Altmetrics

A look at a moving target...

Scott Curtis, UMKC Libraries
In the beginning....

...we’ll start with Eugene Garfield

First published in 1955 in Science, his foundational article “Citation indexes for science. A new dimension in documentation through association of ideas” has been reprinted many times (including here).

“In effect, the system (citation indexing) would provide a complete listing, for the publications covered, of all the original articles that had referred to the article in question. This would clearly be particularly useful...when one is trying to evaluate the significance of a particular work and its impact on the literature and thinking....Such an ‘impact factor’ may be much more indicative than an absolute count of the number of a scientist’s publications....”

The Science Citation Index launched commercially in 1963, and “impact factor” entered the daily vocabulary of academic librarians everywhere.
What is “impact factor?”

Basically, impact factor as defined measures the # of citations of a journal in the articles from a fixed set of journals. Then, there comes some math to assess the frequency with which the average journal article in that journal will be cited. So, lots of citations = bigger impact factor for the journal.

Web of Science: Journal Citations Reports, Journal Impact Factor (JIF)

Elsevier: Scopus, SCImago Journal Rank and SNIP (Source Normalized Impact per Paper)

As originally developed, “impact factor” is a journal-level metric
How Publishers Use Impact Factor

Journal marketing....

...and sales.

Journal Impact Factor in Web of Science

Journal Citation Reports®

Journal Titles Ranked by Impact Factor

<table>
<thead>
<tr>
<th>Full Journal Title</th>
<th>Total Cites</th>
<th>Journal Impact Factor</th>
<th>Eigentor Factor Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-A CANCER JOURNAL FOR CLINICIANS</td>
<td>20,486</td>
<td>131.723</td>
<td>0.05281</td>
</tr>
<tr>
<td>NEW ENGLAND JOURNAL OF MEDICINE</td>
<td>293,525</td>
<td>59.558</td>
<td>0.68583</td>
</tr>
<tr>
<td>NATURE REVIEWS DRUG DISCOVERY</td>
<td>25,460</td>
<td>47.120</td>
<td>0.06294</td>
</tr>
</tbody>
</table>
...and along comes Hirsch (2005)

**h-index** is simply an indicator, easily calculated.

It is the largest integer number of papers within a given set of papers that contain at least that many citations.

So a researcher having an h-index of 12 in Scopus means that 12 of the papers authored by the researcher have been cited at least 12 times, but that 13 of the papers have not been cited at least 13 times.

H-index is set dependent, therefore.

As originally developed, h-index is a *personal metric*.
Finding h-index in Scopus

Morrison, David C.
University of Missouri-Kansas City, Department of Basic Medical Science, Kansas City, United States
Author ID: 35591526700

Documents: 242
Citations: 8203 total citations by 6304 documents
h-index: 47
Co-authors: 150 (maximum 150 co-authors can be displayed)
Subject area: Immunology and Microbiology, Medicine View More

242 Documents Cited by 6304 documents 150 co-authors
Journal-level h-index in Google Scholar

<table>
<thead>
<tr>
<th>Publication</th>
<th>h5-index</th>
<th>h5-mc</th>
</tr>
</thead>
<tbody>
<tr>
<td>The New England Journal of Medicine</td>
<td>328</td>
<td>520</td>
</tr>
<tr>
<td>The Lancet</td>
<td>268</td>
<td>416</td>
</tr>
<tr>
<td>Cell</td>
<td>216</td>
<td>330</td>
</tr>
<tr>
<td>Proceedings of the National Academy of Sciences</td>
<td>216</td>
<td>280</td>
</tr>
<tr>
<td>Journal of Clinical Oncology</td>
<td>202</td>
<td>296</td>
</tr>
<tr>
<td>JAMA: The Journal of the American Medical Association</td>
<td>184</td>
<td>277</td>
</tr>
<tr>
<td>Circulation</td>
<td>182</td>
<td>278</td>
</tr>
<tr>
<td>Nature Genetics</td>
<td>182</td>
<td>268</td>
</tr>
<tr>
<td>Journal of the American College of Cardiology</td>
<td>163</td>
<td>244</td>
</tr>
<tr>
<td>PLoS ONE</td>
<td>161</td>
<td>210</td>
</tr>
</tbody>
</table>

“... that dog-eared (but uncited) article that used to live on a shelf now lives in Mendeley, CiteULike, or Zotero—where we can see and count it. That hallway conversation about a recent finding has moved to blogs and social networks—now, we can listen in. The local genomics dataset has moved to an online repository—now, we can track it. This diverse group of activities forms a composite trace of impact far richer than any available before.”
So, What is Altmetrics?

According to NISO,

“Altmetrics is a broad term that encapsulates the digital collection, creation, and use of multiple forms of assessment that are derived from activity and engagement among diverse stakeholders and scholarly outputs in the research ecosystem.

The inclusion in the definition of altmetrics of many different outputs and forms of engagement helps distinguish it from traditional citation-based scholarly metrics. At the same time, it leaves open the possibility of the complementary use of those traditional measurements for purposes of gauging scholarly impact. However, the development of altmetrics in the context of alternative assessment sets its measurements apart from traditional citation-based scholarly metrics.”

Whew!
Altmetrics are measures that look at scholarly and research impact other than through “traditional” citation counting/impact factors.

Altmetrics can be measured for *individual articles*, *researchers/authors*, or at the *journal* level.

The NISO document [Altmetrics Definitions and Use Cases](#) presents several scenarios where different stakeholders may want to use altmetrics.
Types of Altmetrics

A [2012 blog post](https://impactstory.org) at ImpactStory suggested that altmetrics fall into the following types or categories:

<table>
<thead>
<tr>
<th></th>
<th>scholars</th>
<th>public</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>recommended</strong></td>
<td>citations by editorials, f1000</td>
<td>press article</td>
</tr>
<tr>
<td><strong>cited</strong></td>
<td>citations, full-text mentions</td>
<td>wikipedia mentions</td>
</tr>
<tr>
<td><strong>saved</strong></td>
<td>citeulike, mendeley</td>
<td>delicious</td>
</tr>
<tr>
<td><strong>discussed</strong></td>
<td>science blogs, journal comments</td>
<td>blogs, twitter, facebook, etc.</td>
</tr>
<tr>
<td><strong>viewed</strong></td>
<td>pdf downloads</td>
<td>html downloads</td>
</tr>
</tbody>
</table>

*more on this company later!
Article-Level Metrics (ALM) altmetric tools

Following the analysis of Merlo (2015) in his article “Altmetrics - a complement to conventional metrics,” we’ll briefly discuss four tools being used to gather altmetrics at the article-level. This level of gathering is important for researchers interested in the significance of their work.

- ALM - PLoS One
- Altmetric
- ImpactStory
- Plum Analytics
Example of ALM in PLoS One

A New Metabolomic Signature in Type-2 Diabetes Mellitus and Its Pathophysiology

Inken Padberg, Erik Peter, Sandra González-Maldonado, Holger Witt, Matthias Mueller, Tanja Weis, Bianca Bethan, Volker Liebenberg, Jan Wiemer, Hugo A. Katus, Dietrich Rein, Jörg Schatz

Published: January 17, 2014 • http://dx.doi.org/10.1371/journal.pone.0085082

Abstract
Click on “Metric” for more detail...

<table>
<thead>
<tr>
<th>Total Article Views</th>
<th>HTML Page Views</th>
<th>PDF Downloads</th>
<th>XML Downloads</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,723</td>
<td>3,993</td>
<td>915</td>
<td>31</td>
<td>4,939</td>
</tr>
<tr>
<td>PMCID</td>
<td>1,415</td>
<td>641</td>
<td>n.a.</td>
<td>1,784</td>
</tr>
<tr>
<td>Totals</td>
<td>6,136</td>
<td>1,556</td>
<td>31</td>
<td>6,723</td>
</tr>
</tbody>
</table>

36.30% of article views led to PDF downloads.

*Although we update our data on a daily basis, there may be a 48-hour delay before the most recent numbers are available. PMC data is*
Key features of ALM-PLoS

Metrics in five categories: Viewed, Saved, Discussed, Recommended, Cited (cited is, of course, a “traditional” metric)

Visualizes article usage as a function of age where possible

Application Programming Interface (API) is freely and publicly available
Confusingly, a leading tool for altmetrics is Altmetric.

One Altmetric’s key visualizations is the Altmetric Attention Score, graphically represented as a donut with bands of varying width representing different types of attention received by the research output.
# Altmetric Attention Score Donut Colors

<table>
<thead>
<tr>
<th>Policy documents</th>
<th>Google+</th>
</tr>
</thead>
<tbody>
<tr>
<td>News</td>
<td>LinkedIn</td>
</tr>
<tr>
<td>Blogs</td>
<td>Reddit</td>
</tr>
<tr>
<td>Twitter</td>
<td>Faculty1000</td>
</tr>
<tr>
<td>Post-publication peer-reviews</td>
<td>Q&amp;A (stack overflow)</td>
</tr>
<tr>
<td>Facebook</td>
<td>Youtube</td>
</tr>
<tr>
<td>Sina Weibo</td>
<td>Pinterest</td>
</tr>
</tbody>
</table>
Key features of Altmetric

Aggregates data from social media, “traditional” media (including popular and professionally specific), and online reference managers

Has been adopted by Springer, Nature Publishing Group, BiomedCentral, and other publishers

Is one of the data sources used in ImpactStory

Altmetric is a for-profit entity; Application Programming Interface (API) available for fee that covers the entire application, while non-commercial license available for reduced API to retrieve basic altmetrics data
What is Impactstory?

Impactstory is a web service “...that helps researchers explore and share the online impact of their research. By helping researchers tell data-driven stories about their work, we're helping to build a new scholarly reward system that values and encourages web-native scholarship.”

Impactstory is a 501(c)(3) non-profit with funding from the Alfred P. Sloan Foundation and the National Science Foundation.
My Impactstory page

Scott Curtis
University of Missouri Kansas City University Libraries Federal Depository Library Program Coordinator

ACHIEVEMENTS

Global Reach
Your research has been saved and shared in 5 countries.
- Countries include Germany, Japan, Poland and 2 more.

Greatest Hit
Your top publication has been saved and shared 7 times.
- Your greatest hit online is Informing collection development through citation examination of the civil engineering research literature.

All Readers Welcome
Your writing has a reading level that is easily understood at grade 9 and above, based on its abstracts and titles. That's great — it helps lay people and practitioners use your research. It also puts you in the top 5% in readability.

ACTIVITY

23 Saves and shares across 3 channels: 18 4 1

PUBLICATIONS

- Informing collection development through citation examination of the civil engineering research literature
  2011 ASEE Annual Conference and Expo, Conference Proceedings


- Racetrack for competing viscous fingers
Achievements like...

Big in Japan
Your work was saved or shared by someone in Japan! Only half of researchers can claim this honor.

link share
Key features of Impactstory

Commitment to free and open data (to the extent researchers make it possible)

Co-founded by Jason Priem, who coined “altmetrics” and wrote the Altmetrics Manifesto

API code is open for development on GitHub

Search other researchers’ Impactstory by using ORCID number
Metrics using Plum Analytics

Here’s an example of a PlumPrint from Plum Analytics:

Notice measures beyond citations like

- Usage in HTML/PDF views
- Comments/Mentions on social media
- Citation metrics from CrossRef

Here’s a blog post on PlumX within CINAHL.
Key features of Plum Analytics

Metrics in **five categories**: Usage, Captures, Mentions, Social Media, and Citations

Plum Analytics is a for-profit entity owned by EBSCO, with a suite of products tailored for individual researchers, research groups, and institutional repositories.
What do Researchers Want from Metrics?

Care a lot about making tenure/promotion

- Want to publish in journals that will appeal to their tenure/promotion committee
- Want their articles to be viewed as significant contributions to the field

Care a lot about applying for grants - getting money for research

- Want to publish in journals that will appeal to granting agencies
- Want granting agencies to see the value of their articles based on grant funding

Care a lot about what colleagues think

- Want to publish articles that their peers regard highly
Are altmetrics good metrics?

“...it’s not the collaboration, it’s the ego, stupid! Ego moves Academia.”

“Self-tracking can be a means of taking control, a strategy for empowering by making contributions visible, or to contest auditing done by others...Enacting research as a game might however lead to other, less desired, consequences. Similarly to evaluation systems, a further focus on gathering points ...might lead to goal displacement where the aim of doing sound and relevant research is superseded by the effort of gathering more points.”

“Informed with the strengths and limitations of the tools and data available, researchers can construct more comprehensive portfolios and richer narratives of the ways in which their scholarship is diffused and the impact it has on society. With proper understanding, altmetrics can help to tell this story.”
Discussion/Questions
Resources


Thank you!