Editorial

Artificial intelligence, the state-of-the-art in scientific editing

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In ancient Greek mythology, Prometheus defied Zeus by stealing fire from Mount Olympus, granting humanity the power to cook, craft tools, and build civilizations. This myth analogizes the transformative impact of artificial intelligence (AI) in scientific writing. Early scholars labored over manuscripts, enduring time-consuming revisions, cross-referencing, and inevitable human errors. Many modern editors still inherited those traditional methods and thus resisted change. AI, acting as a "Prometheus," challenges this tradition, bringing the "fire" of automation to the scientific field through machine learning.[1] Analogous to Zeus punishing Prometheus, concerns have emerged regarding AI's growing role in scientific publishing. Critics argue that excessive reliance on AI may diminish human intellectual input and challenge established editorial norms.

A key ethical issue involves authorship: scientific writing traditionally reflects an author's critical reasoning, yet AI tools now contribute significantly to phrasing, rewording, and structural suggestions. Despite lacking consciousness or intent—and thus ineligible for authorship—AI use must be transparently disclosed. To preserve academic integrity, the International Committee of Medical Journal Editors (ICMJE) recommended in 2024 that authors specify the nature and extent of AI assistance.[2–4]

Several key organizations regulate ethical standards in medical publishing, including the World Association of Medical Editors (WAME) and ICJME. According to WAME, editors must be able to access and assess the use of technology in article preparation. Authors should disclose the use of AI tools or chatbots, detailing its extent of use. This aligns with ICMJE guidelines, which emphasize acknowledging writing assistance and providing transparent methodology in the Methods section. Editors are also encouraged to use detection tools for AI-generated or modified content. To ensure scientific accuracy and reduce the risk of harmful health outcomes, WAME emphasizes that access to such tools should be universal, regardless of financial limitations.[5] Beyond AI-related issues, editorial decisions must be based solely on a manuscript's importance, originality, clarity, and alignment without AI involvement.[6]

Despite ongoing controversy, AI can significantly support in improve editorial efficiency and accuracy, including detecting author's unethical use of AI. AI tools assist editors with various tasks, including plagiarism detection, reviewer selection, and preliminary quality assessments. For example, iThenticate, integrated with Crossref services, has long helped many publishers to ensure the originality of submitted manuscripts.[7] Major academic publishers have also adopted AI to streamline the peer review process. Elsevier uses the Editorial System Reviewer Explorer to assess internal consistency in manuscripts and suggest appropriate reviewers. Springer Nature is actively exploring AI applications to enhance reviewer selection and manuscript evaluation.[8–10]

Just as Prometheus' gift of fire transformed humanity, AI is changing the landscape of scholarly journals, particularly the Medical Journal of Indonesia (MJI). As the official scientific journal of the Faculty of Medicine at Universitas Indonesia, published in partnership with the German-Indonesian Medical Association, MJI is a preeminent peer-reviewed and open access publication.[11] However, the significant volume of submitted manuscripts, the rigorous and time-consuming editorial process, and the pressure to meet ambitious publication targets present ongoing challenges for MJI. In response to these demands, we are exploring innovative solutions, particularly AI integration in the editorial workflow, as a promising strategy to enhance multiple facets of the editorial process.

One of the primary advantages of AI lies in its ability to automate a wide range of repetitive tasks, including

initial manuscript triage, formatting checks, language correction, and plagiarism detection. By streamlining these routine activities, AI significantly reduces manual workload and accelerates processing times, thereby improving operational efficiency. Beyond efficiency, AI enhances consistency and accuracy. It standardizes formatting and referencing styles across manuscripts, ensuring uniform language quality, and identifying textual inconsistencies or methodological flaws. Importantly, AI-powered systems can detect subtle errors that may elude human reviewers, ultimately contributing to more polished and scientifically rigorous manuscripts. Another critical advantage is significant time savings. By rapidly identifying and resolving issues that do not require subjective judgment, AI allows editors to allocate more time and attention to complex editorial decisions.[12] This increased capacity facilitates the handling of more manuscripts in less time, thereby boosting overall editorial productivity.

AI also enhances the manuscript screening process through intelligent decision support capabilities. It can flag potential ethical concerns, assess manuscript relevance using topic modeling and keyword analysis, evaluate citation accuracy, and identify possible issues related to disclosures, such as conflicts of interest. These functions contribute to a more informed and efficient editorial decision-making process. Moreover, automating administrative and routine editorial tasks enables better resource allocation. Human editors can thus focus on high-level analytical responsibilities, such as content evaluation and peer review coordination, fostering a more sustainable and effective editorial ecosystem.

MJI become Indonesia's first journal to integrate AI technologies into its editorial using Paperpal Preflight (Cactus Communication, India). These AI technologies are primarily utilized across three critical domains: research integrity, language quality, and technical compliance. In the realm of research integrity, AI ensures that submitted manuscripts adhere to ethical and scientific standards. It verifies the accuracy of authorship claims, the authenticity of cited content, and the appropriateness of reference usage. Additionally, it checks for alignment with the journal's scope and scientific standards, while screening for unethical language and fabricated content. It also reviews disclosure elements, including author contributions, conflict of interest declarations, data availability statements, and funding acknowledgments. In terms of language quality, AI identifies issues related to clarity, redundancy, conciseness, logical transitions, and narrative flow. It offers suggestions for improved phrasing and evaluates manuscripts for grammar, vocabulary, stylistic consistency, and overall linguistic precision. For technical compliance, it performs structured checks across five key areas. These include adherence to word and sentence count requirements, including those for titles and abstracts; conformity of figures and tables to MJI formatting guidelines; completeness of manuscript metadata—such as author details, keyword lists, and plain language summaries; accuracy and format of references; and the structural organization of the abstract.

Just as Heracles once freed Prometheus from his chains, editors and scholars today are now learning to embrace AI, not as a replacement for human intellect, but as a powerful tool. When used wisely, AI enhances human creativity rather than suppressing it. The divine flame of technology no longer burns as a threat, but as a beacon, illuminating the path to clearer, sharper, and more polished manuscripts.

This "Prometheus"-AI, once perceived as a threat to human effort, is now a catalyst for progress. It serves as a testament to the idea that knowledge, when harnessed responsibly, can enhance rather than undermine human potential. To maintain this balance, both editors and researchers must integrate AI ethically and define its role clearly within scientific writing and evaluation processes. This involves transparent disclosure of AI usage in manuscripts, careful assessment of ethical risks such as content distortion or unintentional plagiarism, and a sustained emphasis on human oversight and validation of AI-generated outputs.[13–15] Editors must remain vigilant in identifying the use of AI in manuscript preparation, particularly in cases where the authors provide no disclosure. Moreover, peer review by qualified subject matter experts and final editorial decisions should remain under the exclusive authority of humans, ensuring accountability, integrity, and contextual judgment in scientific publishing.

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