCI's electronic version), MedLine, PubMed, PubMed Central, Embase, Scopus, EBSCO, ProQuest Central, CiteSeerX, Caspur, Directory of Open Access Journals (DOAJ), Elsevier BIOBASE, INSPEC, Index Copernicus, Google scholar, and Scirus, among others.

Journals must adhere to a few basic publishing guidelines in order to use academic indexing services. Journals must have an International Standard Serial Number (ISSN), Digital Object Identifiers (DOIs), a published schedule, a copyright policy, and fundamental article-level metadata in order to comply with indexing standards. Following that, indexers will have various inclusion criteria, such as publishing scope. For example, MedLine and PubMed Central exclusively index journals in the domains of biomedicine and the biological sciences. Many indexers only accept journals that publish within specified subject fields. Additionally, indexes frequently demand information regarding journal editorial rules, such as a publicly published peer review procedure and publication ethics statement, as well as the full identities and affiliations of journal editors.

The measures used to assess the quality and impact of a journal are anticipated to display the place of an academic journal within its discipline. This ranking is commonly used in the scientific community for the evaluation of a journal. The quality and impact of the journal are evaluated through its wide circulation and frequency of citations. Many countries around the world including Pakistan have introduced these measures as an official research evaluation tool.

Web of Science (WoS)

The WoS is a database offering access to complete citation data for several different scientific disciplines. It was formerly managed by the Institute for Scientific Information (ISI) and is currently handled by Clarivate Analytics (previously Thomson Reuters).[3] The Web of Science also manages several regional citation indices, e.g. the Chinese Science Citation Database. The journals on the Web of Science are accessible through a Master Journal List (www.mjl.clarivate.com) which is

updated on monthly basis.[3] The Journal Citation Report (JCR) is being published annually based on the Web of Science's core databases (https://clarivate.com/webofsciencegroup/solutions/journal-citation-reports/). The Impact Factor is derived from JCR data for a given journal. The JCR was initially published as a part of the Science Citation Index (SCI). However, it is now based on citations compiled from the Science Citation Index Expanded (SCIE) and Social Sciences Citation Index (SSCI). Quality measures that can be calculated from the JCR include Impact Factor, EigenFactor Score, Immediacy Index, Cites per Doc (CD2), and Cited Half-life.

Impact Factor (IF)

The IF, launched in 1975, is a citation-based metric that has become a tool to calculate the worth of a journal.[4] It is calculated from the Journals Citation Report (JCR) published by Clarivate Analytics.[3] IF was conceived by Dr. Eugene Garfield, at the Institute for Scientific Information (ISI). The ISI later shifted to Thomson Reuters and then Clarivate Analytics who are now responsible to bring out JCR used for IF calculation. The Impact Factor has been commonly recognized as an indicator to assess the impact and quality of a journal regardless of its size, frequency, and content.[5] The IF is awarded to the journals indexed only in the Web of Science's Journal Citation Reports, so IF is not available for all other journals although indexed in Scopus/PubMed/MedLine databases. Similarly, all journals indexed in Web of Science's Journal Citation Reports with an IF are not listed in Scopus/PubMed/MedLine databases. Principally envisioned to rate the academic journals, the impact factor is also used by the organizations as a shortcut to evaluate the quality of individual manuscripts and for ranking various universities and research institutes. JCR includes references from indexed journals in the Web of Science database and determines the impact factor for any given journal by taking the ratio of the number of citations to articles published by that journal during the last two years and the entire articles published during those two years. For example, this year's impact factor for a journal can be calculated as:

$$\text{IF (2021)} = \frac{\text{Citations in 2021 for manuscripts published in 2019, 2020}}{\text{Total number of manuscripts published in 2019, 2020}}$$

It is pertinent to mention that counterfeit or false impact factors are generated by certain organizations or individuals, and claimed by the respective Journal. These include the global impact factor, universal impact factor, and research impact factor, among others. These fake or bogus impact factors are most often used by predatory journals. The submitting author needs to be aware of these intricacies and must always consult the Master Journal List and/or the Journal Citation Reports to confirm if the journal is indexed or otherwise.

Scopus

In 2004, the Scopus database was launched by Elsevier (a Dutch publishing company). It is currently the largest abstract and citation database of peer-reviewed literature which includes academic journals, books, and conference proceedings. The database provided by Scopus covers more than 36,000 titles of peer-reviewed journals, books, and conference proceedings in different disciplines.[6] Scopus also provides author profiles covering affiliations, number of publications and their bibliographic data, references, and details on the number of citations each published document has received. Scopus database allows four types of quality measures which include CiteScore, *h*-Index, SJR (SCImago Journal Rank), and SNIP (Source Normalized Impact per Paper).

CiteScore (CS)

CiteScore, launched in 2016 by Elsevier, can simply be termed a Scopus impact factor used to evaluate the quality of a journal. CiteScore (CS) is the number of citations received by a journal in the past four years to manuscripts published in the last three years, divided by the total number of manuscripts published in the same three years (indexed in Scopus). CS covers journals in the Scopus database and is published once a year. CiteScore includes all document types indexed by Scopus, e.g. original manuscripts, reviews, letters, notes, editorials, and conference papers, while Impact Factor includes very selective quality data, i.e. citable documents including original manuscripts and reviews only. This year's CS for a journal will be calculated based on the following formula.

$$\text{CS (2021)} = \frac{\text{Citations in 2021 for manuscripts published in 2018, 2019, 2020}}{\text{Total number of manuscripts published in 2018, 2019, 2020}}$$

Higher Education Commission's Strategy for Accreditation of Journals

The Higher Education Commission (HEC), Pakistan has categorized the research journals into three types namely, W, X, and Y, with W being the uppermost category. [7] This categorization is based on six

internationally accepted parameters (,e.g. impact factor, citescore, among others) that measure the quality of a journal. The six parameters used in the categorization of journals as per HEC criteria were selected from an article by Bollen *et al*., [8] and include, Eigenfactor Score,[9] Article Influence Score, SCImago Journal Rank, Source Normalized Impact per Paper, h-index, and Cites per Doc (CD2). These parameters are calculated using a novel Journal Prestige Index (JPI) measure through an online HEC Journal Recognition System (HJRS) which can be accessed at https://hjrs.hec.gov.pk. The eligibility requirements for each of these categories are different as given below:

Eligibility Requirements for "W" Category Journal

- Indexation in reputable global databases, preferably Scopus and Web of Science.
- Citation data from a variety of sources are available, including Eigenfactor Score, Source Normalized Impact per Paper, Impact Factor, and SCImago Journal Rank.
- Should have a weighted average score on all the aforementioned parameters on thresholds defined for each scientific field calculated through a computerized system.

Eligibility Requirements for "X" Category Journal

- Published articles should be peer-reviewed by an international team of experts in the relevant field.
- Indexing/abstracting with at least one accepted indexing abstracting agency of HEC with some additional quality criteria.
- At a minimum, 1/4th of the published articles should have international authorship.
- The self-institutional publication is not allowed.
- Manuscripts should be processed through Open Journal Systems (OJS) or a similar journal management system.

Eligibility Requirements for "Y" Category Journal

- An academic editorial board having Ph.D. degrees in relevant fields (i.e., area of publication) with strong research and publications background.
- The editor or editorial board members are not allowed to publish in the journal.
- Self-institutional authorship should not exceed 1/5th of total manuscripts.

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