Enhancing the Impact of Your Research

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Galter Health Sciences Library & Learning Center
Metrics and Impact Core

Expertise in bibliometrics, data visualization, and altmetrics.

Custom Reports

Publication Summaries

Information Visualization

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Find us at: https://libguides.galter.northwestern.edu/MIC

Our services are available to Feinberg School of Medicine Faculty, Staff, and Students.
In today’s presentation:

• Discuss evaluation and research impact
• Cover strategies for enhancing research impact
• Demonstrate some tools and resources

Let’s be interactive
We like to hear from you. We will host polls and ask questions during this presentation. Please respond if you are able.

Audience choice for the demonstration
During the presentation we will cover several tools and resources. At the end of the presentation we will poll the audience to decide which tool or resource will be demonstrated.
Research Impact And Evaluation
What is the purpose of research evaluation?

**Advocacy**
- Making the case for research

**Analysis**
- Understanding what works

**Accountability**
- ...to taxpayers and donors

**Allocation**
- Rewarding impact

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How is research impact part of research evaluation?

Example of an evaluation plan (referred to as a logic model)

What is research impact?

Research impact is the **demonstrable contribution** that research makes to the economy, society, culture, national security, public policy or services, health, the environment, or quality of life, beyond contributions to academia.

*Research Impact Principles and Framework*, Australian Research Council
Why might we think about research impact?

Promotion & Tenure
Grant Applications
Progress Reports
Program Review

Though there are other many reasons ....

https://becker.wustl.edu/impact-assessment/model

Northwestern Medicine
Feinberg School of Medicine
How might we use metrics to understand impact?

<table>
<thead>
<tr>
<th>Concept</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific output</td>
<td>Publications</td>
</tr>
<tr>
<td>Scientific impact</td>
<td>Citations received</td>
</tr>
<tr>
<td>Scientific collaboration</td>
<td>Co-authored publications</td>
</tr>
<tr>
<td>Interdisciplinarity</td>
<td>Disciplinary classification of (cited) publications</td>
</tr>
<tr>
<td>Societal impact</td>
<td>Co-authored publications with industry, (citations from) clinical guidelines, patents, policy reports, mentions in social media</td>
</tr>
<tr>
<td>Productivity</td>
<td>Publications / researchers</td>
</tr>
<tr>
<td>Mobility</td>
<td>Change in researcher affiliation</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

Note: metrics are a proxy for understanding research impact. They should not replace or supersede expert assessment.
And there are a lot metrics, too

Bibliometrics, such as:

**H-index**: based on analysis of publication data using publications and citations to provide “an estimate of the importance, significance, and broad impact of a scientist’s cumulative research contributions.”

See: [https://vimeo.com/173624979](https://vimeo.com/173624979)

**Relative Citation Ratio**: citation-based measure of scientific influence of a publication. It is calculated as the citations of a paper, normalized to the citations received by NIH-funded publications in the same area of research and year.

**Journal Impact Factor**: The Journal Impact Factor is a measure reflecting the annual average (mean) number of citations to recent articles published in that journal.

Alternative Metrics (altmetrics), such as:

**News Mentions**: The number of mainstream online news and magazine outlets that reference a research output

**Policy Mentions**: The number of times a research output has been cited in policy documents from government bodies or NGOs.

**Github: Forks, Collaborators, Watchers**: Github “Forks” are created when a user makes a copy of a repository (i.e., a group of files). A “collaborator” is another Github user who is able to perform many actions on the files within the repository, including edits. “Watchers” are Github users who have asked to be notified of activity in a repository, but have not become collaborators.
Which metrics are you familiar with?

- h-index
- Journal Impact Factor
- Journal Quartile
- Field Weighted Citation Impact
- Twitter Mentions
Helpful Frameworks for Research Impact

Becker Medical Library Model for Assessment of Research Impact

<table>
<thead>
<tr>
<th>Advance of Knowledge</th>
<th>Books or Book Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Book or book chapters generated by the research study is noted in a bibliography. Book is used as a textbook for higher education. Translations of the book. Book or book chapter cited in subsequent publications.</td>
</tr>
</tbody>
</table>

| Change in Understanding and Awareness | |
|--------------------------------------| Research study findings represent a paradigm shift in a field. Research study findings lead to change in understanding a problem. |

| Citations to Publications | Number of first generation citations. Number of second generation citations. Countries represented by citations. Institutions represented by citations. Languages represented by citations. |

https://becker.wustl.edu/impact-assessment
### Research Impacts

<table>
<thead>
<tr>
<th>Research Impacts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of journal articles published</td>
<td>The number of peer-reviewed journal articles published over a particular timeframe is a quantitative metric of the volume of research produced by an individual or institution.</td>
</tr>
<tr>
<td>Number of citations</td>
<td>Measures of citations to published articles are used as a proxy for article quality. Can include Highly Cited Papers, Normalized Citation Score, etc.</td>
</tr>
<tr>
<td>Number of research output downloads</td>
<td>The number of times a research output has been downloaded gives an indication of how much it is being of use and the level of interest in it.</td>
</tr>
<tr>
<td>Mentions in Social Media</td>
<td>Information on who is citing the institution in social media can help identify where the influence of the medical school or teaching hospital is being felt across the sector, noting that this may be within academia.</td>
</tr>
</tbody>
</table>

http://www.rand.org/pubs/research_reports/RR1606.html
A review of the characteristics of 108 author-level bibliometric indicators

**Indicators of publication count**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P (total publications)</td>
<td>Count of production used in formal communications</td>
</tr>
<tr>
<td>FA (first author counting)</td>
<td>Credit given to first author only</td>
</tr>
<tr>
<td>Co-authors</td>
<td>Indicates cooperation and growth of cooperation at inter- and national level</td>
</tr>
<tr>
<td>Noblesse Oblige (last author counting)</td>
<td>Indicates importance of the last author for the project behind the paper</td>
</tr>
</tbody>
</table>
The Metrics Toolkit provides evidence-based information about research metrics across disciplines, including how each metric is calculated, where you can find it, and how each should (and should not) be applied. You’ll also find examples of how to use metrics in grant applications, CVs, and promotion dossiers.

https://www.metrics-toolkit.org/
Altmetrics are data that can explain both the volume and nature of attention that research receives online. Certain kinds of altmetrics are also indicators for potential downstream impact.

http://www.whatarealtmetrics.com/
“Citations, journal impact factors, h-indices, even tweets and Facebook likes – there are no end of quantitative measures that can now be used to try to assess the quality and wider impacts of research.”

from Responsiblemetrics.org

Keep in mind that “the way research is evaluated has a significant effect on the whole of the scholarly endeavour.”

from Lizzie Gadd, Influencing the changing world of research evaluation
What does responsible metrics mean?
- **Humility**: recognizing that quantitative evaluation should support – but not supplant – qualitative, expert assessment;
- **Robustness**: basing metrics on the best possible data in terms of accuracy and scope;
- **Transparency**: keeping data collection and analytical processes open and transparent, so that those being evaluated can test and verify the results;
- **Diversity**: accounting for variation by field, and using a range of indicators to reflect and support a plurality of research and researcher career paths across the system;
- **Reflexivity**: recognizing and anticipating the systemic and potential effects of indicators, and updating them in response.

Road map for enhancing research impact

- Update online presence
- Focus on open access
- Follow your colleagues
- Credit for your work
Improve your online presence: update online profiles

- **FSM Faculty Profiles** [http://www.feinberg.northwestern.edu/faculty-profiles/](http://www.feinberg.northwestern.edu/faculty-profiles/)

- **ORCID** [http://orcid.org/](http://orcid.org/)

- **Scopus Author ID** [https://www.eidited/scopus/kw/author+ID/](https://www.eidited/scopus/kw/author+ID/)

- **Web of Science Researcher ID** [http://www.researcherid.com](http://www.researcherid.com)

- **Google Scholar** [https://scholar.google.com/](https://scholar.google.com/)

- **Linked In** [https://www.linkedin.com/](https://www.linkedin.com/)
Which online profiles do you keep up-to-date?

- FSM Faculty Profiles
- ORCID
- Scopus Author ID
- Web of Science Researcher ID (via Publons)
- Google Scholar
- LinkedIn
Sign up for an ORCID and/or connect your ORCID to Northwestern systems:
https://orcid.it.northwestern.edu

See our ORCID Guide:
https://libguides.galter.northwestern.edu/orcid

Note, in the future you may be asked to sign into ORCID through some Northwestern systems.
Use your ORCID ID

Tips for using your ORCID iD and record:

• Use your ORCID iD if prompted during manuscript submission and grant proposal submissions.
• Link your ORCID iD to (or include it in your profile for) other services, including ResearcherID, figshare, and your professional organizations.
• Include your ORCID iD on conference posters (generate a QR code, if you like, right from your ORCID record page), to direct people to your works.
• Consider including your ORCID iD on your webpage, in social media accounts, and in your email signature.
Consider Open Access

Open access (OA) publications are:
- free to readers
- do not have as many copyright restrictions on their use as traditional publications

OA publications generally:
- receive higher visibility
- generate more citations
- allow authors to retain copyrights

Resources:
- Northwestern Open Access Fund
  http://libguides.northwestern.edu/oafund
- Directory of Open Access Journals (DOAJ)
  http://www.doaj.org/
Consider Open Access with DigitalHub

DigitalHub
https://digitalhub.northwestern.edu/

DigitalHub is an online repository for the scholarly output and research data of Feinberg School of Medicine

- disseminate work to a larger audience
- provide a citable link and easy access to your work
- store your research in a central searchable database
- ensure long-term preservation of your work
What can you upload to DigitalHub?

- research papers
- case reports
- technical reports
- figures
- images
- guidelines
- datasets
- summary statistics
- books
- newsletters
- user guides
- conference papers
- abstracts
- presentations
- educational materials
- workshop resources
- and so much more...

Content in DigitalHub

The content must be scholarly, educational, or related to the university's mission.

The content must be in its final form. DigitalHub is intended to be an archive, not a storehouse for works in progress.

The content must be in a digital format.
Consider Copyright and Creative Commons Licenses

- Academic authors have various tools to negotiate with publishers to retain the rights they may need after their work is published

- Big Ten Academic Alliance Provosts are advocates for open access and author rights (NU is a member)
  https://www.btaa.org/library/scholarly-communication/introduction

- SPARC Copyright Addendum
  http://www.sparc.arl.org/sites/default/files/Access-Reuse_Addendum.pdf

- Creative Commons licenses allow a creator to simply identify the types of uses that are allowed and those that are prohibited.
  http://creativecommons.org/

For more information see NU Libraries Author Rights guide:
http://libguides.northwestern.edu/scholcomm/authorrights
Curate your work: Set up alerts for your work

• Curate from Latin *curare* meaning "take care"
• Keep your profiles updated
• Set up alerts in:
  • Scopus
  • Web of Science
  • Google Scholar
  • Google
Useful Tools and Resources
Audience Choice for Demonstration

- Review websites describing bibliometrics:
  - Metrics Toolkit
  - What are Altmetrics?
- Setting up publication/citation alerts in major databases:
  - Scopus
  - Web of Science
- Finding bibliometrics in popular resources:
  - Scopus
  - Altmetric Bookmarklet
- Review new citation analysis tools:
  - Scite (tool for analyzing citations)
  - VosViewer (tool for visualizing networks)

All data are preliminary
Bibliometric Websites
- Metrics Toolkit

The Metrics Toolkit is a resource for researchers and evaluators that provides guidance for demonstrating and evaluating claims of research impact. With the Toolkit you can quickly understand what a metric means, how it is calculated, and if it’s a good match for your impact question.
Bibliometric Websites

- **Altmetrics**

  - New way to measure engagement with research outputs
  - Data that explain both the volume and nature of attention research has received online
  - Provides evidence of engagement with diverse audiences and potential impact

  - Can measure how many people have shared or engaged with a scholarly output online (Twitter, news outlets, Wikipedia citations, post-publication peer review, citations in policy documents)
  - Complementary to bibliometrics (citation-based)
Bibliometric Websites
- Altmetrics

Resources

Advantages

Real time information
Reach new audiences
Track various kinds of output

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7/23/20
Publication/Citation Alerts
- Web of Science

How to add a Citation Alert

Add Alerts to Your List
When you add citation alerts, you receive emails when someone cites articles you selected. You can also use this feature to keep a list of your favorite articles.

To add an article:
1. Search one of our Web of Science citation databases (e.g., Web of Science Core Collection).
2. When you’re viewing a full record, click **Create Citation Alert** (Note: not all full records have the **Create Citation Alert** button; for more information, read our help article).
3. Click the **Citation Alerts** link from the top of any *Web of Science* page to view your alerts list.

How to create an Alert

Add Searches to Your List
When you save searches to this list, you can set alerts to receive emails with the latest documents found from your search query.

You can also access your saved searches from any computer at the institution and run saved searches from the *Web of Science* homepage.

To save a search:
1. Click **Create Alert** on the left side of the search results page.
2. Give your search a name, and if you want, add a description. **Email Alerts** is automatically selected, but if you don’t want alerts, just uncheck it.
3. Click **Save** to add the search to your list.
Bibliometrics in Popular Resources

- Scopus
Bibliometrics in Popular Resources

- Altmetric Bookmarklet

1. Add bookmarklet to your bookmarks toolbar
2. Visit any paper
3. Get article level metrics with a single click
Scientists need a shorter path to research freedom

Francis Collins

Reports for visitors are limited to 10 Smart Citations.
Please sign up for a free account or sign in to access unlimited Smart Citations.

4 Citation Statements (4 Sources)

1. "...Among a total of 13 young recipients of these prizes, 7 were born in Asia, 5 were from Europe, and 1 was born in New Zealand. Although the average age at which biomedical scientists begin an independent career has steadily drifted upward, the accomplishments of the young prize winners are striking (1/2): (4/5). . . ."

The Long Road To Renown: The 2015 Vilcek Foundation Prizes Prashant Nair, et al. 2015 FASEB
scite report

All data are preliminary

https://scite.ai/
New Citation Analysis Tools

-VosViewer

• VOSviewer is a software tool for constructing and visualizing bibliometric networks. These networks may for instance include journals, researchers, or individual publications, and they can be constructed based on citation, bibliographic coupling, co-citation, or co-authorship relations. VOSviewer also offers text mining functionality that can be used to construct and visualize co-occurrence networks of important terms extracted from a body of scientific literature.

• Download at: https://www.vosviewer.com/
New Citation Analysis Tools
-VosViewer

- A quick search and export in Scopus for the subject area of Pediatrics (applied at the journal-level) and Northwestern affiliation, limit to final publications, articles, reviews, and 2010-2019:
  SUBJTERMS (2735) AND AF-ID (“Northwestern University” 60007363) OR AF-ID (“Northwestern University Feinberg School of Medicine” 60013227) OR AF-ID (“Rehabilitation Institute of Chicago” 60001590) OR AF-ID (“McGaw Medical Center of Northwestern University” 60006203) OR AF-ID (“Ann & Robert H. Lurie Children’s Hospital of Chicago” 60017031) AND LIMIT-TO (PUBSTAGE, “final”) AND LIMIT-TO (DOCTYPE, “ar”) OR LIMIT-TO (DOCTYPE, “re”) AND LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010)

- See publication list here: https://northwestern.box.com/s/hy7ymdd84ku2cy4uxt29o4phsfbeng38

- In VosViewer, consider creating a term co-occurrence map using the overlay visualization with scores by average publication to view topical trends over time.

All data are preliminary
New Citation Analysis Tools - VosViewer
Thank You