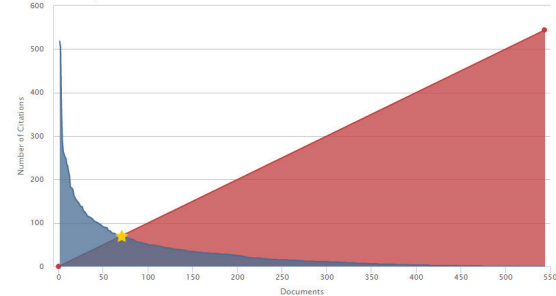


Talking to your researchers about the *h*-index

BY JENNY DELASALLE | MAY 24, 2016

This author's *h*-index is 71

The *h*-index is based upon the number of documents and number of citations.



Scopus

The *h*-index is an indicator of research impact based on citation measurement. It is an attempt to measure a researcher's productivity and the impact of their published documents. It was introduced by Jorge E. Hirsch in 2005 and has become one of the most common research impact metrics. It can be used for an individual author, or any collection of documents, e.g., for a journal or a research group's outputs.

How is *h*-index calculated?

If a researcher has an *h*-index of 4, it means that 4 of his/her documents have been cited at least 4 times as shown below. If document 5 in the list accrues one more citation then the author's *h*-index would increase to 5.

Professor X has a total of 10 documents:

Document 1: 50 cites

Document 2: 18 cites

Document 3: 11 cites

Document 4: 7 cites

----- *h*-index: 4

Document 5: 4 cites

Document 6: 3 cites

Documents 7, 8, 9, 10: 0 cites

What we can also see is that though the author has received an impressive 50 citations on Document 1 that is not reflected in the *h*-index.

h-index will vary based on data source

The calculation for *h*-index is the same regardless of where it's found; however, the *h*-index could vary depending on the data source. For example, if one database indexes and draws data from a larger pool of journals then it may have more citations to include in the calculation. Therefore, when comparing *h*-indexes, it is important to compare from the same data source. Three of the most common are:

- Scopus
- Web of Science
- Google Scholar

Benchmarking an author's *h*-index

It's important not only to use the same data source when benchmarking authors, but also to account for discipline and career stage. This is also a good time to have a discussion with your researcher on whom they want to compare themselves to, which will likely change over time. Your researcher's co-authors or colleagues might be a place to start.

You can find sources that attempt to quantify what a good *h*-index might be in a certain discipline. For example, on the London School of Economics and Political Science Impact Blog they discuss average *h*-scores for 120 social science academics, showing average *h*-scores by discipline and position.

SUBJECT	Lecturer	Senior Lecturer	Professor
Economics	3.11	2.40	7.60
Geography	3.73	5.75	6.50
Sociology	1.91	2.50	3.67
Political Science	1.20	2.07	3.43
Law	0.83	0.50	2.83

Source: (<http://blogs.lse.ac.uk/impactofsocialsciences/the-handbook/chapter-3-key-measures-of-academic-influence/>)



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In comparison, the following table of highly cited Spanish scientists demonstrates the wide range from clinical medicine to mathematics.

Table III
Highly cited Spanish scientists

ISI Field	Name	<i>h</i>	<i>H</i>	<i>N_c</i>	<i>N_p</i>
Chemistry	A. Corma	60	55	12210	625
Clinical Medicine	J. Rodés	84	65	15644	1047
Environment/Ecology	C. M. Herrera	35	32	2213	106
Immunology	F. Sánchez Madrid	56	29	8112	235
Mathematics	D. Nualart	15	28	892	125
"	J. M. Sanz Serna	21	40	1282	75
"	J. L. Vázquez	22	42	1015	111
"	E. Zuazúa	19	36	821	141
Molecular Biology & Genetics	M. Barbacid	79	35	17816	217
Neuroscience & Behavior	J. M. Palacios	72	41	14231	540
Physics	M. Aguilar Benítez	38	38	7782	214
Plant & Animal Science	C. M. Duarte	38	42	2944	252

N_c = number of citations; *N_p* = number of papers

Source: (<https://arxiv.org/ftp/physics/papers/0607/0607224.pdf>)

Criticisms of the *h*-index and suggested alternatives

Criticism of <i>h</i> -index	Alternative
<i>h</i> -index can only be as high as the number of documents published.	g-index (number of citations factors into calculation)
An emeritus professor may have a higher <i>h</i> -index than an early career researcher, even if the emeritus professor has not published in years and the ECR has one of the most popular research papers of the year.	- contemporary <i>h</i> -index (weights recent citations more heavily) - h5-index (outputs from last five years; Google Scholar)

There are many other *h*-type indexes that can be used based on your researchers' specific situation.

Other criticisms of the *h*-index include that it does not take into account the authors' roles or the context of the citation. For example, what if a co-author has only played a minor role in authoring the paper, yet they get the same value out of the citations within their *h*-index calculation as a lead author. Or perhaps the paper was cited in a negative way, yet the citation still counts toward a positive impact metric.

Improving a researcher's *h*-index

As a librarian, you can discuss with your authors ways in which they might improve their *h*-index and other measures based upon citations. These include:

- Publish a review article. These articles receive more citations than other papers (in general). Caveat: Some data sources may not include review articles as a document type in the *h*-index calculation.
- Don't be too modest: sometimes you can self-cite. Even if the researcher's self-citation has been stripped out of a calculation, it might lead to other citations that are counted.
- List documents out in order of the number of citations they have received. Is there one document that lacks only a few citations that could boost the score? Has the citation-tracking source missed any citations for that paper?
- Ensure author profiles are consolidated and accurate in databases such as Scopus, Web of Science and Google Scholar. Are all of your researcher's papers attributed to him/her? Having multiple profiles in one data source will likely reduce your *h*-index.
- Register for an ORCID iD and link it to the other profiles to maintain a global view in one place.

For more information, see "Effective Strategies for Increasing Citation Frequency." **LC**

Conclusion

Remind your researchers that the *h*-index is only one measure of productivity and impact, and that they should be looking at a more comprehensive picture that includes other scholarly activity and commentary, and social and mass media activity.

Additional resources

Watch the Library Connect webinar "Research impact metrics for librarians: calculation & context," where Jenny Delasalle discuss the *h*-index among other topics, along with Andrew Plume.

Explaining the g-index: trying to keep it simple, May 25, 2016 post on Jenny Delasalle's blog

Read about Scopus and the *h*-index on the Scopus blog, "5 facts about Scopus and the *h*-index."