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THE ETHICAL TIGHTROPE

Examining Bibliometrics in Research Evaluation

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Abstract: The evaluation of research output plays a critical role in academic careers and funding decisions. Bibliometrics, the statistical analysis of scholarly publications, has become a prominent tool in this process. However, this growing reliance on bibliometrics raises significant ethical concerns. This article examines the limitations of bibliometrics and its potential biases. The study argues that an overemphasis on metrics can distort the true value of research and stifle innovation. The study tries to show a more comprehensive approach to research evaluation that acknowledges the merits of bibliometrics alongside qualitative assessments of research merit and impact.

Index Terms: Bibliometrics, Altmetrics, Citation metrics, Research Evaluation, Publish or Perish, Ethical Consideration of Bibliometrics.

1 INTRODUCTION

Academic funding decisions, career paths, and institutional reputation are all shaped by research evaluation, which is the cornerstone of academia. Bibliometrics is a popular method for assessing research, which is the analysis of scholarly publications using quantitative data. Nevertheless, there are certain ethical questions raised by the growing use of bibliometrics, which makes a critical analysis of its advantages and disadvantages necessary. By analyzing the benefits and drawbacks of bibliometrics, this paper walks the ethical tightrope between objectivity and accountability in study appraisal. "Ethical tightrope" in bibliometrics could mean conducting research that adheres to rigorous standards while still achieving good results. Bibliometrics has benefits in terms of efficiency and standardization, but it can also introduce biases, mask the contributions of

certain individuals, and deter innovative research. This study aims to provide insights for a more morally sound and nuanced approach to study evaluation through this analysis.

Benefits and Drawbacks:

Bibliometrics can provide objective measures of research impact, such as citation counts and h-index. This allows for easier comparison across disciplines and institutions. Additionally, it can highlight emerging research areas and identify influential scholars. However, bibliometrics is not without drawbacks:

- **Prioritize Quantity over Quality:** Bibliometrics may encourage researchers to publish many publications, potentially compromising quality for quantity.
- **Discipline Bias:** Citation practices vary significantly throughout disciplines, which makes it challenging to compare scholars in other domains equally.
- **Ignorance of Non-Quantitative Impact:** Bibliometrics ignores the wider societal effects of research, such as public outreach or policy influence.
- **Author Order Issues** The weight given to different authors within a publication can be unfair, especially in large collaborations.

Many ethical issues are brought to light by these drawbacks:

- **Publishing Pressure:** Regardless of the quality of the research, an excessive focus on bibliometrics may lead to publishing pressure in high-impact journals. This can stifle innovation and discourage researchers from exploring new or unpopular topics.
- **Gaming the System:** To artificially boost their metrics, researchers may be engaged to participate in suspicious activities like author inflation, which involves adding extra authors to papers, or self-citation rings.
- **Implications for Careers:** Early-career researchers and scholars working in non-traditional research environments may suffer if funding decisions and career advancement are heavily influenced by bibliometrics.

After reviewing the literature, this paper gives some suggestions to solve those problems.

2 LITERATURE REVIEW

Ioannidis, John P.A....[et al.] (2019) prepared a standardized citation metrics author database of 100,000 most-cited scientists across all scientific fields.

Ellegaard, Ole and Wallin, Johan A. (2015) showed a critical analysis of the role and impact of bibliometric analysis in the evaluation of scholarly output.

Lee, D. (2024) describes that large collaboration projects have become increasingly common in scientific research. However, a hidden cost of these collaborations can be the invisibility of junior researchers, who often play crucial roles but struggle to receive due credit for their contributions.

Maggio, Lauren A., Meyer, Holly S. and Artino Jr, Anthony R. (2017) provide insights into the real-time impact analysis of health professions education research by employing altmetrics. Altmetrics, or alternative metrics, are non-traditional measures that capture the online attention and engagement surrounding scholarly outputs.

Ann Kobli, Nathalie...[et al.] (2024) show that over the last few decades, there has been a trend in academic publication in the social sciences toward performance-based funding systems (PBFs) and nonacademic stakeholders managing research. More and more "game" metaphors are being used to explain the ensuing conditions of information production and distribution.

P. van Dalen, Hendrik and Henkens, Kène (2012) investigate the effects of the "publish-or-perish" culture prevalent in academia worldwide. This culture emphasizes the importance of publishing research outputs, often measured by quantitative metrics such as publication counts, to advance one's academic career.

Azer, Samy A. and Azer, Sarah (2019) aims to explore the relationship between traditional citation-based metrics and alternative metrics (Altmetrics) in assessing the impact and visibility of research articles in the field of medical professionalism. They compare the rankings of top-cited articles obtained through bibliometric analysis with those determined using altmetric scores, which capture online attention and engagement across various platforms.

3 OBJECTIVES

1. Identify the strengths and weaknesses of Bibliometrics.
2. Explore ethical considerations inherent in the use of Bibliometric indicators.
3. Suggest an alternative approach to remove the drawbacks of Bibliometrics.

4 METHODOLOGIES

To fulfil the objective, data have been collected by surveying the existing literature:

4.1 Strengths of Bibliometrics

Ellegaard, Ole and Wallin, Johan A. assess the impact of bibliometric analysis on research evaluation practices, including academic hiring, promotion, and funding decisions. They discuss the use of bibliometric indicators such as citation counts and h-index in assessing individual researchers and research groups.

4.2 Limitation of Bibliometrics

4.2.1 Publication Bias

4.2.1.1 Ioannidis, John P.A....[et al.] prepared a standardized citation metrics author database on mostly cited scientists on 22 scientific fields and 176 subfields, this publicly available database provides researchers and evaluators with a range of citation metrics for each author, including - total citations, h-index (a measure of productivity and impact), Coauthorship-adjusted hm-index (a variant of h-index that accounts for collaboration), Citations to papers in different authorship positions (first author, single author, etc.), Career-long and single-year impact.

Merit:

- The use of consistent metrics across disciplines facilitates comparisons between researchers in different fields, overcoming the limitations of traditional citation analysis.

Demerit:

- Citation metrics alone cannot capture the full picture of research impact. Groundbreaking research with low citations or research with significant societal influence may be undervalued.
- Citation metrics can incentivize researchers to prioritize publications in high-impact journals over the quality and originality of their work.
- The importance of individual contributions can be obscured by authorship order, potentially disadvantaging junior researchers or those playing a supporting role.

4.2.2 Authorship and Collaboration

4.2.2.1 Lee, D. (2024) identified several factors that contribute to the invisibility of junior researchers in large collaborations, such as:

Authorship Order: The traditional practice of listing authors based on seniority can push junior researchers.

Division of Labour: Large projects often involve a complex division of labour. Junior researchers may be tasked with critical but less glamorous work like data collection, analysis, or methodology development.

Lack of Recognition: Junior researchers are less known in comparison to senior researchers.

Consequences of Invisibility:

- Delayed Promotion
- Discouragement

Promoting Recognition for Junior Researchers:

- Explore alternative metrics beyond traditional citations that capture the value of a researcher's contributions within a large project. This could include software development, data analysis, or project management skills.

4.3 Ethical Considerations of Bibliometrics:

4.3.1 Ann Kobli, Nathalie...[et al.] (2024) addresses how gamification becomes a crucial component and offers an overview of the literature on research related to publishing in the social sciences. Quantifying publication results creates a highly competitive market where individuals who play the game poorly are denied access to goods and services, making it difficult to evaluate and financially encourage research success. Gamified procedures result in predatory publication and unethical behaviour due to pressure to publish.

4.3.2 P. van Dalen, Hendrik and Henkens, Kène (2012) begins with an introduction to the publish-or-perish culture, explaining its origins and prevalence within researchers, institutions, and the scholarly community. The author employs a survey methodology to gather data on the experiences and perceptions of scholars regarding the pressures and incentives associated with publishing in academia.

Intended Consequences: Examines the intended consequences of the publish-or-perish culture, such as incentivizing researchers to produce high-quality research outputs, promoting academic productivity, and facilitating knowledge dissemination and advancement within disciplines.

Unintended Consequences: The author also explores the unintended consequences of the publish-or-perish culture, which may include increased competition, pressure to prioritize quantity over quality, publication bias, research misconduct, and negative effects on researchers' mental health and well-being.

Implications and Recommendations: Discusses the implications of the survey findings for academia and proposes recommendations for mitigating the negative effects of the publish-or-perish culture while maintaining its positive aspects. This may involve promoting alternative metrics for research evaluation, fostering a supportive research environment, and encouraging responsible publishing practices.

4.4 Alternative Approaches

4.4.1 Maggio, Lauren A., Meyer, Holly S. and Artino Jr, Anthony R. (2017) present their findings from the real-time impact analysis, highlighting the patterns and trends in online attention received by health professions education research articles. They discuss the types of altmetrics indicators observed, such as Tweets, Facebook shares, Mendeley saves, and news mentions, and their implications for assessing research impact.

4.4.2 Azer, Samy A. and Azer, Sarah (2019) identifies a set of articles related to medical professionalism and gather citation counts as well as altmetric scores for each article.

Results of Bibliometric Analysis: Present the results of their bibliometric analysis, identifying the top-cited articles in medical professionalism based on citation counts from academic databases such as PubMed or Web of Science. They discuss the characteristics of these articles and their impact on the scholarly community.

Results of Altmetric Analysis: The authors then examine the altmetric scores of the same set of articles, assessing their online visibility and engagement across social media, news outlets, blogs, and other platforms. They compare the rankings obtained through altmetric analysis with those obtained through bibliometric analysis.

Comparison and Discussion: Compare the rankings of top-cited articles derived from bibliometric analysis with those derived from altmetric analysis. They discuss the discrepancies and similarities between the two rankings, reflecting on the strengths and limitations of each approach in capturing research impact.

Implications and Future Directions: Suggest future research directions for further exploring the relationship between traditional bibliometric metrics and altmetrics in assessing the impact of scholarly output.

5 FINDINGS

The analysis revealed that while bibliometrics offers valuable insights into research activity, its use in research evaluation raises significant ethical concerns. Bibliometric can provide a quantitative snapshot of research trends and citation impact. However, an overreliance on these metrics can lead to a narrow evaluation of research quality. The "publish or perish" mentality fostered by a metrics-driven system can prioritize quantity over groundbreaking research and discourage innovative approaches.

Furthermore, bibliometric indicators are susceptible to various biases. The emphasis on high-impact journals can disadvantage researchers in fields with fewer such journals. Author affiliations at prestigious institutions may receive undue weight. The focus on citations can lead to self-citation practices and neglect valuable research not published in traditional journals.

6 CONCLUSION AND SUGGESTIONS

While bibliometrics offers valuable insights, its limitations and potential biases necessitate a more critical approach. An overemphasis on metrics can distort the true value of research and stifle scholarly innovation.

To navigate this tightrope, a multi-faceted approach to research evaluation can be proposed. Peer review that considers research quality, originality, and potential impact alongside quantitative metrics remains crucial. Furthermore, evaluations by experts within the field and the use of alternative metrics that capture broader aspects of research contribution can provide a more holistic view. Finally, transparent reporting of metrics and clear guidelines for their use in conjunction with qualitative evaluation are essential for a fair and ethical evaluation process.

REFERENCE:

1. Azer, S. A., & Azer, S. (2019). Top-cited articles in medical professionalism: a bibliometric analysis versus altmetric scores. *BMJ open*, *9*(7), e029433.
2. Ellegaard, O., & Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact?. *Scientometrics*, *105*, 1809-1831.
3. Ioannidis, J. P., Baas, J., Klavans, R., & Boyack, K. W. (2019). A standardized citation metrics author database annotated for scientific field. *PLoS biology*, *17*(8), e3000384.
4. Köbli, N. A., Leisenheimer, L., Achter, M., Kucera, T., & Schadler, C. (2024). The game of academic publishing: a review of gamified publication practices in the social sciences. *Frontiers in Communication*, *9*, 1323867.

5. Lee, D. (2024). Exploring the determinants of research performance for early-career researchers: a literature review. *Scientometrics*, *129*(1), 181-235.
6. Maggio, L. A., Meyer, H. S., & Artino Jr, A. R. (2017). Beyond citation rates: a real-time impact analysis of health professions education research using altmetrics. *Academic Medicine*, *92*(10), 1449-1455.
7. Van Dalen, H. P., & Henkens, K. (2012). Intended and unintended consequences of a publish-or-perish culture: A worldwide survey. *Journal of the American Society for Information Science and Technology*, *63*(7), 1282-1293.
8. Bibliometrics. (2024, March 26). In *Wikipedia*. <https://en.wikipedia.org/wiki/Bibliometrics>