Scholarly Communication and Practices in the World of Metrics: An Exploratory Study

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ABSTRACT
Metrics have become objective standards for evaluating research performance. Measurements such as citation counts and h-index are used to evaluate individual research performance as well as the ranking of research institutions and universities. This exploratory study aims to understand the implications of the increasing use of metrics on scholarly communication and practices. A pilot study was conducted in universities in Ireland. Preliminary findings show that researchers use Google Scholar and ResearchGate for self-monitoring and that they perceive bibliometric measures as indicators of achievements. The pilot study also shows that there are mixed feelings toward bibliometrics: while the participants emphasize that research interest is the most important criterion in choosing research topics and publication channels and that citation counts, h-index, and RG scores are coincidental of their research activities, they also perceive the quantitative measures as objective evaluation of research performance without knowing how the h-index or RG scores are calculated.

Keywords

INTRODUCTION
Metrics have become objective standards for evaluating research performance, among other factors such as grant funding and prestigious editorial positions. Measurements such as citation counts and h-index are not only used for evaluating individual’s research performance, but, accumulatively, also for the ranking of research institutions and universities. In addition, altmetrics have been developed to track the impact of scholarly work based on article views, downloads, mentions in traditional news media and social media. The rationale of the use of metrics is, presumably, meritocracy: the higher the citation counts, the higher the quality of research. Consequently, many researchers are increasingly concerned with the marketing of themselves and their work in order to boost bibliometric metrics. Some of the activities include maintaining profiles on various scholarly collaboration networks such as ResearchGate, general social networks, as well as personal and university websites and research blogs.

The goal of this exploratory study is to understand the implications and consequences of using metrics as an evaluative criterion of research performance in different disciplines and the perceived and/or real changes in scholarly communication and practices of individual researchers. The study is important for funding agencies, governments, and universities when developing policies and guidelines for measuring and evaluating research performance. It will also give insights into the cultural and social affordances and implications of the ratings and rankings of research outputs. In this poster, the background, method, and findings of the pilot study are discussed.

BACKGROUND AND LITERATURE REVIEW
Bibliometrics is commonly understood as the quantitative analysis of research outputs and publications, primarily based on citation-based data. It is interesting to note that, however, the original idea of citation index is to provide subject control of the literature (Garfield, 1955). With the founding of the Institute for Scientific Information (ISI), citation index has been used for evaluating impact of journals (Garfield, 1972) and various kinds of analyses based on citation data, from co-citation analysis (e.g., White & McCain, 1998), to interdisciplinarity (e.g., Porter & Rafols, 2009), to the development and growth of disciplines (e.g., Lariviere, Sugimoto, & Cronin, 2012).
Bibliometrics for evaluating individual research performance has become commonplace with the development of measures such as h-index, h10-index, and the RG score provided by ResearchGate. The measurements are often used by universities for recruitment and promotion and by funding agencies for evaluation of research proposals.

Bibliometrics are also used for ranking universities worldwide. For example, citations per faculty account for 20% of the overall ranking score in QS Universities Ranking. Notably, the criteria for evaluation of university performance are almost exclusively bibliometric in the Shanghai Ranking, prepared annually by the Shanghai Jiao Tong University. The calculation is based on Nobel Prizes and Fields Medals for researchers and alumni (30%), number of highly cited researchers (20%), papers published in the journals Nature and Science (20%), papers published in SCI and SSCI indexed journals (20%), and institution’s per capita academic performance with regard to all indicators listed (10%).

The increasing use of bibliometrics in evaluating research performance has raised concerns. Citation analysis is not a method without flaws and limitations (see., e.g., MacRoberts & MacRoberts, 1989), not to mention that the measurements do not take into account the academic practices and epistemic culture in different disciplines (Bornmann & Leydesdorff, 2014). Researchers in various disciplines have raised issues pertaining to the use of bibliometrics as evaluative criteria of research performance (e.g., Blockmans, Engwall & Weaire, 2014; Blyth, et al., 2010; Lawrence, 2007).

It has also been noted that the system of evaluation may weaken critical voices in academia. Sosteric (1999) has stated that “as time passes, and graduate students do what they have to get hired on, less and less of the essence of critical thinking and critical discourse will be rediscovered each generation. It will be a gradual devastation, but it will be devastation nonetheless.” Cronin (2005) has also noted the extensive use of bibliometrics may lead to “symbolic capitalism.” More recently, the Leiden Manifesto (Hicks, et al., 2015) and the publication of Metrics Tide (Wilsdon, et al., 2015) call for responsible use of metrics.

However, few studies have investigated what and how the use of bibliometrics has actually affected day-to-day work in research. The objective of this study is to understand the implications and consequences of metrics with regard to scholarly practices and communication. The research questions are:

a. What is the perception of the importance of bibliometrics such as impact factor and h-index in academic culture?

b. What are the strategies scholars and researchers apply based on the perception of the impact of bibliometrics?

c. What is the changing nature of scholarly communication and practices with the increasing use of bibliometric measures in different disciplines?

**METHOD**

The pilot study was conducted in universities in Ireland. Participants were recruited by email. Potential participants could be of any rank in any discipline, working full- or part-time in universities with research capacities.

Face-to-face interviews were scheduled at a convenient time and place for the participants. The interviews were 30-45 minutes long. The interviews were audio-recorded and anonymised for transcription and data analysis.

**Semi-Structured Interviews and Data Analysis**

The interviews were composed of three major parts: (a) the researcher’s understanding of bibliometrics and altmetrics, (b) the use of bibliometrics, and (c) scholarly communication and practices based on the perception of the importance of metrics in research performance, including tenure and promotion and grant applications.

In the first part, the participant was asked to describe their understanding of bibliometrics. The question was to gauge the participant’s knowledge about the measurements, providers, and uses of bibliometrics. In the second part, the participant was asked to describe how s/he has used metrics in her/his research and research communication, including tracking of citation counts and h-index, maintaining profiles on scholarly networks such as ResearchGate, and tracking of bibliometric and scholarly profiles of colleagues and competitors. In the last part of the interview, the participant was asked to describe the perceived and actual impact of bibliometric measures in their research and research communication. Topics included the quantity and quality of research, marketing strategies, and choices of research topics and publication channels. The participant was also asked to comment on the appropriate and inappropriate uses of bibliometric measures, if any.

The interviews were anonymised and transcribed for data analysis. The development of the codebook was a dynamic process using topics emerged from the interview transcripts until saturation was achieved.

**PRELIMINARY FINDINGS**

Four participants from Business, Computer Science, Engineering, and Health Sciences were interviewed. Three of the participants hold Professorships; one of them is Lecturer/Assistant Professor. All participants in the pilot study have used tools such as Google Scholar and ResearchGate and are aware of the use of bibliometric measures for the evaluation of research performance and university rankings.
Self-Monitoring

The participants have used bibliometric measures for self-monitoring purpose. They see h-index and/or RG score as indicators of their achievements. Although they emphasize that there are limitations of the measurements and that the number “does not really matter,” they gain a sense of achievement when the index or score is going up, particularly when compared to peers in the same field of study. Self-monitoring is seen as a matter of accountability and competitiveness for those who have achieved Professorship, while it is a concern for recruitment and promotion for the early-career researcher.

The self-monitoring of citation counts, h-index, and RG scores also goes hand-in-hand with marketing for the purpose of increasing visibility of publications and scholarly activities. All participants update their research profile regularly, but only one of them uses Twitter as a platform for disseminating news about publications.

Collaboration

The participants have indicated that they have actively looked up research profiles of colleagues and potential collaborators. The h-index and/or RG scores provide a perception of research impact of a potential collaborator. One participant mentioned that “if somebody sends me an email, an academic I’ve never heard from before. I’ll see if they’re on Google Scholar and it annoys me if they’re not.” However, while bibliometric measures play a role, they are not the sole factor for deciding the potential of a collaborator.

Some participants have also indicated that the importance of metrics in collaboration is partly driven by grant application requirements since benchmarking exercises using h-index are used to evaluate the quality and impact of research proposals.

Choice of Journals and Research Topics

All participants indicate that impact factor is not the primary factor in determining the channels for publishing their work and their choice of research topics. Rather, research projects are more driven by availability of grants, industry needs, and most importantly, research interests. However, all participants also aim to publish their work in high impact journals. One participant also indicates the university administration has “pathological obsession” about certain list of publications since they are considered for the international ranking of the department and the university. Nevertheless, it is agreed that journals of higher impact will lead to higher citation counts, which would be advantageous in grant, recruitment, and promotion applications, as well as internal and external marketing of researchers and programmes to collaborators, potential students, and others.

LIMITATIONS OF THE STUDY

The sample size of the pilot study is very small and is limited to a few disciplines, hence the findings are only indicative. A wider spectrum of researchers, both in terms of disciplines and career stages, will be needed in future study.

Also, the pilot study was conducted in Ireland. The findings are thus more relevant to scholars and researchers who work in academic institutions and funding agencies with similar policies and regulations governing the evaluation of research performance.

Finally, the findings of the pilot study are based on semi-structured interviews and hence do not depict a thorough picture of researchers at work as in an ethnographic study. It is hoped that potential sites will be identified for investigating the norms and practices of using bibliometrics in situ and in relation to specific government and university policies, as well as industry and market influences, after the current study.

CONCLUSION

Some important themes pertaining to scholarly communication and practices based on researchers’ perception and understanding of bibliometrics have emerged from the pilot study: (a) active use of Google Scholar and ResearchGate for self-monitoring, as well as tracking and evaluating colleagues and potential collaborators; (b) using bibliometric measures as indicators of achievements for funding applications, administrative reporting, and recruitment and promotion criteria; and (c) publishing in high impact journals for increasing visibility, impact, and citation counts.

The pilot study also shows that there are mixed feelings toward bibliometrics. While the participants emphasise that research interest is the most important criterion in choosing research topics and publication channels and that citation counts, h-index, and RG scores are coincidental of their research activities, they also perceive the quantitative measures as objective evaluation of research performance without knowing how the h-index or RG scores are calculated.

In the next few months, interviews will be conducted in all disciplines in order to understand the diverse scholarly communication and practices in the world of metrics.

REFERENCES


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