

# Research Metrics Evaluation for Analyzing Research Performance

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## Abstract:

Research metrics evaluation plays a crucial role in academic evaluation. This article compares ancient research metrics with the latest metrics, how efficient and up to date. This list will show metrics from old to current research analysis for better research productivity.

Term	Short Definition
<b>Bibliometrics</b>	Bibliometrics is a set of methods to quantitatively analyse academic literature and scholarly communications.
<b>Informetrics</b>	Informetrics is the study of quantitative aspects of information. This includes the production, dissemination, and use of all forms of information, regardless of its form or origin.
<b>Scientometrics</b>	Scientometrics is the study of quantitative features and characteristics of science, scientific research and scholarly communications.
<b>Webometrics</b>	Webometrics is the study of quantitative features, characteristics, structure and usage patterns of the world wide web, its hyperlinks and internet resources.
<b>Cybermetrics</b>	Cybermetrics is an alternative term for Webometrics.
<b>Librametrics</b>	Librametrics is a set of methods to quantitatively analyse availability of documents in libraries, their usage and impact of library services to its user community.
<b>Patentometrics</b>	Patentometrics is a set of methods to quantitatively analyse patent databases, patent citations and their usage patterns.
<b>Altmetrics</b>	Altmetrics is new metrics proposed as an alternative to the widely used journal impact factor and personal citation indices like the h-index. The term altmetrics was proposed in 2010, as a generalization of article level metrics, and has its roots in the twitter #altmetrics hashtag.
<b>Article Level Metrics (ALM)</b>	Article level metrics is an alternative term for Altmetrics.

Bibliometrics, Informetrics, Scientometrics, Webometrics, Cybermetrics, Librametrics, Patentometrics are old evaluation methods. Almetrics and ALM are the two techniques that will help for trend and current evaluation model.

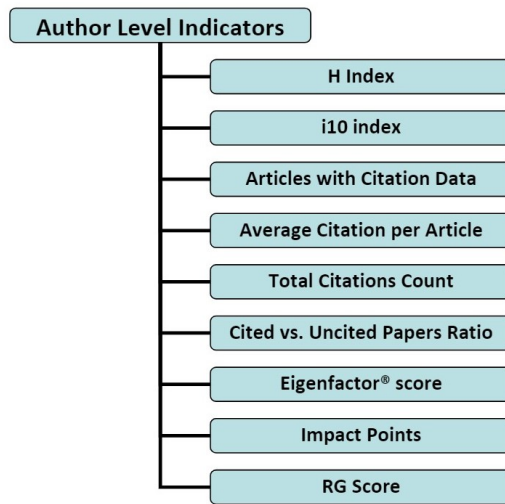
**Keywords:** Research metrics evaluation, Research metrics, almetrics.

Evaluate research metrics is usually happen in two ways:

1. Article level metrics
2. Author level metrics

The detailed indicators for this research metrics are given below. It will give some idea for are all the metrics available in article and author level metrics.

## Author level Metrics:



In author level metrics H-index, i10 index, Average citation per Article, Total citation count are the most used metrics. These metrics are calculated based on citation-based, So citation-based indicators also need to be analyzed.

**Drawback:**

The biggest drawback of these citation-based metrics is,

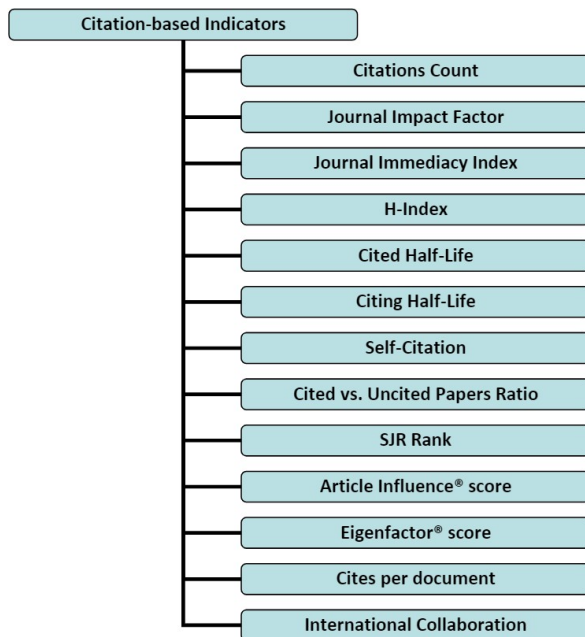
1. If the author stopped to write the paper related to that particular area
2. The author is no more means
3. That paper is not related to updated concepts and trend

Then also, that article will get citations, like citations, h index, i10 index, average citation per article, and all will increase gradually. It won't reflect any new trends and update things through their research.

Data can be taken from different sources. Here I showed some examples.

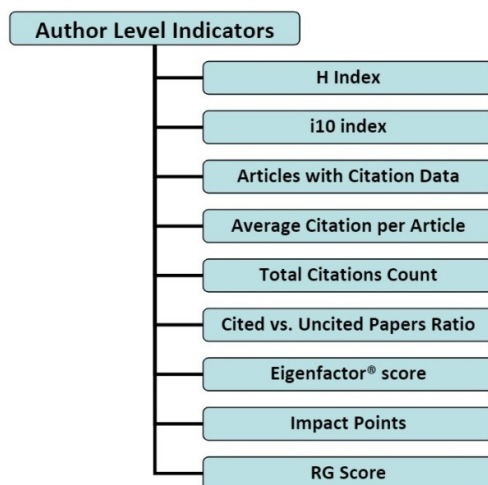
Name of the Indicator	Data Source	Researchers' Profiles/ Tools Used
H Index	Google Scholar, Web of Science, Scopus	Google Scholar Citations, ResearcherID
Citations Count	Google Scholar, Web of Science, Scopus	Google Scholar Citations, ResearchGate
i10 Index	Google Scholar	Google Scholar Citations
g Index	Google Scholar	PoP Software
Articles with citation	Web of Science	ResearcherID
Average citations per article	Web of Science, Google Scholar	ResearcherID, PoP Software
Eigenfactor® score	Web of Science	Social Science Research Network (SSRN)
Impact Points	ResearchGate	ResearchGate
RG Score	ResearchGate	ResearchGate

## Citation based indicators



Citation-based, we can calculate article-level metrics as well as author-level metrics. It can help compute the Journal impact factor and SJR rank for journals. Based on the citation, international collaboration calculation will be done coauthor network map likewise can be designed.

## Article level Metrics:



Article-level metrics are used to calculate the author and institute's h index, i10 index, and Eigen factor.

Here we compare the H-index impact factor with the latest metrics like almetric, SJR, and SNIP. For comparison, I have taken all-new 13 central universities in India, which started under 2009 act-based Scopus publications.

### Central university metrics comparison:

No	University	Citations	No of publications	H-index	Citation per Paper
1	Central University of Punjab	19347	1542	59	12.54669261
2	Central University of Tamilnadu	12016	978	45	12.28629857
3	Central University of Himachal Pradesh	6584	579	38	11.37132988
4	Central University of Jharkhand	9662	878	43	11.00455581
5	Central University of Rajasthan	19634	1835	57	10.69972752
6	Central University of Gujarat	9762	990	41	9.860606061
7	Central University of Jammu	5358	618	32	8.669902913
8	Central University of kerala	8984	1071	38	8.388422035
9	Central University of Haryana	6903	824	33	8.377427184
10	Central University of South Bihar	4979	611	32	8.14893617
11	Central University of Orissa	760	96	14	7.916666667
12	Central University of Karnataka	2785	420	29	6.630952381
13	Central University of Kashmir	1093	221	17	4.945701357

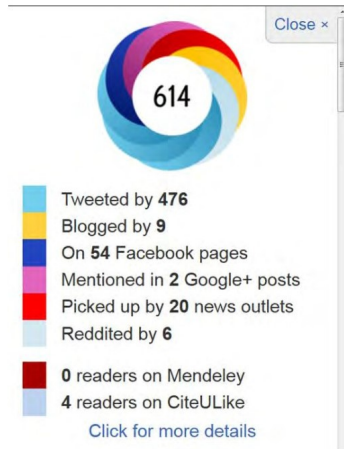
Citation-based H-index value reflects the same: if citation count increases, H index value increases likewise if citation count decrease means H index value decreases.

Citation per paper can be calculated that citation will divide by no of publications. Citation per paper is not dependent upon only citation count, and it depends upon citation count and no of publications. It is giving the quality measurement of that institute perfectly.

### Almetrics:

Altmetrics is the new metrics alternative to the traditional metrics-Scholarly Citations, and it provides unique insights about the research trend and focuses of the organization through social media mentions. Social media metrics or Altmetrics are getting new momentum to capture new and innovative ways to assess the impact of the scholarly publication through various social media platforms, including the mentions in policy documents, Wikipedia, Twitter, Facebook, Mendeley readership, etc. There has been a remarkable rise in the system

for comparing research and ranking universities in the last decades through the various publication-based indicators.



Almetric is calculated based on impact factory and Almetric Explorer from various journals. Here is some example of Almetrics indicators for every article online.

Name of Journal	Web Address	Article Metrics Tool Used
<i>BMJ Open</i> (& other BMJ journals)	http://bmjopen.bmj.com	AltmetricExplorer
<i>eLIFE</i>	http://elife.elifesciences.org	AltmetricExplorer
<i>Nature Communications</i>	www.nature.com/ncomms/	AltmetricExplorer
<i>PeerJ</i>	http://peerj.com	ImpactStory
<i>PLOS One</i> (& other PLOS journals)	www.plosone.org	AltmetricExplorer

### Conclusion:

In the total sum of this article's conclusion, Almetrics is a way to find research productivity widely, efficiently, and numerous compared to old metrics. It gives way to set a trend research productivity and presented in graphical representation for easy understanding. Citation per paper measures the quality of journal or institute in betterment way compared to h index, impact factor values.

### References:

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Collation:120 p., Language: English, 2015