Artificial Intelligence in Academic Writing and Scientific Publishing: Opportunities, Challenges, and the Prospects of Responsible Governance

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Abstract:

The rapid emergence of generative AI and large language models (LLMs) such as ChatGPT in particular since late 2022 has brought about a profound transformation in the practices of academic writing and scientific publishing, it is considered among the most significant shifts since the consolidation of the peer-review system. This article aims to provide a structured critical review of the uses of these technologies across the various stages of scholarly production, from drafting manuscripts to reviewing, editing, and publishing them. It discusses the opportunities these tools afford especially in improving the linguistic competence of non-native English speakers against the methodological and ethical risks of informational hallucination, bias, plagiarism, breaches of confidentiality, and the absence of accountability. It also surveys the positions of major international bodies and large publishers, and highlights the gap between declared policies and actual disclosure practices. It concludes that the present moment calls for a transition from declarative policies to verifiable, accountable governance frameworks that establish a responsible use of AI which serves the quality of knowledge rather than undermining it.

Keywords: Generative artificial intelligence; Academic writing; Scientific publishing; Research integrity; Peer review.

Disclosure of Artificial Intelligence (AI) Tools: The authors declare the use of Claude 4.6 during the writing stage, the tool was used mainly to improve the quality of the writing and to avoid mistakes in the text.

1. Introduction

Since the emergence of the large language models in November 2022, the academic field has witnessed an accelerating wave of adoption of generative AI tools across the various stages of research work. The question is no longer whether researchers use these tools, but how they use them and to what extent this should be regulated.

Large language models are deep-learning algorithms trained on vast quantities of textual data, such that they acquire the ability to generate coherent new text in response to user input. These models operate on a probabilistic principle of predicting the most likely word or token in a given context, rather than understanding meaning in the human cognitive sense. Some researchers have described this mechanism as a stochastic parrot, to indicate that the model may produce text that appears meaningful and superficially coherent while its substance lacks a reliable epistemic basis or is entirely fabricated (Xu, 2025). A distinction is usually drawn between two types of AI tools in the publishing context: generative tools that produce new text or images, and non-generative tools used for tasks such as language editing, data analysis, plagiarism screening, or image processing. This distinction is essential because many policies treat the two types with varying degrees of stringency.

Recent quantitative studies point to a striking expansion of this use; a large-scale study published in *Nature Human Behaviour* estimated that a considerable proportion of scientific papers now bear linguistic traces of large language models, reaching roughly 22 percent in some computer science subfields as shown in figure 1, other studies have detected AI-generated content in a proportion approaching 17 percent of peer-review texts in certain conferences and journals (Liang et al., 2025).

Figure 1 shows the difference between the 0.1% of papers that declared using AI tools in any way before 2023, and the fact that half of the scientific journals have already adopted an AI policy, which proves that declarative policies alone do not produce transparency.

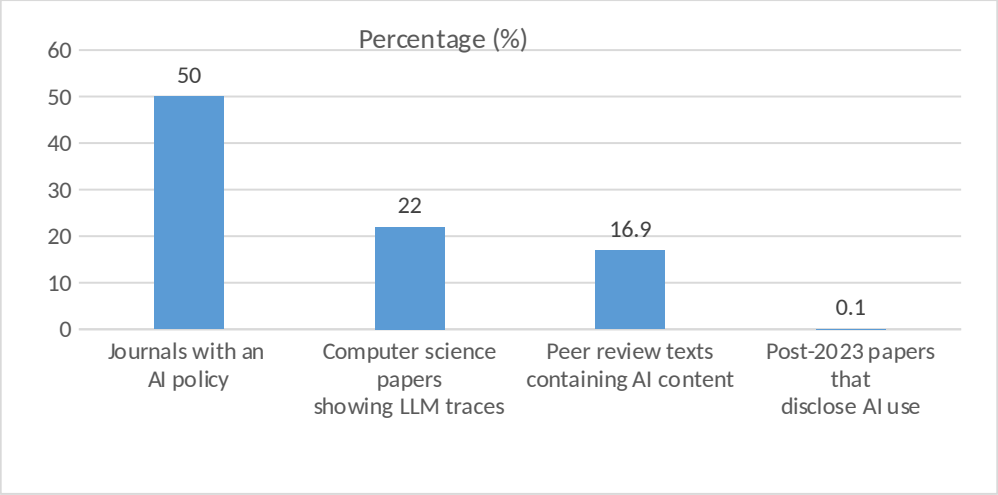


Figure (1): AI usage rates across different factors

This widespread diffusion raises a twofold dilemma: on the one hand, these tools promise to increase productivity, lower linguistic barriers, and accelerate the pace of research; on the other, they pose genuine threats to the integrity and credibility of scientific knowledge. This paper seeks to unpack this dilemma through a systematic analysis that balances opportunities against risks, reviews the current institutional responses, and proposes the contours of a responsible governance framework.

The present paper is organized as follows. Section 1 provides an introduction. Section 2 describes the methodology adopted for this review. Section 3 presents and discusses the results of the review: the opportunities of AI in academic writing, the ethical and methodological challenges and risks, the positions of international bodies and publishers, the gap between policy and practice, AI detection tools, a responsible governance framework, and a comparison of the policies of major academic publishers. Finally, Section 4 concludes the paper.

2. Methodology

This review adopts a systematic methodology, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, to identify, screen, and synthesize the literature on the use of generative artificial intelligence in academic writing and scientific publishing.

2.1 Search Strategy

A structured search was conducted in the Scopus and Web of Science databases for peer-reviewed literature published between 2023 and 2026. The search combined terms related to generative artificial intelligence and large language models (e.g., "generative artificial intelligence," "large language models," "ChatGPT") with terms related to scholarly communication (e.g., "academic writing," "scientific publishing," "peer review," "research integrity," "publication ethics"), connected using Boolean operators (AND/OR) and applied to titles, abstracts, and keywords.

2.2 Inclusion and Exclusion Criteria

Studies were included if they were peer-reviewed journal articles or institutional and publisher policy documents, published in English between 2023 and 2026, that addressed the use of generative AI in manuscript preparation, peer review, editorial processes, or publication policy. Studies were excluded if they were not written in English, were duplicate records, lacked full-text access, or did not directly address academic writing or scientific publishing.

2.3 Study Selection Process

The initial search returned a substantial pool of records. After removing duplicates, the remaining records underwent title and abstract screening against the inclusion and exclusion criteria, and those that did not meet the criteria were excluded at this stage. The remaining full-text articles were then assessed for eligibility, with

further exclusions made mainly for insufficient relevance to the review's focus or lack of full-text availability. The studies that passed this final assessment constitute the literature base of this review. Screening and eligibility assessment were carried out systematically, and any disagreements in study selection were resolved through discussion.

2.4 Data Extraction and Synthesis

From each included source, information was extracted on publication year, journal or publisher, and the study's principal focus (e.g., opportunities, risks, institutional policy, disclosure practices, or detection tools). Because the included sources combine empirical studies, policy statements, and editorial commentary, findings were synthesized thematically rather than through meta-analysis; opportunities, risks, institutional positions, and governance gaps were treated as recurring themes structuring the sections that follow.

3. Results and Discussion

3.1 Opportunities of AI in Academic Writing

In this section, we present the positive side of using AI tools in academic writing, which helps researchers save time and gives them equal opportunities, particularly on the linguistic side, where non-native English speakers have succeeded in publishing their work in prestigious journals without needing linguistic correction from a third party.

3.1.1 Enhancing Linguistic Quality and Narrowing the Language Gap

Among the most well-documented benefits is the ability of these tools to improve writing quality for researchers who are not native English speakers (English remaining the dominant language of global scientific publishing). A large-scale study published in Science, which analyzed more than two million research papers from preprint platforms (arXiv, bioRxiv, and SSRN), showed that large language models increase research output, with a particularly strong benefit for non-native English speakers (Kusumegi et al., 2025). In this way, these tools help mitigate a structural linguistic which leads to the increase of the presence of Global South researchers in prestigious journals.

3.1.2 Paper Organization and Idea Generation

Large language models are used effectively to rephrase paragraphs for improved clarity and flow, to summarize the literature, to suggest organizational structures for manuscripts, and to refine abstracts. They are also employed in the preliminary stages of research to generate ideas and crystallize research questions. The sound ethical orientation, as advanced by a number of editors, is for AI to be a tool that enables the researcher to ask better questions and develop more mature thinking, not a substitute that writes the paper on their behalf (Yoo, 2025).

3.1.3 Efficiency in the Publishing and Editing Stages

At the publisher level, AI tools have been integrated into tasks such as the initial screening of manuscripts, plagiarism checking, verification of data completeness, and matching reviewers to manuscripts. Some major publishing houses have launched specialized tools trained on their own databases to support the writing of literature reviews and article introductions, which opens up prospects for efficiency but at the same time raises questions about the limits of automated intervention in the making of knowledge (Leon et al., 2025).

3.2 Ethical and Methodological Challenges and Risks

3.2.1 Informational Hallucination

Hallucination is among the most serious problems of large language models, denoting the generation of nonexistent information, citations, or references in a superficially convincing form. In the scientific context, where accuracy is an essential condition, this phenomenon may allow fabricated information to seep into the scientific record if it is not subjected to rigorous human verification. For this reason, international guidelines warn that AI outputs may be incorrect, incomplete, or biased, and stress the necessity of reviewing them carefully even when they appear authoritative (Kantor, 2025).

3.2.2 Bias and the Reproduction of Inequality

Since these models are trained on massive datasets drawn from the internet, they inherit the racial, gender, and cultural biases embedded in that data. When used to produce scientific texts, these biases may reproduce themselves within the academic system and amplify their impact, thereby threatening the principle of scientific objectivity (Xu, 2025).

3.2.3 Plagiarism and Intellectual Property Rights

Automatically generated content raises complex questions about originality and authorship rights. A model may produce text that closely resembles sources it was trained on without attribution, and its legal status with respect to intellectual property remains unsettled. Accordingly, the relevant bodies emphasize that AI tools cannot be cited as a primary source of information, because they reproduce other sources often inaccurately whose identity and quality may be unknown (Yousaf, 2025).

3.2.4 Confidentiality in Peer Review

The use of AI tools by reviewers in evaluating manuscripts poses a particular risk related to breaches of confidentiality, since uploading an unpublished manuscript to an external platform may expose the authors' intellectual property and unpublished ideas to risk. The International Committee of Medical Journal Editors has explicitly warned that using these technologies in processing manuscripts may violate the principle of confidentiality on which the review process rests (Arthur et al., 2026).

3.2.5 Accountability and the Attribution of Authorship

The bodies agree that the absence of accountability is the core problem: the model cannot bear responsibility for the accuracy, integrity, and originality of the work, nor approve the final version, nor disclose conflicts of interest, nor enter into copyright and licensing agreements. These are all indispensable conditions of authorship, which makes listing AI as an author fundamentally unacceptable (COPE, 2024).

3.3 Positions of International Bodies and Publishers

The scientific community's response has crystallized around three largely points, despite variation in detail among publishers (Yoo, 2025):

- Human accountability: authors alone bear full responsibility for the content, and AI tools may not be listed as authors or co-authors.
- Transparency: clear disclosure of any use of AI is expected, including the tool's name, version, and the purpose of its use, whether in the methods section or the acknowledgments.
- Rejection of automated authorship: models do not meet the criteria of authorship because they lack legal accountability and the capacity to approve the final version.

Table (1): The positions of the most prominent bodies and publishers

Body	Position on Authorship	Position on Disclosure
International Committee of Medical Journal Editors (ICMJE)	Chatbots may not be listed as authors	Mandatory at submission, in the cover letter and the appropriate section
Committee on Publication Ethics (COPE)	Tools cannot be an author	Mandatory and transparent in the methods or equivalent
World Association of Medical Editors (WAME)	Chatbots cannot be an author	Mandatory, with full technical specifications
Council of Science Editors (CSE)	Machine-learning tools are not listed as authors	Disclosure of use required
Springer Nature	Rejected as author; language editing permitted with acknowledgment	Mandatory, distinguishing generative tools from others |
Elsevier	Rejected as author	Dedicated declaration for the use of generative AI

Table 1 summarizes the positions of the most prominent bodies and publishers, where some journals were early to regulate; journals such as the *Journal of Global Health* adopted the recommendations of the World Association of Medical Editors as early as 2023, affirming that chatbots cannot be authors because they are incapable of grasping the role of the author or assuming responsibility for the paper (Marušić, 2023).

3.4 The Gap Between Policy and Practice

Despite the proliferation of policies, empirical evidence reveals their shortcomings in disciplining reality. A large-scale study published in *PNAS* showed that while more than half of journals had adopted policies on the use of AI, these guidelines failed to actually curb its use or to govern it transparently; it turned out that only about 0.1 percent of publications issued after 2023 within the studied sample disclosed their use of AI, while usage surged indiscriminately regardless of whether a policy existed (He and Bu, 2026).

This stark gap between declared disclosure and actual use indicates that declarative policies alone are insufficient, and that there is a pressing need for verifiable, accountable frameworks rather than merely settling for statements of principle.

3.5 Detection Tools and Their Limits

In response to these challenges, tools have emerged to detect automatically generated text. However, the effectiveness of these tools remains limited and contested, as models grow increasingly sophisticated and their outputs approach human writing to the point where the two become difficult to distinguish — a development some researchers describe as the approach of a writing singularity (Yoo, 2025). The difficulty is compounded in multilingual contexts where detection resources are scarcer, and these tools also raise problems related to false positives that may wrongly accuse innocent researchers (Glynn, 2025). Automated detection is therefore viewed as a supporting element within a broader governance system, not a standalone solution.

The original idea of AI is to imitate human beings, even in their writing style. These AI tools were created by analyzing a large amount of text written by human beings. Therefore, how can we decide whether a text is produced by an AI or written by a human being? One piece of evidence is the phenomenon known as false positives, where texts written long before the era of AI, such as Shakespeare's works, have been identified by AI detectors as AI-generated.

3.6 Toward a Responsible Governance Framework

Based on the foregoing, the contours of a framework for responsible use can be proposed, resting on the following axes:

- First, entrenching the principle of full human responsibility for all submitted content, with rigorous verification of every AI output to ascertain its accuracy and freedom from fabrication and plagiarism. Second, adopting unified, applicable disclosure standards that clearly define what must be disclosed, how, and where, documenting the tool's name, version, date of use, and purpose.
- Third, safeguarding peer-review confidentiality through strict controls on uploading unpublished manuscripts to external platforms.
- Fourth, investing in education and training on ethical use rather than relying on prohibition, so that AI becomes a tool for deepening thinking rather than replacing it.
- Fifth, developing institutional verification mechanisms that go beyond declarative policies toward accountable monitoring, while observing linguistic justice and not criminalizing the legitimate use of AI to improve language.

3.7 Comparative Policies of Major Academic Publishers on Generative AI

3.7.1 Where the Six Publishers Converge

Almost all the very famous publishers reject AI as an author. This is the one point of near-universal consensus: a cross-sectional audit of 162 STM publisher policies found that of the publishers with a publicly available AI policy, none permitted authorship credit for an AI chatbot or other AI tool, and a companion bibliometric study of the largest publishers and highest-ranked journals found that essentially all publishers and journals with generative AI guidance explicitly prohibited listing it as an author. Elsevier, Springer, IEEE, Emerald, and Inderscience each ground this in the same accountability argument a tool cannot bear responsibility for a paper's accuracy or approve its final version, so it cannot meet authorship criteria. (Bhavsar et al., 2025)

3.7.2 Where They Diverge

Elsevier permits generative AI for language and readability improvement pre-submission, but requires a standardized "Declaration of generative AI and AI-assisted technologies" statement placed just above the references and treats authors as ultimately responsible and accountable for the content, regardless of AI involvement. It is also one of the few publishers with an explicit, template-based disclosure format — the study (Ganjavi et al., 2024) found only Elsevier provided a specific disclosure template, advising it be placed in a new, independent section of the manuscript.

Springer (Nature) requires that LLM use be documented in the Methods section, but carves out an exemption: "AI-assisted copy editing" — AI-assisted improvements to human-written text for readability, style, grammar, spelling, and punctuation — does not need to be declared. This copy-editing exemption is more generous than Elsevier's, which still asks for disclosure of language-improvement uses. (Springer, n.d.)

IEEE takes the most granular disclosure approach among the six: authors must identify the AI system used, identify the specific sections of the article where it was used, and briefly describe the level at which it generated content, disclosed in the Acknowledgments. Uniquely, IEEE also regulates the peer-review side directly — reviewers are barred from uploading manuscript content to public AI platforms for review purposes, a confidentiality safeguard. (Monperrus, 2005)

Emerald was among the earliest movers, issuing its stance in February 2023: generative AI tools cannot be credited as authors because they cannot take accountability for the content, and their use must be flagged by the author within the article, chapter, or case study, as well as at submission. Emerald additionally bans AI-generated images outright, a stricter line than Elsevier's "unless part of the documented methodology" carve-out. (Emerald Publishing, n.d.)

Inderscience's policy is comparatively narrow in scope: it exempts routine tools from disclosure — the policy does not apply to spelling or grammar checkers or reference managers — while still requiring that any generative AI used to develop, write, or edit text be described in the Acknowledgements, with authors remaining liable for any inaccuracies or breach of publication ethics even in AI-produced portions. (Inderscience Publishers, n.d.)

IGI Global is the outlier for timing. In the systematic scan of the 100 largest academic publishers as of late 2023, IGI Global was recorded as having no publicly posted generative AI guidance at all — the underlying dataset shows it alongside publishers like Brill and Hindawi with "No" in the guidelines column while competitors such as Springer, Elsevier, Wiley, and Inderscience already had guidance in place. IGI Global has since published a policy bringing it in line with the others: no AI tool will be credited with authorship because only humans can accept responsibility and accountability for a work's accuracy and integrity, with limited, human-overseen AI use permitted in the writing process. (IGI Global, n.d.)

Table (2): AI and academic writing policies of the scientific publishers

Publisher	AI as author	Disclosure required	Where disclosed	Distinctive feature
Elsevier	No	Yes	Dedicated declaration statement before references	Only publisher with a mandated disclosure template
Springer Nature	No	Yes, except copy-editing	Methods section	Explicit "AI-assisted copy editing" exemption
IEEE	No	Yes	Acknowledgments (system, section, level of use)	Also restricts reviewers' AI use for confidentiality
Emerald	No	Yes	Flagged in-text at submission	Early mover (Feb 2023); bans AI images outright
Inderscience	No	Yes	Acknowledgements	Explicitly exempts grammar/reference tools
IGI Global	No	Yes (current policy)	Not centrally specified	Had no public policy as of the Dec-2023 audit baseline

3.7.3 The Broader Pattern This Reveals

Beyond the six-publisher comparison, the underlying WoS-indexed literature converges on a second-order finding relevant to the gap between policy and practice discussed in Section 3.4: heterogeneity itself is the story.

The BMJ bibliometric analysis found substantial variation in what counts as disclosable AI use, where disclosure belongs in the manuscript, and whether authors are explicitly held accountable — with guidance sometimes conflicting even between a publisher and its own affiliated journals. The STM cross-sectional audit reached a similar conclusion from a different angle, finding that only about a third of STM publishers had any public policy as of December 2023, despite near-universal agreement among the ones that did on prohibiting AI authorship. (Lund and Naheem, 2024)

4. Conclusion

Scientific publishing today stands at a decisive crossroads. Generative AI is neither a pure threat nor a magic solution, but a double-edged tool whose balance depends on how it is integrated into the knowledge system. This article has shown that the opportunities are real (particularly in mitigating linguistic barriers and increasing efficiency) but the risks are no less real, from hallucination and bias to the erosion of accountability and breaches of confidentiality. An international consensus has formed around three pillars: full human responsibility, transparency in disclosure, and the rejection of automated authorship. Yet the stark gap between these policies and actual disclosure practices reveals that the coming phase will not be settled by statements of principle, but by verifiable governance frameworks that ensure AI remains in the service of the quality and integrity of scientific knowledge rather than a tool for undermining it. The fundamental challenge remains ethical and institutional as much as it is technical.

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