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Viewpoint

Peer review in the global digital age: perspectives of publishing industry stakeholders

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Abstract

Peer review is a crucial component of the scientific publication process, enabling validation of research, identification of errors, and removal of potential bias. However, there are some well-known limitations, including slow publication cycles and overstringent gatekeeping. Artificial intelligence and digital technology are revolutionizing peer review and publishing by addressing some of the limitations, and fostering closer collaboration among scholars worldwide.[1-3] This paradigm shift aligns with the principles of open science, enhancing the reach and impact of scholarly work. Digital tools for peer review are already transforming many aspects of this process, by enhancing quality control, automation of routine tasks, and expediting laborious aspects of the peer review process, thereby enhancing speed and efficiency. Digital platforms are reducing publication times and potentially allowing for the promotion of diversity and inclusivity of the peer reviewer pool by vastly enhancing global connectivity. Selecting qualified and impartial global reviewers in the digital context is vital for the future of our rapidly evolving and increasingly diverse publication landscape. Editors play a key role in oversight while providing reviewers with clear guidelines and training. In conclusion, digital tools assisting peer review will inevitably play an increasingly useful role in enhancing the efficiency, and potentially the inclusivity and objectivity of the process.

Keywords:

Alternative peer review models, diversity and inclusivity, future trends, peer review, scholarly publishing, technology tools

Introduction

Peer review is the backbone of the scientific publishing process and stands as an essential framework to validate research data, pinpoint errors, and mitigate potential biases. This indispensable process enriches the quality of final publications while maintaining the integrity of scholarly endeavours. However, like all processes, there are limitations, including slow publication cycles as a thorough peer review can take time, the need to increase diversity and inclusivity in the peer reviewer pool (this could be achieved by actively broadening criteria for reviewer selection), and overstringent gatekeeping (some of the most important discoveries were rejected at initial submission).[4] There is scope for improvement. Continuous evaluation by subject matter experts, and researchers, as well as technological advances will undoubtedly lead to improvements in the peer-review process.

How Digital Age Is Transforming Scholarly Publishing?

Quality control is a pivotal role of peer review; and with the introduction of new digital tools, this process could be further improved. For example, tools are emerging that will assist in both pre-peer review editorial checks and peer review, such as helping with editorial technical checks (article scope vs journal scope, article format, the inclusion of disclosures, etc.) and examining a paper's methodology or use of statistics.[5]

One of the disadvantages of the peer review system that is often highlighted is that it can be very time consuming, with authors waiting long periods to receive a decision on their submission. A useful way that digital tools are already being used in the peer review process is the matching of suitable reviewers with papers that match their area of expertise, reducing the time taken for editors to secure reviewers. Caution should also be exercised here, however, to ensure systems to not exacerbate existing biases in the peer review system by excluding individuals from, for example, the global south. Online forums and platforms provide spaces for underrepresented voices to be heard, thereby enriching scholarly discussions and making the academic landscape more diverse and inclusive. Such platforms can provide a useful source for editors to identify new peer reviewers.

Transparent peer review practices foster trust while involving disclosure of conflicts of interest, ensuring open access to reviewer comments, and making revisions made by authors visible. Moreover, making author revisions visible promotes accountability and demonstrates the evolution of a study. These practices collectively uphold the credibility and integrity of scholarly publishing.[6-8]

Digital peer review platforms and social media are fostering a dynamic environment for collaboration and networking where researchers, reviewers, and publishers are increasingly interconnected, transcending geographical boundaries. The convergence of digital peer review and social media expands horizons, promoting vibrant interactions among stakeholders and advancing the collective knowledge base.

Fostering Equity in Digital Peer Review

In a digital age, we need to engage humans in the peer review landscape and elevate voices from diverse backgrounds. It is important to consider access, infrastructure, and literacy rate. For instance, as electronic peer review platforms become heavier and more complex, it will be more difficult for people living in remote areas or with limited access to the internet to use them. Those who lack access to educational opportunities will never be able to become qualified peer reviewers. Unless we begin by increasing access to education, digital media, and the internet, to literacy

practices, many people will be left behind. It is vital to emphasize cultural and narrative humility, drawing on wisdom from health, humanities, and social science studies, because a digital age allows more people to be in closer contact with each other.

End of Human-Dependent Peer Review?

With rapid artificial intelligence (AI) advances in peer review, there has been a long debate on ways to adopt AI and whether AI-assisted peer review processes could be trusted, since the current peer review system is deeply inequitable and suffers from injustice. A lot of factors involve limited recognition of peer reviewers, prevailing exploitation in the system, the absence of tangible benefits to reviewers, and our reluctance to change the system. Although the existing AI-run article review software and models show certain degrees of effectiveness, they are not quite ready to replace human reviewers in the current form. Also, the publishing industry is focusing too much on technological innovations and is giving less attention to the scaling up of these technologies in a diverse social–cultural–political system. It is also because we often do not spend enough time and effort to prepare and enhance the skill set of human resources for technological innovations. With relevance to Peer Review Week[9] 2023, a big question is, Could a few like-minded publishers' associations pool their resources, expertise, and experiences together, and start a concerted effort to lead a rationally paced, effective, long-term transition from the human-dependent peer review to a fully AI-dependent system for the journals?[10]

The Crucial Role of Policymakers

Organizations like the Committee on Publication Ethics (aka COPE), Asian Council of Science Editors, International Society for Medical Publication Professionals (aka ISMPP), and Council of Science Editors play a crucial role in shaping and advancing the whole peer review process within the ever-evolving landscape of scholarly publishing. At this age, where scholarly communities are embracing AI to deal with and facilitate various segments of research and publishing, it is important that policymakers should play their role and define policies, frameworks, and workflows to enable AI solutions in increasing the efficiency and productivity of the peer review process.[11] Recently, AI[12] has proved its potential to fasten and streamline editorial labour work inclusive of manuscript submission, initial content screening, and chances of conflict of interest that allows the reviewers to focus on the key component of the manuscript.

On the other hand, while taking advantage of AI solutions to fasten the peer review process, we must attend to its associated challenges involving ethical considerations such as transparency, fairness, bias mitigation, and training programs for early career and expert reviewers and editorial management teams (Fig 1.). The policymakers must ensure that adequate guidelines and workflows are developed to maintain high standards of research integrity while using AI solutions.

Revamping Peer Review in the Digital Age

Peer review, when conducted well, is an important underpinning to the quality of scientific publications. However, the current system is under increasing strain, which is being felt by all stakeholders: authors with extended times taken to receive a decision on the manuscripts (and therefore the public in experiencing the benefits of new research and other researchers building on the work), reviewers with increasing demands for their time, and publishers/editors managing this process.[13] With the rising challenges of the peer review process, we must look for possible ways of improvement, including making sensible use of the exciting technologies[14] that are emerging while maintaining the benefits of human oversight where this is appropriate, widening the pool of reviewers to include a

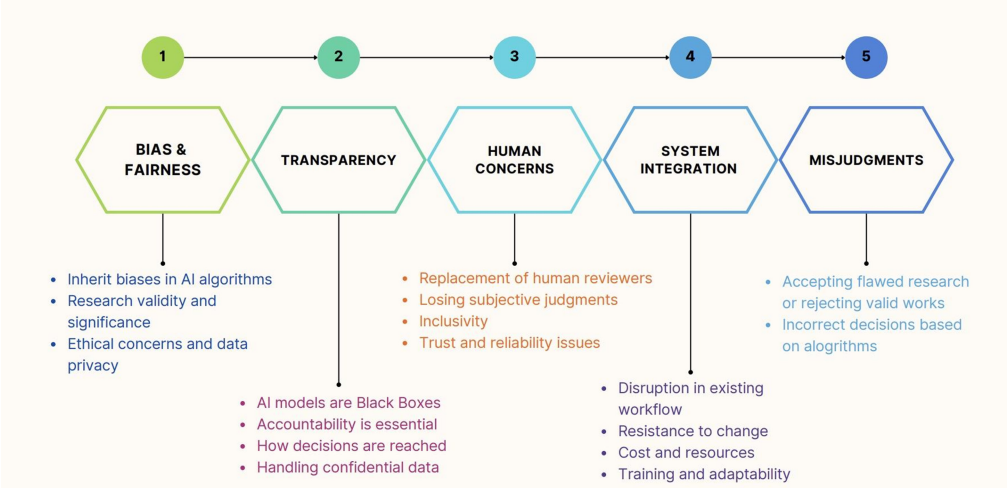

Figure 1. Challenges and concerns of AI-driven peer review.

diverse range of backgrounds and expertise, and giving appropriate credits to reviewers for the quality reviews they complete.

There are some emerging models of peer review in the digital age that promote agility, inclusivity, and thorough scrutiny, enriching the scholarly discourse and adapting to the evolving needs of researchers and readers in the digital era.

- Preprints, for instance, allow researchers to share their findings rapidly, facilitating early dissemination and engagement within the scientific community.[15] Comments received on preprints can enable authors to make revisions to their papers prior to journal submission and can also aid editors, for example, in soliciting submissions or identifying potential reviewers of submitted articles.[16] It has also been suggested that review of preprints is a useful way for those less experienced with peer review (undergraduates, early-career researchers, etc.) to gain experience of the process.[17]
- Post-publication peer review, on the other hand, invites continuous assessment and feedback from the scientific community after publication, enhancing the quality and transparency of research.[18]
- Collaborative review processes involve multiple reviewers working together to provide the evaluations, potentially reducing individual biases. This can also be a method for early-career researchers to gain skills in peer review by working with a more experienced colleague (and in fact it has been suggested that this often occurs without the early-career researchers receiving the appropriate credit).[19]

Technology tools play an important part in streamlining and enhancing the digital peer review process. AI solutions involving online submission systems,[20,21] manuscript tracking systems,[22] and collaborative annotation tools collectively improve digital peer review's efficiency, transparency, and interactivity, facilitating a more robust and accessible scholarly publishing ecosystem.

Ethical Considerations

Ethical considerations are of prime importance while using digital tools for the peer review process. One of the AI solutions like plagiarism detection tools[23] or initial screening plays a considerable role in upholding academic integrity, fastening the process while reducing time and effort, and ensuring that submitted work is original and properly attributed.

However, these AI solutions are not 100% reliable, as they are operated on algorithms dependent on human input that have

limitations and are unable to point out exceptional cases.

Conclusions

It is evident that the future of peer review is multifaceted and the AI transition demands a collective commitment to address the current challenges (diversity, inclusivity, ethical consideration, AI integration) of the peer review process. The overarching message of adaptability and transformation has underscored the pivotal role of policymakers in shaping a healthier future of peer review. As only embracing AI solutions would not be enough, we have to look at the core principles to preserve research integrity, content quality, and ethical concerns while using the AI tools and also prepare effective guidelines on using AI tools as a helping hand in the whole peer review process. To withstand the digital age, we ought to reimage the whole process of peer review itself while re-evaluating traditional norms and exploring ways to recognize the efforts of reviewers. With a lot of suggestions and discussions during Peer Review Week, the scholarly communities must contribute together to ensure that peer review remains the cornerstone of the scholarly research and publishing ecosystem. Considering the authoritative role of policymakers in advancing the peer review process and the potential usage of AI, we can foster a constructive dialogue that will propel peer review into an era of enhanced effectiveness and transparency. United with policymakers, academics, and publishing industry experts, we can shape the future of scholarly communication through informed decisions and strategic collaborations.

References

1. (2023) International Society for Medical Publication Professionals (ISMPP) position statement and call to action on artificial intelligence. *Curr Med Res Opin*:1-2. [CrossRef]

2. Digital accessibility: what it means and why it is important in scholarly publishing. *Editage Insights*. 2023. Available at: https://www.editage.com/insights/digital-accessibility-what-it-means-and-why-it-is-important-in-scholarly-publishing?refer-type=article.

3. Ravindran S. Digital accessibility in publishing. *Codemantra*. 2023. Available at: https://codemantra.com/digital-accessibility-in-publishing/.

4. MACDONALD F (2026). 8 scientific papers that were rejected before going on to win a Nobel Prize. *Science*. Available at: https://www.sciencealert.com/these-8-papers-were-rejected-before-going-on-to-win-the-nobel-prize.

5. Dresden S (n.d.). Evaluating the Quality Assurance Process in Scholarly Publishing - EQUAP2. Www.slub-Dresden.de. Available at: https://www.slub-dresden.de/en/our-profile/projects/evaluating-the-quality-assurance-process-in-scholarly-publishing-equap2-1. Accessed September 18, 2023.

6. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Int J Surg*. 2021;88:105906. [CrossRef]

7. Boutron I, Page MJ, Higgins JP, et al. *Considering Bias and Conflicts of Interest among the Included Studies. Cochrane Handbook for Systematic Reviews of Interventions*; 2019:177-204. [CrossRef]

8. Ross-Hellauer T. What is open peer review? A systematic review. *F1000Res*. 2017;6:588. [CrossRef]

9. *Peer Review Week Homepage*. Available at: https://perreviewweek.wordpress.com/. Accessed 2023 October 3.

10. Irfanullah HMd. Ending human-dependent peer review. The scholarly kitchen. 2023. Available at: https://scholarlykitchen.sspnet.org/2023/09/29/ending-human-dependent-peer-review/

11. COPE. Artificial intelligence (AI) in decision making. Available at: https://publicationethics.org/resources/discussion-documents/ai-artifical-intelligence-decision-making; 2023. [CrossRef]

12. Singh S. AI and peer review: collaborative intelligence and human expertise. Editage insights. 2023. Available at: https://www.editage.com/insights/ai-and-peer-review-collaborative-intelligence-and-human-expertise.

13. Waltman L, Kaltenbrunner W, Pinfield S, Woods HB. How to improve scientific peer review: four schools of thought. *Learn Publ*. 2023;36(3):334-347. [CrossRef]

14. Kousha K, Thelwall M. Artificial intelligence to support publishing and peer review: A summary and review. *Learn Publ*. 2023. [CrossRef]

15. Fry NK, Marshall H, Mellins-Cohen T. In praise of preprints. *Access Microbiol*. 2019;1(2):e000013. [CrossRef]

16. Sarabipour S, Debat HJ, Emmott E, Burgess SJ, Schwessinger B, Hensel Z. On the value of preprints: an early career researcher perspective. *PLOS Biol*, 2019;17(2):e3000151. [CrossRef]

17. McDowell GS, Fankhauser S, Saderi D, Balgopal M, Lijek RS. Use of preprint peer review to educate and enculturate science undergraduates. *Learned Publishing*. 2022;35(3):405-412. [CrossRef]

18. O'Sullivan L, Ma L, Doran P. An overview of post-publication peer review. *Sch Assess Rep*. 2021;3(1). Available at: https://scholarlyassessmentreports.org/articles/10.29024/sar.26. [CrossRef]

19. McDowell GS, Knutsen JD, Graham JM, Oelker SK, Lijek RS. Co-reviewing and ghostwriting by early-career researchers in the peer review of manuscripts. *eLife*. 2019;8. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6822987/

20. Ware M. Online submission and peer-review systems. *Learn Publ*. 2005;18(4):245-250. [CrossRef]

21. Hartley J, Cabanac G. The delights, discomforts, and downright Furies of the manuscript submission process. *Learn Publ*. 2017;30(2):167. Available at: https://hal.science/hal-01740026/:167-172. [CrossRef]

22. Gipp B, Breitinger C, Meuschke N, Beel J. CryptSubmit: introducing securely timestamped manuscript submission and peer review feedback using the blockchain. In: *Acm*. IEEE. Available at: https://ieeexplore.ieee.org/abstract/document/7991588. 2017:1-4. [CrossRef]

23. Chandere V, Satish S, Lakshminarayanan R. Online plagiarism detection tools in the digital age: a review. *Ann Rom Soc Cell Biol*. 2021:7110-7119. Available at: http://annalsofrscb.ro/index.php/journal/article/view/881.

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