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Bibliometrics comes of age

GERT-JAN GERAEDS AND JUDITH KAMALSKI

Almost 40 years ago, when bibliometrics emerged as a field in its own right, no one could have anticipated how developments in technology and research administration would push bibliometrics to center stage in research assessment. Research Trends asks Wolfgang Glänzel, of the Expertisecentrum O&O Monitoring (Centre for R&D Monitoring, ECOOM) in Leuven, how he sees this remarkable “Perspective Shift”.

Research Trends (RT): Once a sub-discipline of information science, bibliometrics has developed into a prominent research field that provides instruments for evaluating and benchmarking research performance. You call this “the Perspective Shift”. Has this Perspective Shift changed the approach of bibliometric research within the community itself; i.e. has it changed the starting points for research projects, shifted the focus of research topics and literature, and so on?

Wolfgang Glänzel (WG): Such a shift can indeed be observed. One must of course distinguish between genuine research projects and projects commissioned, for instance, by national research foundations, ministries or European Framework programs.

Most commissioned work in our field is policy-related and focused on research evaluation. Since this has become one of the main funding pillars of bibliometric centers and, in turn, requires an appropriate methodological foundation, the shift has had measurable effect on the research profile of the field.

The change is also mirrored by the research literature. In a paper by Schoepflin (2001), we found a specific change in the profile of the journal *Scientometrics* that supports this statement: 20 years after the journal was launched, case studies and methodological papers have become dominant.

RT: Does the currently available range of bibliometric indicators, including the Impact Factor (IF), *h*-index, *g*-index and Eigenfactor, accommodate the new reality of bibliometrics and its applications?

WG: Improvements and adjustments within the bibliometric toolkit are certainly necessary to meet new challenges. This also implies development of new measures and “indicators” for evaluating and benchmarking research performance.

Without a doubt, the quantity and quality of bibliometric tools have increased and improved considerably during the last three decades. The plethora of new metrics, however, most of which are designed to substitute or supplement the *h*-index and the IF, are not always suited to serve



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Wolfgang Glänzel

this purpose. Further methodological and mathematical research is needed to distinguish useful tools from “rank shoots.” Time will show which of these approaches will survive and become established as standard tools in our field.

In general, though, I am positive that a proper selection of indicators and methods is sufficient to solve most of today’s bibliometric tasks. And, as these tasks become increasingly complex, each level of aggregation will need specific approaches and standards as well. There will not be any single measure, no single “best” indicator, that could accommodate all facets of the new reality of bibliometrics and its applications.

RT: What do you consider the challenges ahead for bibliometrics and how do you think this will or should be reflected by bibliometric indicators?

WG: There are certainly some major obstacles in bibliometrics, and I will limit my comments to three of them.

First, scientometrics was originally developed to model and measure quantitative aspects of scholarly communication in basic research. The success of scientometrics has led to its extension across the applied and technical sciences, and then to the social sciences, humanities and the arts, despite communication behavior differing considerably between these subject fields. Researchers in the social sciences and humanities use different publication channels and have different citation practices. This requires a completely different approach, not simply an adjustment of indicators.

Of course, this is not a challenge for bibliometrics alone. The development of new methods goes along with the creation of bibliographic databases that meet the requirements of bibliometric use. This implies an important opportunity for both new investments and intensive interaction with information professionals.

The second challenge is brought by electronic communication, the internet and open-access publishing. Electronic communication has dramatically changed scholarly communication in the last two decades. However, the development of web-based tools has not always kept pace with the changes. The demand for proper documentation, compatibility and “cleanness” of data, as well as for reproducibility of results, still remain challenges.

Thirdly, scholarly communication – that is, communication among researchers – is not the only form of scientific communication. Modeling and

measuring communication outside research communities to measure the social impact of research and scientific work can be considered the third important task that bibliometricians will be faced with in the near future.

RT: Inappropriate or uninformed use of bibliometric indicators by laymen, such as science policy-makers or research managers, can have serious consequences for institutions or individuals. Do you think bibliometricians have any responsibility in this respect?

WG: In most respects, I could repeat my opinion published 15 years ago in a paper with Schoepflin entitled “Little Scientometrics – Big Scientometrics ... and Beyond”. Rapid technological advances and the worldwide availability of preprocessed data have resulted in the phenomenon of “desktop scientometrics” proclaimed by Katz and Hicks in 1997. Today, even a “pocket bibliometrician” is not an absurd nightmare anymore; such tools are already available on the internet.

Obviously, the temptation to use cheap or even free bibliometric tools that do not require grounded knowledge or skills is difficult to resist. Uninformed use of bibliometric indicators has brought our field into discredit, and has consequences for the evaluated scientists and institutions as well. Of course, this makes us concerned. Bibliometri-

cians may not pass over in silence the inappropriate use of their research results in science policy and research management.

Bibliometricians should possibly focus more on communicating with scientists and end-users. It is certainly important to stress that bibliometrics is not just a service but, first and foremost, a research field that develops, provides and uses methods for the evaluation of research. Moreover, professionals should be selecting the appropriate methodology to underlie evaluation studies, not clients or end-users.

Despite some negative experiences, the growing number of students and successful PhDs in our field gives me hope that the uninformed use of bibliometric indicators will soon become a thing of the past.

RT: In your opinion, what has been the most exciting bibliometric development of the last decade and why was it so important?

WG: There were many exciting bibliometric developments in the last decade. If I had to name only one, I would probably choose the *h*-index. Not because it was such a big breakthrough – it is actually very simple, yet ingenious – but because its effects have been so far-reaching. The *h*-index has brought back our original spirit of the pioneering days by stimulating research and communication on this topic. In fact, scientists from various fields are returning to scientometrics as an attractive research field.

RT: What do you see as the most promising topic, metric or method for the bibliometric future? What makes your heart beat faster?

WG: There’s no particular topic I think is “most promising,” but the fact that scientometrics has become an established discipline certainly makes my heart beat faster. Now and into the future, the necessity of doing research in our field and of teaching professional skills in bibliometrics is becoming more widely recognized.

