

# Artificial Intelligence in Scientific Writing

Research writing presents challenges, requiring a scientific tone while conveying a message. Managing complex data and numerous references and performing analyses can be particularly challenging, especially for those new to writing. With the rise of technology, artificial intelligence (AI) has emerged as a valuable tool to assist humans in handling time-consuming tasks.

AI employs advanced computer algorithms that mimic the thinking processes of the human brain. AI was first introduced in 1955 and is defined as “the science and engineering of creating intelligent machines.”<sup>[1]</sup> In dermatology, AI was initially used to distinguish benign and malignant cutaneous tumors.<sup>[2]</sup> In cosmetic dermatology, AI is utilized in skin analysis and facial reconstruction models.<sup>[3]</sup> More applications of AI in dermatology have arisen in just several years since its birth. In academic writing, there are six domains in which AI may help. It can generate ideas, develop content, review, manage data, edit, and disseminate.<sup>[4]</sup> This text explores AI tools for research writing, ensuring academic integrity in a technology-driven world, and adopting best practices.

AI can enhance writing in three primary areas: (1) literature review, (2) data analysis, and (3) writing and editing tools. Literature review tools powered by AI assist in gathering relevant articles and providing comprehensive summaries. Some popular options include Litmaps, Elicit, Semantic Scholar, Google Scholar, Scopus, ChatPDF, and Copilot. In addition, AI tools can facilitate complex data handling, enabling predictive modeling and data-driven decision-making.<sup>[5]</sup> Notable data analysis tools include the Statistical Package for the Social Sciences (SPSS, IBM, Chicago, Illinois, United States), R, and NVivo, which are employed for statistical analysis and qualitative data management. For the writing process, tools such as Grammarly, Paperpal, and QuillBot are invaluable for constructing, refining, and editing manuscripts. Some of these tools also offer plagiarism detection. Furthermore, citation managers such as Zotero and Mendeley are essential for organizing references effectively. Presented in Table 1 are the different stages in scientific writing and how AI can assist in these tasks.

The use of AI in scientific writing may compromise research integrity. Research integrity encompasses intellectual

**Table 1: Domain in scientific writing and the corresponding artificial intelligence functions**

Domain in scientific writing	AI function
Research question development	Brainstorming of topic Provides outline for discussion May provide knowledge gaps Able to help formulate objectives and hypothesis
Literature review	Find relevant articles Summarize relevant papers
Data collection and management	May aid in cleaning up datasets Organization of data Identify errors
Data analysis	Data analysis and visualization
Writing assistance	Assist in grammar May help with construction and composition Offers automated citation Able to check for plagiarism

AI: Artificial intelligence

honesty and accountability. This includes transparency and fairness when reporting or writing proposals. The issues that arise from AI usage are authorship, plagiarism, transparency, and accountability.<sup>[5]</sup> Many journals have published guidelines regarding incorporating AI into writing. Writers need to review the author’s guidelines regarding AI use, as different journals may have different policies. Most of these journals consider articles where AI technology is used if there is proper disclosure.<sup>[5,6]</sup> This requires naming the AI technology and detailing where, how, and why the tool was used. This should be included in the paper’s methodology, primarily if an AI tool was used for data management. AI should never be considered authors since they cannot be held accountable.

Even in the academe, AI has slowly been adopted. Different institutions have different policies; for example, the percentage accepted for generated AI text may vary, and AI should be used to assess to what extent. Ultimately, the policy is to disclose the use of AI even in generating ideas; students should never claim it as their own; instead, acknowledge these technologies, cite appropriate references, and verify AI-generated information. Authors should be held accountable for any information they publish. This practice ensures transparency, authorship, and accountability.

Prohibiting the use of AI in academic writing might result in the nondisclosure of these tools, compromising transparency and integrity. Hence, we must equip ourselves

with enough knowledge regarding these tools in the fast-evolving world. These tools could foster equality in publication, especially in countries whose native tongue is not English. With proper usage of AI, repetitive and time-consuming tasks may be lessened. Ideas and knowledge may be conveyed clearly. As intelligent humans, we must not rely exclusively on AI, as it cannot replicate creativity and cognitive abilities inherent to humans. Rather, it is important to use these tools to enhance our intellectual processes.

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