"Evaluation indicators in the scholarly research and publication cycle "

Dr. Afrooz Hamrahi
afruz.hamrahi@gmail.com

Why Evaluation of Scholarly Outputs Is Important?

- The two **major functions** of a scientific publishing system are to **provide access** to and **evaluation** of scientific papers.
- Evaluation **steers the attention** of the scientific community and thus the very course of science. It also **influences the use** of scientific findings in public policy.
- The common goal of most evaluations is to **extract meaningful information** from the audience and **provide valuable insights to evaluators** such as sponsors, donors, client-groups, administrators, staff, and other relevant constituencies.
- there is a general agreement that the major goal of evaluation research should be to **improve decision-making** through the systematic utilization of measurable feedback.

evaluation is the process of judging the amount, number, or value of something

Indicator of evaluation in Scholarly Publication Ecosystem

Form of evaluation

- Content evaluation
- bibliographic evaluation
- altimetric evaluation
- open evaluation

Type of evaluation

- Quantitative evaluation
- qualitative evaluation
- mixed evaluation

Format of evaluation

- Technical evaluation,
- non-technical evaluation

Form of evaluation in Scholarly Publication Ecosystem

1- Content evaluation

- Accuracy: The **reliability**, **truthfulness**, **and correctness** of the content.
- Authority: The **source** of the information.
- Relevance: The **importance** of the information **for your needs**.
- Currency: The **timeliness** of the information
- Purpose: the **reason** the information **exists**

Form of evaluation in Scholarly Publication Ecosystem

Blind peer review

1-1. Content evaluation

Accuracy

Is the information **reliable, truthful, and correct**?

Does **it match** other information you**'ve found**?

Professional appearance – Do you see **spelling or grammar errors**?

Is it **well organized** and easy to **navigate**?

Authority

Who is publishing this information?

Organization , Person ?
Are they **experts**?
Do you trust them?

Can you **contact them** or their organization for more information, or to make corrections?

Relevance

Does it **fit your needs**?

Was it **intended for you**, or written for another audience? (example: children, scientists)

Does it **make sense to use** this web page?

Currency

Is the information **too old**?

Is it **still valid**?

Purpose

Why does this resource **exist**?

Is it there to **inform and educate**?

Is it trying **sell you or convince** you of something?

Form of evaluation in Scholarly Publication Ecosystem

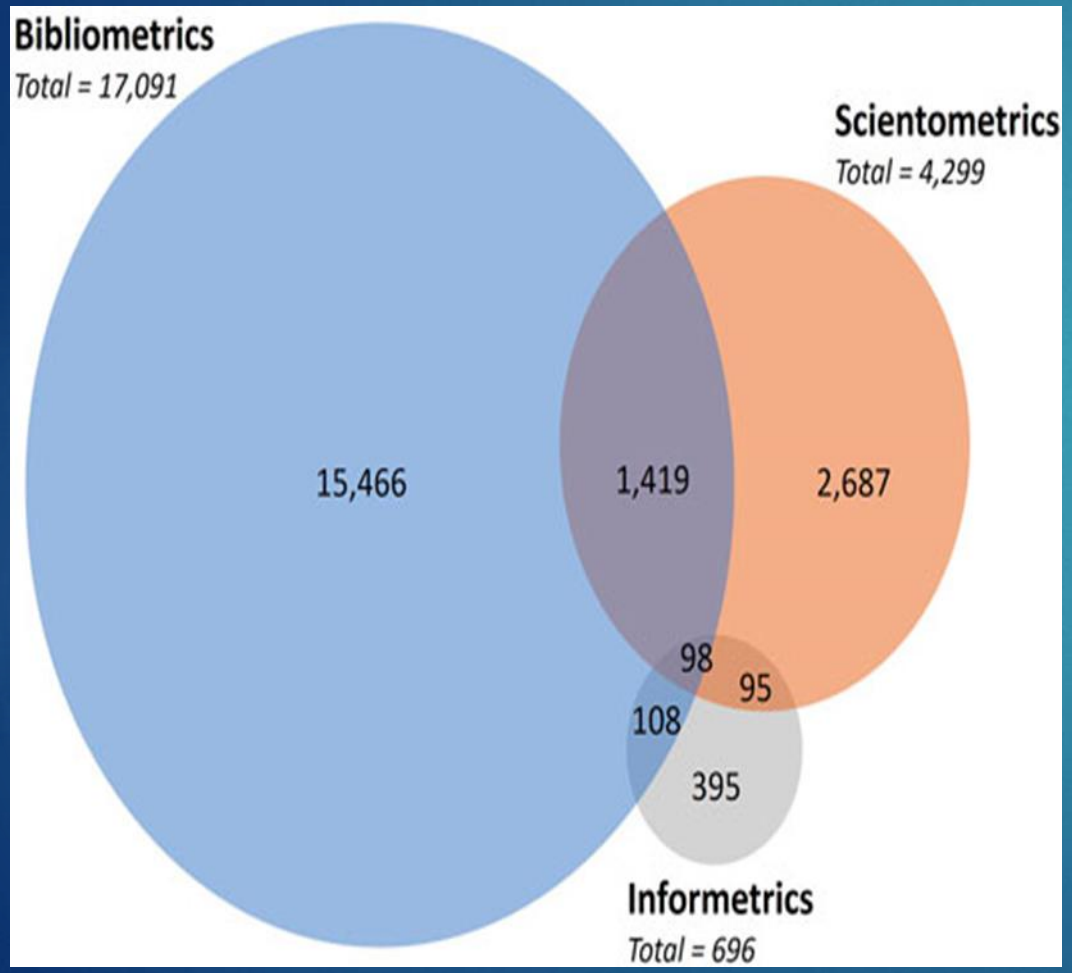
1-3. Bibliographic Evaluation

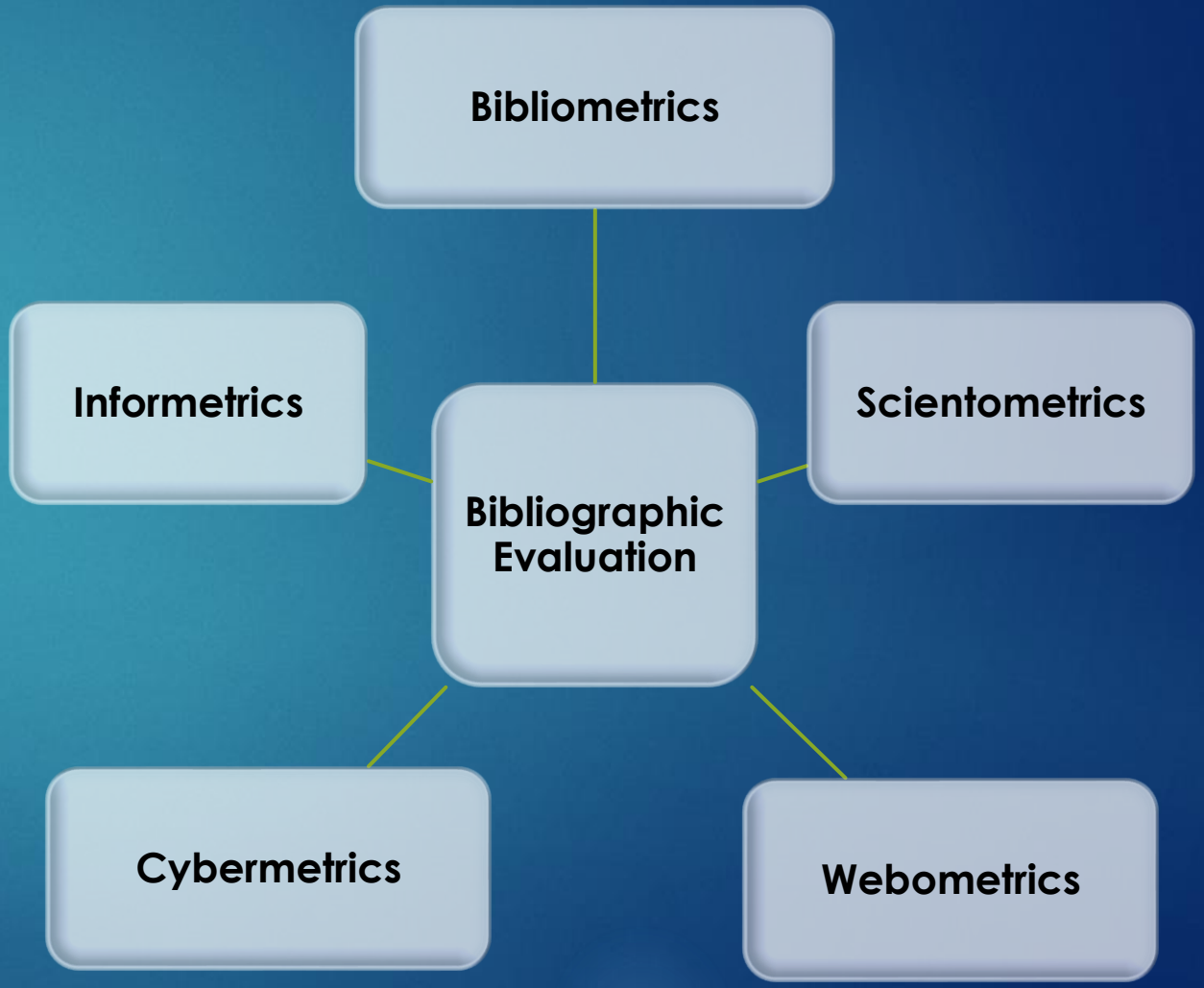
Bibliometrics refers to "the application of mathematics and statistical methods to books and other forms of written communication" (Pritchard, 1969). On the other hand, scientometrics refers to "all quantitative aspects of science and scientific research" (Sengupta, 1992).

Bibliometrics is based on the enumeration and statistical analysis of scientific output in the form of articles, publications, citations, patents and other, more complex indicators.

Form of evaluation in Scholarly Publication Ecosystem

1-2. Bibliographic Evaluation





Mejia, C., Wu, M., Zhang, Y., & Kajikawa, Y. (2021).

Form of evaluation in Scholarly Publication Ecosystem

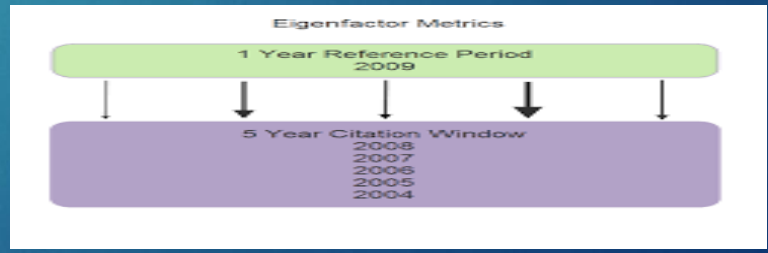
1-3. Bibliographic Evaluation- Resources

- IF
- JRK
- Quartile
- SNIP
- EIGENFACTOR
- G Factor

$$IF_y = \frac{Citations_{y-1} + Citations_{y-2}}{Publications_{y-1} + Publications_{y-2}}$$

$$IF_{2017} = \frac{Citations_{2016} + Citations_{2015}}{Publications_{2016} + Publications_{2015}} = \frac{32389 + 41701}{880 + 902} = 41.577$$

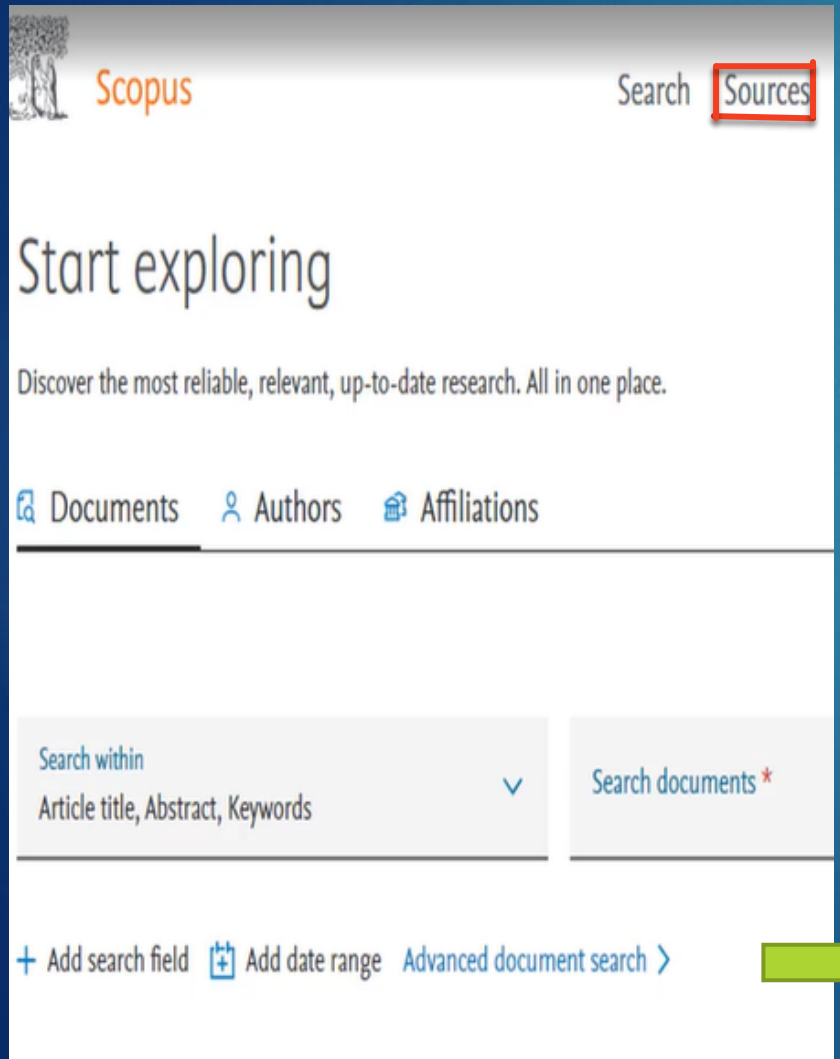
Quartile	Percentile
Q1	75 – 99
Q2	50 – 74
Q3	25 – 49
Q4	0 – 24

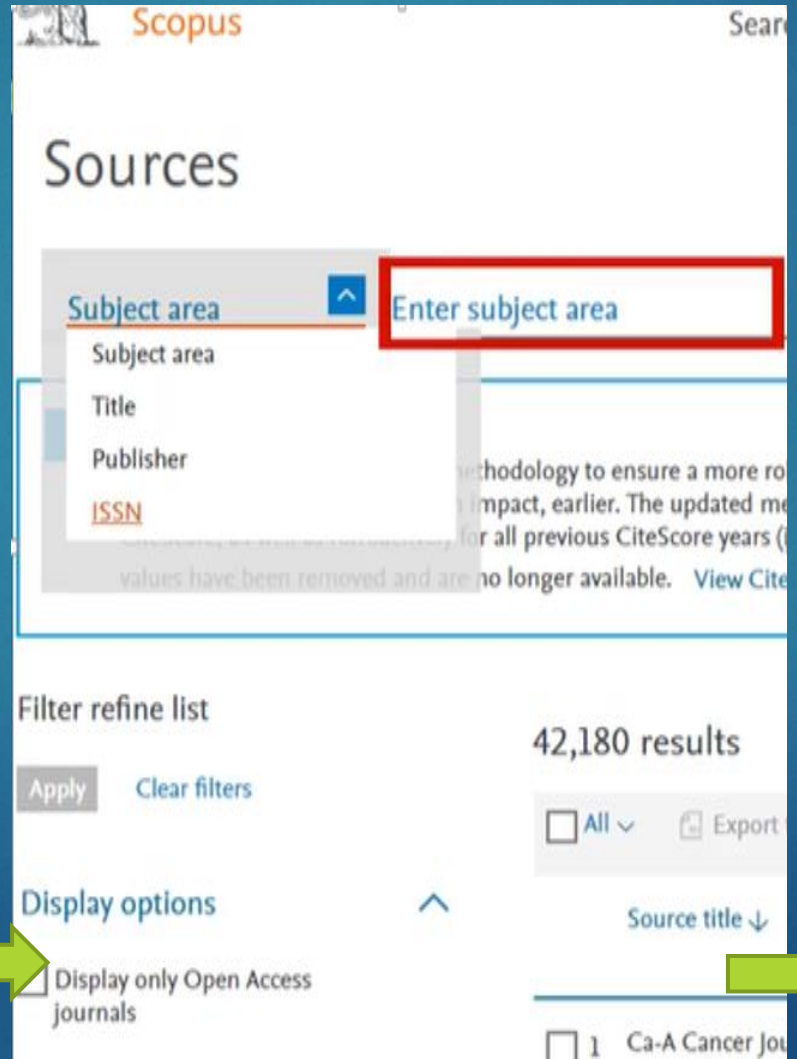


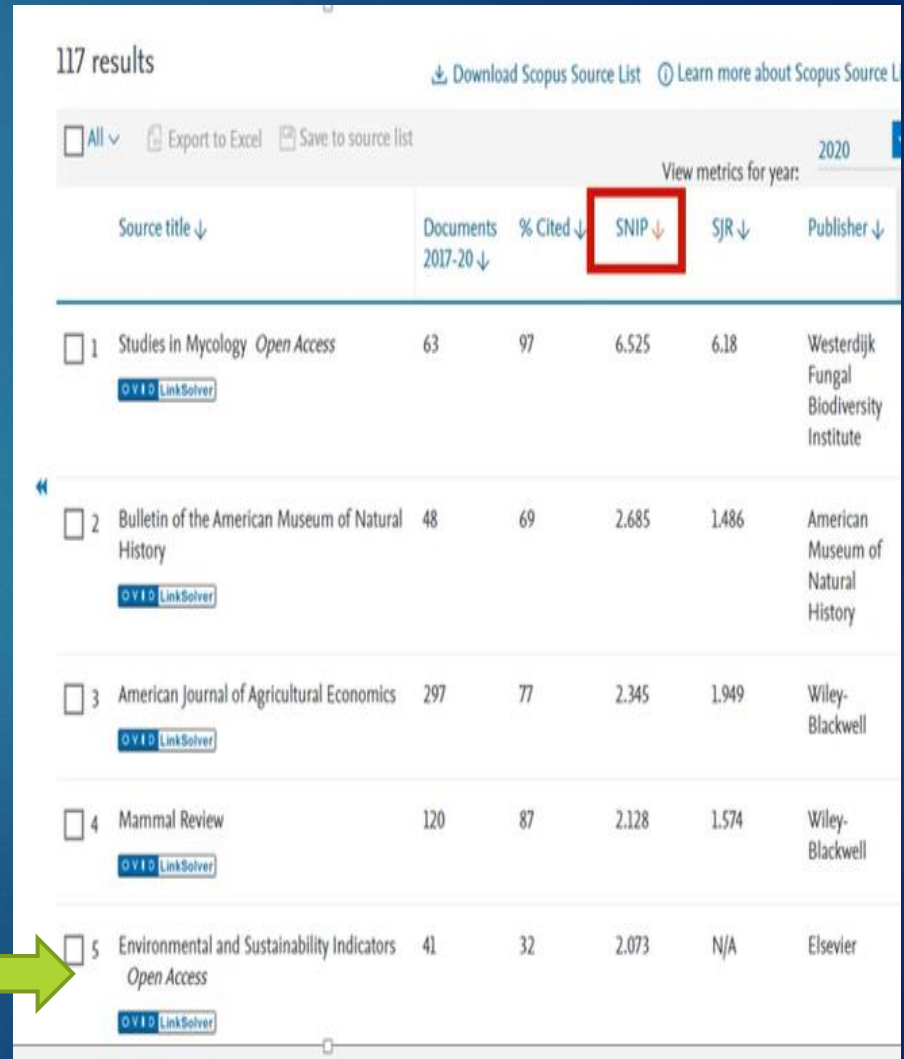
http://www.eigenfactor.org/projects/journalRank/journalsearch.php

Form of evaluation in Scholarly Publication Ecosystem

1-3. Bibliographic Evaluation- Resources







Form of evaluation in Scholarly Publication Ecosystem

1-2. Bibliographic Evaluation- Person

H-index: The h-index is defined as the maximum value of h such that the given author/journal has published at least h papers that have each been cited at least h times. The index is designed to improve upon simpler measures such as the total number of citations or publications. The index works best when comparing scholars working in the same field, since citation conventions differ widely among different fields.

i10-index: developed by **Google Scholar,** the author i10-index is the number of articles published by an author that have received at least 10 citations.

G index: The index is calculated based on the distribution of citations received by a given researcher's publications, such that given a set of articles ranked in decreasing order of the number of citations that they received.

M-index :m-index is another variant of the h-index that displays h-index per year since first publication. The h-index tends to increase with career length, and m-index can be used in situations where this is a shortcoming, such as comparing researchers within a field but with very different career lengths.

e-index, c-index, o-index,

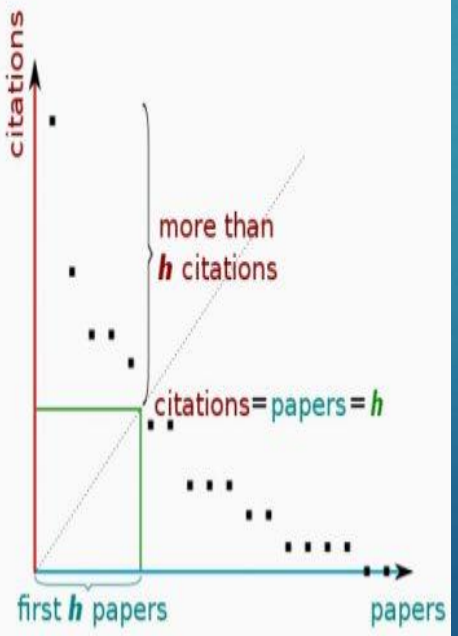
Erdős number : The Erdős number is the number of "hops" needed to connect the author of a paper with the prolific late mathematician Paul Erdős. An author's Erdős number is 1 if he has co-authored a paper with Erdős, 2 if he has co-authored a paper with someone who has co-authored a paper with Erdős, etc.

Form of evaluation in Scholarly Publication Ecosystem

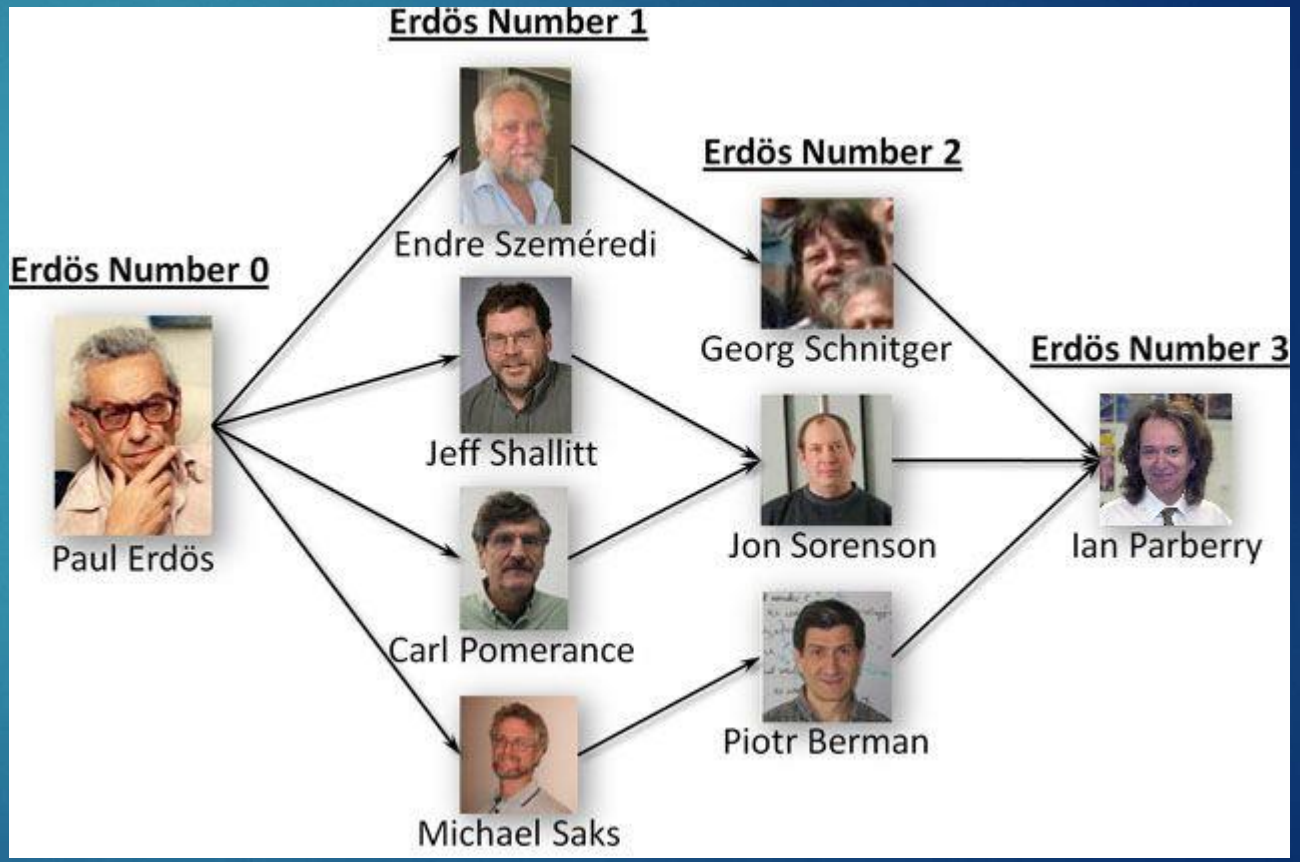
1-2. Bibliographic Evaluation- Person

H index

Articles	Citations
1	46
2	25
3	12
4	11
5	**5 = H-Index**
6	4
7	2
8	1



Erdős number



Form of evaluation in Scholarly Publication Ecosystem

1-2. Bibliographic Evaluation- Scientific Centers

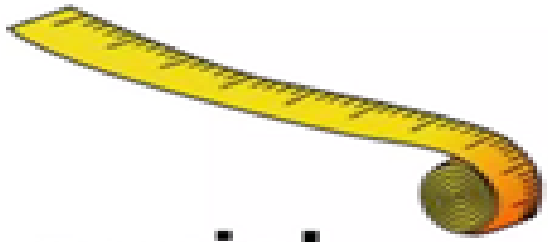
Organisations	Criteria	Percentage
Academic Ranking of World Universities (ARWU)	Alumni	10%
	Awards	20%
	Highly cited researchers	20%
	Papers in Nature and Science	20%
	Papers indexed	20%
	Per capita performance	10%
	Total	**100%**
QS World University Rankings	Academic reputation	40%
	Employer reputation	10%
	Faculty/Student Ratio	20%
	Citations per faculty	20%
	International Faculty Ratio	5%
	International Student Ratio	5%
	Total	**100%**
Times Higher Education (THE)	Teaching (the learning environment)	30%
	Research (volume, income and reputation)	30%
	Citations (research influence)	30%
	International outlook (staff, students, research)	7.5%
	Industry income (knowledge transfer)	2.5%
	Total	**100%**

Form of Evaluation in Scholarly Publication Ecosystem

1-3. Altmetrics evaluation

What are altmetrics?

Altmetrics can be defined as:



"a set of methods based in the social web used to measure, track and analyse scholarly output."

Roemer, R. C. & Borchadt, R. (2015) *Meaningful metrics: a 21st century librarians guide to bibliometrics, altmetrics and research impact*. Chicago: ACRL.

Form of Evaluation in Scholarly Publication Ecosystem

1-3. Altmetrics evaluation

Your influence.
Tracked.
Explained.
Visualized.

Altmetric's interface tracks online engagement to reveal how and where your research is making a difference.

https://www.altmetric.com/

What can Altmetric help you achieve?

Thousands of conversations about scholarly content happen online every day. Altmetric tracks a range of sources to capture and collate this activity, helping you to monitor and report on the attention surrounding the work you care about.

Publishers | Academic | Funders | Researchers | Pharmaceutical | Corporate R&D

Form of Evaluation in Scholarly Publication Ecosystem

1-3. Altmetrics evaluation- Benefits and applications

Academic institutions

Altmetrics can be used to benchmark the influence of your research against your peers, helping you to assess and manage your reputation globally. This means more funding, higher calibre staff, happy stakeholders, and increased alumni donations.

Corporate R&D

Identify the key opinion leaders and influencers in your field and track the waves made by clinical trials or data sets. Altmetrics help you find the right audiences, platforms, and collaboration opportunities to drive innovation, accelerate the pace of discovery, and to maximize the value of your research.

View products***Case studies  https://www.altmetric.com/about-us/what-are-altmetrics/

Scholarly publishers

Altmetrics help publishers to see the bigger picture. Altmetric data insights supply valuable evidence to assist authors' future funding applications by demonstrating where their work is being mentioned. From finding collaborators and identifying influencers, to reporting to stakeholders and enhancing marketing plans, Altmetric results can underpin an array of operations.

Government and funders

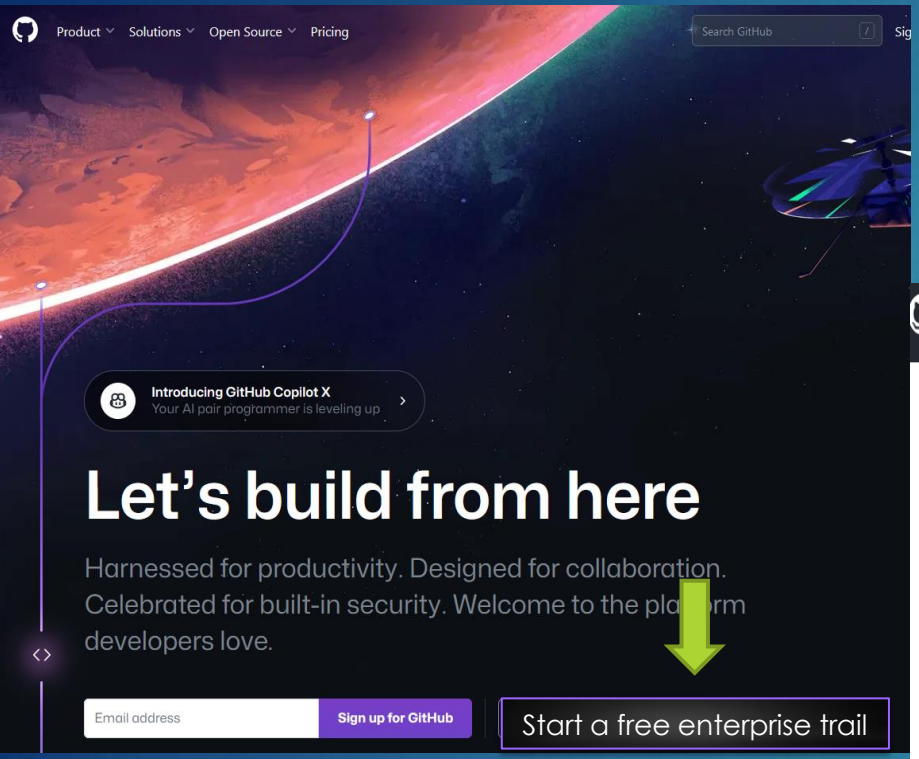
Altmetrics don't just provide clear evidence of the influence of your funded research. They can also play a key role in refining outreach strategies for departments and empowering governments and funders when justifying their investments. The Altmetric dashboard creates clear visuals that can be easily exported, allowing users to benchmark projects, track engagement, and identify potential gaps.

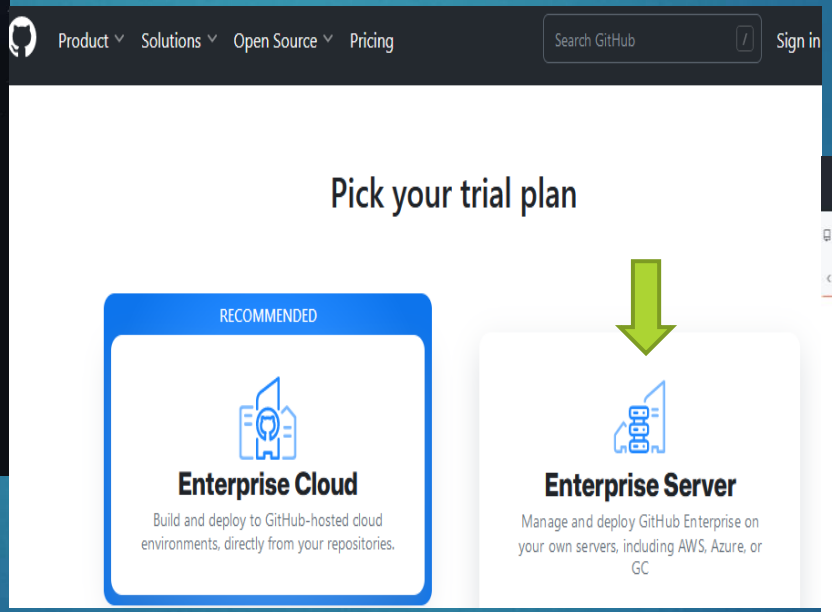
Form of Evaluation in Scholarly Publication Ecosystem

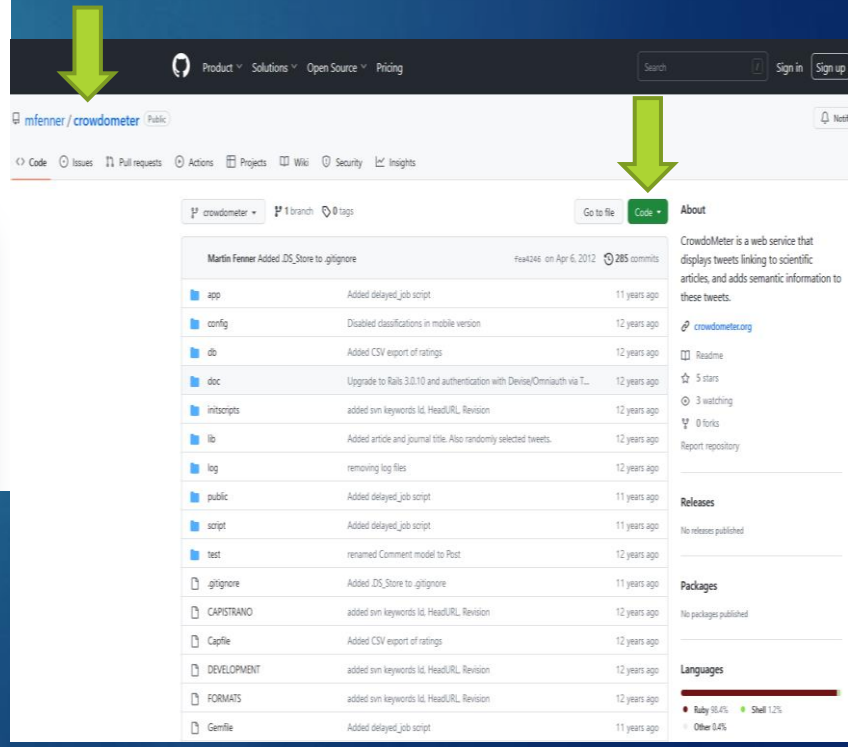
1-3. Altmetrics Evaluation- Tools and providers

Form of Evaluation in Scholarly Publication Ecosystem

1-3. Altmetrics Evaluation- Tools and providers







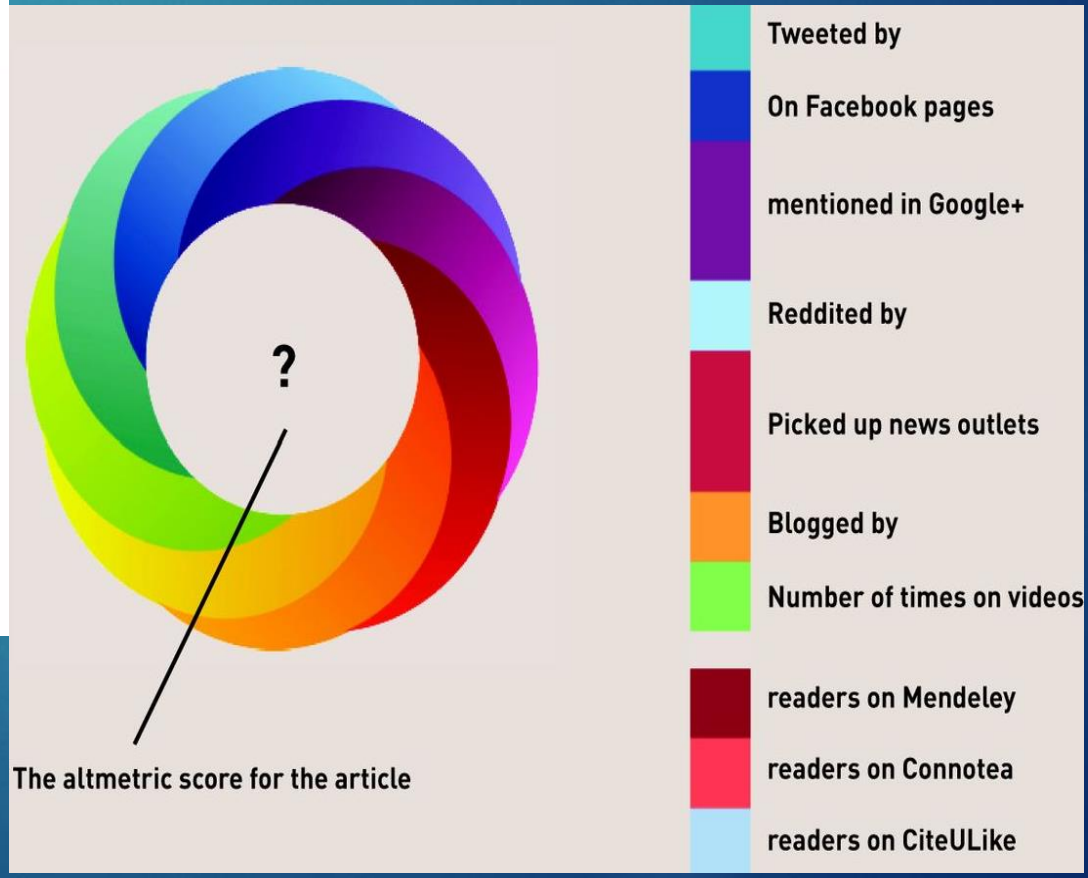
https://github.com/mfenner/crowdometer

Form of Evaluation in Scholarly Publication Ecosystem

1-3. Altmetrics Evaluation- Indicators

What is actually measured?

- Click and views
- Downloads
- Captures (e.g. bookmarking)
- Favouriting or liking
- Mentions
- Shares
- Tweets



Form of evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation

Where Does OE Come From?

- While **open access** (OA) is becoming a reality, open evaluation (OE), the other side of the coin, has received less attention.

- The current system of scientific publishing provides **only journal prestige** as an indication of the **quality of new papers** and relies on a **non-transparent and noisy pre-publication peer-review process**, which delays publication by many months on average.

- Here I propose an OE system, in which papers are evaluated post-publication in an ongoing fashion by **means of open peer review and rating**.

- Through signed ratings and reviews, scientists steer the attention of their field and build their **reputation**. Reviewers are motivated to be objective, **because low-quality or self-serving signed evaluations** will **negatively impact their reputation**. A core feature of this proposal is a division of powers between the accumulation of evaluative evidence and the analysis of this evidence by paper evaluation functions (PEFs).

Form of evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation

Open Evaluation Definition:

Reviewer's identities may or may not be disclosed to the public. This is in **contrast** to the **traditional peer review** process where **reviewers remain anonymous** to anyone but the journal's editors, while authors' names are disclosed from the beginning.

Open peer review may be defined as "any scholarly review mechanism providing **disclosure of author and referee identities** to one another at any point during the peer review or publication process".

- Concurrent with broader developments in Open Science and increased **transparency in research**, Open Peer Review is a **complex, and rapidly evolving topic**.

Main concepts: Open identities--Open reports--Open participation

Form of evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation

Different Attitudes on Open Evaluation:

A. In terms of the evaluation of scholarly outputs (journal articles, proposals), "open evaluation" can refer to **the judging of an output not just by a jury of experts** ("classic expert evaluation"; for scholarly journals, this often means **blind peer review**) but rather by **a jury of anyone interested in the output**. Such evaluation mechanisms are, at the time of writing this *entry*, controversial and part of evergreen discussions about how scholarly peer review is performed.

B. OE, an **ongoing post-publication process** of transparent peer evaluation (including written reviews and ratings of papers), promises to address the problems of the current system. the authors' replies and editors' recommendations.Allowing **self-selected reviewers**(either short comments or full reviews to comment) rather than or in addition to reviewers who are **selected by the editors**

Form of Evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation

The First Attempts to Operate Various Types of OE:

Journal of Medical Internet Research(1999) was decided to *publish the names of the reviewers* at the *bottom of each* published *article*

British Medical Journal(1999) *revealing reviewers' identities* to the *authors* but *not the readers*

BMC(BioMed Central)(2000) the reviewers' names are included on the peer review reports & In addition, if the article is published ***the reports*** *are made available online* as part of the "pre-publication history

Nature(2006) experiment in *parallel* open peer review(the ***regular*** *anonymous process* + available online for open to *identified* ***public*** *comment*)

Form of Evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation

Mega Journal and OE:

Mega journal is a peer-reviewed academic **open access journal** designed to be **much larger than a traditional journal** by exercising low selectivity among accepted articles. It was **pioneered by PLOS ONE**. This "very ***lucrative publishing model***" was soon emulated by other publishers.

Mega-journals are **a new kind of scholarly journal made possible by electronic publishing**. They are open access (OA) and **funded by charges**, which **authors pay** for the publishing services.

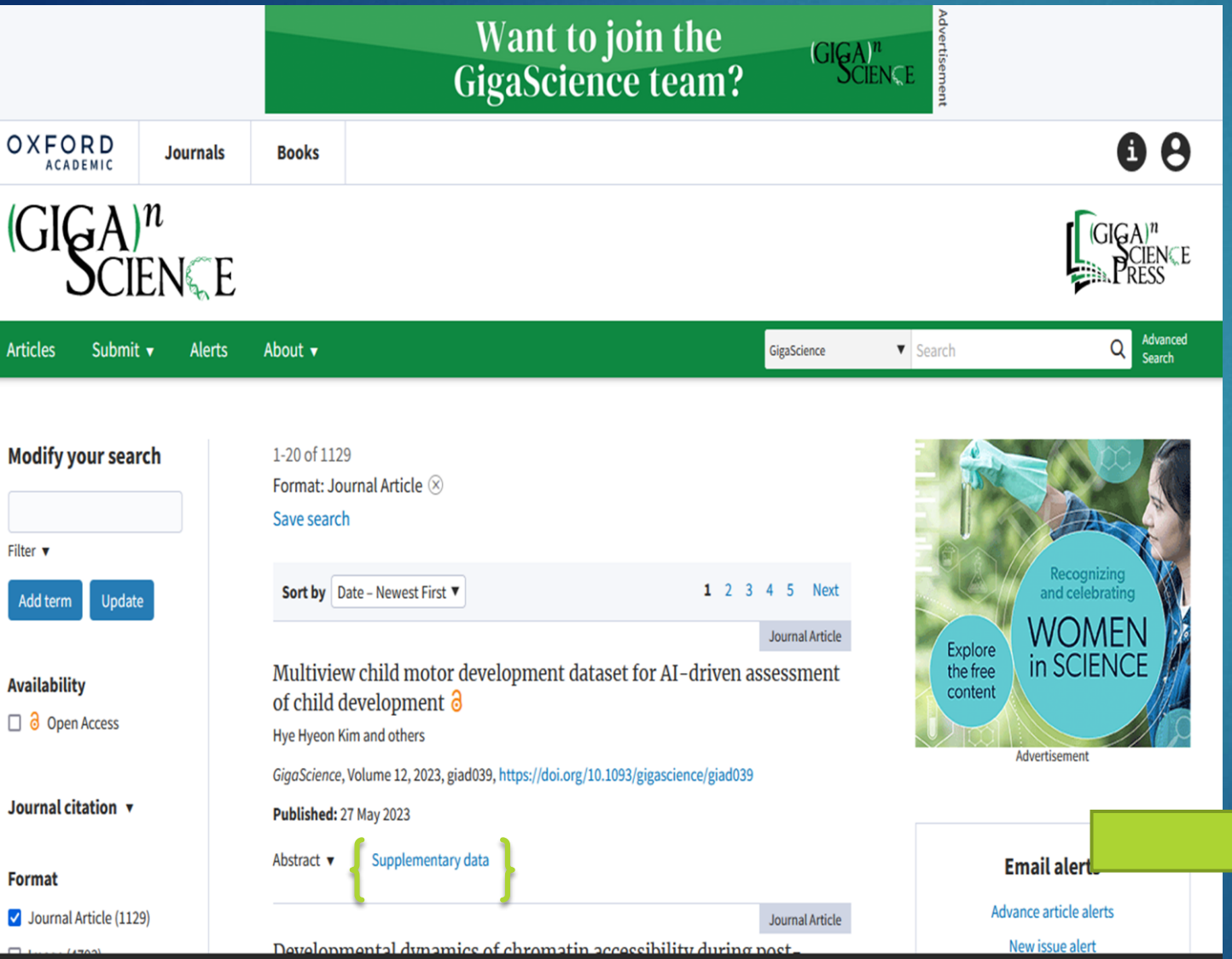
Mega Journal of Oncology **(Impact Factor: 1.970)** is a diverse open group of oncology specialists who interact with cancer patients, primary care clinicians, and many other clinical professionals.

Form of Evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation

Mega Journal and OE:

https://academic.oup.com/gigascience



Supplementary data

giad039_GIGA-D-22-00210_Original_Submission - pdf file

giad039_GIGA-D-22-00210_Revision_1 - pdf file

giad039_Response_to_Reviewer_Comments_Original_Submission - pdf file

giad039_Reviewer_1_Report_Original_Submission

Ashwin Ramesh Babu, Ph.D. -- 11/15/2022 Reviewed

- pdf file

giad039_Reviewer_1_Report_Revision_1

Ashwin Ramesh Babu, Ph.D. -- 3/21/2023 Reviewed

- pdf file

giad039_Reviewer_2_Report_Original_Submission

Lei Ma -- 1/16/2023 Reviewed

- pdf file

giad039_Reviewer_3_Report_Original_Submission

Tracy Anne Hammond -- 1/24/2023 Reviewed

- pdf file

giad039_Supplemental_File - docx file

Form of evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation- Principles of the open peer-review oath

- Principle 1: I will **sign my name** to my review
- Principle 2: I will **review with integrity**
- Principle 3: I will treat the review as a discourse with you; in particular, I will **provide constructive criticism**
- Principle 4: I will be **an ambassador** for the practice **of open science**

Form of evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation- Benefits

- will be able to describe **the history of peer review** in the **context**
- will be able to use a range of **post-publication review**, **commenting**, and **annotation services**
- will be able to describe the issues with **the traditional metrics** and **next-generation metrics**
- will be able to build and demonstrate their **personal research impact profile**, both **quantitatively** and **qualitatively**
- will become **familiar with the relevant criteria for research evaluation(**be able to have a **critical discussion** about them with their colleagues and those who drafted them)
- Open identities have been argued to **incite reviewers to be "more tactful and constructive"**
- To **prevent** reviewers from following their **individual agendas**

Form of evaluation in Scholarly Publication Ecosystem

1-4. Open Evaluation Indicators

Multiple paper evaluation functions (PEFs), freely defined by individuals or groups (e.g., scientific societies, private, and public organizations) provide a plurality of perspectives on the scientific literature.

Alongside this, more diverse criteria of research evaluation beyond **traditional methods** are emerging, and with these come a range of **practical**, **ethical**, and **social factors** to consider.

Type of Evaluation in Scholarly Publication Ecosystem

2-1. Quantitative Evaluation

1. Quantitative indicators: These indicators **deal with the quantitative aspects** of scientific and technical publications.

Examining the status of scientific and technical publications only quantitatively, these indicators include the number of documents **published** by a **country**, the number of articles published by a **person**, the number of **citations** received by a person, and the like. Obviously, the number of these indicators is more than the mentioned cases, given that any indicator that can quantitatively evaluate the status of scientific and technical publications using numbers and figures falls in this area (Vinkler, 2010; Glänzel et al., 2019).

it involves data provide information that can be counted to answer questions " how many" , " how much"

Limitation of quantitative evaluation :
only gives idea about the facts of **numerically measuring aspect**

Not enough to **explain all the aspects deeply**

Type of Evaluation in Scholarly Publication Ecosystem

2-1. Qualitative Evaluation

Qualitative Evaluation: Data acquired through a **qualitative and naturalistic measure** is a type of information that :

- **describes traits or characteristics**
- **Takes holistic approach with a specific focus**
- **tells a richer story**
- **Interprete finding and process**
- **Understanding phenomena**

three fundamental dimensions must be assessed in any evaluation of a scientific publication: **scientific quality**, **relevance for development**, and **valorisation of research**.

Qualitative Evaluation: "Shows **HOW** can you apply, synthesize, evaluate, and design.

Type of Evaluation in Scholarly Publication Ecosystem

2-1. Qualitative Evaluation- system evaluation & resource evaluation

Evaluation Dimension	Codes generated during qualitative analysis
System Quality:	• Access • Availability • Capacity • Flexibility • User Friendly • Speed • System Consistency/Reliability
Information Quality:	• Accuracy • Integration with other systems • Security
Business Process Quality:	• Integration with other systems • Manual DIY System • Business Processes
System Functionality:	• Notifications/Alerts • General Functionality • Timeouts • Confirmation of mark input
Service Quality:	• System Support (Responsiveness) • Training (Assurance, User Support) • University Provisions

Watungwa, Tatenda & Pather, Shaun. (2019)

References Dimensions	
Features quality	Availability
	Multiliguality
	Reusability
	Provenance
	Recency
	Openness
Technological quality	Accessibility
	Alignment to standards
	Usability
	Compatability
Content quality	Structure
	Accuracy
	Comprehensiveness
	Discoverability
	Multimodality
	Self-assessment

Elias, ET AL., 2020

Type of Evaluation in Scholarly Publication Ecosystem

2-1. Hybrid Evaluation

3. Hybrid indicators: These indicators, which are a combination of one or more indicators, **evaluate more specific aspects of scientific and technical publications**, intending to strengthen the indicators through their combination; calculating the number of citations in a specific time period or subject area. **Eigen factors Score,** the Matthew effect and the Crown Index are considered as hybrid indicators (Vinkler, 2010; Glänzel et al., 2019; Waltman, 2016).

A common method that evaluators use to analyze qualitative **data is triangulation**, which involves taking data, finding themes, coding them, and then comparing or triangulating the data from different data sources and different data collection methods.

FORMAT of Evaluation in Scholarly Publication Ecosystem

3-1. Technical Evaluation-

Sub-dimensions	Criteria	Evaluation scale (1-4)
Process	Electronics production	1. If any of the processes is used 2. If any two processes are used 3. If any three processes are used 4. All processes are used
	Embedded programming	
	2D/3D designing	
	Manufacturing technique (Additive/Subtractive)	
Outcome	Examples used or customized the code	1. Basics of all outcomes 2. Basics of all items and one at advanced stage 3. Two at basic stage and two at advanced stage 4. All advanced stage. No part taken from examples
	Parametric, non-parametric design, 3D or 2D, press fit designed or not	
	Number and typological variety of machines used (CNC, Laser, Vinyl) etc	
	Inputs and outputs	
Stage of development	Initial stage (Idea)	1. Initial stage 2. Partially completed prototype 3. Completely functional prototype 4. Commercial product
	Unfinished prototype stage	
	Working prototype	
	Product (ready for commercial usage)	
Reproducibility	Unavailability of information (Documentation)	1. If all the statements are true, low reproducibility 2. If more than one is true 3. If only one is true 4. None of them are true
	Requirement for specific components unavailable in FabLab inventory	
	Specific tools/machines	

FORMAT of Evaluation in Scholarly Publication Ecosystem

3-1. Technical Evaluation- Characteristics

Characteristics of technical evaluation format

- Pre-evaluation
- During evaluation
- Post evaluation

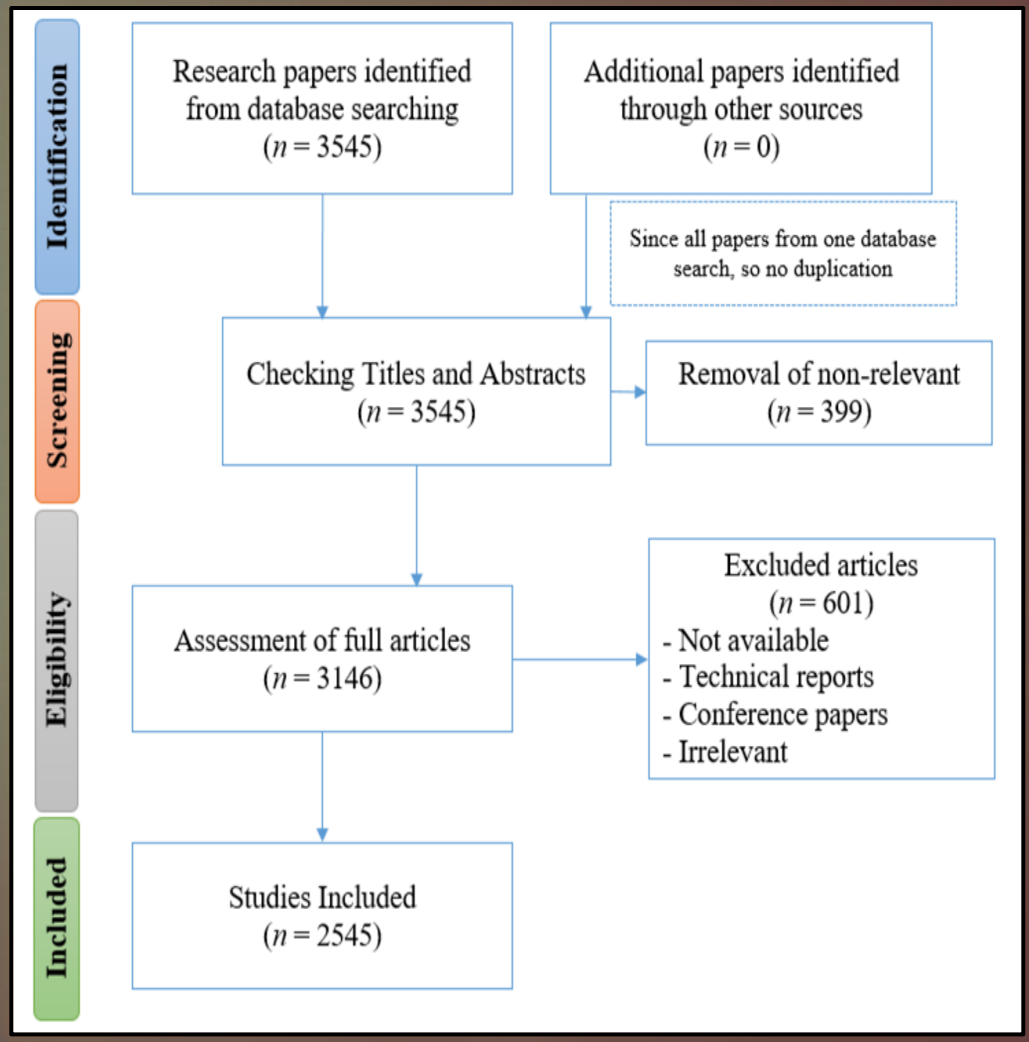
FORMAT of Evaluation in Scholarly Publication Ecosystem

3-1. Technical Evaluation- sample

Prisma Flowchart

Prisma flowchart is a type of flowchart used to report systematic reviews and meta-analyses. It describes evidence-backed details in a transparent manner so that users can easily and fully understand. There are two main components: a **checklist of items** and **a flow diagram**.

PRISMA primarily focuses on the reporting of reviews evaluating the effects of interventions, but can also be used as a basis for reporting systematic reviews with objectives other than evaluating interventions (e.g. evaluating a etiology, prevalence, diagnosis or prognosis).



FORMAT of Evaluation in Scholarly Publication Ecosystem

3-2. Non-Technical Evaluation- research made evaluation

paper evaluation format

Appendix 3: Evaluation Form Research Paper - First Examiner

Name student: Student nr.:	Name first examiner:	Date:		Total score (max 100)/10: 0,0	Title:
Aspects	Criteria	Grade (1-10) *(fill out this column => scores follow automatically)*	Wgt	score	
Title page	Title, name, student number, number of ECTS, supervisor names, site where research was carried out and all other relevant information are presented at the title page. The (kind of) journal and the audience for which the paper is intended are mentioned, if relevant with an indication of the special guidelines of the journal.	0,0	0	0,0	Informati
Abstract	The abstract should follow the APA guidelines except length (accepted length is 150-250 words). An abstract is accurate, concise, coherent and readable. Key elements are: problem investigated, participants involved, method used, key findings and conclusions.	0,0	1	0,0	
Introduction and theoretical background	The research is anchored, relevant and precise. For the paper this means the following: * It is clear in which domain(s) the research is situated. * The choices made to limit the scope of the research are clear and understandable. * The paper makes clear what you want to know or achieve (the knowledge gap). * The practical and/or theoretical relevance is indicated. * The goal and/or research question is clearly indicated and well formulated. If necessary for clarification, sub-questions are added. If relevant, a hypothesis is formulated. * Key concepts in the research question are explained in the surrounding text * The theoretical background also gives an indication of what is already known about the topic	0,0	2	0,0	
Methods section	The methods used to answer this question form an adequate, systematic, valid and reliable way to answer the research question or test the hypothesis. Attention is paid to: context, participants, research instruments (interview scheme, questionnaire etc.), data collection and data analysis (including labeling system if used). The procedure is transparent.	0,0	2	0,0	
Results	Data are represented clearly and efficiently. The data selection is relevant. Where appropriate, interesting phenomena are brought to life with quotes from participants/students/subjects. The reasoning from/interpretation of data to results is comprehensible and acceptable	0,0	2	0,0	

Journal club presentation evaluation format

Criteria for assessing Journal Club presenters

Name of presenter	
Date of presentation	
Name of Chair	
Question/topic	
Study selected	

1. Were the following slides included in the presentation?

- A clear question
- Aims and objectives
- A case report/context of the question
- Literature search (databases / PICO / search terms)
- Details of any Guidelines relating to the study
- Bibliographic details of the paper selected

- A flow chart of the study / details of the study
- Appraisal of the study using the GATE frame
- A summary / conclusion
- A CAT

2. Quality of the presentation

On a scale of 1 to 4: 1 excellent / 2 good / 3 adequate / 4 needs attention

Clear communication		1	2	3	4
Good use of media	1	2	3	4	
Interactive		1	2	3	4

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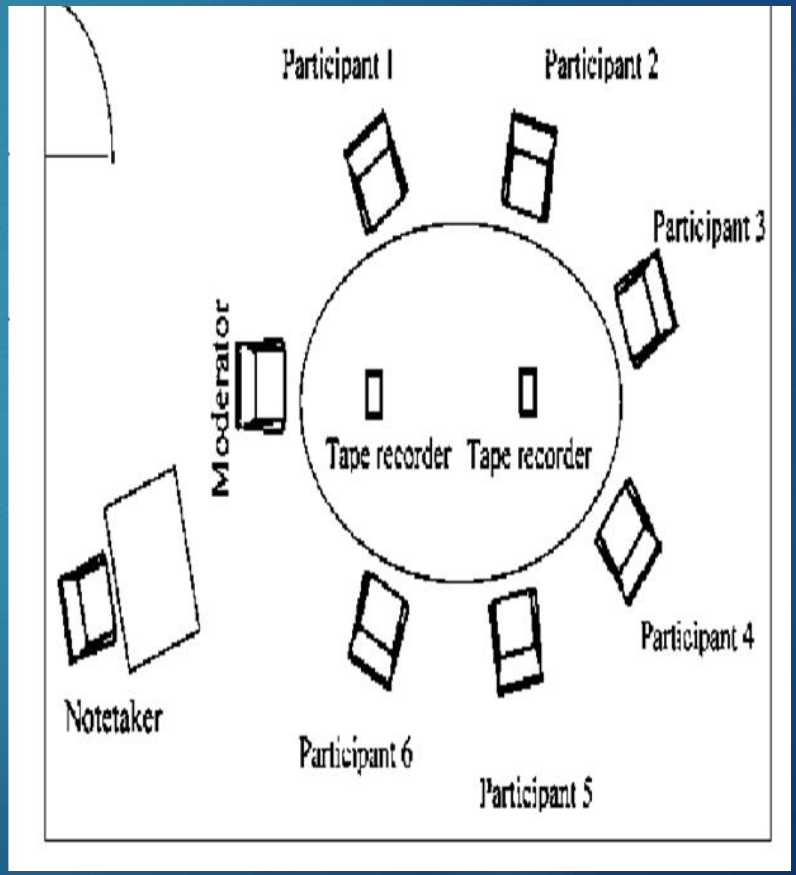
FORMAT of Evaluation in Scholarly Publication Ecosystem

3-1. Non-Technical Evaluation- discussion base

Discussion Tools

Person Who Did Something Wrong

- What happened?
- What else happened?
- What were you thinking about when .. happened?
- What have you thought about since .. happened?
- Who has been affected by what happened?
- How has/have .. been affected?
- What needs to happen next?
- What can you do to make things right?



FORMAT of Evaluation in Scholarly Publication Ecosystem

3-1. Non-Technical Evaluation- discussion base

MS Progression Discussion Tool

Disease activity in past 6 months	Symptoms in the past 6 months	Impacts experienced in past 6 months
Has the patient experienced any relapses in the past six months? Yes/No • How many? • Recovery rate from most recent relapse? Has an MRI been performed in the past six months? Yes /No • Signs of new activity?	Has the patient experienced any visual symptoms in the past six months due to their MS? Yes /No • Were the symptoms experienced during relapse? • Were symptoms **intermittent** or **persistent**? • If the symptoms were **persistent, improving, stable or worsening** -- over time?	Please indicate the impact of the patient's overall symptoms in the past 6 months on following: • Mobility • Self-care • Other dailiy activities • Hobbies and leisure • Paid and unpaid work None/little/moderate/severe/unable

Visual, sensory, motor, ambulatory, bladder & bowel, co-ordination & balance, cognition, fatigue, speech, pain

For More Study

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- Open Evaluation: A Vision for Entirely Transparent Post-Publication Peer Review and Rating for Science
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Thank you

Afruz.hamrahi@gmail.com

098-7132125319