

## Ethical Challenges of Artificial Intelligence for Scientific Integrity and Academic Publishing

### Desafíos éticos de la inteligencia artificial para la integridad científica y la publicación académica

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#### Dear Editor-in-Chief:

Artificial intelligence (AI) has become a fundamental tool in scientific research. Its implementation encompasses data and image analysis, results interpretation, hypothesis generation and validation, and the modeling of complex phenomena.<sup>1</sup> These applications materialize through what the specialized literature refers to as AI systems, a concept that goes beyond the generic notion of AI by specifying concrete technological architectures composed of interdependent components.

UNESCO defines AI systems as "information-processing technologies that integrate models and algorithms capable of learning and performing cognitive tasks, resulting in outputs such as prediction and decision-making in both material and virtual environments. AI systems are designed to operate with varying degrees of autonomy through the modeling and representation of knowledge, the exploitation of data as well as the computation of correlations".<sup>2</sup>

In practice, these systems process large datasets across fields such as genomics and climatology, identifying complex patterns via machine-learning algorithms. In the medical domain, they analyze diagnostic imaging with accuracy comparable to that of human specialists. They also significantly accelerate the scientific discovery process by optimizing tasks ranging from data analysis to drug design. While these tools can reduce certain human interpretive biases, it is critical to recognize that they also introduce new biases inherent to training data and algorithmic design. However, this transformative capacity also entails methodological and ethical challenges that must not be underestimated.<sup>2</sup>

In the context of scientific publishing, AI systems present significant methodological limitations. Automated manuscript generation using large language models may produce seemingly valid findings that lack empirical support, fabricating content such as non-existent citations and/or data.

Algorithmic opacity further complicates peer review by hindering traceability of data analysis and reproducibility of results. Moreover, AI systems may perpetuate publication biases by favoring statistically significant trends over null or negative findings, thereby distorting the scientific landscape. The validation of AI-generated content constitutes an additional challenge, as apparent textual coherence may conceal conceptual errors or fabricated references that evade traditional editorial review process.<sup>3,4</sup>

Ethical conflicts related to AI in scientific publishing arise across multiple dimensions. First, authorship has become a central point of controversy when autonomous systems contribute substantially to the content but cannot be traditionally attributed, thereby blurring established academic authorship criteria<sup>5</sup>. Second, transparency is compromised when AI tools used during the research process are not disclosed, violating the principle of complete reporting. Likewise, concerns about originality emerge when algorithms restructure existing knowledge without introducing genuine conceptual novelty, raising questions about legitimate scholarly contributions.

Confidentiality is also at risk when manuscripts containing sensitive data are processed through commercial AI platforms, while insufficient human oversight can lead to the publication of non-validated clinical recommendations, potentially compromising evidence-based medical practice<sup>1</sup>.

UNESCO's recommendations<sup>2</sup> establish key pillars such as the protection of human rights, equity, sustainability, transparency, and accountability, among other fundamental principles. For scientific journals, the application of these principles translates into the need to develop specific editorial policies.

The Heredia Declaration<sup>6</sup> emerged as a regional initiative and articulates the core principles for the responsible use of AI in scientific editing, positioning itself as an international ethical benchmark. This document underscores that AI systems must be conceptualized as support tools whose implementation requires continuous human oversight, transparency in their use, and accountability. Its guiding principles, organized according to the roles of authorship, peer review, and editorial work, state that AI cannot replace human responsibilities nor be considered an author, given its inability to assume moral or legal commitments.

In addition, the Guide for the Use and Reporting of Artificial Intelligence in Scientific and Academic Journals<sup>7</sup> operationalizes these principles by providing concrete tools for editorial implementation. The document introduces essential technical concepts such as instruction protocol

networks (prompts) and standardized flowcharts that enable systematic documentation of interactions with AI systems. This methodology ensures the level of traceability required by the Declaration, establishing specific protocols for authors, reviewers, and editors to transparently disclose the model used, the instruction protocols applied, and the validation criteria employed.

The joint adoption of frameworks such as the Heredia Declaration<sup>6</sup> and its implementation guide<sup>7</sup> represents a significant advancement in AI governance within scientific publishing, harmonizing ethical principles with practical applications. This integration enables journals to establish robust editorial policies that mitigate risks such as biases propagation, violations of intellectual property, and algorithmic opacity.

These global frameworks require adaptation to specific contexts. In the case of Cuba, the development and use of AI necessitate an ethical approach tailored to national priorities—one that safeguards data with national sovereignty, prevents biases that reproduce social inequalities, and ensures citizen participation<sup>8</sup>. The authors consider that institutions such as *Editorial Ciencias Médicas* and *Universidad de Ciencias Médicas* of Villa Clara could lead this adaptation by establishing clear strategies for the ethical use of AI in research, academic publishing, and education.

In conclusion, the dual emphasis on principles and practice ensures that technological implementation preserves the fundamental values of transparency, reproducibility, and human responsibility that underpin scientific communication.

## REFERENCIAS BIBLIOGRÁFICAS

1. Resnik DB, Hosseini M. The ethics of using artificial intelligence in scientific research: new guidance needed for a new tool. *Ai Ethics*. 2025;5(2):1499-521. doi: 10.1007/s43681-024-00493-8
2. Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO). Recomendación sobre la ética de la inteligencia artificial [Internet]. Francia: UNESCO; 2022 [cited 2025 nov. 19]. Available en: [https://unesdoc.unesco.org/in/rest/annotationSVC/DownloadWatermarkedAttachment/attach\\_import\\_bb7b928e-4a57-4dde-ad45-3522d2ae3681?\\_=381137spa.pdf&to=45&from=1#pdfjs.action=download](https://unesdoc.unesco.org/in/rest/annotationSVC/DownloadWatermarkedAttachment/attach_import_bb7b928e-4a57-4dde-ad45-3522d2ae3681?_=381137spa.pdf&to=45&from=1#pdfjs.action=download)
3. Paz-Enrique LE. Inteligencia artificial como herramienta de apoyo a los proce-

- sos editoriales de las revistas científicas. Gac Méd Espirituana [Internet]. 2025 [cited 2025 nov 19];27. Available en: <https://revgmespirituana.sld.cu/index.php/gme/article/download/2696/pdf%202696/17260>
4. Alnaimat F, AlSamhori ARF, Hamdan O, Seil B, Kumar AB. Perspectives of artificial intelligence use for in-house ethics checks of journal submissions. J Korean Med Sci. 2025;40(21). doi: 10.3346/jkms.2025.40.e170
  5. International Committee of Medical Journal Editors (ICMJE). Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals. Updated april 2025 [Internet]. ICMJE; 2025 [cited 2025 nov. 19]. Available en: <https://www.icmje.org/icmje-recommendations.pdf>
  6. Penabad-Camacho L, Penabad-Camacho MA, Mora-Campos A, Cerdas-Vega G, Morales-López Y, Ulate-Segura M, et al. Declaración de Heredia: principios sobre el uso de inteligencia artificial en la edición científica. Rev Electrón Educ. 2024;28(1):1-10. doi: 10.15359/ree.28-S.19967
  7. Penabad-Camacho L, Morera-Castro M, Penabad-Camacho MA. Guía para uso y reporte de inteligencia artificial en revistas científico-académicas. Rev Electrón Educ. 2024;28(S):1-41. doi: 10.15359/ree.28-S.19830
  8. CubaSi [Internet]. La Habana: CubaSi; c 2020 [citado 2025 nov. 19]. Inteligencia artificial en Cuba: realidades, retos y la promesa de CecilIA. Available en: <https://www.cubasi.cu/es/articulo-opinion/inteligencia-artificial-en-cuba-realidades-retos-y-la-promesa-de-cecilia>

