

Research Guide Research Impact Metrics

In academia, research is not only about publishing but also about making an impact. But how is the impact measured? - That's where the research metrics come into the picture.

Research metrics are tools to measure the influence or impact of the scholarly work of researchers (author-level metrics), publications (article-level metrics), and journals (journal-level metrics) (<u>Kavic & Satava, 2021</u>).





Author Metrics

• H-index

H-index is named after J.E. Hirsch, who defined it as "the number of papers with citation number \geq h, as a useful index to characterize the scientific output of a researcher".



The H-Index is 3, as 3 papers have at least 3 citations

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The h-index is calculated by ranking a researcher's publications in descending order by the number of times they've been cited. The h-index is the number of papers in the list that have been cited at least that number of times.



Subjects: Research, Metrics, Academia Tags: Research, academia, scholarly work, citations Subject Librarian: Nabeel Ahmad | nabeel.ahmad@iihs.ac.in | T+ 91 080- 6760 6661 Except where otherwise noted, this work is subject to a Creative Commons Attribution 4.0 license



• G-Index

Leo Egghe proposed G-Index as an improvement on the h-index in 2006. To calculate the G-Index, rank a set of articles in decreasing order of the number of citations they received. Then, find the largest number, G, such that the top G articles receive at least g^2 citations.



• Publication Count

Publication count is a basic metric that measures the total number of publications produced by an author, researcher, unit, or institution. A higher publication count indicates greater activity within the research community.





Article Metrics

• Citation counts

Citation counts are a metric used to measure the impact of a scholarly work in academia. The assumption is that the more a publication is cited, the more influential it is. They indicate how often a particular piece of research has been referenced in other academic publications, serving as a measure of its relevance and contribution to the field.

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Altmetrics

Altmetrics, or alternative metrics, are a way to measure the online attention and engagement of research. Social media mentions, downloads, exports, comments, and attention of a scholarly publication. A company Altmetric.com generates the altmetrics for organizations and articles.



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• Field normalised citation metrics

The two most common field normalized citation metrics are: Relative Citation Ratio (RCR) from iCite and Field Weighted Citation Impact from Scopus.

• **Relative Citation Ratio (RCR) from <u>iCite</u>** only takes into consideration articles indexed in Pubmed. It is calculated by dividing the article's average annual citation rate (excluding the first calendar year in which the article was published) and dividing it by the expected citation rate of Pubmed articles in the same co-citation network that were published in the same year.



Relative Citation Ratio

• <u>Field Weighted Citation Impact from Scopus</u> measures the impact of articles included in Scopus. It is calculated by dividing the total number of citations an article has received the year it was published and 3 complete calendar years after its publication by the average number of citations articles of the same field, publication type, and publication year are expected to receive within the same time period.

Calculating Field Weighted Citation Impact







Journal Metrics

The most common measure of journal metrics is the Impact Factor (IF) to find the frequency with which the average article in a journal has been cited in a particular year. It is calculated by dividing the total number of citations in two-years by the total of articles in two years.

• Journal Impact Factor (JIF): It's a product of Clarivate covers the journals indexed in Web of Science and provides impact factor and ranking of journals.

Calculating Journal Impact Factor



• <u>SCImago Journal Rank (SJR)</u>: calculates the impact of journals indexed in Scopus by assessing the citations received by an article in a journal taking into account the rank (quality) of the journal where the citations originated. SJR is calculated by dividing the average of weighted citations received in a year by the number of documents published in a year.



• <u>**Eigenfactor Score**</u>: measures the number of times articles from the journal published in the past five years have been cited in the JCR (Journal Citation Reports) year.



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(EF = Eigenfactor® score; AI = Article Influence® score)







Research Metrics Tools

- <u>Google Scholar</u>: Google Scholar is a very broad multidisciplinary database that can be used to track article citations and author impact metrics. It allows researchers to set up their profile and curate it.
- <u>Web of Science</u>: Web of Science includes metrics about publications (documents), authors and journals, based on citations from other documents indexed in the Web of Science databases. Author metrics include the percentage of papers on which a researcher was the first, last or corresponding author. Web of Science links to Journal Citation Reports, a tool that provides journal level metrics.
- <u>Scopus</u>: Scopus provides four platform-specific metrics on a publication's metrics page: Total citations within a user-selected date range, citations per year for a chosen period, citation benchmarking (percentile ranking), and Field-weighted Citation Impact.

- <u>Altmetrics</u>: Altmetric.com provides a free bookmarklet for researchers that can be added to a bookmarks bar to view the altmetric data of a journal article that is being read online.
- <u>Dimensions AI</u>: Dimensions AI provides access to a large and linked research database. It offers various metrics to assess research impact, including traditional citation counts and alternative metrics (altmetrics) like social media shares and news mentions.
- Lens.org: offers tools to analyse research impact, including <u>In4M metrics</u>, institutional rankings, and the ability to explore citations of scholarly works in patent literature.

References

Kavic, M. S., & Satava, R. M. (2021). Scientific Literature and Evaluation Metrics: Impact Factor, Usage Metrics, and Altmetrics. *JSLS: Journal of the Society of Laparoendoscopic Surgeons, 25*(3), e2021.00010. <u>https://doi.org/10.4293/JSLS.2021.00010</u>

ⁱ Some graphics are made <u>Napkin AI</u> tool.

