

## Altimetric, bibliometrics, citation indices, download counts, Eigen factor - The ABCDE science of research and publication

Dear Editor,

In today's era of academic excellence and competence, scientific research and publishing into a reputed journal are considered as symbol of individual growth. Ethically, the process of publication must be considered a shared responsibility.<sup>[1]</sup> Writing a manuscript, reviewing papers, publishing in a peer-reviewed journal needs skill, expertise, and

background knowledge of the subject.<sup>[2]</sup> This letter is aimed at providing useful insights regarding altimetric, citation indices, citation analysis, citation indices, impact factor, and various scientific terminologies used during research and publication. We believe this will be helpful for all the authors, reviewers, and readers and may escalate the scientific output while publishing a research paper.

Altimetrics also called as alternative metrics helps in quantitative measurement of the quality and quantity of research output that scientific work is receiving through citations, article download, and dissemination.<sup>[3]</sup>

Bibliometrics is a scientific statistical method for the analysis of articles and publications. The sub-category of bibliometrics

**Table 1: Various citation indices, citation indexing services**

Index	Description
<b>Citation Indices</b>	
h index (Hirsch)	This is a measure of quality and quantifies the impact of published work of a researcher or a scientist. A researcher has an h index h, if h of the researcher's P articles have received at least h citations each
g index	The g index is a measure of highly cited papers. It means the maximum number of g papers that together received g <sup>2</sup> or more citations
e index	This aims at considering the contributions of excess citations, which are mainly from highly cited papers
a index	This refers to the total number of citations included in the h-core, evaluates the researcher's contribution, and also masks the different citation distributions of the authors
i10 index	An author's publications having at least 10 citations. This is available on Google Scholar and helps to judge the productivity of a scholar
Citation counts	This sums up the citations received to date in the data source, measure the quality of articles which may be cited for negative as well as positive impact
Download counts	This refers to the number of unique downloads of an article. They are also a good predictor of citations and are available faster than normal citations. Download count usually mirror citations, are available about 2 years earlier and hence predict future impact of scientific papers
Keywords plus	This includes title words, author-supplied keywords, and abstract words and phrases to enhance retrievability
Acknowledgment index	This is a method for indexing and evaluating acknowledgments in the scientific literature and quantifies the impact of acknowledgments
<b>Citation Indexing Services</b>	
Web of Science (Clarivate Analytics)	This includes seven databases: Science Citation Index (SCI), Social Sciences Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI), Index Chemicus, Current Chemical Reactions, Conference Proceedings Citation Index: Science and Conference Proceedings Citation Index: Social Science and Humanities
Scopus (Elsevier)	This helps to track, analyze, and visualize research and is one of the major abstracting and citation platforms of peer-reviewed manuscripts
Citeseer	This helps us to understand citation graph analysis, related document retrieval, and another searching of scientific literature
Google Scholar	Provides citation and search of published literature across many specialties
PubMed	Free search engine maintained by the United States National Library of Medicine at the National Institute of Health. Contains over 2,300 million records including subscription-based and open access journals
Research Gate	European academic scholarly platform for scientists, clinicians, and publishers for disseminating publications, find collaborations and ask and answer questions. It also enlists all the citations of papers uploaded on the website
Publons	This is a commercial platform that depicts the peer review process of a researcher and allows them to follow, crosscheck, and showcase their peer review and editorial contributions for academic journals. The citations listed here are imported through the Web of Science only
CrossRef	Digital Object Identifier Registration Agency and reference linking services. It covers the interlinking of books, journals, conference, proceedings, and databases
EBSCOhost	This is one of the most used reference database services

Contd...

**Table 1: Contd...**

Index	Description
Science Citation Index Expanded	The is a broader version of SCI. It has a non-zero impact factor. The journals under this database ranked for impact factor
Science Citation Index	This offers bibliographical access to a compilation of more than 9,200 journals across 178 scientific specialties. It helps in searching for articles that cite a known author or work (Cited Reference Search), as well as searching by subject, author, journal, and author
Emerging Sources Citation Index (ESCI)	The journal's index in this ESCI will not come with an impact factor. The journal listed in this new index is analyzed yearly and only qualified research gets transferred to SCIE. This helps to escalate that the important research works are visible in the Web of Science Core Collection
Institute for Scientific Information	It is an academic publishing service which offers bibliographic and scientometric database. It also entails citation indexing and analysis. And also publishes the annual Journal Citation report with impact factor
<b>Impact Factor and Related Indices</b>	
Impact factor	It helps to rank journals within a specialty or a sub-specialty and also determines the average citation count for a journal
Median impact factor	The median value of all the journal impact factors in the specialty category
Year impact factor	The citations are counted in the last 5 years and again divided by the source items published in the last 5 years
5-year impact factor	This is a measure of the average number of times articles published in the last 5 years have been cited in the journal citation report
Cited half-life index	This measures the number of years, starting from the current year that accounts for half of the total citations received by the cited journal in the current year
Immediacy index	This measures the average number of times an article published in a particular year within a specific journal is cited over the same year
Aggregate impact factor	This is the number of citations from all journals in the subject category and the number of articles from all journals in the category
Impact factor inflation	It is a ratio of a 2-year impact factor (2YIF) to a 2-year impact factor without self-citations (2YIF*). This is aimed to determine how journal self-citations escalate the impact factor of a journal
<b>Tools to the Measure Impact factor</b>	
Journal citation reports	This provides information about academic journals in the sciences and social sciences subject categories, including impact factors, the journal immediacy index, and the journal citing half-life. The is also a quantitative tool for ranking, evaluating, categorizing, and comparing journals
Eigen factor	This factor is a PageRank-type measure of the influence of a journal with rankings which are freely available online. This is an estimate of the percentage of time that library users spend with that journal
Recursive impact factor	This gives citations from journals with higher impact greater weight than citations from lower impact journals
SCImago Journal Rank	This is a measure of the scientific impact of journals that is responsible for both the number of citations received by a particular journal and the importance of the journals where such citations come from
Source Normalized Impact per Paper (SNIP)	This measures citation impact by weighting citations based on the total number of citations in a subject field. The impact of one citation is given higher respect in subject areas where citations are less likely to come and vice versa
<b>Other Indices and Terminologies</b>	
Indian Citation Index	Was developed with specific motives to promote knowledge content, published in Indian journals, and bridge the gap between the content sources and content users via the World Wide Web

that analyses scientific work is called scientometrics. They are major sources to analyses journal citations and relationships among them. The most commonly used methods are citation analysis and content analysis.<sup>[4]</sup>

**Citation Analysis and Indices-** It determines the impact or the quality of an article of an author by analyzing the number of times the author has been cited in different papers. The various platforms which are helpful to determine the citations of an author are Web of Science, Google Scholar Scopus, Research Gate, Publons, etc. The citations vary among them due to the limitation of data in various platforms.<sup>[5]</sup>

**Download Counts-** This refers to the number of unique downloads of an article. They are also a good predictor of citations

and are available faster than normal citations. Download count usually mirror citations, are available about 2 years earlier and hence predict the future impact of scientific papers.

**Eigen Factor-** This factor is a PageRank-type measure of the influence of a journal with rankings which are freely available online. This is an estimate of the percentage of time that library users spend with that journal.

The various scientific terminologies and indices used in publication and research are listed in Table 1.

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### Conflicts of interest

There are no conflicts of interest

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