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DATES:

Received: 27 June 2025

Revised: 13 Nov. 2025

Revised: 16 Mar. 2026

Accepted: 08 May 2026

Published: 29 July 2026

HOW TO CITE:

Sobuwa S, Bingwa N, Managa M, Hintsho-Mbita N, Tyasi TL, Maseko B. From metrics to meaning in research evaluation. *S Afr J Sci*. 2026;122(7/8), Art. #22825. <https://doi.org/10.17159/sajs.2026/22825>

ARTICLE INCLUDES:

- ☒ Peer review
- ☐ Supplementary material

DATA AVAILABILITY:

- ☐ Open data set
- ☐ All data included
- ☐ On request from author(s)
- ☐ Not available
- ☒ Not applicable

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From metrics to meaning in research evaluation

The evaluation of research impact in higher education has long been dominated by citation-based metrics and their derivatives, such as impact factors and h-indices. While these measures offer the appeal of standardisation and comparability, they capture only a narrow dimension of scholarly influence and often reinforce global, disciplinary and linguistic inequities. The rise of altmetrics has promised a broader, more immediate view of research engagement, yet these too remain vulnerable to bias, manipulation and structural asymmetries that privilege well-resourced institutions and English-language scholarship. We argue that the problem lies not only in the tools of measurement but in the broader *metrification* of higher education itself, where numerical indicators have supplanted expert judgement and contextual understanding. Drawing on the South African context, we argue for a recalibrated approach to research impact assessment. We outline the principles that should inform the development of a flexible, context-sensitive framework that integrates quantitative and qualitative evidence. Such an approach aligns with global movements for responsible research assessment, including the San Francisco Declaration on Research Assessment (DORA) and the Leiden Manifesto, while foregrounding local priorities such as transformation, equity and societal relevance. Ultimately, we call for a shift from counting outputs to interpreting contributions, towards an evaluative culture grounded in judgement, context and inclusion.

Significance:

This paper advances the international movement for responsible research assessment by arguing for a context-sensitive framework that integrates quantitative and qualitative evidence. It situates global critiques of metrification within the South African higher education context, where transformation, equity and societal relevance are central concerns. By revealing how citation and altmetric indicators perpetuate structural inequities and distort academic priorities, the paper lays the groundwork for a holistic, inclusive, contextually grounded framework for evaluating research impact aligned with South Africa's developmental and social justice imperatives.

Introduction

For decades, the evaluation of research impact has been dominated by quantitative indicators, particularly citation-based metrics such as citation counts, journal impact factors and the h-index.¹⁻⁵ These indicators have become entrenched in the global academic landscape, influencing funding allocations, academic promotions, institutional rankings and even national research strategies.⁶⁻⁹ Their appeal lies in their apparent simplicity and standardisation as they offer a single number that appears to quantify the scholarly value of a piece of work.¹⁰ Yet this apparent objectivity is deceptive. It is now widely acknowledged that citation-based indicators capture only a narrow slice of research influence, largely limited to academic impact within disciplinary and linguistic boundaries that privilege the Global North and certain fields, while systematically undervaluing others.^{4,11} This narrowing is sustained by the myth of meritocracy, which treats outcomes of unequal systems as neutral indicators of talent and effort, thereby masking structural advantage, particularly in the Global South.¹²

This critique is well established. Scholars have documented how citations reflect disciplinary conventions, network effects, language dominance and institutional hierarchies, rather than objective measures of quality or real-world relevance.^{7-9,13,14} The dominance of these indicators has been described as a form of "metric monoculture", narrowing how scholarship is recognised and rewarded.^{15,16} Indeed, research that has a meaningful impact on policy, industry or communities often remains invisible in conventional citation databases, particularly in fields such as the humanities, applied sciences and regionally focused work in the Global South.^{15,17} These blind spots not only distort individual assessments but also shape institutional priorities and, ultimately, research agendas.

In response to these limitations, alternative approaches to impact assessment have gained traction. Altmetrics, for example, provide a more immediate and comprehensive picture of engagement by tracking online attention across platforms such as blogs, policy documents and mainstream media.^{18,19} These indicators aim to make visible aspects of influence that traditional metrics often overlook, particularly the societal and cultural dimensions of research. However, altmetrics are still metrics: they are not immune to biases, structural inequities and manipulation. They can reproduce the very inequalities they were meant to redress, such as privileging English-language discourse or amplifying already well-networked scholars, and they are vulnerable to gaming, algorithmic opacity and the volatility of social media ecosystems.²⁰⁻²² Altmetrics, therefore, expand the lens but do not fundamentally resolve the problem of relying on numerical indicators to capture complex social phenomena, such as 'impact'.

This paper enters the debate not by rehearsing the now well-documented critiques of citation metrics^{3,4,11,23}, but by proposing a recalibrated approach to research impact evaluation that integrates multiple forms of evidence. Rather than positioning metrics and qualitative assessments as oppositional, we argue for their combination within a context-sensitive and inclusive framework. This article does not claim to present a fully elaborated evaluative framework either; rather, it offers a call for such frameworks to be collectively developed and identifies the key considerations that should inform that process. Our goal is not to abandon metrics altogether, but to situate them alongside other forms of knowledge and evidence in ways that are meaningful, equitable and reflective of diverse research contributions. This approach acknowledges the growing recognition, reflected in initiatives such as the

EDITORS:

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KEYWORDS:

research impact, citation metrics, altmetrics, research evaluation, neoliberalism

FUNDING:

None



Leiden Manifesto²⁴ and the San Francisco Declaration on Research Assessment (DORA)²⁵, as well as narrative CV frameworks, that impact assessment must evolve beyond narrow numerical proxies to incorporate richer, more nuanced understandings of scholarly influence.

We also engage with a deeper critique that underlies the current debates: the metrification of higher education itself.^{15,16} This refers to the ways in which counting has increasingly replaced judgement, with metrics becoming targets in themselves, often driven more by managerial and ranking logics than by scholarly or societal goals. As many critical higher education scholars have argued, devising more sophisticated ways to measure impact does not address the underlying problem.^{4,15,23} Harley²⁶ argues that such metrification has alienated academic labour from its intellectual and social purposes. This “alienation of academic work”, as Harley terms it, illustrates how measurement regimes can erode scholarly autonomy, collegiality and public engagement, reproducing the very inequalities they purport to redress. Her analysis highlights the need to reassert judgement, context and scholarly purpose in understanding and assessing research value.

In what follows, the paper first provides a concise overview of the limitations of traditional citation-based metrics, situating these within established debates on research evaluation. We then critically examine the emergence and promises of altmetrics, highlighting both their potential to broaden the lens of research impact and their inherent limitations, including issues of bias, manipulation and uneven global applicability. Building on this, we articulate an inclusive approach to research impact assessment that integrates multiple forms of evidence, including both quantitative and qualitative, within context-specific evaluative practices. We then engage with the broader critique of the metrification of higher education, showing why technical fixes alone are insufficient without cultural and structural shifts in how impact is understood. We conclude with a call for recalibrated research evaluation approaches that advance inclusivity, equity and the responsible use of metrics, while foregrounding expert judgement and contextual interpretation.

Rethinking citations in research evaluation

Citation-based metrics have long functioned as the dominant proxy for measuring scholarly impact.¹ Their appeal stems from their quantitative clarity and standardised application, enabling easy comparison across individuals, institutions and countries.^{11,14,27} High citation counts often convey academic influence, making them instrumental in determining promotions, funding allocations and institutional rankings.⁴

However, this reliance on citation metrics is increasingly recognised as problematic. Citations reflect disciplinary norms, linguistic hierarchies and network effects rather than intrinsic research quality.^{13,17,28} Fields such as clinical medicine or molecular biology attract higher citation volumes than the humanities or locally oriented research, rendering cross-disciplinary comparisons misleading.¹⁷ Geographic and linguistic biases further compound these distortions, privileging English-language scholarship and marginalising contributions from the Global South.²⁹⁻³³ Moreover, citations are vulnerable to strategic behaviour. Self-citation practices, citation cartels and journal coercion inflate numbers and distort perceived impact.³⁴⁻³⁶ Citation cartels are reciprocal agreements among authors or journals to cite each other’s work disproportionately, artificially elevating citation counts without reflecting genuine scholarly influence.³⁴ Such dynamics exemplify Goodhart’s Law: once a measure becomes a target, it ceases to be a good measure.³⁷ Citation counts also fail to capture the qualitative nature of influence; they offer no distinction between citations driven by endorsement and those arising from critique or controversy.^{11,13}

Citation metrics are not always a reliable indicator of quality, as they often focus on quantity. Highly cited papers may be controversial or well known rather than impactful.¹³ This emphasis on quantity can encourage researchers to ‘game the system’ by prioritising publication volume and self-citation.^{13,27} Another important consideration is the time lag between publication and citation accumulation, which varies by discipline and research type. Some disciplines accumulate citations quickly, while others do so slowly.³⁵

Citation metrics also cannot capture the full context of why, where or by whom a work was cited. Citations from renowned scholars or multiple regions may indicate a broader impact than those from lesser-known or local sources.¹¹ Cross-disciplinary citations show wider applicability, while citations from prestigious journals may reflect higher quality.⁶ The context of citations, positive or negative, also matters for understanding impact.³ Tracking citation frequency trends over time can provide insights into a publication’s evolving influence.

Some evaluators attempt to address disciplinary disparities through normalised indicators such as the field-weighted citation impact, which adjusts for differences among academic fields by comparing a researcher’s citation rate to the global average for similar publications in the Scopus database.³⁸ A value of 1.00 represents the global average; values above 1.00 indicate higher-than-average citation performance, and those below 1.00 indicate fewer citations. For instance, a score of 1.60 means outputs are cited 60% more than expected, while a score of 0.75 indicates 25% less.³⁸ While such measures improve comparability, they remain dependent on database coverage and citation culture and must still be interpreted in context rather than used as absolute indicators of quality.

These limitations and contextual nuances have prompted growing calls for more responsible and interpretive approaches to research evaluation – approaches that move beyond counting citations to understanding what they signify.

The emergence of altmetrics: Broadening the lens

Against the backdrop of the shortcomings of citation-based evaluation, alternative metrics, also known as altmetrics, have gained prominence. Altmetrics track online engagement with research outputs through channels such as X (formerly Twitter), blogs, policy documents, Mendeley readership, news coverage and other digital platforms.^{19,20} Their promise lies in capturing real-time attention and making visible dimensions of research influence that conventional citations overlook, including societal, cultural and policy impact.

Altmetrics can be particularly valuable in fields where immediate public engagement or practical application is crucial, providing a more comprehensive understanding of how knowledge is disseminated and circulated. They also have the potential to give voice to scholarship outside traditional academic publishing, including grey literature, data sets and policy briefs.³⁹ Yet, these metrics are not without their limitations. Social media attention does not necessarily reflect the quality of research. Many altmetric signals are shallow; retweets and likes are low-effort engagements that cannot be equated with rigorous scholarly uptake.^{39,40} Furthermore, altmetrics are highly susceptible to manipulation. Coordinated campaigns, bot activity or network amplification can artificially inflate attention scores, replicating the distortions already familiar in citation metrics.⁴¹

These indicators are also unevenly distributed globally. Much of the infrastructure for capturing altmetric data is located in the Global North, and platforms like Overton remain limited in their coverage of non-English and policy documents from the Global South.⁴¹ As a result, scholarship from underrepresented regions risks invisibility, echoing the same structural inequalities present in citation databases. In this sense, altmetrics expand the evaluative landscape but do not resolve its core inequities.

Towards a holistic and context-sensitive framework

Given the limitations of both citation metrics and altmetrics, evaluating research impact requires a more integrated, reflective approach. A holistic framework recognises that no single metric can adequately capture the complexity of research influence. At this stage, the purpose is not to offer a completed evaluative framework. Rather, it calls for a combination of quantitative and qualitative evidence, interpreted within the appropriate disciplinary and contextual settings.

A key feature of such a framework is its flexibility: it should not be uniformly applied across all situations, but rather used selectively when the stakes, complexity and multidimensionality of impact warrant it. Holistic evaluation is particularly critical in high-stakes assessments such as promotion to senior academic ranks, allocation of major research funding, renewal of research chairs and institutional performance reviews. These are moments when decisions can significantly shape academic careers, institutional directions and societal outcomes, and where narrow reliance on single metrics can be most damaging.

By contrast, lower-stakes or routine evaluations, e.g. periodic internal reporting or project monitoring, may lean more heavily on selected metrics, provided their limitations are acknowledged. This tiered approach ensures that holistic evaluation is reserved for contexts where it adds the most value, while still allowing efficiency where appropriate.

The holistic framework also recognises that research impact is multidimensional. Depending on the context, evaluation may need to consider contributions from various perspectives, including academic, societal, economic, cultural and policy. In biomedical sciences, for example, research uptake might be reflected in clinical guidelines, patents or translational innovations. In the humanities and social sciences, contributions may be expressed through public engagement, policy debate or cultural production. In fields with strong community partnerships, local impact, often invisible in citation counts, may be a decisive indicator of value.

Importantly, holistic approaches must also be context-sensitive. South African universities operate within complex realities shaped by transformation imperatives, resource constraints and competing expectations of global competitiveness and local responsiveness. A framework that integrates metrics with narrative and qualitative evidence can account for this diversity and prevent the privileging of research that is merely visible to global databases.

This approach aligns with international movements for responsible assessment, most notably the DORA and the Leiden Manifesto. DORA explicitly calls for moving away from journal-based metrics, such as the journal impact factor, and urges evaluators to assess research on its own merits, recognising a diversity of outputs and impacts.²⁵ The Leiden Manifesto complements this by outlining ten principles that emphasise

contextualisation, transparency and the primacy of qualitative assessment.²⁴ Embedding these principles within a South African framework offers both conceptual clarity and international legitimacy, while allowing space for local adaptation and responsiveness. Such a framework does not reject metrics but integrates them judiciously, ensuring that they inform rather than dominate evaluation. It allows for disciplinary variation, encourages diverse forms of scholarly contribution and creates space for meaningful impact narratives alongside quantitative indicators.

Confronting the metrification of higher education

The debate about metrics cannot be fully understood without acknowledging the wider phenomenon of metrification in higher education. Over time, universities have increasingly embraced global university rankings and performance indicators as tools of governance.^{42,43} Metrics have migrated from being descriptive tools to prescriptive targets, shaping behaviour across the academic ecosystem.

As many critical higher education scholars have argued, this managerial turn is not simply about measurement; it is about power.⁴⁴⁻⁴⁶ Metrics offer the illusion of objectivity and comparability, allowing administrators and policymakers to make decisions that appear neutral but often reinforce existing hierarchies.⁴⁴⁻⁴⁶ When citations, impact factors or altmetric scores become targets, academic activity can become distorted, focusing more on 'what counts' than on what matters.²⁻⁴

Bill Readings⁴⁷ characterised this transformation as the shift from the *university of culture* to the *university of excellence*. In *The University in Ruins*, he argues that "excellence" has become the central organising principle of the contemporary university – an empty, bureaucratic ideal that justifies managerial control and constant evaluation without reference to substantive educational or intellectual goals. Under the banner of "excellence", the university's traditional mission of critical inquiry and social engagement gives way to a culture of audit, branding and competition. In this sense, metrification is not merely a technical evolution but a symptom of the university's deeper reconstitution as a corporate and administrative apparatus.

In the South African context, Harley²⁶ has shown how these global dynamics are locally reproduced through an "audit culture" that alienates academic labour from its intellectual and social purposes. Under metrified regimes of accountability, research is valued primarily through publication counts and performance indicators, often at the expense of collegiality, creativity and social engagement. Building on Harley's critique, we argue that reclaiming judgement, context and scholarly purpose requires not only technical reform but a cultural reorientation in how research value is defined. A narrative and evidence-based approach creates space to explore how opportunity structures shape performance, countering meritocratic framings that otherwise perpetuate inequality.¹²

A well-implemented holistic framework directly challenges this trend. By combining quantitative indicators with qualitative assessments and narrative evidence, a holistic framework shifts the emphasis from narrow performance targets to a more comprehensive understanding of scholarly contributions. For example, a research team influencing rural health policy or community-level interventions may show little in the way of citation or altmetric counts, but their work can be rigorously assessed through case studies, stakeholder testimonies and policy outcomes. Such an approach would help correct systemic imbalances in how research from underrepresented fields and regions is valued.

Moreover, holistic evaluation can offer a counterweight to the dominance of global university rankings. Instead of simply reacting to external pressures, institutions can develop internal evaluative cultures that are fit for purpose, reflecting their missions, strengths and societal commitments. In the South African context, this might mean placing greater weight on contributions to transformation, social justice and community engagement – areas that traditional metrics routinely overlook.

Ultimately, the move toward holistic assessment is both a technical and cultural shift. It requires not only new frameworks but also trust in expert judgement, peer review and contextually grounded interpretation. In doing so, it can help ensure that research evaluation supports, rather than distorts, the scholarly enterprise.

Conclusion: Responsible integration, not metric abandonment

The limitations of citation-based metrics are well known, and the emergence of altmetrics, although promising, has introduced new complexities. Both forms of measurement, if used in isolation, are insufficient for capturing the full scope of research impact. A more meaningful approach requires integration: combining traditional metrics, altmetrics and qualitative evidence within context-sensitive frameworks that value disciplinary diversity and geographic equity.

Such an approach aligns with international movements toward responsible research assessment, including the Leiden Manifesto, DORA and narrative CV initiatives. It promotes equity by recognising contributions from scholars and regions that dominant metrics have historically marginalised, and it safeguards against the distortions of metrification by embedding numbers within interpretive and expert-led processes.

Ultimately, the goal is not to discard metrics but to reclaim them as one tool among many – useful when applied with care, but insufficient on their own. The task ahead is therefore not merely to critique existing metrics, but to develop positive, context-sensitive frameworks for academic evaluation that universities can adapt to their own purposes, values and institutional contexts. By integrating multiple forms of evidence, we can build research evaluation systems that not only measure impact more accurately but also reflect the values of inclusivity, intellectual diversity and societal relevance upon which scholarly communities depend.

Acknowledgements

We acknowledge Professor Thad Metz for encouraging the writing of this paper following one of his insightful talks.

Data availability

There are no data pertaining to this article.

Declarations

We have no competing interests to declare. We have no AI or LLM use to declare.

Authors' contributions

S.S.: Conceptualisation, writing – original draft, writing – review and editing. N.B.: Writing – original draft, writing – review and editing. M.M.: Writing – original draft, writing – review and editing. N.H.-M.: Writing – original draft, writing – review and editing. T.L.T.: Writing – original draft, writing – review and editing. B.M.: Writing – original draft, writing – review and editing. All authors read and approved the final manuscript.

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