Embracing the use of artificial intelligence in scientific publishing (Editorial)

Embracing the Use of Artificial Intelligence in Scientific Publishing

Phillip Phan, Sonali Desai, Ezequiel Garcia Elorio, David Greenfield, Reece Hinchcliff, Usman Iqbal, Paul O'Connor, Anthony Staines, Rosa Sunol, Aziz Sheikh

Generative artificial intelligence (AI) tools such as large language models (LLM) have begun to transform many industries, including healthcare. Scientific publishing is no exception. AI has the potential to revolutionize scientific publishing by enhancing various stages of the publication process, including manuscript screening, peer review, and content generation. AI-driven tools can analyze large datasets, identify trends, and generate hypotheses, significantly accelerating the research process. Additionally, AI can assist in the writing of scientific papers, providing researchers with tools to organize information, generate coherent narratives, and even predict peer review outcomes.

The ethical and practical issues related to the use of AI in publishing continue to evolve and can be seen in the recent position statement on AI in publishing by the Committee on Publication Ethics (COPE)[1]. As editors of the International Journal for Quality in Health Care (IJQHC), an important academic health care journal, it is our responsibility to address the impact of AI in our field. In this policy statement, we elaborate on the appropriate and responsible use of AI in the guidelines released by Oxford University Press (OUP), the publisher of this journal.[2]

The OUP guidelines cover authorship, accountability and disclosure. In this editorial, we expand on the OUP guidelines in terms transparency, explainability, reproducibility, and ethical considerations. We discuss the expectations, rationale, and practical steps for authors when preparing and submitting their work; and for reviewers, if they use AI to help assess manuscripts. We expect authors to be accountable to these guidelines.

Transparency and Explainability

Transparency and explainability are the cornerstones of scientific research. Authors and reviewers must thoroughly describe the AI algorithms, models, and tools used, including their design, training data, evaluation metrics, and limitations. These descriptives must be submitted as supplements to the manuscript. By providing detailed explanations of AI methodologies, authors can ensure that their findings are verifiable by independent parties. The declaration of AI use must be stated in a summary statement in the methods section of the submitted manuscript.

To facilitate transparency, authors are required to make comprehensive documentation of AI models and datasets publicly available. For example, AI-generated R, Python, or similar codes for data analysis should be provided as a supplement for reviewers and readers to inspect. Current practice is for authors to provide deidentified data (or explain why they cannot) in public data repositories such as the Open Science Framework[3] or the ReShare UK Data Service[4]. In the same way, authors must deposit their appropriately labeled data used to train their AI models in public data repositories. Note that synthetic data, if used, is not personal health information (PHI), which minimizing the barrier to publication in the public domain. Such practices promote scientific rigor and foster collaboration and innovation within the research community.

Reproducibility and Ethical Considerations

Related to transparency, reproducibility is another critical dimension of the policy. Reproducibility is ensured by the sharing of detailed information on data sources, collection methodologies, and preprocessing techniques. Sharing AI models, code, and datasets as open access resources ensures that other researchers can independently validate the results, thereby enhancing the reliability of AI-supported research.

Ethical considerations are paramount when utilizing AI in research. Our standing policy on publishing ethics mandates that authors adhere to ethical principles, including obtaining informed consent when processing personal data, respecting privacy rights, and complying with data protection regulations. In the age of AI, where the pace of research is accelerated, taking the time to ensure that ethical processes are followed is particularly important. Additionally, authors must be vigilant in identifying and mitigating potential biases in AI algorithms to ensure fairness and avoid discrimination. For example, the training data used to generate AI algorithms should first be inspected for over or under representation of groups within a population, so that any results such as clinical practice guidelines generated from the data can be carefully assessed for potential bias. Similarly, while authors need not to be programmers, they must know the provenance of the tools, that they are produced by reputable organizations that are committed to ethical use and transparency. In practice, this means that authors should cite the tool, version, and date of use at first mention in the manuscript.

The Use of Reporting Guidelines and Peer Review

The editors require the use of established reporting guidelines, such as "CONSORT-AI" or "STARD-AI," to ensure comprehensive and transparent reporting of AI methodologies. Manuscripts must include these checklists, clearly identifying parts of the manuscript that employed AI tools, and briefly discuss their potential impact on the evidence and conclusions, where appropriate. In the same vein, it is good practice for authors to present performance metrics such as the area under the curve (AUC), statistical analyses, and discuss uncertainties or limitations associated with their AI methods. These analyses should be briefly described in the methods section of the manuscript, and accompanied with detailed supplements. Where appropriate, Journal editors will invite experts to critically evaluate the quality and validity of AI methodologies used in submitted manuscripts.

Reviewers must scrutinize the reproducibility aspects of the manuscript and consider the overall impact and scientific significance of the research. This means making sure that the provenance of the data and methods are clearly reported and asking clarification questions when unclear about these aspects of the manuscript. We note that it is increasingly common for reviewers, especially among non-native English speakers, to use LLMs in their assignments. We encourage the use of the tool for such purposes but caution that the reviews produced by LLMs tend to be non-specific. Reviewers must critically assess the specificity, and scientific insight of AI-generated reviews, to ensure that they are consistent with the reviewer's own reading of the paper. If using AI for reviewing, we suggest the reviewer use the tool to provide a 'second opinion' of their reading of the paper, so that the submitted review is the reviewer's own work. Good reviews are specific, and incisive, and developmental, which require the thoughtful experience of a human reviewer.

Implementation and Review

The implementation of these guidelines marks a significant step towards the rigorous and responsible use of AI in scientific research. The editors will actively remind authors and reviewers of these guidelines

in invitation and decision letters, expecting full compliance. Additionally, we will periodically review and update these guidelines to reflect advancements in AI technologies, emerging community standards, and evolving ethical considerations.

Conclusion

The future of scientific publishing is intertwined with advancements in AI. As researchers, it is natural for us to embrace the latest technologies to enhance the productivity and quality of our work. AI, as with the word processor, is no different; but in using AI, we must remain mindful of its limitations and potential ethical implications. At the IJQHC we want to harness the power of AI to advance scientific knowledge, foster innovation, and ultimately benefit society. This means being circumspect about the risks while encouraging mindful experimentation. Finally, we would like to point out that publishing is the dissemination of research, so that the appropriate use of AI in publishing is simply a well-execute research project that employs AI at the appropriate stage (hypothesis generation, data acquisition and analysis, and reporting). By adhering to these guidelines, we hope to ensure that AI, regardless of how it evolves, serves as a tool for scientific progress and the highest standards of transparency, fairness, reproducibility, and scientific rigor.

---

[1] https://publicationethics.org/cope-position-statements/ai-author (accessed June 1, 2024)
[2] https://oxfordjournals.org/pages/authoring/books/author-use-of-artificial-intelligence (accessed June 24, 2024)
[3] https://osf.io/ (accessed June 1, 2024)
[4] https://reshare.ukdataservice.ac.uk/ (accessed June 1, 2024)