



Training Centre in Communication
Train. Support. Empower

Understanding and Using Research Metrics in Higher Education: From Counting to Context

PRESENTED BY: Joy Owango
- Executive Director

@tccafrica



Introduction



Duration: 60 minutes



: Researchers, librarians,
research managers, university leaders,
and policy makers



Workshop Objective

This session explores not only how metrics work but also how to use them responsibly to enhance research visibility, assessment, and impact.



Workshop Objective

By the end of this session, participants will be able to:

- Understand key types of research metrics.
- Interpret citation and alternative metrics critically.
- Apply responsible metrics principles (DORA, Leiden Manifesto).
- Understand how scientometrics works
- Use metrics to inform institutional and personal research strategies.



What are Research Metrics

Research metrics are quantitative tools used to assess the quality and impact of research outputs, including articles, journals, and researchers themselves.

- Research metrics are **quantitative measures** that help evaluate the performance and impact of research activities.
- They provide insights into how research outputs are received and utilised within the academic community and beyond.
- These metrics can be applied at various levels, including individual articles, journals, and researchers, to gauge their influence and effectiveness in contributing to knowledge and innovation ([Editor Resources, Taylor & Francis](#))



Contd...

Quantitative indicators of research performance or influence.

Used at multiple levels: researcher, institution, national, publications, global.

Support decisions in funding, hiring, promotion, and strategy.

Note:

Metrics offer a snapshot of performance but don't tell the full story.



Why Research Metrics Matter

Metrics inform:

- Institutional benchmarking and reputation
- Researcher visibility and career progression
- Policy and funding allocation
- Strategic visibility and reputation

Discussion: How do metrics drive institutional behaviour and shape research culture — for better or worse?
How metrics are currently used in your institutions.



How metrics data are generated



Types of research metrics

Author-level metrics

These measure a researcher's overall productivity and impact.

- **h-index:** Measures a researcher's productivity and citation impact by counting the number of papers ('h') that have received at least 'h' citations each.
- **g-index:** An alternative to the h-index that gives more weight to highly-cited articles by calculating the largest number ('g') of articles that have, on average, at least 'g' citations each.
- **i10-index:** Used by Google Scholar, this metric is the number of publications with at least 10 citations.
- **Times Cited:** The total number of times an author's publications have been cited by others.

Important Considerations:

- *Author metrics can differ across databases*

Types of research metrics

Journal-level metrics

These metrics reflect the influence and prestige of an academic journal. Researchers use them to decide where to publish, and librarians use them for collection management.

- **Journal Impact Factor (JIF):** The average number of citations received per article published in that journal during the two preceding years. It is published by Clarivate in *Journal Citation Reports*.
- **CiteScore:** Calculated using citation data from the Scopus database, CiteScore measures the average number of citations received in a year for articles published in the journal during the previous three years.
- **SCImago Journal Rank (SJR):** A metric that weighs citations based on the prestige of the citing journal. A citation from a high-ranking journal is worth more than one from a low-ranking journal.



Types of research metrics

Journal-level metrics

- **Source Normalized Impact per Paper (SNIP):** This metric normalizes citation counts to account for differences in citation practices between subject areas, allowing for fairer comparisons of journals from different disciplines.
- **Eigenfactor:** Measures a journal's overall influence over a five-year period. It gives more weight to citations from highly influential journals and excludes self-citations.

Note:

- **Journal metrics** vary significantly across disciplines. For example, some fields, like medicine, have higher citation rates and more established journals, which tend to have higher impact metrics.
- **Journal metrics** are not designed to evaluate individual articles. An article in a high-impact journal may not necessarily be of high quality, just as a high-quality article can be published in a journal with a lower impact metric



Types of research metrics

Alternative metrics (Altmetrics)

Altmetrics track the attention a scholarly output receives across the web, expanding the view of impact beyond traditional academic circles. They capture immediate engagement and show how research is influencing a broader audience.

- **Mentions:** Includes discussions on platforms like Twitter (now X), Facebook, and other social media sites.
- **News and Media Coverage:** Tracks mentions and coverage in traditional and online news outlets.
- **Policy Document Citations:** Monitors mentions in policy documents, think tank publications, and government reports.



Types of research metrics

Alternative metrics (Altmetrics)

- **Bookmarks and Downloads:** Tracks data from online reference managers like Mendeley and counts of downloads from publisher websites.
- **The Altmetric Attention Score:** Visualized as a colorful "donut," this score is a weighted count of all online mentions, with different colors indicating the source.

Note:

- Altmetrics are not normalized, so comparisons between sources or outputs should be made with caution.
- They capture a different type of impact than citation metrics, focusing more on public engagement and influence outside of academia

Policy documents
News
Blogs
Twitter
Post-publication peer-reviews
Facebook
Sina Weibo
Syllabi
Wikipedia

Google+
LinkedIn
Reddit
Research highlight platform
Q&A (Stack Overflow)
Youtube
Pinterest
Patents



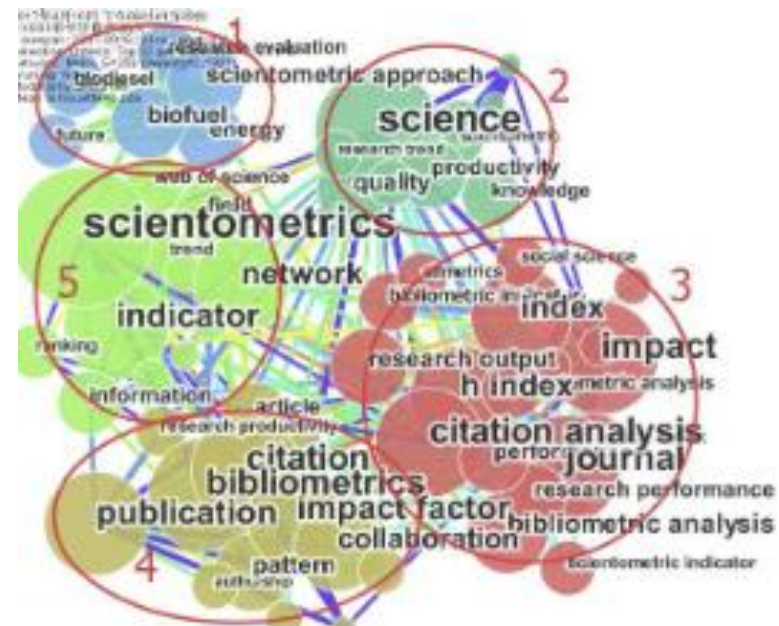
Research metrics resources

- [Measuring Research Impact: Citation Metrics](#)
- [NISO Alternative Assessment Metrics \(Altmetrics\) Initiative Metrics Toolkit](#)
- [Beyond Bibliometrics: Harnessing Multidimensional Indicators of Scholarly Impact](#)
- [Understanding research metrics](#)



Introduction to Scientometrics

- **Scientometrics** is the measurement of scientific output, and the impact of scientific findings.



Scientometrics- Core Concepts and applications

- **Quantitative analysis:** Scientometrics applies quantitative and statistical methods to study science as an information and communication process.
- **Research evaluation:** It provides tools to measure research quality and impact through metrics like citations, publication numbers, and specific indicators such as the h-index.
- **Science mapping:** Techniques like co-citation analysis are used to map scientific fields, identify research clusters, and understand the intellectual structure of a discipline.
- **Policy and management:** The field helps inform science policy decisions, such as funding allocations, by providing objective data on research activity and impact.
- **Tracking scientific progress:** By analyzing metrics over time, scientometrics can track the dynamics of scientific activity, identify emerging trends, and evaluate the progress of a subject.

Scientometrics- Key Indicators and methods

- **Bibliometrics**: A core component, focusing on the analysis of scientific publications and their citations.
- **Citation analysis**: Analyzing citation counts as a measure of influence and importance.
- **Co-citation analysis**: Examining which documents are cited together to map the relationships between research papers and identify influential works.
- **H-index**: A widely used metric for individual researchers, representing the number of papers an author has published that have each been cited at least that same number of times.
- **Impact factor**: A journal-level metric used to reflect the average number of citations to recent articles published in that journal.



What are PIDs



A persistent identifier (PI or PID) is a long-lasting reference to a document, file, web page, or other object.



Source: https://en.wikipedia.org/wiki/Persistent_identifier

Role of PIDs

- ORCID → Researcher ID
- DOI → Digital Object Identifier
- ROR → Research Organization Registry, Ringgold
- DOCiD™, ISNI, DataCite, Crossref → For interoperability

Note:

PIDs help track and connect research outputs across systems, ensuring credit and accurate metrics.



Responsible use of research metrics



Responsible use of research metrics

- The Problem: Overreliance distorts research behavior.

Solutions:

- [DORA](#) – evaluate research on its content.
- [Leiden Manifesto](#) – 10 principles for responsible use.
- [The Metric Tide](#) – combine metrics + peer review.

- Note:

Metrics should inform, not replace, expert judgment.

Question: “Does your institution use any of these frameworks?”



Responsible use of research metrics

Responsible evaluation practices require that metrics be used ethically and transparently. Guidance from initiatives like the Leiden Manifesto and the Declaration on Research Assessment (DORA) emphasises:

- **Context over Quantity:** Quantitative metrics should always be interpreted within the appropriate disciplinary context.
- **Supporting Qualitative Assessment:** Metrics should support, not supplant, qualitative expert judgment.
- **Avoiding Comparisons Across Fields:** Citation and publication practices differ widely, so comparing metrics between different disciplines can be misleading.
- **Using Multiple Indicators:** Relying on a single metric can create a skewed picture. Using a variety of metrics—including both traditional and alternative measures—offers a more comprehensive view of research impact.

Responsible use of research metrics

- The Problem: Overreliance distorts research behavior.

Solutions:

- [DORA](#) – evaluate research on its content.
- [Leiden Manifesto](#) – 10 principles for responsible use.
- [The Metric Tide](#) – combine metrics + peer review.

- Note:

Metrics should inform, not replace, expert judgment.

Question: “Does your institution use any of these frameworks?”



Responsible use of research metrics

- The Problem: Overreliance distorts research behavior.

Solutions:

- [DORA](#) – evaluate research on its content.
- [Leiden Manifesto](#) – 10 principles for responsible use.
- [The Metric Tide](#) – combine metrics + peer review.

- Note:

Metrics should inform, not replace, expert judgment.

Question: “Does your institution use any of these frameworks?”



Metrics and Open Science

Open Science changes how we measure impact:

- Recognize open data, software, preprints.
- Track reuse and collaboration.
- Reward openness, transparency, and societal contribution.

Note:

Link metrics to FAIR data principles and Open Access policies.



Research Metrics- Practical Application: Researchers

- Maintain ORCID and public profiles.
- Use institutional repositories.
- Monitor citations and altmetrics responsibly.
- Share preprints, data, and code.

Note:

Participants should “own their digital footprint.”



Research Metrics- Practical Application: Universities

Develop research dashboards (Dimensions, InCites).

Align metrics with institutional missions.

Include qualitative assessment in promotion criteria.

Encourage Open Access and data sharing.



Pitfalls and Misuse of Research Metrics

- ⚠ Overemphasis on journal metrics
- ⚠ Ignoring disciplinary and language diversity
- ⚠ Self-citation and gaming
- ⚠ Neglecting local impact

Discussion:

Participants share examples of metric misuse and its consequences.



Research Metrics That Matter for Africa

Value *local relevance* and *societal impact*

Recognize *African journals and repositories* (AJOL, AfricArXiv)

Use metrics to showcase *regional innovation*

Encourage *data-driven research policy*

Note:

Highlight the need for *contextualised metrics* — not copying global standards blindly.

Discussion: Participants discuss what “impact” means in African contexts.



Tools for Research Metrics

Citation-based: Scopus, Web of Science,
Dimensions, Google Scholar

Altmetrics: Altmetric.com, PlumX, Overton

Institutional Dashboards: Dimensions Analytics,
InCites

Repository Metrics: Figshare, DSpace, Zenodo



Key Takeaways

- ✓ Metrics are tools, not truths
- ✓ Combine quantitative and qualitative evidence
- ✓ Align evaluation with institutional goals
- ✓ Promote fairness, transparency, and Open Science





CONTACT US

Website: www.tcc-Africa.org

Email: info@tcc-Africa.org

Physical Address:

University of Nairobi, School of
Biological Sciences, Chiromo Campus,
Gecaga Institute Building.

Postal address:

Training Centre in Communication,
P.O. Box 21553, 00100 GPO,
Nairobi, Kenya

Let's Connect



info@tcc-africa.org



www.tcc-africa.org

[@tccafrica](https://twitter.com/tccafrica)



in

