

The Expanding Role of Artificial Intelligence in Scientific Article Writing; Promise, Pitfalls, and the Path Forward

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The concept of artificial intelligence (AI) has quickly become embedded in academic life in recent years. What started out as basic grammar checking software has developed into complex language models that can produce paragraphs, pages, and occasionally entire manuscripts with remarkable flow. AI has emerged as an unexpected writing partner for many academics, especially those managing clinical, instructional, and administrative tasks. However, as its popularity grows, so does the need to consider how this change will affect scientific research going forward.

AI's rise in scientific writing is not difficult to understand. The pressure to publish has intensified globally, and academic writing remains one of the most time-consuming and mentally demanding aspects of research. For early-career researchers and those from non-English-speaking backgrounds, the challenge is even more profound. In these circumstances, AI becomes more than a tool; it becomes a support system. Studies have shown that tools like ChatGPT can significantly improve clarity, coherence, and readability in scientific texts, reducing linguistic barriers that have historically disadvantaged many scholars. In low- and middle-income countries, where access to specialized writing support is limited, AI can amplify visibility

and empower researchers to present their findings more competitively on the international stage.^{1,2}

However, the increasing comfort with AI introduces deeper questions about authenticity, creativity, responsibility, and what it truly means to be a scientist. Scientific writing is not merely the arrangement of sentences, it is an intellectual journey. Each paragraph reflects the researcher's curiosity, struggle and ultimately understanding. When AI begins generating parts of this narrative, the heart of scholarly writing risks becoming diluted. The International Committee of Medical Journal Editors (ICMJE) has made it clear that AI cannot fulfill authorship criteria, as it cannot assume responsibility for content accuracy, ethical conduct, or scientific interpretation.³ This underscores a key truth, while AI may assist with writing but the intellectual ownership must remain entirely human. Another important challenge is the reliability of AI-generated content. Despite their incredible fluency, large language models do not "understand" science, they predict words based on patterns. As a result, they may generate statements that appear acceptable but are scientifically incorrect. Research has shown that AI models may confidently produce fabricated references, inaccurate claims, or misinterpretations of data.^{4,5} In a field such as biomedical research, where precision directly affects patient care and public health, such errors can be dangerous if not rigorously checked.

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Plagiarism presents an additional layer of concern. AI-generated text is derived from massive datasets of existing writing. While the output may appear original, it can unintentionally mirror scientific phrasing or conceptual structures found in published literature. Traditional plagiarism detectors may fail to identify such complex duplication.⁶ This has prompted many publishers, including Elsevier and Wiley, to update their policies and require transparency in AI use and explicit declarations in manuscripts.⁷

Yet, Removing AI would be neither practical nor beneficial. AI has already proven itself immensely valuable for tasks such as improving grammar, refining sentence structure, organizing thoughts, summarizing literature, and preparing preliminary drafts. It provides access to academic writing support and enables researchers to focus more on scientific reasoning rather than formatting. Importantly, AI can help reduce disparities in research productivity, giving a voice to investigators who have historically struggled with linguistic and editorial barriers.

The real challenge, therefore, is not whether AI should be used, but how it should be integrated responsibly. Researchers must approach AI as a helpful collaborator, not a replacement for scientific thinking. Human judgment, creativity, and ethical responsibility remain irreplaceable. Institutions and journals should prioritize training in AI literacy, ensuring that researchers understand both the capabilities and limitations of these tools. Transparency regarding AI use must become routine in the academic community, not as a matter of policing but as a matter of integrity.

Looking ahead, AI will undoubtedly shape the future of scientific communication. It may transform peer review, accelerate literature synthesis and broaden global collaboration. But the intrinsic nature of research and curiosity that fuels exploration and the

responsibility that comes with scientific truth must remain firmly rooted in human hands.

If used wisely and ethically, AI has the potential to enhance the quality of scientific writing. It can reduce barriers, improve clarity, and support equitable participation in global scholarship. But the foundations of scientific inquiry such as critical thinking, originality, accountability and integrity must continue to guide us, ensuring that human intellect remains at the center of knowledge creation.^{4,6}

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