

Systematic review on Artificial Intelligence in the editorial management of scientific journals

Carlos Rafael Araujo Inastrilla^{1,*}, Mayelin Llosa Santana¹, Dayami Gutiérrez Vera¹, María del Carmen Roche Madrigal¹, Alejandro Rodríguez Urrutia¹ and Alejandro Araujo Inastrilla¹

¹University of Medical Sciences of Havana. Health Technology Faculty. Havana, Cuba.

Abstract

INTRODUCTION: scientific journals play a crucial role in the dissemination and validation of scientific knowledge, and editorial management ranges from conceptualization to post-publication of content. Artificial intelligence (AI) has had a great impact on scientific communication and editorial management of scientific journals. AI can offer solutions and benefits for editorial management, but it also poses technical, economic, social and ethical challenges that should be considered and approached with caution and responsibility.

OBJECTIVE: to describe the benefits and limitations of the use of AI in the editorial management of scientific journals through a systematic literature review.

METHOD: a systematic literature review was conducted based on the PRISMA methodology. An information search was carried out in different bibliographic database systems, indexing systems and search engines, and inclusion and exclusion criteria were applied to the identified studies.

RESULTS: the information search allowed retrieving a total of 2750 sources, of which 10 articles that met the stated criteria were included. Benefits such as the facilitation of writing, translation, review and editing tasks were identified, as well as limitations related to ethical issues, bias, errors and plagiarism generated by AI.

CONCLUSIONS: While AI can streamline the production and analysis of information distribution, it also poses challenges in terms of reliability, ethics and authenticity of published content. It requires the critical involvement of human intelligence for proper exploitation.

Keywords: Artificial Intelligence, Editorial Management, Scientific Journals, Systematic Review.

Received on 5 April 2024, accepted on 20 May 2024, published on 4 June 2024

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doi: 10.4108/airo.5643

*Corresponding author. Email: araujo.inastrilla@gmail.com

1. Introduction

Artificial intelligence (AI) is a discipline that seeks to create systems capable of performing tasks that require human intelligence, such as natural language processing, image recognition, machine learning or content generation. It has had a great impact on various fields of knowledge and society, including scientific communication and the editorial management of scientific journals. [1]

Scientific journals are the main vehicles for the dissemination and validation of scientific knowledge, and fulfill the functions of registration, dissemination, certification and archiving of research results. The editorial management (EM) of journals involves a series of stages, actions and participants ranging from conceptualization to post-publication of the contents. [2],[3]

AI, from the different applications it has for the most varied sectors, [4] can offer solutions and benefits for EM. Its appropriate and ethical use would facilitate and optimize the tasks of writing, translating, revising, editing,

producing, classifying, disseminating and evaluating content.

AI can also improve the quality, speed, visibility and impact of scientific journals, and other aspects of interaction with readers and users.[4],[5] In addition, AI can contribute to the generation of new knowledge by analyzing large volumes of data and identifying patterns, trends and relationships. [6]

However, AI also poses challenges and limitations for EM, which must be considered and approached with caution and responsibility. Among these challenges are the technical, economic, and social aspects involved in the implementation and use of AI in journals. [5]

Ethical, legal and quality issues arising from the application of AI in scientific communication must also be taken into account. Conflicts related to authorship, plagiarism, bias, error, privacy, security, credibility and trust require very careful treatment within the field of scientific research and communication. [5],[7]

Therefore, a critical and rigorous reflection on the role and impact of AI in EM is needed. In this way, it will be possible to take advantage of its potential to improve scientific communication, without losing sight of the values and objectives that support it. In this sense, we propose to describe the benefits and limitations of the use of AI in EM based on a systematic review of the literature.

2. Method

A systematic literature review was conducted based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology. [8] The review aims to synthesize evidence on the benefits and limitations of the use of IA in the EM of scientific journals.

This review was based on a search for information in different bibliographic database systems, indexing and abstracting systems, and search engines: SciELO, Google Scholar, PubMed/Medline, Dialnet, Redalyc.

To meet the objective, we included those studies, preferably from the last five years (2020 - 2024) published in scientific journals that met the following criteria:

- Articles on the benefits and limitations of AI in EM.
- Original studies, review or opinion studies that contributed aspects of scientific value to the research topic.
- Publications in English or Spanish.
- Published in open access.

So-called "gray literature" sources and government documents were not included. In cases where interesting results were found from these types of sources, manual searches were performed to check other types of sources that reported information about these results in a specific way.

The studies identified as a result of the searches in the different databases were checked for duplicity and duplicate records were eliminated. Studies were screened according to title and abstract. The full texts of the articles were then reviewed.

Papers that only addressed the computer-technical aspect of AI implementation were discarded. In this way, we avoided selecting papers that were partial or biased.

3. Results and Discussion

The information search made it possible to retrieve a total of 2750 sources of information. Of these, the majority were obtained through Google Scholar (89.3%). This search engine was followed by Scopus (9.2%), Pubmed (1.2%) and SciELO (0.3%).

However, a search with such broad results had a large volume of information irrelevant to the study. Through the application of filters and the elimination of overlapping records in the different databases, the search results were simplified to a total of 942 studies (Figure 1).

From this first screening, it was possible to exclude a total of 849 studies (90.1% of the articles included in this stage) of the 942 mentioned above. With this exclusion, 93 articles passed to the stage of retrieval for suitability. At this stage, 40 (43.0 %) were eliminated as they were not retrieved. Of the remaining 53 (57.0 %), 43 (81.1 %) were eliminated after a critical reading of the full text of the articles (Figure 1).

It was decided to include in the literature review a total of 10 articles, which met the stated criteria and the quality parameters necessary to be included in the study. This amount represents 0.3% of the total number of articles found in the information search. The selection process was described in the flow chart of this review (Figure 1).

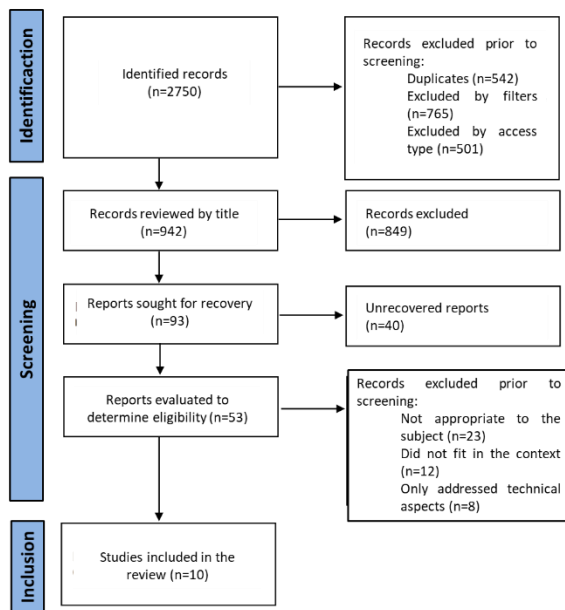


Figure 1. Systematic review flowchart.

According to the literature review, a scenario of lights and shadows can be glimpsed regarding the use of AI tools in scientific communication and EM. They directly affect research design, data collection and article writing; and the internal processes of journals in the processing of manuscripts. [9]

The main indexes and databases with the greatest impact in the world have already created a set of guidelines to regulate the use or abuse of AI in the process of developing scientific articles. These regulations regulate, limit or prohibit, as appropriate, the use of AI at different stages of EM. [10]

These activities include the writing process, the definition of authorship of the text, the elaboration of figures and images, and the responsibility of the authors. ¹⁰ Overall, the information reviewed is consistent with the regulation of AI in these tasks. [7],[10],[11-18]

Table 1. Results of the systematic literature review

Author	Benefits	Limitations
Spinak [11]	AI can facilitate the writing, translation, revision and editing of scholarly manuscripts for authors who do not write in English as their first language. AI can assist editorial management from conceptualization to post-publication, covering aspects of information literacy, standardization, evaluation, dissemination and preservation.	AI raises ethical questions about the responsibility, liability and transparency of authors. AI should not be treated as the author of academic articles. AI requires human supervision, controls and monitoring. It must respect the ethical and quality principles of scientific communication.
Zielinski et al.[12]	AI can improve the quality of research, optimize publication processes, increase the visibility and impact of journals, and facilitate interaction with readers.	AI involves technical, economic and social challenges for scientific journals. AI can generate biases, errors and plagiarism. AI can affect the credibility and trust of authors and reviewers.
Villasmil-Espinoza[10]	Generative AI should be used to improve the readability and language of the work, under human guidance and supervision; adjustments can be made to improve the quality in the visibility of original images, without altering the content.	There may be inaccuracies or biases generated by AI. The use of generative AI or AI-assisted tools to create or alter images in submitted manuscripts is not allowed. Language models do not satisfy authorship criteria.
Grillo[13]	AI can help authors and researchers who are less skilled in writing. Facilitates translation and mastery of information in English. Reviews that a considerable part of manuscripts have been at least partially translated with AI. It facilitates the performance of simple text editing tasks.	Researchers and authors from disadvantaged geographic areas have difficulty accessing AI tools. AI-generated text detection tools are limited. This makes it difficult to unmask false information and fraudulent authors.
Medina-Romero [14]	It is concluded that the SmartPaper. AI tool, oriented to academic work, allows the assimilation and generation of information; it makes it possible to reduce academic production times. It contributes to the accessibility and democratization of technological innovation without substituting the researcher.	The creators of SmartPaper.AI face a number of challenges: optimizing performance through ongoing review and refinement; promotion, sustainability and sustainability.
Romero[15]	AI can streamline the production and analysis of scientific journal information distribution, specifically in peer review processes. It offers opportunities to improve the efficiency, accessibility and accuracy of research. The key lies in finding a balance between the adoption of emerging technologies and the standards of quality and rigor that have been fundamental to the scientific community.	Concerns arise that these automated processes may miss important nuances and contexts that human reviewers would detect. Another challenge lies in the reliability and ethics of content generation by AI. There is the potential for articles with errors or false data to be disseminated. Scientific journals must establish strategies to ensure the integrity of published content and the authenticity of authors.
Cárdenas [7]	Academia must be more adaptive and take advantage of AI. Researchers have direct and free access to dozens of	Generative AI does not have a sensory experience of the external world based on social relationships.it lacks the

	AI tools that allow them to write in a language they do not master, to structure fuzzy ideas into clear and concise paragraphs, to review hundreds of articles in a few hours, even to analyze quantitative data without knowing how to use statistical software.	human contextualization that comes from emotions, culture, personal histories, and other intangible human experiences such as intuition and empathy.
Ángelo Benvenuto-Vera[16]	AI, and in particular Natural Language Processing, has made significant advances with language models such as GPT, which help researchers at different stages of their work. To ensure the quality and transparency of AI-based research, researchers are advised to share the details of their methods and algorithms, and to allow others to verify and replicate their results.	The evolution of AI and the creation of language models as research tools raises ethical and legal challenges due to their lack of awareness.
Lopezosa[17]	AI can support the editorial process of scientific articles in four phases: reception, evaluation, review and dissemination. Generative AI can facilitate the creation of original and relevant content for researchers. However, it must be used with ethics, integrity and transparency, and subjected to validation and scrutiny by the scientific community.	The processes presented are conceptual. To apply them at any scale, further integration between AI applications will be required in the future.
Muya[18]	AI, trained on a wide variety of topics, is useful even in specialized fields, with some caveats. Researchers and publishers should be aware of its capabilities and potential impact. From the author's point of view, an AI language model can improve the quality of scientific articles in many ways. For example, it can help non-English speakers with intelligent translations that adjust tone and style.	AI has limitations and challenges that require caution and responsibility. Some language models developed face accusations of violating privacy or spreading false information. Educators and students must learn to use AI appropriately and not as a human-effortless shortcut.

In intellectual activities, AI should be a tool or a complement under human supervision. Thus, AI software can be used to improve, from the point of view of grammar, style or spelling, a text previously created by human intelligence. [10],[11]

The idea of avoiding the use of AI in the basic generation of texts is generalized, because of its impossibility to assume the scientific, political or ethical responsibility that the dissemination of knowledge in all scientific areas implies at all times. Furthermore, care must be taken to avoid the errors and inaccuracies that identify the texts produced by these softwares. [10-12],[15]

Among the implications for EM are the quantitative evaluation of researchers and technological adaptation to improve editorial processes. The automation of repetitive tasks such as checking bibliographic references or detecting plagiarism, and the possibility of offering personalized recommendations to researchers are among the positive aspects to be highlighted. [7], [13-18]

Several tools, some based on neural networks, are used by scientific journals to control plagiarism, identify reviewers, detect statistical errors, check structure, or report contributions. The literature shows that automation helps in the search for reviewers and high-value evidence. [19]

Previous studies have shown the usefulness of AI to assist in the peer review process in the evaluation of format and plagiarism. However, it has limitations in detecting rigor, originality and contribution. [14], [15], [20]

The most notable impact of AI in peer review is its potential to detect inconsistencies, plagiarism, and other integrity issues in manuscripts more efficiently than human reviewers. This can lead to higher quality and reliability in published research. Additionally, AI can assist in identifying the relevance of a study and its alignment with the latest research trends, which facilitates editors in selecting suitable reviewers. However, reliance on algorithms can also introduce biases if they are not properly designed and trained, and a lack of transparency in AI processes could hinder trust in editorial decisions. [14], [15], [20]

However, scientific journals face the challenge of integrating AI in an ethical and transparent manner, to develop appropriate standards and guidelines. Issues of good practice in scientific writing arise, such as proper acknowledgment of authorship and transparency in the communication of the results and methods used. [10-13]

The ethical considerations surrounding AI involve ensuring fairness, transparency, and integrity, which are paramount in maintaining trust in the scientific community.

AI applications in EM must navigate complex ethical landscapes. One primary concern is bias mitigation. Biases in AI can stem from various sources, including data selection, algorithmic design, and the interpretation of results. These biases can skew editorial decisions, potentially favoring certain demographics or viewpoints. Ethical AI must strive for impartiality, giving equal consideration to all submissions regardless of origin or

authorship. Transparency is another ethical pillar, requiring that the processes and criteria by which AI tools operate are open and understandable to authors, reviewers, and readers. This transparency ensures that the scientific community can trust the integrity of the publication process. [10-13]

To mitigate biases, it is crucial to develop AI tools with diverse and inclusive datasets that reflect the broad spectrum of research and opinions within the scientific community. Regular audits and updates of AI systems are necessary to identify and correct any emerging biases. Involving multidisciplinary teams in the development and management of AI tools can provide a range of perspectives that help prevent one-sided algorithms. Furthermore, establishing clear ethical guidelines and training for both AI developers and users is essential in fostering responsible AI usage. [10-13]

AI also poses challenges in relation to plagiarism, proper attribution of non-textual content, and human responsibility in critical decision-making. [14-18] These elements add further complexity to the web of the ethical dilemma, which reveals various challenges regarding the management of information, knowledge, and knowledge resulting from research. [21], [22]

Through a systemic review of the literature on the use of artificial intelligence (AI) in editorial management, different benefits and limitations in its use were outlined. It is important to make conscientious use of these tools under critical supervision of researchers and editors.

EM is undergoing a significant transformation driven by rapid advances in Artificial Intelligence (AI). Emerging trends and innovations in AI are set to revolutionize the way editorial content is curated, managed, and disseminated. The evolution of generative AI, which has already reached its "hobbyist" phase, is one of the most impactful trends in 2024. We are witnessing the proliferation of increasingly efficient foundational models with open licenses, such as Meta's LLaMa family of large language models (LLMs) and others like StableLM, Falcon, Mistral, and Llama. [23-26]

These models are enhancing the capabilities of AI to generate and optimize content, which is crucial for editorial management. Moreover, the focus is shifting towards governance, middleware, training techniques, and data pipelines that make generative AI more reliable, sustainable, and accessible. [23-26]

The rise of multimodal AI, which can process and integrate different types of data such as text, images, and audio to create a more holistic editorial process, is another emerging trend. Small language models and open-source advancements are also gaining ground, offering more accessible model optimization and the potential for customized local models and data pipelines. These trends

indicate a move towards more personalized and efficient editorial management systems. [23-26]

Looking to the future, innovations in AI are expected to further integrate into scientific publishing. Tools like ChatGPT have shown the potential to disrupt traditional publishing models by providing AI-assisted writing and reviewing, which could transform the nature of the scientific paper. The industry is adapting to new technologies that offer solutions for organizing and sorting data, generating new content, and recognizing patterns. Additionally, the role of AI in enhancing editing and content management through advanced text analysis tools is becoming increasingly significant. [27]

The future of editorial management is intertwined with advancements in AI. As we navigate through 2024 and beyond, the trends and innovations in AI present exciting opportunities to enhance the efficiency, precision, and reach of editorial content. It is imperative that the industry embraces these changes while ensuring ethical standards and bias mitigation to maintain the integrity of scientific publishing. The potential for AI to revolutionize editorial practices is vast, and with responsible development and use, it can lead to a new era of innovation in the field.

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