Safeguarding Academic Rigor: Identifying and Mitigating Impediments to Research Quality in Higher Education Institutions

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ABSTRACT

The imperative for high-quality research in Higher Education Institutions (HEIs) is universally acknowledged, yet tangible evidence and consensus on its criteria remain elusive, often confined to theoretical discourses and guidelines. This ambiguity renders the state of academic research in many universities, including those in Ethiopia, susceptible to inconsistency and a lack of practical impact. This study aimed to identify the principal impediments to maintaining academic research quality, taking three Ethiopian universities as a case. A mixed-methods approach was employed, collecting quantitative and qualitative data through questionnaires and interviews from postgraduate students, instructors, research directors, and journal assessors. The analysis revealed a confluence of significant barriers, including pervasive plagiarism and academic fraud, fundamental flaws in research design and methodology, an institutional culture that prioritizes quantitative publication metrics over substantive quality, pervasive issues with research data integrity, and graduate student challenges such as indolence and imposter syndrome. The study concludes that a systemic failure to address these issues undermines the integrity and value of academic research. Consequently, it recommends concerted, multi-level interventions. These include institutionalizing robust ethical frameworks to combat plagiarism and fraud, shifting incentive structures from quantity to quality, implementing rigorous data management protocols, and establishing support systems to foster research competence and psychological resilience among graduate students.

Keywords: Research Quality, Academic Integrity, Plagiarism, Higher Education, Ethiopia, Imposter Syndrome, Research Methodology, Bibliometrics.

INTRODUCTION

The pivotal role of higher education (HE) in national development is universally acknowledged, placing the quality of its core functions- teaching, research, and service- under intense scrutiny. However, in many contexts, including Ethiopia, maintaining high standards of academic research remains a formidable challenge. This study aims to identify the principal impediments to sustaining academic research quality in Higher Education Institutions (HEIs), using three Ethiopian universities as a case study. This paper delineates the conceptual and theoretical background of research quality, outlines the research problem and purpose, and details the materials and methods employed. It subsequently presents the results and discussion, culminating in conclusions and actionable recommendations to mitigate the identified barriers.

Conceptual and Theoretical Background of the Study

The contribution of higher education to socio-economic development is more critical than ever, making the quality of its teaching, research, and service a paramount concern globally (Altbach, Reisberg, & Rumbley, 2019). Concurrently, a confluence of internal and external factors-ranging from faculty competency and student preparedness to infrastructural limitations and global competitive pressures-threaten the integrity and impact of academic output in HEIs. This concern is amplified by rising public expectations and a growing policy culture that demands evidence-based decision-making, thereby necessitating robust, high-quality research (Deeming, 2022).

The concept of "research quality" is inherently dynamic and contested, shaped by disciplinary norms, contextual factors, and diverse stakeholder perspectives (Oancea, 2019). Despite this plurality, common conceptual threads emphasize the fulfillment of core standards such as rigor, relevance, validity, reliability, and freedom from bias and fraud. At its heart, quality research is characterized by transparency, consistency, and a consensus on purposeful standards for undertaking and reporting scholarly work. As Treharne and Riggs (2015: 59) assert, transparency is "universal for all research" encompassing the clarity of the research report, the replicability of methods and results, and the confidence that the data robustly support the findings and conclusions.

When viewed through the lens of standards, research quality encompasses the entire scientific process, including the alignment of methods with research questions, subject selection, outcome measurement, and safeguards against biases and inferential errors (Shavelson & Towne, 2002). Establishing explicit, consensual quality standards is fundamental to claiming an investigation as a 'disciplined' inquiry (Dörnyei, 2007) and is a prerequisite for the effective translation of knowledge into practice (Graham et al., 2006).

This drive for standards is further intensified by an accountability landscape in HE that demands transparency and the efficient use of resources. This has prompted a shift beyond purely methodological concerns toward evaluating the fitness for purpose (whether the research meets the specifications of users) and fitness of purpose (whether the research activities are aligned with user needs to guarantee utility) of its findings (Boaz & Ashby, 2003; Sallis, 2002). The proliferation of national research assessment exercises, such as the UK's Research Excellence Framework (REF), underscores this trend, linking research quality directly to funding and institutional prestige (Watermeyer, 2019). This system often creates tension between neoliberal models, which emphasize quantifiable individual performance for promotion, and more formative models that use peer review and expert panels to empower researchers and shape knowledge cultures (Besley, 2009; Peters, 2007).

The debate on research quality criteria is also marked by methodological pluralism. Efforts to establish parallel criteria for qualitative research-such as credibility, transferability, dependability, and confirmability-demonstrate an ongoing endeavor to create inclusive yet rigorous frameworks (Lincoln & Guba, 1985; Ragin, Nagel, & White, 2003). A comprehensive synthesis of quality standards, relevant across paradigms, includes posing significant questions, linking to theory, applying appropriate methods, ensuring replicability, and undergoing rigorous peer review (NCDDR, 2005). Crucially, achieving quality is not about meeting one or two standards but about a holistic adherence to a set of interdependent principles (Shavelson & Towne, 2002).

Despite these extensive efforts to define and assure quality, significant impediments persist in HEIs globally. A critical and often overlooked barrier is research data quality, which refers to a dataset's fitness to support its intended use case (Cai & Zhu, 2015). Poor data quality, arising from errors in collection, management, or curation, fundamentally undermines the reliability of findings and the validity of conclusions, posing a severe threat to research integrity (Breck et al., 2019). In the Ethiopian context, where this study is situated, understanding these conceptual foundations is essential for diagnosing the specific, on-the-ground challenges that impede the realization of high-quality academic research.

Problem Statement

The global shift towards evidence-based policy and practice has rightfully placed a premium on high-quality academic research. However, this demand often contrasts sharply with the realities within many HEIs, where the integrity and rigor of research are compromised by a complex array of impediments. This problem is particularly acute in developing higher education systems, such as Ethiopia's, which face unique challenges related to rapid expansion, resource constraints, and evolving academic cultures (Tessema, 2022).

The core of the problem is twofold. First, the conceptualization of *research quality* itself is a subject of ongoing scholarly debate. As Dörnyei (2007: 42) notes, while the importance of quality is universally acknowledged, "when it comes to specifying the concrete 'quality criteria' to be applied, the literature is characterized by a host of parallel or alternative views and very little consensus". This theoretical fragmentation is compounded by disciplinary differences and methodological pluralism, making it difficult to apply a single set of standards across diverse research paradigms (Boaz & Ashby, 2003; Oancea, 2019).

Second, and more critically for this study, is the gap between these theoretical discussions and the practical, on-the-ground barriers that prevent the production of quality research. Prior investigations into research quality have often focused on downstream metrics like productivity and performance (e.g., citation analysis) or high-level guidelines for quality development (Jaroonkhongdach et al., 2014). There remains a significant lack of empirical research that systematically identifies the fundamental, operational impediments within specific institutional contexts-particularly those related to ethical integrity (e.g., plagiarism, fraud), methodological soundness (e.g., flawed designs and instruments), and the systemic pressures that prioritize quantity over quality.

In the Ethiopian context, this gap is pronounced. While principles of quality research exist in textbooks and policy documents, the tangible barriers that stifle their implementation are not well understood. Anecdotal evidence and preliminary observations from the researcher's own teaching and leadership experiences at Addis Ababa University at the Federal Ministry of Education point to serious concerns regarding research design, data quality, academic integrity, and supervisory efficacy. Therefore, a critical investigation is needed to move from general suspicion to a clear, evidence-based identification of these impediments.

Purpose of the Study

In light of this problem, the purpose of this study is to empirically identify and analyze the principal impediments to maintaining academic research quality in Ethiopian HEIs. Using three selected universities as a case study, this research has specifically investigated barriers related to:

1) Research ethics and integrity (e.g., plagiarism, fraud);

2) Methodological rigor (e.g., research design, rationale, and data collection tools);

3) Institutional systems and culture (e.g., review processes, incentive structures); and

4) Researcher capacity and psychological factors (e.g., supervisor and student competencies).

By pinpointing these specific challenges, this study aimed to provide a foundational diagnosis that can inform targeted interventions and policies to strengthen the research ecosystem in Ethiopian universities and similar contexts.

THE RESEARCH METHODOLOGY

This study focused specifically on academic research, defined as scholarly inquiry conducted by postgraduate students to fulfill degree requirements (theses/dissertations) and by faculty members as part of their academic career and publication pursuits. It employed a mixed-method research approach to comprehensively identify the impediments to academic research quality. This approach facilitated the collection of both quantitative and qualitative data, allowing for triangulation and a more nuanced understanding of the research problem (Creswell & Plano Clark, 2017).

The study was conducted at three Ethiopian public universities, purposively selected based on their institutional age and demonstrated productivity in offering postgraduate programs. To ensure anonymity, the universities are referred to as U1, U2, and U3. A purposive sampling technique was used to select participants who were directly involved in or knowledgeable about the research process. The sample consisted of 160 individuals across the three universities, including: 1) Postgraduate (PG) research instructors, 2) Postgraduate students, 3) Research/graduate program directors and associate deans, and 4) Journal article assessors.

The distribution of the questionnaire was as follows: U1 (n=71), U2 (n=46), and U3 (n=43).

To gain in-depth, qualitative insights, semi-structured interviews were conducted with seven key informants, including: 1) Research Vice Presidents (from U2 and U3), 2) Research Directors (one from each university), and 3) Senior Journal Assessors (from U1 and U2).

Two primary data collection tools were utilized: a questionnaire featuring both closed-ended (Likert-scale) items and open-ended questions to gather scalable quantitative data and qualitative explanations; and a semi-structured interview guide to explore complex issues and gather detailed expert opinions.

All participants were assured of confidentiality and anonymity. The questionnaires were distributed directly and collected upon completion.

The data analysis followed a concurrent mixed-methods approach. Quantitative data from the closed-ended questionnaire items were analyzed using descriptive statistics (means, standard deviations, frequencies) with the assistance of statistical software to identify major trends and patterns. Qualitative data from the open-ended questionnaire responses and interviews were analyzed thematically. This involved transcribing the interviews, coding the data, and identifying recurring themes related to research impediments.

Supplementary document analysis of relevant literature on research data quality was conducted to contextualize and deepen the findings. This integration of methods allowed the qualitative data to "put flesh on the bones" of the quantitative results, providing richness and depth to the overall analysis (Dörnyei, 2007: 39).

As part of ethical considerations, a systematic coding of the interviewees and that of the respondents was made to maintain participant anonymity. Coding of the interviewees was made bringing the codes of the universities and the interviewees together: I_1U1, I_2U1; I_1U2, I_2U2, I_3U2; and I_1U3, I_2U3 standing respectively for interviewees 1 and 2 at U1; interviewees 1, 2, and 3 at U2; and interviewees 1, and 2 at U3. In the same vein, questionnaire respondents were coded sequentially as R1 to R143, with blocks assigned to each university (R1-R64 from U1; R65-R105 from U2; R106-R143 from U3).

RESULTS AND DISCUSSIONS

Whereas 160 copies of the questionnaire were dispatched at the three universities, just 143 copies (64, 41, and 38 respectively from U1, U2, and U3) were properly filled and returned. The return rate was 89%. The result showed that 62(54%), 49(42%), and 5(4%) of the respondents were respectively from CEBS, TEFL and others. The rest did not specify their areas of disciplines. This section, therefore, presents the respondents' biodata on sex, qualifications, roles/posts, their years of experiences at their respective universities, and their academic ranks. This has been followed by presentation of the results on factors that affect research quality at HEIs.

Biodate of the Respondents

Hundred twenty-four (81%) of the respondents were males whereas just 19 (13.3%) were females showing male dominance. For the fact that the data sources were selected using purposive and availability sampling, no conscious efforts were made to get representative female subjects. The case, nonetheless, could signal the prevailing females' underrepresentation in teaching as well as in research posts at HEIs in Ethiopia.

The result on the educational qualification of the respondents has shown that the majority (56%) of them were master's degree holders, followed by doctorate degree (27%) holders. The rest were studying for their doctoral degree. Whereas 116 of the respondents properly indicated their roles/posts within their respective universities, 27 did not do that.

Table 1: Respondents' Roles/posts within their Universities

SN	Roles/posts	Universities						
		U1		U2		U3		sum
		N	%	N	%	N	%	
1	Graduate Research course instructors	6	5	6	4	5	4	17

2	Research/graduate program directors	3	2	3	2	3	2	9
3	Research/graduate program associate deans	3	2	2	1	2	2	7
4	Journal assessors	5	4	5	4	4	3	14
5	Graduate program students	43	31	16	12	10	7	69
	Sum (other than missing)	60	45	32	23	24	18	116

Table 1shows that 60 (45%), 32 (23%), and 24 (18%) of the respondents were respectively from U1, U2, and U3 with varying roles. As the Table further shows, 69, 17, 14, 9, and 7 were respectively graduate program students, graduate research course instructors, journal assessors, research/graduate program directors, and research/graduate pro- gram associate deans at the three universities. Of the 43 graduate program students at U1, seven were basically employees of other universities and were pursuing their postgraduate study at U1 when the data for this study were collected. The predominance of U1, particularly on the number of graduate program students was due to the fact that it is the oldest and the largest learning institution in Ethiopia entrusted with training high level manpower for the economy and professionals working in the rest of the HEIs in the country.

Requested to indicate their years of experiences at their respective universities, 138 reacted and five was a missing system, as can be seen from Table 2.

Table 2: Respondents' years of experiences at their universities

		Frequency	Percent
Valid	Under 3	24	17
	3-6	38	27
	7-10	35	24
	Above 10	41	29
	Total	138	97
Missing	System	5	3
Total		143	100

Table 2 Shows that 29%, 27%, and 24% of the respondents indicated that they had experiences of above 10, 3–6, and 7–10 respectively at their respective universities. This shows that the respondents had moderate experiences to judge the practices and/or issues of academic research quality.

The respondents were also requested to indicate their respective ranks. The results have been shown that the majority (36%) of the respondents had the rank of assistant professorship, followed by 34%, 20%, and 3% lecturer-ship, associate professorship, and professorship respectively.

Factors that affect Research Quality at HEIs

Quantitative and Qualitative data have been presented in this subsection. Eleven questions on the factors that affect research quality at HEIs were presented to the respondents for rating the level of their agreement on a scale ranging from 1 to 5, where, 1, 2, 3, 4, and 5 stand respectively for *very little, a little, medium, greatly, and very greatly.* Quantitatively, 11 questions on the factors that affect research quality at HEIs were presented

to the respondents for rating the level of their agreement on a scale ranging from 1 to 5, where, 1, 2, 3, 4, and 5 stand respectively for *very little, a little, medium, greatly, and very greatly*. The Cronbach's Alpha reliability of the eleven closed items is .882. Cronbach's Alpha if item deleted for all also range from .865 to .881 (see Appendix 1). The case signifies that the items in the questionnaire are correlated and are internally consistent for generating dependable evidence.

Though different for different questions, a maximum of 138 respondents reacted to the issues on the factors that affect research quality as can be seen from Table 3.

Table 3: Factors that affect Research quality

SN	Factors that affect Research quality:	N	Minimum	Maximum	Mean	Std. Deviation
1	Delay of Peer review process	138	1.00	5.00	3.74	1.02026
2	Favoritism in peer review	139	1.00	5.00	3.70	1.03318
3	Favoritism in research assessment	137	1.00	5.00	3.87	.93003
4	Plagiarism	139	1.00	5.00	4.04	1.22391
5	Failure to detect fraud in research work	138	1.00	5.00	3.85	1.05956
6	Incompetency of publication research assessors	137	1.00	5.00	3.74	1.10500
7	Incompetency of graduate degree research examiners	136	1.00	5.00	3.75	1.12052
8	Insufficient rationale	138	1.00	5.00	3.75	1.06065
9	Inadequate design	132	1.00	5.00	3.86	1.05406
10	Flaws within the design of the study	137	1.00	5.00	3.78	.99790
11	Flaws within the research instruments	138	1.00	5.00	3.7536	1.05202

As can be seen from Table 3, plagiarism, favoritism in research assessment/peer review, inadequate design, and failure to detect fraud in research work are the major factors that affect research quality respectively with average means of 4.04, 3.87, 3.86, and 3.85.

The Table further depicts that delay of peer review process for journal publications, inefficiencies in peer review, incompetency of publication research assessors, incompetency of graduate degree research examiners, insufficient research rationale, and flaws within the design of the study and within the research instrument were also among the factors that affected research quality. When seen per se, all the average means are above medium and inclined to greatly.

Furthermore, requested to indicate the factors that might affect the quality of research quality at HEIs in general and at their respective universities in particular, five interviewees (I1U1, I2U1; I1U2, I3U2; and I2U3) indicated that negligence and reluctance of graduate advisors, delay of peer review process for publications, plagiarism and fraud in research work, and poor data quality were the major factors that affected the quality of research at their respective universities in particular and at other HEIs in the country in general. Furthermore, three interviewees (I2U1; I1U2, and I1U3) argued the emphasis given to the number of publications and citations as a principle of "publish or perish" pressurized academic staff members to look for quantity publications in order to succeed in academic career, which in turn endangered the quality of research results. This shows that HEIs in Ethiopia prefer journal publication and bibliometric analysis results over quality.

While journal publication and bibliometric analysis provide quantitative data, it is faulty to assume that all *research* that is published in journals or cited by others are accurate, reliable, valid, free of bias, non-fraudulent, or of sufficient quality (Boaz & Ashby, 2003). Further, bibliometric analysis is primarily a measure of quantity and can be artificially influenced by journals with high acceptance rates.

In addition to the quantitative results, different sources including the interviewees and literature sources consider plagiarism as a serious threat endangering research quality at HEIs. Two interviewees (I_2U1 and I_1U2) further indicated that negligence of graduate advisors to control plagiarism, graduate researchers' indolence, booming electronic technologies, increasing number of students (large classes), unattended collaborative and/or group works, and poor research data quality were the major causes of plagiarism.

Negligence and reluctance of graduate advisors that the interviewees indicated can be seen in line with "failure to detect fraud in research work" with a mean of 3.85 and SD 1.05956 (see Table 3).

One interviewee (I_1U1) and three respondents (R7, R69, and R117) indicated that graduate student researchers' indolence is one of the factors that jeopardize the quality of their research works. The subjects argued that some graduate students appear in feelings of uncertainty, purposelessness, idleness, and in doubt while they are at the middle of their research work and when they are overwhelmed with voluminous and unorganized data.

Moreover, plagiarism has been perceived as an increasing threat due to the ease of copying from on-line sources. This indicates that the trends of plagiarism have changed in recent years due to the advent of the Internet [20, p.3]. Warning the likely damage that the increasing trend of plagiarism would do to confidence in the quality of assessment and academic standards, James, Mcinnis, & Devlin (3010:5) further indicate:

[p]lagiarism varies in both intent and extent, ranging from deliberate fraud, to negligent or accidental failure to acknowledge sources of paraphrased material and misunderstandings about the conventions of authorship. Many students who represent someone else's work as their own are aware they are cheating. Plagiarism also arises from ignorance of the conventions for attribution and differing assumptions in regard to the origins of ideas. The more subtle manifestations of plagiarism highlight the need for effective educational campaigns alongside rigorous detection methods.

Plagiarism can be exacerbated by large classes wherein instructors' follow-up of student research and learning becomes loose, and students can deliberately cheat feeling somewhat anonymous and "lost in the crowd" and therefore believe they are less likely to be caught (James, Mcinnis, & Devlin, 301038). This is coupled with the current emphasis in HE on group work, which have inadvertently led to an increase in students plagiarizing each other's work.

In enquiring "how widespread is plagiarism in Australia", James, Mcinnis, & Devlin (3010:37), have argued that in the absence of trustworthy quantitative data, it is impossible to determine whether plagiarism has risen or is rising in Australian higher education. The authors, nonetheless, underscored that Plagiarism in higher education is alarmingly taking many forms, such as:

1) Submitting, as one's own, an assignment that another person has completed;

2) Downloading information, text, computer code, artwork, graphics or other material from the internet and presenting it as one's own without acknowledgment;

3) Quoting or paraphrasing material from a source without acknowledgment;

4) Preparing a correctly cited and referenced assignment from individual research and then handing part or all of that work in twice for separate subjects/marks;

5) Cheating in an exam either by copying from other students or using unauthorized notes or other aids;

6) Copying from other members while working in a group; and

7) Contributing less, little or nothing to a group assignment and then claiming an equal contribution and share of the marks.

Finally, research data quality was also an area that affects the quality of research undertakings. Data quality problems can arise from different sources. For instance, Tozzi (2021) indicates that: 1) manual data entry errors, 2) likely machines imperfections while scanning, for instance with Optical Character Recognition (OCR), 3) lack of complete information, 4) ambiguous data, 5) duplicate data, and 6) data transformation errors are the common ways in which data quality errors can creep into organization's data operations and eventually affecting research quality. Furthermore Cai and Zhu (2015:10) indicate that "Poor data quality will lead to low data utilization efficiency and even bring serious decision-making mistakes".

CONCLUSIONS

This study set out to identify the critical impediments to maintaining research quality within the context of Ethiopian HEIs. The findings, drawn from a cohort of experienced academics and postgraduate students, paint a concerning picture of multifaceted challenges that compromise academic rigor.

The most salient impediments identified include a troubling prevalence of plagiarism and academic fraud, which erode the very foundation of scholarly integrity. This is compounded by systemic issues such as favoritism in research assessment and incompetency among reviewers and examiners, which undermine fair and rigorous evaluation. Methodological weaknesses-manifested in inadequate research designs, insufficient rationales, and flawed data collection instruments-point to a broader crisis in research competence and oversight.

Furthermore, the study highlights a critical misalignment in institutional incentives. The prevailing *publish or perish* culture, which prioritizes quantitative metrics like publication counts and citations, often occurs at the expense of substantive, high-quality research. This quantitative dependency, while easily measurable, is a poor proxy for genuine research impact and validity (Firdissa, 2023).

At the individual level, graduate student indolence and the psychological phenomenon of imposter syndrome were identified as significant barriers, leading to self-doubt, paralysis, and a failure to engage deeply with the research process. Finally, pervasive poor research data quality threatens the reliability of findings and the credibility of subsequent decisions based on such evidence.

While this study is limited by its focus on three universities and its cross-disciplinary approach, its findings illuminate systemic issues that are likely prevalent across the Ethiopian higher education landscape. Addressing these impediments requires a holistic and systemic reform, moving beyond isolated fixes to fundamentally reshape the research culture, incentives, and support structures within HEIs.

RECOMMENDATIONS

Based on the findings of this study, the following targeted recommendations are proposed to mitigate the identified impediments and foster a culture of high-quality, ethical research in Ethiopian HEIs:

1. The Ethiopian HEIs, in collaboration with the Ministry of Education, must develop, communicate, and enforce comprehensive policies against plagiarism and academic fraud.

2. HEIs should critically re-evaluate promotion and funding criteria to move beyond a simplistic "publish or perish" model, among others, by incorporating indicators of research quality, such as peer review feedback, societal impact, and methodological rigor, rather than relying solely on bibliometric counts.

3. HEIs should enhance research capacity and methodological rigor by putting in place mandatory, credit-bearing courses on research methodology and data management for all postgraduate students; and continuous professional development for academic staff on advanced research design, contemporary data analysis techniques, and effective research supervision.

4. HEIs should put in place robust data quality assurance protocols by establishing clear guidelines and providing tools for proper data collection, storage, and curation; and promoting principles of data integrity that enhances the reliability and verifiability of research findings.

5. HEIs should foster a supportive research environment for graduate students targeted at combating indolence and imposter syndrome by establishing structured mentoring programs, creating peer-support networks, offering access to counseling services, and normalizing discussions about research anxieties and providing constructive, ongoing feedback that can build student resilience and confidence.

Finally, this study exhibits significant methodological rigor through its comprehensive mixed-methods approach, which integrates quantitative and qualitative data to provide a nuanced analysis. A key strength is its inclusion of a diverse range of essential stakeholders-including postgraduate students, instructors, research directors, and journal assessors-ensuring a holistic understanding of the challenges. Furthermore, it makes a substantial contribution by clearly identifying specific, actionable impediments, such as the pervasive culture of prioritizing quantitative publication metrics over substantive quality, alongside issues of plagiarism and methodological flaws, thereby establishing a strong foundation for targeted interventions.

However, the study is not without limitations. While the impediments identified are likely universal, the generalizability of specific policy solutions may be constrained, as the root causes and institutional-political nuances within the three Ethiopian universities studied will require considerable adaptation for application in other higher education contexts. Additionally, while the research effectively diagnoses the problem and concludes that a systemic failure necessitates multi-level interventions, the development of detailed, exemplified policy mechanisms falls outside its scope. This, in turn, places the onus on implementing institutions to contextualize and develop the concrete policies, suggesting a critical avenue for future research.

Statements and Declarations

I hereby declare that there are no any financial or non-financial Conflict/Competing interests that are directly or indirectly related to the work submitted for publication. The article is also compliant with ethical standards.

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