



RETRACTED: Metrics in research impact assessment and grant funding: Insights from researchers in the "Reviewer 2 Must Be Stopped!" Facebook group

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Abstract

Research assessment and grant funding are vital to higher education. However, the reliance on quantitative metrics in these processes has raised concerns about their validity and potential negative consequences. This study aims to investigate the game of numbers in research assessment and grant funding, focusing on the perspectives of experienced researchers from around the globe. Accidental sampling elicited responses from more than 15 experienced researchers across different academic disciplines, institutions, and countries. The data were collected from the popular "Reviewer 2 Must be Stopped!" Facebook platform, which includes more than 135,000 members across the globe. Two posts were made, allowing participants to share their experiences, perspectives, and concerns related to metrics and numbers in research assessment and grant funding. The results from the thematic analysis revealed diverse perspectives among experienced researchers. Some participants expressed concerns about the dominance of quantitative metrics, highlighting the limitations and potential biases associated with their use. Others acknowledged the value of certain indicators in showcasing research impact. Moreover, the impact of metrics on grant funding awards was also documented. The study highlights the necessity for a more balanced and context-aware approach to research assessment and grant funding, incorporating qualitative measures and acknowledging the diverse nature of research impact.

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Introduction

In the ever-evolving landscape of higher education, research has become the nucleus driving institutions toward excellence, innovation, and societal advancement. Pursuing knowledge, discovery, and groundbreaking solutions propels universities and researchers to transcend boundaries, inspiring a relentless quest for meaningful contributions to their respective fields. As academia expands, the significance of research impact assessment and securing grant funding has become an intricate game, intertwining ambition, intellect, and a strategic understanding of the dynamics that govern this ever-competitive arena. Universities and research institutions across the globe strive to advance the frontiers of science, drive societal development, and address the most pressing challenges facing humanity (Owan et al., 2023; Odigwe & Owan, 2022). Central to this pursuit is the ever-increasing emphasis on research impact assessment and securing grant funding, which have become critical barometers of success in today's competitive academic milieu (Lambovska & Todorova, 2021; Owan & Asuquo, 2022). In fact, academics are now considered fictionally, as manager, zombie, ninja, nervous wreck, activist, third space precariat, and early career precariat (Andrew, 2023) due to their academic roles; some of which appear to involve irrational compliance and obedience to modern academic demands.

As the 21st century unfolds, the global scientific community has grappled with an unprecedented explosion of information thanks to advancements in technology and communication. This rapid proliferation of knowledge has led to immense opportunities and profound challenges. While scholars have the potential to access a vast repository of information, the sheer volume of research output makes it increasingly challenging to discern impactful and reliable research from the deluge of mediocre work (Odigwe & Owan, 2022). Consequently, in the past, institutions and funding agencies have used qualitative assessment methods to evaluate the influence of research outcomes and gauge their real-world relevance (Bakker et al., 2020). Qualitative evaluations, including peer reviews and expert judgments, strive to provide a more nuanced understanding of the societal implications and practical applications of research (Louder et al., 2021; Reed et al., 2021).

However, in recent years, quantitative metrics have been used in research impact assessments (Fleming et al., 2021; Lauronen, 2020; Ma & Ladisch, 2019). Journal impact factors, citation counts, h-indices, and altmetrics, among other numeric indicators, have emerged as quantitative indicators for attempting to capture the reach and significance of individual research papers and researchers (Owan & Owan, 2021). See Moed and Halevi (2015) for a detailed discussion of these and other metrics. In fact, as Professor Stephen Brookfield submits, "everything in higher education has been commodified to some degree" (Brookfield et al., 2019, p.84). The commodification of research output does not imply that they would not serve helpful purposes. However, many scholars have questioned the validity of using metrics to assess the quality of scholarly output, stating that the numbers tell nothing but mere fragments of the complex and multifaceted reality of academic research (Calò, 2022; Hicks et

al., 2015; Wilsdon, 2016). They argue that reducing the value of scholarly work to a set of quantitative measures not only oversimplifies the true impact of research but also promotes a culture of academic conformity, where researchers might prioritise publishing in high-impact journals over pursuing groundbreaking and potentially transformative studies (Xu & Li, 2016). It has been documented that heavy reliance on metrics is responsible for several unethical practices, such as salami slicing, 'abeg put my name syndrome', citation cartels, gambling and h-index manipulation, such as 'cite-me-I-cite-you', unnecessary self-citation inflation and other unacceptable practices (Moed & Halevi, 2015; Owan & Asuquo, 2022; Owan & Owan, 2021).

Complicating matters further, substantial differences exist in publication and citation practices across subject fields. For instance, in molecular biology, cited reference lists in scientific publications tend to be longer and more focused on recent articles than do those in fields such as mathematics, resulting in higher citation rates for target articles in the former, especially during the early postpublication period (Moed & Halevi, 2015). This divergence can affect the accuracy of absolute citation counts, making normalised indicators, such as those comparing citation impact to the world citation average in the relevant subfields, more appropriate. However, employing normalised indicators is not without its challenges. Bibliometric research has revealed complexities in counting variations in institutions and individual names, potential errors due to limited database coverage, and the exclusion of "gray literature", such as technical reports, which may lead to partial assessments in certain disciplines (Donner et al., 2020; Guerrero-Bote et al., 2021; Jappe, 2020).

Furthermore, the prestige of the journal where a paper is published introduces another layer of intricacy. Various indices, such as the Impact Factor (Web of Science), Source Normalised Impact per Paper (Scopus), and SCImago Journal Rank (SJR), are utilised to gauge journal prestige, each addressing specific challenges in research assessment (Owan et al., 2023). The debate over the fairness and accuracy of citation indices as measures of productivity and impact persists. Despite such opposition and evident limitations, citation counts remain widely used in research assessments (Moed & Halevi, 2015; Owan & Owan, 2021). While citation analysis can be useful, it should complement other evaluative approaches to provide a more comprehensive and well-rounded assessment of research impact and productivity. The need for an objective measurement and the failure of metrics in "telling the whole story" about a given research work has prompted scholars to seek new ways of assessing research impact. For instance, subjective tools such as questionnaires have been developed to measure research impact (e.g., Dembe et al., 2014; Solans-Domènech et al., 2019).

Moreover, while evaluating "large cancer research funding in Australia", Bowden et al. (2018) focused on key indicators, such as knowledge production, career advancement, generation of newer tools for future research, further income generation, development of newer policies and products, and other health, social and behavioural benefits. Similarly, during an evaluation, Ravenscroft et al. (2017) found that the results of metrics used as measures of

research impact did not conform well with the results of the Research Excellence Framework (REF). The authors suggested that the non-academic impact of research be evaluated using information mined from a broad range of resources, including social media engagement, news articles and political debates arising from academic work. Clements et al. (2017) introduced "snowball metrics," a more robust methodology that promises to improve upon the current system, but concluded that data from quantitative assessments of research impact are informative but should never replace human judgments in peer reviews when assessing research quality.

Measuring research impact depends on how the concept is defined and contextualised. Research impact could have different meanings in academic and broader socioeconomic contexts. There is a disparity between the academic and broader socioeconomic impacts of research and assessments in the UK considering these two dimensions separately (Penfield et al., 2014). The term 'impact' refers to the fact that the influence of research has advanced beyond academia (Chowdhury et al., 2016). Nevertheless, this distinction is unclear in impact assessments outside the UK, where academic outputs and socioeconomic impacts are often viewed as one. In Nigeria, research impact is considered holistically, and individuals are assessed based on its utility value in academia, with little emphasis on socioeconomic impact or innovativeness. Some universities in Nigeria now regard mere publishing in journals indexed in Scopus and Web of Science as indicators of research impact due to the international reputation of the two databases (Owan et al., 2023).

Since metrics are now a part of the research assessment system, it is crucial to understand whether they matter in deciding who receives grant funding and their overall role in the impact assessment of research. Research assessment and grant funding are important components of higher education, as they enable universities and institutions to support research undertakings and academic advancement (Sato et al., 2021). The increased emphasis on metrics and quantitative indicators has created a complex and competitive landscape that governs research assessment and grant funding in higher education (Hicks, 2012). This has led to various assessment frameworks with unique indicators and criteria (Reed et al., 2021). The "game of numbers" has increasingly influenced decision-making, with researchers, institutions, and funding bodies using metrics extensively to evaluate academic performance, allocate resources, and make funding decisions.

According to the findings of Thuna and King (2017), respondents expressed concerns about how metrics impacted their appointment to editorial boards, selection for administration, grant funding, evaluation of other scholars for promotion, job applications, and choices of publication venues. After reviewing a large pool of previously funded projects, Győrffy et al. (2020) found moderate positive correlations between the scientometric standing (such as the h-index, citation counts and yearly average) of principal investigators during grant submission and their future research output.

The existing body of research on the role of metrics in grant funding decisions and research impact assessment is limited and lacks sufficient empirical attention. Despite extensive discussions and commentary on the topic (e.g., Adam et al., 2018; Carpenter et al., 2014; Helmer et al., 2020; Moed & Halevi, 2015; Recio-Saucedo et al., 2022; Wilsdon, 2016), studies investigating this topic are scarce. This knowledge gap in the literature suggests the need for comprehensive and rigorous research to better understand how metrics influence funding decisions and impact assessments in the academic and research community. Several systematic reviews (e.g., Cruz-Rivera et al., 2017; Milat et al., 2015; Peter et al., 2017; Razmgir et al., 2021) have described a lack of qualitative studies in this area, creating a methodological gap. These studies have recommended that future studies on this subject adopt a qualitative approach to assess the role of metrics in grant funding decisions and research impact assessment. Qualitative studies can provide in-depth insights into the perceptions, experiences, and attitudes of scholars, funding agencies, and policymakers, which may not be fully captured by quantitative analyses alone (Yadav, 2022). It is important to analyse participants' views to enhance research quality, inform policy guidelines, and minimise unintended consequences. The insights gained from this study can lead to improved funding allocation, better recognition of interdisciplinary research, and greater compliance with metrics. For these reasons, the present study was conceived to draw qualitative insights into the role of research metrics in grant funding and impact assessment. Specifically, the study assessed the following:

1. The role of metrics in research funding decisions and practices across different disciplines and regions;
2. The role of metrics in research impact assessment in higher education institutions.

Research questions

The following research questions were answered in this study:

1. How has metric utilisation influenced research funding decisions and practices across different disciplines and regions?
2. How have metrics affected research impact assessment in higher education institutions?

Methods

Research design

The research philosophy guiding this study was interpretivism. It acknowledges that reality is socially constructed and seeks to understand the diverse perspectives and experiences of experienced researchers regarding research assessment and grant funding processes. A qualitative research approach was employed for this study. This approach allowed the researchers to delve into the subjective experiences and perceptions of the participants, providing a comprehensive understanding of their views on metrics in research

assessment and grant funding. The chosen research strategy was a qualitative case study. This strategy facilitated an in-depth exploration of the phenomenon of interest (the game of numbers in research assessment and grant funding) within the context of the "Reviewer 2 Must be Stopped!" Facebook group. This study was conducted as cross-sectional research, collecting data from the Facebook group over two occasions. The data collection process spanned two months from June to July 2023 to ensure sufficient data diversity and representation. The research design of this study is illustrated using Saunder's research onion (Saunders et al., 2009, 2012) in Figure 1.

pool of experienced researchers with relevant perspectives. Two separate posts were made in the group to facilitate data collection. The first post invited participants to share their experiences regarding how reliance on metrics has influenced their access to grant funding at their respective institutions. The second post sought to understand how metrics are used in research impact assessment across different academic institutions. Participants' responses were collected and transcribed verbatim for analysis. The data collection process was meticulously documented to promote replicability.

Verifiability and trustworthiness

To enhance the verifiability and trustworthiness of the study, triangulation was employed. The researchers cross-referenced the data from multiple sources, such as posts and comments, to validate the findings and ensure consistency. The research team engaged in intercoder reliability checks, wherein two independent researchers coded a subset of the data to establish coding agreement. Any discrepancies were resolved through discussion, ensuring the reliability of the coding process. Member checking was also conducted, wherein a select group of participants was asked to review and validate the preliminary findings. Incorporating their feedback strengthened the study's validity and ensured an accurate representation of the participants' perspectives.

Ethical consideration

The research adhered to strict ethical guidelines throughout the study. Informed consent was obtained from all participants, who provided detailed information about the study's purpose, data usage, and rights. Participant anonymity was maintained using pseudonyms, and all identifying information were removed from the transcribed data. The study obtained approval from the Institutional Review Board (IRB) to ensure compliance with ethical standards. Ethical documentation, including informed consent forms and IRB approval, were meticulously maintained for transparency and replicability.

Data analysis

Thematic analysis was used to analyse the collected data. The researchers immersed themselves in the transcribed responses to identify recurring themes and patterns. A systematic coding process was used to categorise and organise the identified codes into overarching themes, ensuring a comprehensive understanding of the participants' experiences and perspectives. The data analysis process was thoroughly documented, including detailed explanations of coding decisions and theme development. This documentation served to promote replicability and transparency in the study's findings.

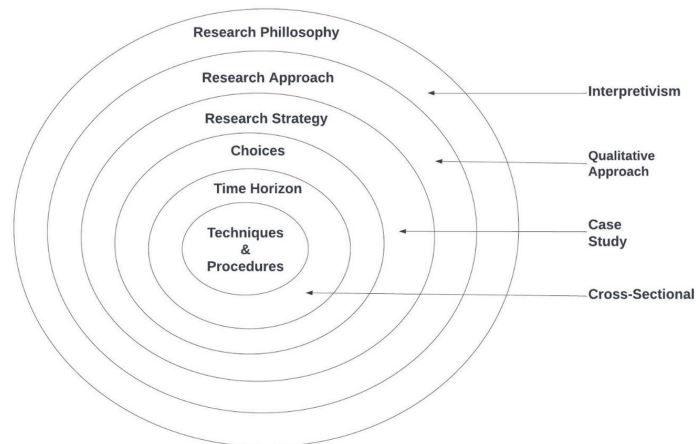


Figure 1: Research onion of Saunder showing the research design of this study.

Participants

Accidental sampling was utilised to select more than 15 experienced researchers from various academic disciplines, institutions, and countries. Participants were chosen based on their active engagement in the Facebook group's research assessment and grant funding discussions. All participants were considered experts with substantial knowledge of their respective institutions' research assessment and grant funding processes. Table 1 describes the demographic profiles of the participants.

Table 1: Demographic profiles of the participants.

Participant	Label	Gender	Discipline	Location
Participant 1	P1	Male	Chemistry	Scotland
Participant 2	P2	Male	Postdoctoral Fellow	Finland
Participant 3	P3	Female	Human Ecology	Sweden
Participant 4	P4	Female	Researcher	Lithuania
Participant 5	P5	Male	Human Geography	Italy
Participant 6	P6	Male	Biology	India
Participant 7	P7	Male	Researcher	Europe
Participant 8	P8	Male	Physiology	Pakistan
Participant 9	P9	Female	Neuroscience	Mexico
Participant 10	P10	Male	Computational Biology	USA
Participant 11	P11	Male	Management	USA
Participant 12	P12	Male	Data Science	France
Participant 13	P13	Male	Biology Education	Hungary
Participant 14	P14	Female	Educational Measurement	Nigeria
Participant 15	P15	Male	Internal Medicine	Nigeria

Data collection

The data were collected from the "Reviewer 2 Must be Stopped!" Facebook Group, which boasts more than 135,000 academic members worldwide. The group's popularity and strict regulation of academic membership ensured a rich

Results

The results of the qualitative analysis demonstrate a diverse range of perspectives regarding the role of metrics in modern day research-related practices. The results are organised according to the major themes that emerged from the analysis:

Theme 1: Metrics in funding evaluation

Participants' views on the significance of metrics in research funding decisions were explored in this theme. On one hand, some participants acknowledge that their institutions and funding agencies rely heavily on metrics when making funding decisions. Metrics such as publication counts, impact factors, and citation indices are viewed by some participants as objective measures of researchers' productivity and impact. Some participants disclosed that their institutions rely on metrics when making research funding decisions. However, some expressed concerns about potential flaws in the system, such as oversimplification and the disregard of qualitative contributions. Moreover, some participants shared the common view that even though metrics are extensively used for research funding, there is growing awareness of the need to be more cautious about using this approach for evaluation. Some participants revealed the following regarding the role of metrics in funding evaluation:

P1: "I am not sure about securing funding, but my university management is obsessed with them in terms of 'performance management'."

P7: "From my experience (and my experience only), it is very important in Europe."

P9: "Depends on the country and area. In my country (Mexico), in theory, funding should not depend on metrics but rather on quality. In practice, committees base their decisions mainly on metrics, even when they were specifically instructed to ignore them. It is an old custom that is hard to let go."

P10: "I think this goes by the economic concept that one thing is as good as its alternatives allow it to be. There are always more PIs (Principal Investigators) than funding, and when it comes to rationing time, how else do we objectively compare them other than things like impact factors and publications? By assigning a board of 'morally incorruptible true experts' and centralised planning Soviet style? I do not know a better solution than the current system."

On the other hand, several participants argue against the overreliance on metrics in grant funding. They highlight the importance of valuing the strength of research proposals and other qualitative aspects over publication metrics. Participants mention a shift toward prioritising well-written and thoughtful research proposals rather than excessively emphasising metrics. This shift suggests a growing recognition of the limitations of metrics and the need for a more balanced evaluation process that considers the potential impact and novelty of research projects. On the

opposing end, some participants revealed the following regarding the role of metrics in grant funding:

P2: "I am sure there are huge differences between fields, countries, and funding agencies here (I am in Biogeosciences in Finland). My primary funding agency, the Research Council of Finland, has banned impact factors from CVs/publication lists because the ranking of a journal is a very poor predictor of the impact of an individual article - even many Nature papers turn out to have very few citations. We include our individual citation record (e.g., total number of citations, h-factor). My overall impression is that funding agencies have a more qualitative and holistic view of research performance, i.e., they look at your CV. Publication record, supervision record, project management experience, previous funding, public engagement on the research topic, etc., are all considered."

P3: "Metrics have not influenced my funding or applications. In my small transdisciplinary field, they would not make much sense."

P4: "The use of metrics for assessment depends on the funder and the people who will review your application. I think ERC now focus on the quality of work and proposal rather than indices."

P6: "Simple. Those who do not understand research by reading it have no other way but rely on indices. Those who know science will not. However, such people are not found in funding agencies nowadays."

P8: "In our part of the globe, Pakistan, no weightage is given to these metrics such as citations, h-index, etc., while considering Research Grant funding. The grant reviewers mostly pay attention towards novelty and practical applicability of the project."

P5: "Since the use of metrics for evaluation lacks scientific and analytical validity, only those who continue to advocate for their use can provide answers to this question. Is the practice of incorporating Impact Factors (IFs) of the journals where people published being implemented? That would be irrational, though it is possible (I have come across CVs with cumulative IFs, which is simply absurd). Are they relying on IFs as indicators of the quality of individual articles instead of reading them? It may be a careless approach, but it is feasible. In summary, there is no reasonable way to utilise metrics effectively, and this inquiry delves into imprudent and flawed practices."

In a follow-up discussion, Participant 5 was further asked to share a perspective on circumstances in which every decision about hiring, firing or promotion was an invitation to accuse bias and whatever best suits the candidate; having a set of numbers from disinterested sources to back the decision can be very useful. The response obtained is as follows:

P5: "Apologies for being frank, but believing that "numbers" are free from biases is precisely that insanity I was referring to before. Are we talking of kids playing with things they do not understand or of competent adults? Can an adult with PhD and academic credentials do something they know is sloppy and not be blamed? Let us be adults. Having metrics that appear to be objective and independent of personal bias allows them to make decisions that put the best people into jobs, grant resources where they will be used most productively, or get rid of non-performing personnel without themselves being targeted."

Theme 2: Critique of metric-based evaluation

Theme 2 focused on participants' critiques and reservations regarding the use of metrics in research funding assessments and decision-making. The participants expressed their concerns and scepticism about the reliance on metrics as the primary or sole criterion for evaluating research proposals and allocating funding. These studies lend their attention to metric-based evaluation methods' limitations and potential drawbacks. Participants expressed a growing concern about the limitations and potential adverse effects of relying heavily on quantitative measures to allocate research funding. The perspectives of five participants exemplify the reservations surrounding the use of metrics in funding decisions.

P1: "My university management are obsessed with them in terms of 'performance management'. However, there is uncertainty about whether metrics directly impact funding decisions in my institution."

P7: "I know mediocre scientists who have accumulated a good number of articles and citations by being at the right time in the right lab, and they can secure funding for projects which are either extremely incremental or downright stupid. I have the counterexample of an Indian postdoc who is brilliant but does not have an impressive CV and struggles to secure even personal grants. The reason scientific progress is slowing down so much is, in my opinion, a combination of a lack of investments coupled with a system that fosters mediocrity to some extent. I am part of this system and have not done much to change it. Things are so bad, but if we voice it, we are discredited since we have no power. Moreover, those with power will not change things because why would they?"

P9: "In my institution, there is a contradiction between the stated emphasis on quality over metrics in funding decisions and the reality that committees still heavily rely on metrics. This discrepancy ushers in challenge in breaking away from an entrenched culture of metric-based evaluation, despite acknowledging the importance of focusing on research quality."

P10: "Metrics are used in my institution due to the sheer number of Principal Investigators competing for limited funding. Funding agencies are now facing

a dilemma in efficiently comparing researchers objectively. This approach is not appropriate, especially now that many agencies are adopting inclusive approaches to research impact assessment."

P15: "Before the advent of metrics, assessment of scholarly impact was primarily based on qualitative evaluations, peer reviews, and expert judgments rather than quantitative measures. The impact was also based on the number of patents earned through discoveries that are new, non-obvious, industrially applicable, disclosed in detail, and fall within the scope of patent-eligible subject matter. However, with metrics, such as citation counts and journal impact factors, the assessment of scholarly impact shifted towards more quantitative and standardised approaches. These do not have any meaning for me, but my institution continues to emphasise that people go for Q1- and Q2-indexed journals in Scopus and Web of Science. I do not understand why universities like ours will emphasise these things over our quality of work. Even teaching is less important during assessment than metrics (ordinary numbers). As a result, many people continue to fail promotion even though they have given their best for their universities through teaching, research and community service. We should go back to the old assessment system, or instead of relying solely on metrics, researchers should be made to justify their research's social and economic value as part of the promotion requirements."

The critique presented by these participants underscores several common concerns about using metrics in research funding assessments. These include the risk of oversimplifying research productivity, fostering a focus on quantity rather than quality, perpetuating a culture of mediocrity, and creating an environment where researchers are incentivised to "game the system" to improve their metrics artificially. Moreover, the critiques point to a potential disconnect between the espoused values of funding decisions based on quality and the actual reliance on metrics in practice. This discrepancy suggests the need for a more balanced approach to research funding evaluation that considers both quantitative metrics and qualitative evaluations of research impact and potential.

Theme 3: Metrics and research impact assessment

This theme focuses on participants' views regarding the role of metrics during research impact assessment. Participants were asked to share their views on how metrics are used during their promotion career advancement appraisals and measure their impact in their respective fields. One of the key findings is the varied perspectives on the significance of metrics in research impact assessment. While some participants acknowledged the importance of metrics, others criticised their use as scientifically unsound and difficult to justify in practice. Nevertheless, some participants agreed that metrics are widely used for research impact assessment at their institutions.

P12: "In my country, research impact assessment is based on lists provided by the government. This is very problematic, given how political ideology can skew evaluations."

P13: "Hungary in general: papers in Scopus indexed journals (preferred: Q1, Q2), number of citations, h-index. In all disciplines, however, specifics (e.g., how many citations or papers are needed for a promotion) vary according to discipline. In humanities/social sciences, monographs also count (but they do not replace journal papers)."

P14: "My institution relies so much on metrics such as the h-index of scholars and impact factors of the journals where authors published their papers. Authors must meet the minimum criteria set in the metric-based system to be promoted to different ranks. For instance, you will only be promoted to a professor only if you have at least five papers in Scopus or Web of Science, other publications in national or association journals, and a h-index of 5 or higher. Those seeking promotion to the rank of associate professor needed approximately 3 papers in these databases and a h-index of 3. The total number of publications must be sufficient to give you the required points. Although other aspects, such as the number of courses taught, students' research supervised, and conferences attended, are necessary conditions that must be satisfied, research metrics seem to have a domineering place among all these measures. For instance, you do not even get a clearance to submit your records for promotion assessment if you do not meet the Scopus or h-index requirements. Besides, papers published in journals with impact factors are graded more favourably with higher scores than those without them."

On the other hand, some respondents agreed that while metrics are being used, there is a gradual shift toward complementing metric-based assessments with subjective evaluations. This can be seen in the direct quotations of two participants:

P8: "The Impact Factor of a journal and h-index of a scholar plays a pivotal role in research assessment and hence his/her promotions in academic/research institutes. However, the tide is now turning against these contentious metrics, and emphasis is gradually being levied upon the Impact of Research, its applicability, and its practicality."

P11: "At my institution, we use multiple measures of research impact, including number of citations, quality of journal, journal impact factor, external assessments of your scholarship, research being used in doctoral seminars, awards, select membership due to your areas of expertise, and invitations extended to you to give presentations/talks based on your research. I enjoy it because there are different avenues for different scholarships to show impact."

Discussion

The first research question sought to explore the perspectives of scholars on the role of metrics in research funding decisions. The qualitative analysis revealed a diverse range of perspectives among the participants. Some participants acknowledged the extensive use of metrics, such as publication counts, impact factors, and citation indices, as objective measures of researchers' productivity and impact. Some participants expressed concerns about how funding decisions are based on numeric indicators when deciding who gets what. However, concerns about potential flaws in the system, such as oversimplification and neglect of qualitative contributions, were also voiced. This finding corroborates the evidence presented by Dinsmore et al. (2014) that funding agencies such as the 'Wellcome Trust' utilise metrics in making funding decisions and consider altmetrics an innovative approach. These findings also align with the results obtained by Thuna and King (2017), where participants stated, among other things, that impact metrics were important for them to secure grants. These findings further support the findings of Gyórfy et al. (2020) that the scientometric standing of an author was important for grant funding and future research output. Nevertheless, the approaches adopted in the cited studies and the present study were quite different.

Many participants acknowledged the importance of research metrics but suggested that a more balanced approach to evaluation be used, where metric-based evidence is supplemented with subjective evaluation inputs from core domain experts. This finding implies that policymakers should consider incorporating qualitative methods alongside metrics to improve the validity and reliability of research funding decision-making. This shift indicates a move toward a more comprehensive evaluation approach that values qualitative aspects, such as research impact and novelty. This aligns with the results of Butler et al. (2017), who found that no perfect all-encompassing metric exists for measuring research impact and that no single traditional metric can accommodate all facets of research impact in the modern era. By prioritising the strength of research proposals and qualitative contributions, higher education institutions and funding agencies can encourage researchers to focus on producing high-quality and innovative research beyond mere publication counts. This approach may foster a research culture that rewards excellence and creativity, leading to more impactful and groundbreaking research outcomes. In addition, the findings of this study have implications for teaching and learning in higher education institutions, where the focus is gradually shifting from the classroom activities of academics towards research. Using a balance approach will ensure that academics are assessed by cumulative scores from both their classroom and research performance, not just from the latter, as we currently see today.

The critique of overreliance on quantitative metrics, which may foster a culture of mediocrity and artificial inflation of metrics, calls for caution when using metrics as the primary evaluation criterion. A balanced evaluation approach considering quantitative metrics and qualitative impact is crucial to mitigate these potential drawbacks. Encouraging

researchers to produce high-quality work with genuine societal relevance can promote a research ecosystem that values excellence and meaningful contributions. These findings corroborate the results of Bakker et al. (2020), who revealed that participants familiar with metrics expressed concerns about their misuse and desire to be involved in decision-making around their use. Similarly, in an editorial published by ACS Nano, a group of experts resolved that research impact measurement should go beyond citations and publications, considering real-world effects and encouraging thoughtful assessment by funding agencies, institutions, and researchers while fostering incentives for research development and contributions beyond academia (Chai et al., 2022).

The second research question explores participants' views on the role of metrics in research assessment in higher education institutions. Participants expressed diverse views on the importance of metrics in research evaluation. While some acknowledged the pivotal role of metrics such as the Impact Factor and h-index in research assessment and promotions, others criticised their use as scientifically unsound and challenging to justify. This finding aligns with the results of Deeming et al. (2018), where participants provided broad support for using standardised and customised metrics in research impact assessment. This diversity of perspectives underscores the complexity of using metrics as evaluation criteria in research impact assessment. The implications of these findings are twofold: first, the diverse views on the importance of metrics underscore the need for a balanced approach to research evaluation that considers both quantitative metrics and qualitative assessments; second, the criticisms of metric-based evaluation emphasise the necessity of addressing the limitations and potential biases associated with metrics to ensure a fair and comprehensive assessment of research impact in higher education institutions.

This shift involves using multiple measures of research impact, including citations, journal quality, external assessments, awards, and research usage in doctoral seminars. This finding agrees with the results of Deeming et al. (2018), where most participants felt that the current research environment encourages academics to focus on publishing papers and building their academic reputation, which sometimes clashes with making broader impacts outside of academia. Emphasising qualitative aspects alongside metrics promotes a fairer and more accurate assessment, encouraging researchers to focus on producing meaningful and impactful research outcomes. This finding implies that a one-size-fits-all evaluation system may not accurately capture diverse contributions and research priorities across different regions and disciplines. By considering these contextual factors, policymakers and institutions can mitigate potential biases and design evaluation frameworks that are fair, transparent, and inclusive. This approach ensures that researchers' achievements are assessed and aligned with their respective regions' and disciplines' specific characteristics and goals, promoting a more equitable and effective research evaluation process.

Limitations and prospective research directions

While this study provided valuable insights into the influence of metrics on research funding decisions and assessments, it also had several limitations that should be acknowledged. First, the sample size was small and not fully representative of all disciplines and regions. This may limit the generalisability of the findings and might not fully capture the diverse perspectives on metric utilisation in different academic contexts. Another limitation is the potential for self-selection bias among the participants. Those who chose to participate in the study may have had stronger opinions about the topic, leading to a skewed representation of views.

Additionally, the qualitative nature of the study might limit the ability to quantify and measure certain aspects of the participants' responses, making it challenging to draw precise conclusions. Furthermore, the study focused on participants' perspectives and experiences, which might not entirely reflect the actual practices and policies of funding agencies and institutions. Incorporating data from funding agencies and institutional records could provide a more comprehensive picture of how metrics are used in decision-making.

In future research, it would be beneficial to conduct larger-scale studies with more diverse samples to increase the generalisability of the findings. Longitudinal studies tracking changes in metric utilisation over time help identify trends and patterns. Moreover, combining qualitative and quantitative methods could offer a more robust analysis of the impact of metrics on research funding decisions. Finally, exploring the perspectives of key stakeholders, such as funding agencies, university administrators, and policymakers, would provide a more comprehensive understanding of how metrics are integrated into funding and assessment practices. Despite these limitations, the study lays the groundwork for further exploration and calls attention to the need for balanced and nuanced evaluation methods in research funding decisions. By addressing these limitations and pursuing future research, we can continue to advance the knowledge in this critical area and promote more effective and equitable research evaluation practices in higher education institutions.

Implications for teaching and learning

The implications of this study for teaching and learning in higher education systems are far-reaching, especially in redefining the balance among the three statutory duties of academics—teaching, research, and community service. The study suggested the need for academic institutions to de-emphasise metrics when assessing scholarly contributions. This shift can recalibrate the priorities of scholars, prompting them to strike a more balanced approach between teaching and research. As pressure to meet strict quantitative metrics diminishes, academics can allocate more time and energy to excel in their teaching responsibilities. The current emphasis on research metrics may have led to a sense of insensitivity towards teaching. With a reduced reliance on metrics, scholars can redirect their focus toward improving the quality of teaching. This can lead to the development of innovative teaching methods, a stronger emphasis on

student engagement, and a dedication to fostering a positive learning environment. This study implies that the pursuit of metrics sometimes results in the production of papers lacking practical relevance. Shifting away from a solely metric-driven approach allows scholars to prioritise research with genuine societal impact. This, in turn, can lead to more practical and applicable research outcomes, enriching the learning experience for students by connecting theoretical knowledge with real-world scenarios. The third statutory duty, community service, often takes backseat in the pursuit of research metrics. As scholars pay more attention to teaching and research with societal relevance, community services can be better integrated into academic agendas. This may involve active engagement with local communities, sharing expertise with the public, and contributing to solutions for real-world problems. De-emphasising metrics in assessment allows space for a more holistic academic experience. Students can benefit from educators who are not solely focused on research output but are equally invested in creating a positive learning environment and making meaningful contributions to the community. The intense pressure to meet research metrics can contribute to burnout among academics. By shifting the focus away from metrics and fostering a more balanced approach, institutions can contribute to the well-being of scholars. This, in turn, positively impacts the teaching and learning environment, as educators can bring a more positive and energised mindset to their work.

Conclusion

This study significantly contributes to the field by highlighting the diverse perspectives among scholars regarding the role of metrics in research funding decisions and assessments in higher education institutions. The findings revealed a diverse range of perspectives among participants, with some acknowledging the significance of metrics as objective measures of researchers' productivity and impact. In contrast, others criticised the overreliance on metrics and advocated for a more comprehensive evaluation approach. Moreover, the shift toward adopting multiple measures of research impact in certain institutions reflects a growing recognition of alternative indicators beyond traditional metrics. The findings underscore the necessity of a balanced evaluation approach that integrates qualitative assessments with traditional quantitative metrics. This approach is critical for funding agencies to reconsider their evaluation criteria. The recommendation to adopt a balanced evaluation approach, which values qualitative contributions and societal impact alongside traditional metrics, holds the potential to reshape the research landscape. This shift can foster a culture that rewards excellence and creativity, encouraging researchers to produce high-quality and innovative work beyond mere publication counts. The implications of this research underscore the importance of a balanced and thoughtful approach to research evaluation that considers both quantitative metrics and qualitative aspects of research quality. As institutions and funding agencies strive to make informed decisions about research funding and assessment, these insights can guide the development of more effective and fair evaluation methods that capture the true impact and novelty of research contributions. Additionally, the

study emphasises the need for ongoing dialogue and reflection on using metrics in research assessment to foster a culture of rigorous and unbiased evaluation in the academic community. Based on the findings and conclusions of this study, the following recommendations were made:

1. Institutions should work toward creating evaluation frameworks that go beyond quantitative metrics. Qualitative assessments, such as peer reviews and expert evaluations, should be incorporated to provide a more holistic view of scholarly contributions, including teaching and community service.
2. Higher education institutions should encourage scholars to develop a balanced academic portfolio that encompasses teaching, research, and community service. They should recognise and reward contributions in all three areas, fostering a culture that values well-rounded academics.
3. Tertiary institutions should offer professional development opportunities that focus on enhancing teaching skills and promoting impactful community engagement. This could include workshops, training sessions, and mentorship programs to support academics in all aspects of their roles.
4. Institutions should revisit promotion and tenure criteria to ensure that they reflect a balanced assessment of faculty contributions. We should consider weighting teaching and community services alongside research on promotion decisions to encourage a more equitable distribution of effort.
5. Higher education institutions should actively seek and consider student feedback on the effectiveness of teaching. This can provide valuable information concerning the impact that educators have on students' learning experiences and help in refining teaching methods.
6. Higher education institutions should educate faculty, administrators, and stakeholders about the limitations and potential biases associated with relying solely on quantitative metrics.
7. Funding agencies should consider incorporating a balanced evaluation approach that goes beyond quantitative metrics. While metrics such as publication counts, impact factors, and citation indices provide valuable insights, funding decisions should also consider qualitative contributions and the societal impact of research.
8. Funding agencies should encourage researchers to provide evidence of their engagement with communities, the practical relevance of their

work, and contributions to teaching during promotion assessment. This approach ensures that funding decisions consider the broader spectrum of scholarly activities, fostering a research culture that values excellence in various dimensions.

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