Research Trends

Volume 1 | Issue 9 Article 12

1-1-2009

Why did you cite…?

Research Trends Editorial Board

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identifying historical trends and increasing institutional ranking among peers.

Gathering the data

"Benchmarking in the US has not relied heavily on bibliometrics, although we did start using bibliometric tools to help structure some of our decision-making data, and I expect this approach to continue," says Calto.

"Beyond simple benchmarking, we did deeper investigations, such as SWOT analyses. At Columbia, for example, we discovered that we were very strong in applying for training grants, but were lagging behind our peers when it came to funding for large program projects," he explains. SWOT information and similar analytical interpretations are key to what grant administrators and research institute senior management need in order to pursue better strategies.

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As there is no central funding database in the United States, Calto had to gather data from the country's two biggest funding sources – the National Institute of Health (NIH) and the National Science Foundation (NSF) – as well as from the many smaller societies and foundations that make funding available.

Calto believes that while he had a lot of success and offered his institution's administrators some insight into performance, there is still much to do. "Comprehensive data is our greatest challenge. Fragmented, non-standard data is really the Achilles' heel for many research institutes. For instance, each funding body uses different cataloguing systems, some use annual data, others not.

"And with globalization, we are also dealing with radically different funding systems – the way research is funded in the US is not the same as in other parts of the world," he adds.

Making indicators work for you

According to Calto, to interpret any data correctly, it is essential to bring in the qualitative context. This involves conversations with scientists and funding agencies, and a good general knowledge of the research market.

"I like bibliometric and funding data because they are fair and objective ways to rank people, departments and institutes. However, databases are never complete and they must be interpreted carefully. Most department chairs also take into account the importance of originality and innovative research, even though they might not fit into standard metrics," he explains.

Calto recently joined Elsevier as Director of Product Management for Performance and Planning in the Academic and Government Products Group, where he is now working to develop the very tools that he would have appreciated when he was at Columbia.

"It's possible to do some very good analyses using bibliometric databases, but for the really detailed information, research institutes now have to allocate resources, such as people and time. This is why dedicated tools that allow senior management to see research performance at a glance are so critical," he explains.

With access to good data and the tools necessary to carry out efficient analysis, research institutes can ensure that they are applying for the right funding at the right time, with as little internal stress possible. Eventually, this approach will optimize results and reduce missed opportunities.

Useful links

National Institutes of Health
National Science Foundation

Why did you cite...?

...a Nobel Laureate?

There are many reasons why authors cite other authors. Often, citations are motivated by the wish to acknowledge the influences of colleagues. Yet this is clearly not the full picture. An alternative view is that people tend to cite within their social network: authors will cite works by authors they have interpersonal connections with *(1)*.

We have previously discussed how winning a Nobel Prize can affect citations. In Did you know?, we note that 2008 Nobel Laureate in Chemistry, Roger Tsien, has received 38,989 citations*. But, is this because of his large interpersonal network or the influence that his work has had on other researchers?

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Roger Tsien, 2008 Nobel Laureate for Chemistry

Tsien's 1998 paper, "The green fluorescent protein" *(2)*, has been cited 1,814 times*. Professor Uli Nienhaus, from the Institute of Biophysics at the University of Ulm, Germany, has cited this paper on several occasions. He says: "This paper summarizes essential biochemical and biophysical research results on green fluorescent protein up to 1998. It is a comprehensive, clearly written treatise that is an excellent introduction to this field. And this is why we refer readers to this review in the introductory paragraphs of our own research papers."

Professor Rebekka M. Wachter, from the Center for Bioenergy and Photosynthesis at Arizona State University, US, has also cited Tsien's 1998 article on more than one occasion. She explains: "Roger Tsien is an eminent authority on fluorescent proteins. His ground-breaking work on green fluorescent protein and its variants is nicely summarized in his 1998 review article. Also, his research on green fluorescent protein maturation paved the way for an active and highly productive project area in my lab on the mechanism of the green fluorescent protein self-processing reaction that yields visible color."

Looking at an older paper by Tsien from 1980 *(3)*, the same reasons for citing it apply. Dr. Sandra Claro from the Biophysics department at São Paulo University in Brazil confirms that she cited Tsien's paper because "he was the first to do experiments chelating intracellular calcium by BAPTA. In addition, he is a respected researcher."

These researchers cite Tsien to acknowledge his authority in the field rather than for personal reasons. Or, as Professor Nienhaus puts it: "The purpose of citing related work is not to do someone a favor but to provide additional background and support to scientific statements and conclusions."

However, he adds that citing because of interpersonal connections is not necessarily a bad thing. "Science is a social activity, and if I know a researcher in person, it is likely that I am also more familiar with his or her work. Moreover, a personal relationship may also build enhanced confidence and trust in someone's results. That may then lead to a certain bias in the choice of citations. I view this as entirely acceptable and unavoidable."

Even though the anecdotal evidence presented here shows that authors cite authors out of acknowledgement for scientific influences, the critical comment placed here indicates that citing people who are personal acquaintances is not necessarily objectionable.

* Source: Scopus

Useful links

The Nobel Foundation

References

(1) Bornmann, L. and Daniel, H.P. (2006) "What do citation counts measure? A review of studies on citing behaviour", *Journal of Documentation*, Vol. 64, Issue 1, pp. 45–80.

(2) Tsien, R.Y. (1998) "The green fluorescent protein", *Annual Review of Biochemistry*, Issue 67, pp. 509–544.

(3) Tsien, R.Y. (1980) "New calcium indicators and buffers with high selectivity against magnesium and protons: Design, synthesis, and properties of prototype structures", *Biochemistry*, Vol. 19, Issue 11, pp. 2396–2404.