

Reimagining Peer Review: A More Efficient and Rewarding Approach

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Peer review has been a fundamental pillar of scholarly publishing for decades, serving as a critical mechanism for maintaining academic rigor and research integrity. Yet, the contemporary landscape of scholarly evaluation is fraught with mounting challenges that threaten the sustainability of this essential process. Reviewers are experiencing burnout as submission volumes increase, and many scholars are becoming increasingly unwilling to participate. These issues have led to inefficiencies in the peer review process, contributing to delays, inconsistent quality, and growing frustration among reviewers.

But what if peer review did not have to feel like a burden? What if it could be a more meaningful and intellectually rewarding experience that also resulted in higher quality?

The issue of low-quality or fraudulent papers passing through peer review is not a failure of peer review itself, but a result of weak editorial standards and insufficient safeguards. The problem goes beyond a shortage of reviewers or reviewer fatigue—though these are valid concerns. At its core, it is about reaffirming the role of scholarly publishers as gatekeepers, ultimately accountable to readers who rely on research to be trustworthy, reliable, and useful.

It is the gatekeeper's role to uphold and protect this rightful expectation. With this reaffirmation naturally comes the question of what steps must be taken to strengthen the gatekeeping function, which involves both editors and peer reviewers. First, editors and peer reviewers must be carefully selected. Then, they need to be properly trained, valued, and inspired. They should also be given sufficient time, independence, and appropriate compensation or rewards for their work, along with the right degree of creative

freedom. Additionally, they must be well-supported with tools and technologies that ease their workload and reduce fatigue, allowing them to focus on their core responsibility: maintaining quality and integrity in research publishing.

Investing in these aspects is essential. Beyond a certain point, excessive mechanization risks diminishing the value of the publishing process. Emphasizing the gatekeeping role as the foundation of scholarly publishing can enhance the long-term value and sustainability of the industry.

Editors can be supported through additional training, access to more educational resources and networking opportunities, and the use of advanced technologies, including artificial intelligence (AI) tools for screening and editing—provided their use cases and value have been properly tested and established. Peer reviewers can benefit from better training, improved compensation or recognition, career advancement opportunities, and technologies that reduce cognitive load, enhance efficiency, and support reviewer training.

With increasing reviewer fatigue causing peer review delays—and challenges like undetected fraud—publishers might consider fully AI-based peer review. However, this would be a critical mistake, risking superficial assessments, ethical blind spots, and a decline in scholarly rigor. Peer review is more than polished writing—it requires insight, critical thinking, and nuanced evaluation, which remain uniquely human capabilities. AI can assist, but the depth and integrity of peer review must stay in human hands. A better approach is to reduce reviewer fatigue by offering meaningful recognition, particularly career-enhancing incentives, and equipping reviewers with AI tools that enhance efficiency and focus. This leads to higher-quality assessments without replacing human judgment.

This article explores 1 such idea: a potential technological framework designed to support reviewers, ultimately leading to greater satisfaction and higher-quality output in the reviewer role. The vision is for a technology-based framework that enables reviewers to enter a flow state by removing distractions and eliminating cognitively tedious tasks, allowing them to focus primarily on deep reading,

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critical analysis, and extracting insights. Ideally, this framework would help reviewers complete their work in a maximum of 2 sittings—one focused on generating insights and the other on organizing and refining them.

The same technology could also enhance reviewer training by gamifying the process, making it more engaging and effective. However, although such tools improve efficiency and focus, they do not fully address reviewer motivation, which depends on benefits and recognition—challenges that must be tackled separately.

This raises an important question: Why invest in such a framework instead of simply improving compensation or recognition? Although better incentives can increase participation and ensure timely review completion, they do not inherently guarantee quality. Quality stems from sustained attention. This article advocates for a tool designed to preserve and enhance attention, which is increasingly under threat in today's society.

The PRISM Framework: A Vision for a More Enriching Peer Review Experience

The Peer Review Intelligent Support Module (PRISM) offers a fresh, big-picture approach to addressing the challenges of peer review. Rather than focusing solely on specific process improvements, PRISM reimagines the human engagement aspect of peer review. Its goal is to transform the review experience into something not only more efficient but also more fulfilling and intellectually stimulating, ultimately resulting in higher-quality and more helpful peer reviews.

PRISM integrates concepts from behavioral science, AI, and immersive technologies to create a more rewarding and meaningful process for reviewers. At its core, PRISM is built on the idea of intellectual engagement and inducing a flow state that accelerates peer review timelines and improves the overall quality of peer review.

Key Elements of the PRISM Framework

1. Fostering a Flow State for Reviewers

PRISM enhances engagement by promoting a flow state—a focused, intrinsically motivated state. Key features include:

- **Distraction-Free Environments.** Adaptive and immersive workspaces that reduce distractions and improve focus.
- **Automated Administrative Support.** AI-driven tools that handle tasks like citations, plagiarism detection, and formatting, allowing reviewers to focus on content. These systems follow a walled garden approach: although they may interact with a large language model-based system, they do not generate new content. Instead, they perform predefined tasks, such as checking, proofreading for language, and verifying

references—adding value to the review process by saving time.

- **Real-Time Feedback.** AI-powered insights provide instant feedback, enhancing learning and motivation.

2. The PRISM Pod & Console: A Seamless, Socio-Technical Solution

PRISM includes 2 key components to optimize the reviewing process:

1. **Cognitive Support Space (Pod).** A dedicated space in the reviewer's office or home for deep, focused work.
2. **AI Console.** A virtual assistant that helps with taking audio notes, organizing and proofreading them, translating them into other languages if needed, conducting factual and reference checks, and performing predictive research impact analysis.

These components work together to streamline the review process, making it more efficient and intellectually rewarding. This framework and its tools can be integrated with publishers' peer review systems.

Accelerating Peer Review with PRISM: A Technology-Enhanced 2-Phase Approach

PRISM streamlines peer review into a highly efficient 2-session model, enabling reviewers to complete thorough evaluations in just a few hours.

1. **Session 1: Deep Reading and Voice-Note Feedback (2–3 h)**
Reviewers engage in deep reading and critique, capturing insights via voice notes. PRISM transcribes and organizes these notes into structured feedback, minimizing the need for lengthy written comments.
2. **Session 2: Refinement and Finalization (2–3 h)**
After a brief reflection period, reviewers revisit their voice notes and refine their feedback, ideally on a later day. AI tools assist in organizing content, improving clarity, and ensuring alignment with the manuscript's objectives. The result is a polished, cohesive review that effectively conveys the reviewer's perspective.

How PRISM Enhances Efficiency and Quality

- **Initial Review Phase.** Reviewers focus on manuscript evaluation while PRISM transcribes voice notes in real time.
- **Refinement Phase.** AI-driven tools refine the review, ensuring it is comprehensive, well-structured, and clear.

By structuring the review process into focused sessions and eliminating time-consuming tasks like formatting and

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editing, PRISM allows reviewers to concentrate on delivering insightful feedback. Automated quality checks and plagiarism detection further enhance efficiency and reliability.

Applying the PRISM Framework to Reviewer Training

The PRISM framework can be a powerful tool, not only for enhancing the peer review experience but also for training new and experienced reviewers.

By integrating elements like structured learning, gamification, and AI-driven personalized learning, PRISM can help reviewers develop essential skills, gain confidence, and improve the quality of their evaluations. Gamified training modules, including interactive case studies, simulated peer review exercises, and scenario-based challenges, can allow reviewers to engage with real-world examples and ethical dilemmas. AI-enhanced personalized learning can adapt training paths based on individual strengths and weaknesses, providing instant feedback and insights into reviewing tendencies. Cognitive support tools such as AI-assisted review guidance, preloaded checklists, and distraction-free training environment can ensure that reviewers can apply their training effectively in real-world scenarios. Furthermore, PRISM can continuously evaluate training effectiveness through performance analytics, reviewer feedback loops, and longitudinal impact assessments, ensuring ongoing improvement.

By leveraging PRISM for reviewer training, scholarly publishers can cultivate a skilled, engaged, and motivated reviewer community, ultimately enhancing the quality and integrity of peer review while making the process intellectually rewarding.

Why PRISM Can Help

PRISM is not just a set of tools—it is a rethinking of the entire reviewer experience. By integrating advanced technologies

like AI and immersive tools, PRISM aims to eliminate the frustrations that currently plague peer review. Reviewers can focus on the intellectual challenge of evaluating manuscripts, without being bogged down by tedious administrative work.

Through these improvements, PRISM aims to make peer review something scholars want to engage with, not something they feel obligated to do.

The framework also seeks to have a long-term impact on the sustainability of the peer review process. By combining professional development and efficiency, PRISM can cultivate a more committed and skilled group of reviewers, ensuring that peer review remains robust and reliable.

Looking Forward: A Future-Proof Solution

Ultimately, PRISM offers a vision for a future-proof peer review system—one that adapts to the evolving challenges of modern scholarly publishing.

At its core, PRISM has the potential to function as an adaptive ecosystem that evolves alongside the dynamic landscape of scholarly communication. The vision extends beyond operational optimization. PRISM invites us to imagine a scholarly review environment where learning, professional development, and research integrity are seamlessly integrated. It can enable a future where peer review becomes a true opportunity for intellectual growth—where reviewers feel valued and motivated, and where the highest standards of academic rigor are not just maintained but actively pursued.

By placing human potential at the center of technological innovation, PRISM has the potential to offer a compelling blueprint for the future of scholarly publishing—one that empowers authors, supports reviewers, strengthens publishers, and ultimately serves the broader academic community and the readers who rely on rigorous, trustworthy research.