A Inteligência Artificial está a Revolucionar a Publicação Científica
Artificial Intelligence Revolutionizing Scientific Publishing

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Introduction

Since the introduction of artificial intelligence (AI) chatbots, such as ChatGPT, researchers have promptly initiated experimentation with the tool, utilizing it for various daily tasks, ranging from overcoming writer´s block to drafting abstracts or refining articles.[1]

Last year, Nature launched a survey to researchers about the use of AI tools and has revealed that scientists are concerned, as well as excited, by the increasing use of artificial intelligence tools in research. Out of more than 1600 scientists who responded to the survey, nearly 31% said they had used chatbots. Of those who use chatbots, 43% do so on a weekly basis, and only 17% use them daily. About the question "what do you use AI chatbots for? Refining text was the chosen use for 63% of respondents, about 56% used it for editing, and 14% used it for preparing manuscripts.[1,2]

As this data shows, artificial intelligence (AI) is revolutionizing various aspects of scientific writing and editing, offering innovative solutions to streamline processes, enhance efficiency, and improve the quality of scientific publications. But to talk about the use of AI in publishing, we have to distinguish between generative AI (GenAI) and discriminative AI.

Generative AI (GenAI) tools

Discriminative AI (most of the tools available online, such as Grammarly) are models trained to discriminate between categories (e.g., grammatically correct or incorrect). GenAI, on the other hand, are trained to be able to generate new content (text, audio or visual content). Because of this more advanced feature, it is not only useful to check for grammar, but it can also help with structure and content as well.

It is a frequent mistake to assume that ChatGPT and Grammarly are alike. They are not, they are distinct tools with significant differences.

The most popular models of GenAI available are ChatGPT from OpenAI (https://chatgpt.com/ or free version https://chatgpt.com/), Gemini from Google (https://gemini.google.com), and Claude from Anthropic (https://www.anthropic.com/claude)

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If Grammarly is used there is no need for disclosure, because Grammarly is discriminative AI, and therefore, cannot create content. But publishers want GenAI use disclosed because its creative capacity could alter the paper's content.

How is the scientific community responding to the rise of GenAI?

Many universities and publishing ethics organizations, such as COPE Committee on Publication Ethics (https://publicationethics.org/cope-position-statements/ai-author) created policies for researchers on the responsible use of GenAI.

This policies focus on: responsible use, the need for disclosure, and protecting authors' confidentiality and privacy rights.

Publishers policies regarding using generative AI

ChatGPT and other similar tools can be useful, under human supervision, to transform data, results and main conclusions into a proper scientific article, because not all researchers or doctors are necessarily good writers and not everyone has access to professional medical writers. So, we can ask: are authors permitted to employ generative AI when writing scientific articles? For the majority of publishers, the answer is affirmative. For instance, at Springer Nature, utilizing GenAI in paper writing is acceptable, but it must be disclosed within the Methods section of the article. Certain publishers, like Science, additionally mandate the inclusion of the prompt utilized, along with specifying the GenAI model.[1]

Just as Nature's survey of 1600 participants proved that researchers are concerned, but also enthusiastic, about the growing use of artificial intelligence tools in research, another study published in the BMJ in 2024 by Ganjavi C *et al* proved that editors are also aware and alert of these issues of GenAI use and had released guidelines on how GenAI could be used.[2,3]

Ganjavi C *et al* reported that among the top 100 largest publishers, 24% provided guidance on the use of GenAI, of which 15 (63%) were among the top 25 publishers. Among the top 100 highly ranked journals, 87% provided guidance on GenAI. Of the publishers and journals with guidelines, the inclusion of GenAI as an author was prohibited in 96% and 98%, respectively.[3]

In other words, the publishers and editors are concerned that GenAI can be used to produce fake but convincing

articles and indicate that GenAI can only be used to improve the readability and language of the work and not to replace essential author duties such as producing scientific, pedagogic, or medical insights, citing references, drawing scientific conclusions, or providing clinical recommendations. When using AI, humans should oversee and control it. It is important to carefully check and edit all work because AI might make mistakes or leave out important things. The authors are the ones who are finally responsible for the contents of the work. Then the authors must be transparent and must disclose in the manuscript the use of GenAI in a statement at the end of the article, and the statement must be published with the paper, similar to how the involvement of medical writers should be declared.[4]

Another key concern related to the use of GenAI in scientific writing is the homogenization of content, because by optimizing for efficiency, GenAI systems can potentially lead to content becoming increasingly uniform and repetitive.

In a recent editorial published in the Lancet Infectious Diseases, the authors checked all submissions received during February 2024, and only 0.6% of articles declared the use of ChatGPT, and 1.8% used AI as a tool in their research (which is allowed and should be elaborated on in the methods). By contrast, 3.6% reported the involvement of medical writers.[5]

The use of AI tools is not a rejection criterion, but a poorly written and inaccurate paper written by ChatGPT will be rejected just as a poorly written and inaccurate paper by a human.

I want to emphasize that AI technologies can never be listed as an author or co-author, nor can they be cited as an author. Authorship implies responsibilities and tasks that can only be attributed to and performed by humans.[4]

Keep in mind that publishers prohibit the use of GenAI for creating or modifying images.

Journals are promoting responsible use of AI and raising policy awareness. Hence, it is crucial to thoroughly review the editorial guidelines of the target journal to see what they say about this issue.

Peer review process and GenAI

In addition to authorship, peer review is another area where we can imagine using GenAI. But, currently, the vast majority of publishers do not allow the use of AI for peer review, because peer review involves confidentiality and author´s rights, and assurances regarding privacy and proprietary rights cannot be guaranteed and might be violated if reviewers upload sections of an article or their evaluations to GenAI

Due to the confidentiality of the peer review process, GenAI should not be used to assist in the review, evaluation or decision-making process.

GenAI can be used to recommend reviewers, but only based on keywords and other metadata and never violating the confidentiality of the peer review process.

The role of AI in content plagiarism detection

AI-based plagiarism detection software are very useful and will play a very important role in helping to identify instances of content duplication or improper citation in scholarly works. By comparing submitted manuscripts against extensive databases of published literature, these tools help maintain the integrity of academic publications and uphold standards of originality.

Potential benefits of GenAI in scientif writing

There are undoubtedly new benefits that arise from the application of GenAI:

- Save time and effort: new ways of discovering relevant scientific information and helping to summarize and simplify large amounts of content;
- Improve the language, tone and style of a paper;
- Identify novel research topics;
- Promote research: GenAI can create promotional copy or layperson´s summaries;
- Recommend reviewers, but only based on keywords and other metadata and never violating the confidentiality of the peer review process;
- Match the manuscript to a journal: suggest relevant journals based on the scope of the manuscript.

Conclusion

The GenAI tool should not be used for content creation. We should write and then enter the text into GenAI to improve its clarity and readability. Regarding the content, you can also ask for suggestions on the key topics to include in the introduction. Or, inquire about any gaps to fill or important studies that have been missed.

But these tools can have many more uses, such as the creation of text and images from little input information, which can lead to the creation of fake and deceptive content, and that can be dangerous. It is necessary to develop and improve anti-AI checking tools, just as we have plagiarism detection tools.

The use of AI tools is shaking up the scientific publishing landscape, but it is crucial to balance the benefits of GenAI with ethical considerations and ensure that human expertise and judgment will remain central to the publishing process. ■

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