Bibliometric Indicators and Academic Integrity

Tilak Hazarika
Department of Library and Information Science,
Gauhati University, Guwahati, Assam

Research need

- There is no alternative to carry out quality research work in one's relevant field/discipline to remain relevant
- Carrying out and guiding research is part and parcel for a faculty member in University and Colleges
- Grasping the very ground of research is the first step to develop ones research portfolio
- Familiarity with the distribution of quality literature in ones field is very important.
- Getting access to sufficient literature that too with upto the level of required precision is one of the most fundamental guiding force.

CARE journals

- Coverage of Indian journals in leading databases in abysmally poor
- CARE is taking care of the Indian Research output

  A latest report ugccare.docx

Biobliometrics and Bibliometric Indicators

- Biblio means books and other media of communication.
- Bibliographic information refers to those information pertaining to book or other scholarly content which are used to describe, identify, retrieve and use the scholarly contents. Technically it is referred to as **Meta Data**
- Growth rate of scholarly content is almost unsurmountable
- This issue has invited attention of the information workers since the second half of the last century and took a disruptive growth since the ICT revolution accelerated since 1990s.

Biobliometrics and Bibliometric Indicators

- Journals are referred to as the **mirror of a subject**
- Quantity and quality of research articles published in the scholarly journals reflect the true health of a given subject
- Attention of the information scientist have been accentuated on the journals
- Capturing, indexing, distributing and documenting the primary literary sources have always been drawing the attention of the information workers.
- Eugene Garfield (1925-2017) a pioneering information scientist founded the Institute of Scientific Information (ISI) in Philadelphia in 1956.
- It is now known as Web of Science (https://webofknowledge.com)

Web of Science

- The oldest and one of the largest database in the world mapping comprehensive citation data for many disciplines of science, social science arts and several region specific databases. (total 256 disciplines)
- No. of records in WoS : >90 million
- No. of Journals indexed: > 21,294 journals + books and conference proceedings in core collection and > 34,502 journals + books, proceedings, patents, and data sets in the platform
- Maintained by Clarivate Analytics https://clarivate.libguides.com/webofscienceplatform/coverage
- Search features are available in WoS to search and locate relevant research published worldwide
- Similarly, lots of features are there to analyse the search results

Scopus

- Scopus is another comprehensive abstract and citation database covering primary literature worldwide.
- It is slant to Science and Technology
- No. of journals indexed : 22000+ journals from around 5000 publishers
- It is a product of the Elsevier https://www.sciencedirect.com/
- Scopus has excellent features for analysis and visualization of the search results.

Bibliometric Indicators

WoS

- Impact Factor
- h-index

Scopus

- SCImago Journal Rank (SJR)
- Source Normalized Impact per Paper (SNIP)
- CiteScore
- Pulm Index
- FWCI

GoogleScholar

- I10 index
- h- index

g- index, hg - index, z-index, Field Weighted Citation Impact (FWCI), Eigenfactor and different weighted metrics are there used in research analysis and evaluation belongs to the domain of Scientomeetrics

Altmetrics is another fast evolving interesting area

Journal Impact Factor

Mathematical Expression

$$I_{f(j)} = \frac{C_1 + C_2}{S_1 + S_2}$$

$I_{f(j)}$ = Impact Factor of Journal

C_1 = Number of Citations received by S_1 source items published in the year Y

C_2 = Number of Citations received by S_2 source items published in the year Y

S_1 = Number of source items published in the journal J in the year Y-1; and

S_2 = Number of source items published in the journal J in the year Y-2.

Journal Impact Factor

Example

No of source items published by journal J in the year 2018 = 35

No of source items published by journal J in the year 2018 = 40

No of citations received by the source items published in 2018 = 45

No of citations received by the source items published in 2019 = 50

Now, the impact factor of the journal J will be (35+40)/(45+50) = 1. 267

This impact factor is for the year 2020

Features of Journal Impact Factor

- It do not have any unit
- The impact factor may be considered as an indication of the quality of the journal in most cases.
- The impact factor indicates the standing of the journal in the world.
- Expressed upto 3 decimal e.g. 3.415
- Values ranges between 0-50
- Not constant
- Database specific
- Review journals enjoy higher impact factor
- Varies from subject to subject

Uses of Journal Impact Factor

- Selection of Journals in the libraries
- Discontinuation of Journals
- Publishing papers
- Evaluation of research output

Normalized Impact Factor

Mathematical Expression

$$nI_{f(J)} = \frac{nI_{f(J)} = I_{f(j)} x 10}{hI_f}$$

$nI_{f(J)}$ = Normalized impact factor of journal J for the year Y

h_{If} = Highest impact factor of the subject category in the year Y to which the journal J belongs.

$I_{f(ja)}$ of a journal belonging to subject category A is 0.50 and the hI_f of the journal in the subject category is 10

$I_{f(jb)}$ of a journal belonging to subject category B is 1.50 and the hI_f of the journal in the subject category is 30

Then the $nI_{f(Ja)}$ is 0.50x10/10 = 0.50

and the $nI_{f(Jb)}$ is 1.50x10/30 = 0.50

Features and Uses of Normalized Impact Factor

Features

- It is a number and don't have any unit
- It is also year specific and Db specific
- Value of Normalised Impact Factor ranges between 0-10

Uses

- Comparing journals belonging to different subjects
- Comparing research output of different researchers and different organizations

Limitations of Journal Impact Factor

- It is journal specific
- Database specific
- All citations are given same weight
- Self citation may inflate the value

h-index

If n number publications of a researcher have received n each or more citations then h-index of the researcher is n, while other papers (Np –h) have received less than h citation (Hirsch, J.E. 2005)

In this case the h-index is 6

	Paper	Citation
	1	200
	2	175
	3	70
	4	30
	5	10
h-index	6	8
	7	4
	8	2
	64	1
	Np = 100	500

I10 index

The number of publications of a researcher that has received 10 each citations is the I10 index, while other papers (Np-I10) have received less than 10 citations

In this case, the I10 index is 2

	Paper	Citation
	1	200
	2	170
	3	70
	4	25
	5	12
	6	8
	7	5
	8	4
	9	3
I10 index	10	2
	45	1
	100	500

g-index

The g-index is calculated based on the distribution of citations received by a given researcher's total publications, such that:

> given a set of articles ranked in decreasing order of the number of citations that they received, the g-index is the unique largest number such that the top g articles received together at least g^2 citations.

g-index looks at overall record

A g-index of 20 means that and academic has published at least 20 articles that **combined** have received at least 400 citations.

However, unlike the h-index these citations could be generated by only a small number of articles.

g-index

The g-index is calculated based on the distribution of citations received by a given researcher's total publications, such that:

> given a set of articles ranked in decreasing order of the number of citations that they received, the g-index is the unique largest number such that the top g articles received together at least g^2 citations.

Paper	Citation
1	350
2	35
3	10
4	3
5	2
15	0
Tp = 20	Tc= 400

g-index looks at overall record

A **g-index of 20** means that the researcher has published at least 20 articles that **combined** have received at least 400 citations.

However, unlike the h-index these citations could be generated by only a small number of articles.

SCImago Journal Rank (SJR)

- SJR gives the relative rank of a journal in a database among other journals in the same field
- SJR Calculation

  Average of Wighted Citations received by a journal in a year **divided by** the No. of papers published in three previous years

Eigenfactor and SJR metrics rely on computing, through iterative weighting, the influence of a journal based on the entire citation network. They differ from traditional metrics, like the Journal Impact Factor, that simply compute a raw citation score.

Way out to build the ladder

- Prepare a research synopsis
- Carry out extensive literature survey
- N-List, UGC-Infonet, GoogleScholar, Researchgate
- Open Access Journals (https://doaj.org/), Open Access Books (https://www.doabooks.org/)
- Academic Search Engines (https://paperpile.com/g/academic-search-engines/)
- Research design
  - Sample design
  - Survey population
  - Survey design/Experiment design
  - Data Analysis
  - Report Writing
  - Submit and attend reviewer queries

Getting visible

- Google Scholar https://scholar.google.com/
- Researchgate https://www.researchgate.net/
- Academia.edu https://www.academia.edu/
- Orcid Id https://orcid.org/
- Personal blog
- Institutional Repository
- Social Media

Thank you All