

USING ARTIFICIAL INTELLIGENCE TOOLS TO STRENGTHEN THE QUALITY, EFFICIENCY AND INTEGRITY OF EDUCATIONAL RESEARCH IN HIGHER EDUCATION

¹PROF. OMOREGIE, E.O.; ²PROF. JIMOH, B.; & ³OMOZUAWO, E.S.

Educational Foundations and Management, Faculty of Education

Ambrose Alli University, Ekpoma, Edo State, Nigeria

Email: 1euniceregs@aauekpoma.edu.ng; 2basjim121@gmail.com; & 3omozuawosophieemike

³Humanities and Social Sciences, School of General Studies

Auchi Polytechnic, Auchi, Edo State, Nigeria

Abstract

Artificial intelligence (AI) is increasingly becoming part of the everyday work of researchers in higher education. Its value, however, depends less on the novelty of the technology than on how carefully researchers use it. This paper examined how AI tools can support three closely related goals in educational research: improving quality, reducing avoidable time and effort, and protecting research integrity. A PRISMA-informed conceptual review was undertaken using literature and substantive sources published between 2021 and 2026. Attention was given to AI-supported literature discovery, synthesis, data analysis, academic writing, peer review and research-integrity activities. Tools discussed include Elicit, Consensus, Scite, ResearchRabbit, Semantic Scholar, Grammarly, Paperpal, Trink AI and Turnitin's AI-related features. The review suggests that AI can make some research tasks faster and can widen access to scholarly information, particularly for researchers working in resource-constrained settings. At the same time, AI outputs may contain inaccurate claims, incomplete coverage, biased summaries or fabricated references. These risks become more serious when researchers treat AI output as a substitute for reading, judgement and methodological verification. In response, the paper proposes the QUERI framework—Quality, Use, Ethics, Rigour and Integrity—as a practical guide for responsible AI-assisted educational research. The paper argues that Nigerian higher education institutions should move beyond either unrestricted enthusiasm or blanket rejection of AI. Instead, they should build research cultures in which AI is used transparently as an assistant, while responsibility for evidence, interpretation and scholarly judgement remains with the researchers.

Keywords: Artificial Intelligence, Educational Research, Academic Integrity, Higher Education, AI research tools, QUERI Framework

Introduction

Artificial intelligence is changing the way researchers search for information, organize evidence, analyze data and prepare academic manuscripts. These changes are particularly relevant to higher education, where research quality is closely tied to the ability of academic staff and postgraduate students to locate credible evidence, use appropriate methods and communicate findings clearly. AI therefore presents an opportunity, but it also creates a responsibility: researchers must decide where the technology adds genuine value and where human judgement remains indispensable.

The Nigerian higher education environment makes this discussion especially important. Universities and polytechnics operate under pressures that include limited access to some subscription databases, inadequate research infrastructure, heavy workloads and funding constraints. AI-supported tools may reduce some of these barriers by helping researchers identify relevant literature, compare studies, improve drafts and organize information. However, access to a tool does not automatically produce better research. Poorly verified AI output can introduce errors into a study just as quickly as it can save time. Recent Nigerian studies also indicate that AI use is

already becoming part of students' research practices, while concerns about training, access, accuracy and responsible use remain. (Akinwalere & Akinrinola, 2025; Iferi et al., 2026)

A useful distinction is between general-purpose generative AI and research-oriented tools that retrieve or organize information from identifiable sources. Applications such as ChatGPT, Gemini and Claude can assist with brainstorming, explanation, drafting and language refinement, but their outputs still require careful verification. Research-oriented platforms such as Elicit, Consensus, Scite, ResearchRabbit and Semantic Scholar are designed more directly around scholarly search, evidence discovery or citation relationships. Even these tools should not be treated as infallible. Their usefulness depends on database coverage, search design, the quality of indexed sources and the researcher's ability to interpret the evidence.

This paper therefore asks: how can AI tools be used to improve the quality and efficiency of educational research without weakening research integrity? The discussion treats quality, efficiency and integrity as connected but distinct concerns. A tool may save time while reducing depth of engagement; it may improve language while introducing an unsupported claim; or it may identify many papers while missing relevant Nigerian or African scholarship. Responsible adoption requires these trade-offs to be made visible rather than hidden.

Literature Review

AI Tools across the Research Pipeline

Educational research is not a single activity. It involves problem identification, literature searching, research design, data collection, analysis, interpretation, writing, review and, eventually, dissemination. AI can be introduced at several points in this pipeline, but its role should differ from one stage to another. For example, AI may be useful for generating search terms or organizing a large set of references, whereas decisions about research design, interpretation of findings and ethical treatment of participants require direct human responsibility.

Recent studies point to several practical benefits of AI in education and research, including time savings, easier access to information, and assistance with writing and feedback. At the same time, studies report barriers such as limited digital literacy, over-reliance on AI, privacy concerns and uncertainty about acceptable academic practice. These findings suggest that the question is not whether researchers will encounter AI, but whether they will have the skills and institutional guidance needed to use it well.

AI for Literature Discovery and Synthesis

Literature discovery is often one of the most demanding stages of a research project. Researchers must develop search terms, identify relevant studies, screen titles and abstracts, assess relevance and then read the selected sources closely. AI-supported research platforms can reduce the mechanical burden of some of these tasks. Elicit, Consensus, ResearchRabbit, Scite and Semantic Scholar, for example, provide different combinations of semantic search, citation analysis, evidence extraction and citation-network discovery.

The attraction of these tools is clear, particularly where researchers have limited access to expensive databases. They can help a researcher move from a small number of known papers to a wider set of related studies and can reveal connections that a conventional keyword search may miss. However, the output is only a starting point. Researchers still need to inspect the original articles, check whether the evidence supports the interpretation and consider studies that may not be well represented in the tool's database.

Performance figures reported by commercial or tool-related sources should also be interpreted cautiously. Claims about screening recall, extraction accuracy or database size may be useful indicators, but they do not mean that a tool can replace a systematic review team or an experienced researcher. Performance depends on the task, the dataset, the search strategy and the quality of the underlying evidence.

AI for Data Analysis, Writing and Research Integrity

AI can also assist with selected aspects of data analysis and academic writing. Tools such as Julius AI and similar natural-language analysis platforms can help researchers explore datasets using ordinary language, while transcription tools can reduce the time required to convert recorded interviews into text. In qualitative research, AI-assisted coding may help organize large volumes of text, provided that researchers review the coding decisions and retain a clear audit trail.

Writing assistants such as Grammarly, Paperpal and Trinka can improve grammar, clarity and academic style. Their appropriate role is editorial rather than intellectual: they can help a researcher communicate an argument, but they should not determine the argument or supply evidence that has not been independently established.

Research integrity tools provide another layer of support. Similarity-checking systems can identify textual overlap, while citation-analysis tools can help researchers examine whether cited work supports, contradicts or merely mentions a claim. AI-generated-text detection, however, should not be treated as definitive proof of misconduct because automated detectors can produce false positives and false negatives. The safest approach is to combine technological checks with normal academic procedures, including source verification, transparent authorship and careful supervision.

One of the most important risks is hallucination: an AI system may produce a confident response containing a false claim, an incorrect interpretation or a reference that does not exist. The problem is particularly serious in academic writing because a fabricated reference can appear credible and may be copied into subsequent work. Consequently, no AI system should be treated as an authority simply because its response is fluent.

Table 3

Selected evidence from a recent Nigerian Higher-education Study

Aspect	Reported evidence	Interpretation	Relevance to this paper
Study context	66 tertiary institutions; 119,032 students in the population	Large multi-institutional Nigerian context	Supports the need for context-sensitive AI research policy
Sample	11,903 research-active students	Substantial analytical sample	Provides recent Nigerian evidence rather than relying only on international literature
AI use → digital wiseness	$\beta = .120$; $p < .001$	Statistically significant but small association	AI use may support digital judgement, but effect size matters
AI use → digital competence	$\beta = .102$; $p < .001$	Statistically significant but modest association	Access to AI does not by itself guarantee strong digital capability
AI use → research engagement	$\beta = .214$ (behavioural); .964 (cognitive); .165 (emotional), all reported as significant	Relationships vary considerably by engagement dimension	AI should be examined by function and outcome rather than treated as a single benefit

Recent Nigerian evidence helps place the discussion in a local context. Iferi et al. (2026) examined the relationship between AI-tool use, digital wiseness, digital competence and three dimensions of research engagement among higher education students in Nigeria. The study covered 66 tertiary institutions across three geopolitical regions and reported a population of 119,032 students; a multistage procedure produced a sample of 11,903 research-active students. The authors found statistically significant relationships between AI use and several research-related outcomes, although they cautioned that many of the effects were modest and should not be interpreted as strong causal effects. [Ncitem0turn0search0Q](#)

Evidence from recent Nigerian Research

Figure 1. Internal consistency of constructs reported by Iferi et al. (2026). Note: this figure reproduces reported reliability coefficients and is not original data from the present conceptual paper.

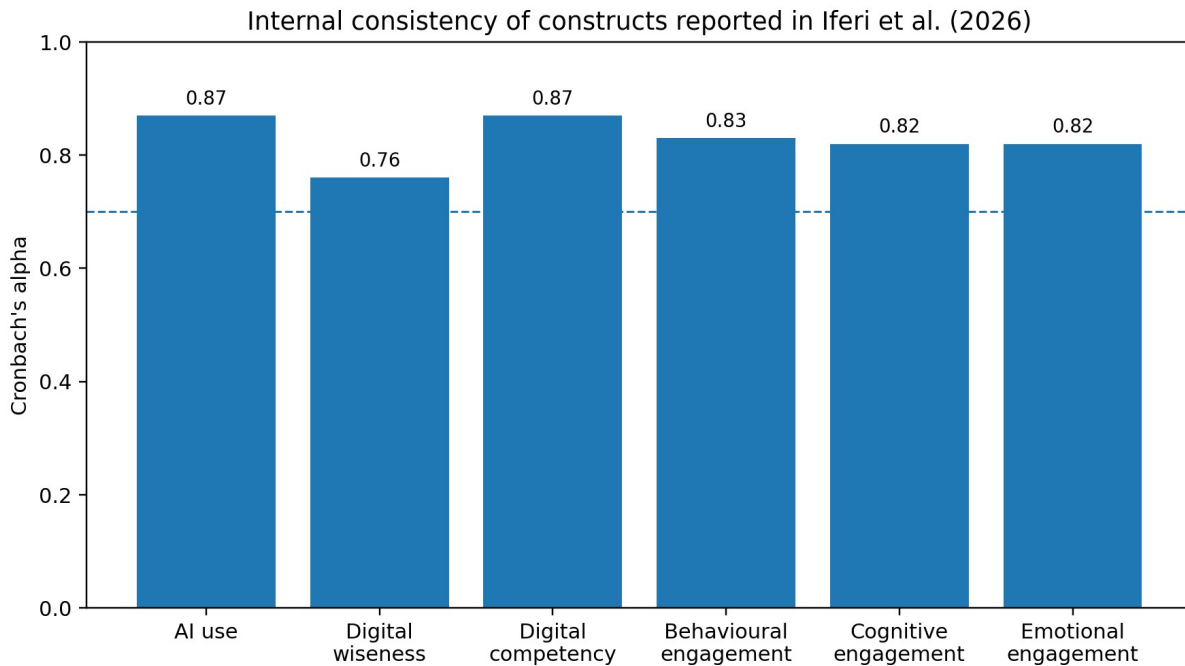
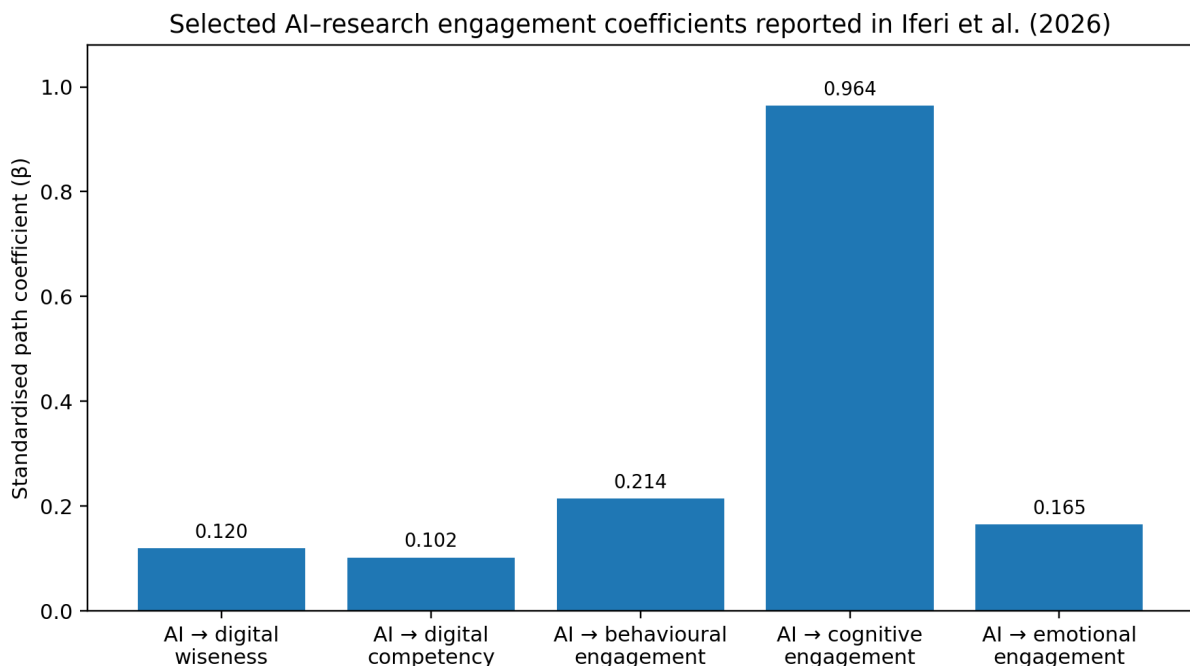


Figure 2. Selected standardized path coefficients reported by Iferi et al. (2026). Note: the figure is included as an evidence snapshot; the coefficients are not estimates from the present paper.



heoretical Framework

The discussion is informed by three complementary perspectives. The first is research quality assurance, which places emphasis on originality, methodological rigour, significance and clear communication. From this perspective, AI should be judged by whether it strengthens or weakens those dimensions rather than by how impressive its output appears.

The second perspective is the Technology Acceptance Model and related adoption research (Davis, 1989; Venkatesh et al., 2012). These perspectives help explain why researchers adopt technologies. Perceived usefulness is important, but actual use is also shaped by facilitating conditions such as reliable internet access, institutional support, digital literacy and clear policies. This is especially relevant to Nigerian higher education.

The third perspective is responsible research and innovation, which emphasizes anticipation of risks, reflection on assumptions, inclusion and responsiveness (Owen et al., 2013). Together with research-integrity scholarship (Steneck, 2006; COPE, 2023), this perspective reinforces the idea that AI adoption should not be driven by convenience alone. Researchers must also consider privacy, fairness, transparency, accountability and the consequences of error.

Methods

This paper used a PRISMA-informed conceptual review rather than a full systematic review or meta-analysis. Searches were undertaken across Scopus, Web of Science, Google Scholar and ERIC using combinations of terms relating to artificial intelligence, generative AI, academic research, educational research, literature review, research integrity and higher education. The review focused on material published between 2021 and 2026, together with relevant policy and professional guidance.

Sources were considered in relation to four practical criteria: accuracy and citation grounding; breadth of coverage; accessibility and cost in the Nigerian higher education context; and safeguards for research integrity. The review synthesized the evidence conceptually rather than assigning numerical scores to the studies. The QUERI framework presented below emerged from this synthesis.

The QUERI framework for AI-assisted educational research

The QUERI framework is proposed as a simple decision framework for researchers who use AI during the research process. The acronym represents Quality, Use, Ethics, Rigour and Integrity. The five dimensions are interdependent: a tool that improves efficiency but weakens integrity is not a successful research intervention.

1. **Quality (Q).** AI should be used where it makes a defensible contribution to research quality. It may help a researcher broaden a literature search, compare themes across studies, identify possible gaps or improve the clarity of a manuscript. It should not replace the researcher's reading, interpretation or judgement. A literature review generated without close engagement with the original sources may sound polished while remaining shallow or incomplete.

2. **Use (U).** The researcher should remain the primary intellectual agent. AI may act as an assistant, but responsibility for the research question, methods, evidence, interpretation and final text remains with the researcher. Responsible use includes keeping a record of significant AI assistance, checking outputs and following the disclosure requirements of the institution or target journal.

3. **Ethics (E).** Ethical use includes protection of confidential information, participant privacy, fairness and equitable access. Researchers should not upload confidential research data or identifiable participant information to an AI service unless the data-management arrangements explicitly permit it. They should also be alert to the possibility that AI-generated summaries may under represent African scholarship or reproduce biases present in the underlying data.

4. **Rigour (R).** AI-assisted work must meet the same methodological standards as work completed without AI. Where AI is used for screening, coding, transcription, analysis or statistical assistance, the researcher should document the process and independently check important outputs. Any limitations in database coverage, model capability or the date of available information should be acknowledged where relevant.

5. **Integrity (I).** Integrity requires that every important claim can be traced to credible evidence. Researchers should verify AI-generated references against the original publications before citing them. AI should not be listed as an author, and its contribution should be disclosed where required by institutional or publisher policy. Similarity checks and other integrity tools can support quality assurance, but they should complement rather than replace scholarly judgement.

Table 1
Evaluation of Selected AI Research Tools across QUERI Dimensions

Tool	Main research use	Evidence/accuracy consideration	Accessibility	Integrity consideration
Semantic Scholar	Scholarly search and citation discovery	Links searches to indexed scholarly literature; output still requires source checking	Free access available	Source links and citation context can support verification
Elicit	Literature discovery and screening support	Useful for semantic search and evidence extraction; performance varies by task	Free and paid options	Claims and extracted evidence should be checked against original papers
Consensus	Evidence-oriented search	Designed to surface findings from academic studies; not a substitute for full-text appraisal	Free and paid options	Study type and source context can support critical appraisal
ResearchRabbit	Citation-network discovery	Useful for mapping relationships among papers; depends on indexed coverage	Free access available	Source-paper links support traceability
Scite	Citation context and post-publication monitoring	Helps distinguish supporting, contrasting and mentioning citations	Free and institutional access options	Can flag citation concerns and retractions

Grammarly / Paperpal / Trinka	Academic language and style	Useful for clarity and editing; should not determine substantive claims	Free and paid options	Researchers remain responsible for originality and final wording
Turnitin-related tools	Similarity and AI-related checks	Useful as screening evidence; automated AI detection is not conclusive	Usually institutionally licensed	Supports broader integrity checks when combined with human review

Source: Authors' synthesis based on the literature and tool-related sources listed in the references.

Table 2
QUERI Framework—Dimensions, Principles and Practical Application

Dimension	Focus	Core principle	Practical question
Q—Quality	Improve the strength of research	Use AI to extend, not replace, scholarly thinking	Does this use of AI make the research better?
U—Use	Responsible human control	The researcher directs and verifies AI assistance	Have I checked and documented the important outputs?
E—Ethics	Privacy, fairness and access	Protect people, data and equitable participation	Could this use expose data or reproduce bias?
R—Rigour	Methodological discipline	Document and independently check AI-assisted processes	Can another researcher understand and evaluate how AI was used?
I—Integrity	Trustworthiness and accountability	No fabricated evidence or undisclosed authorship	Can every important claim and citation be verified?

Source: Authors' original framework (2026).

Discussion

Where AI offers the clearest research value

The most convincing case for AI in educational research is not that it can conduct research on its own. Its immediate value is more modest and more practical: it can reduce the time spent on repetitive information-handling tasks. Searching for related studies, organizing references, producing a first-pass transcription, checking language and tracing citation relationships are examples of tasks where assistance can be useful. This can create more time for the work that cannot be delegated easily: reading critically, designing a sound study, interpreting evidence and making defensible arguments.

For researchers in Nigeria, these potential matters because the benefits of open or low-cost tools can partly offset resource limitations. Nevertheless, the phrase 'democratization of research' should be used carefully. Access to a free tool does not eliminate differences in internet reliability, research training, database coverage, computing resources or institutional support.

Nigerian context and the importance of institutional support

The Nigerian context adds another layer to AI adoption. Researchers may be attracted to AI because it helps them work faster, but sustainable use requires more than individual enthusiasm. Institutions need clear guidance on acceptable use, privacy, authorship, disclosure and the handling of research data. They also need practical training so that staff and postgraduate students can distinguish between useful assistance and unsupported AI-generated content.

Policy should therefore avoid two extremes. A blanket prohibition is unlikely to be effective as AI becomes embedded in common research software, while unrestricted use creates avoidable risks. A proportionate approach would define permitted uses, require human verification of substantive outputs and protect confidential research information.

Hallucination and citation reliability

Hallucination is one of the most serious risks in AI-assisted academic writing because fluent language can disguise factual error. A generated reference may contain a real author with the wrong

title, a plausible journal with an incorrect volume or a completely invented publication. The danger is greater when researchers copy references without opening and checking the original source.

The practical response is simple, although it requires discipline: important claims and citations must be checked against primary or authoritative sources. Retrieval-oriented research tools can make this process easier, but retrieval does not remove the need for appraisal. A source may be genuine and still be irrelevant, outdated or misinterpreted.

Equity, bias and African scholarship

AI tools may broaden access to global scholarship, but access should not be confused with balanced representation. Search and synthesis systems depend on the material they can retrieve and the patterns in their underlying data. Researchers working on African education should therefore examine whether Nigerian and other African studies are adequately represented in an AI-generated evidence base.

A practical safeguard is to combine AI-supported discovery with deliberate searches of Nigerian and African journals, institutional repositories and other relevant local sources. This does not mean rejecting international evidence; it means ensuring that local evidence is not overlooked simply it is less visible in an AI-generated summary.

Conclusion

AI has a legitimate and potentially valuable role in educational research, but its contribution should be measured by the quality of the research it supports rather than by the sophistication of the tool itself. AI can help researchers discover literature, organize information, improve language, explore data and perform selected quality-assurance tasks. These benefits are particularly relevant in resource-constrained higher education environments.

At the same time, AI does not remove the central responsibilities of a researcher. Evidence must still be appraised, methods must still be defended, interpretations must still be justified and citations must still be verified. The most serious risks identified in this review—hallucinated information, fabricated citations, privacy problems, bias and over-reliance—are manageable only when human oversight is built into the research process.

The QUERI framework provides a practical way of keeping that oversight visible. By asking whether AI improves Quality, whether it is being used responsibly, whether Ethics have been considered, whether methodological Rigour has been maintained and whether research Integrity has been protected, researchers can make more balanced decisions about when and how to use AI. The central principle is that AI should support scholarly work while responsibility for the research remains with the researcher.

Suggestions

1. Develop clear institutional guidance on AI-assisted research, covering acceptable uses, disclosure, authorship, data protection and responsibility for final outputs.
2. Provide practical AI research-literacy training for academic staff and postgraduate researchers, with particular emphasis on source verification, prompt design, bias, privacy and research integrity.
3. Encourage researchers to use AI primarily for supportive tasks—such as literature discovery, organization, language refinement and preliminary analysis—while retaining direct control over research design and interpretation.
4. Require independent verification of AI-generated citations, quotations, statistical claims and other substantive evidence before they are included in a manuscript, report or thesis.
5. Encourage researchers to combine AI-assisted discovery with deliberate searches for Nigerian and African scholarship so that local evidence is not systematically overlooked.
6. Include a short AI-use statement in research reports, theses and journal manuscripts where required, indicating which tools were used, for what purposes and what human checks were applied.

7. Institutions should periodically review their AI guidance because tools, capabilities and publisher policies are changing rapidly. The principles of transparency, accountability and scholarly integrity should remain constant even as specific tools change.

Practical QUERI self-audit

Before submitting research in which AI has been used, the researcher should be able to answer 'yes' to the following questions:

- Did AI assist my work without replacing my own intellectual engagement?
- Have I recorded or disclosed the important ways in which AI was used?
- Have I protected confidential and participant-related information?
- Have I independently checked AI-assisted analysis and substantive claims?
- Have I verified every AI-generated citation against the original source?
- Have I considered whether relevant Nigerian or African scholarship may have been missed?

Table 4

Practical comparison of AI research tools

Tool	Best suited for	Main strength	Main caution	Recommended use
Semantic Scholar	Literature discovery	Broad scholarly search and citation links	Coverage is not universal	Initial literature search and citation tracing
Elicit	Literature screening and evidence extraction	Helps organize and compare studies	AI summaries require source checking	Screening support and evidence organization
Consensus	Evidence-oriented questions	Connects answers to academic studies	Should not replace appraisal of full papers	Rapid evidence discovery
ResearchRabbit	Citation-network exploration	Visualizes relationships among papers	Depends on available indexed links	Finding related and influential studies
Scite	Citation context	Shows supporting, contrasting and mentioning citations	Access and coverage vary	Citation verification and monitoring
Grammarly Paperpal / Trinka	/ Academic language editing	Improves clarity and style	Can alter wording without understanding the researcher's intended meaning	Final language refinement after substantive writing
Turnitin	Similarity and integrity screening	Supports text-similarity checking	AI detection is not conclusive evidence of misconduct	Final quality-assurance screening

Note. Tool capabilities and access arrangements change over time; researchers should verify current functionality and institutional licensing before adoption.

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