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Research on the Development of a Collaborative Peer Review Platform for Medical Journals (Postprint)

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Abstract

Objective: To address issues such as the shortage of external peer reviewers in the peer review process of medical journals. **Methods:** The collaborative review model was analyzed using the literature method. Based on drawing lessons from its innovative measures, problems were analyzed through in-depth interviews with industry experts. **Results:** The characteristics of the journal collaborative review platform were summarized from three aspects: review information, external reviewers, and manuscript publication. **Conclusion:** Based on the actual situation in China, a model for a medical journal collaborative review platform was designed from four aspects: platform construction, expert database establishment, review management, and expert incentives, providing a reference for optimizing the review process of medical journals.

Full Text

Research on the Construction of a Collaborative Peer Review Platform for Medical Journals

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Abstract

Objective: To address the shortage of external peer reviewers and other challenges in medical journal peer review. **Method:** We analyzed collaborative re-

view models through literature review and conducted in-depth interviews with industry experts to identify key issues, building upon innovative measures from existing models. **Results:** The characteristics of collaborative review platforms were summarized across three dimensions: review information management, external reviewer engagement, and manuscript publication processes. **Conclusion:** Grounded in China's practical context, we designed a collaborative peer review platform model for medical journals encompassing four core components: platform infrastructure, expert database establishment, review management, and reviewer incentives, providing a reference for optimizing peer review practices in medical publishing.

Keywords: Medical journals; Collaborative peer review; Peer review; External review; Platform construction

Introduction

Peer review serves as a critical mechanism for ensuring publication quality in academic journals, and improving its methodologies and quality remains a persistent goal in academia. However, the traditional peer review system adopted by most journals suffers from several widely recognized problems [1-5]. First, there is a shortage of qualified external reviewers, making it difficult to achieve “expert matching” where reviewers possess deep expertise in the manuscript’s specific subject area. Peer review inherently demands high academic standards; otherwise, it loses its fundamental purpose. On one hand, highly accomplished scholars typically have tighter schedules, and only a small proportion have the time and willingness to review. On the other hand, as research becomes increasingly specialized, finding competent reviewers for niche or interdisciplinary topics—particularly in medical research—has become exceedingly difficult. Studies in specific fields show that 20% of available experts handle 69% to 94% of all review assignments [6]. Second, managing the external review process is challenging, often resulting in prolonged review cycles. International surveys indicate that 43% of respondents consider peer review too time-consuming, with 65% of authors reporting typical turnaround times of approximately three months [4]. Domestic journals often set review deadlines of three to six months. For editorial offices, since external reviewers are engaged on a voluntary basis, their primary employment occupies most of their time, making delays commonplace and last-minute cancellations not unusual. Third, insufficient incentives for reviewers lead to poor cooperation. The lack of adequate motivation represents a systemic weakness in peer review, a problem even major publishers like Elsevier and Sage have attempted to address through free platform access or discounted book purchases, though with limited success [7]. After all, reviewing is not considered part of a reviewer’s formal job responsibilities and contributes little to their professional advancement or income.

With the advancement of networking and digital technologies, academic jour-

nal editing and publishing models are undergoing disruptive innovation. Internationally, collaborative platforms for external review have gained significant attention, with mature models that substantially mitigate the drawbacks of isolated review processes [8]. Currently, domestic journals still rely primarily on self-built expert databases, with rare collaboration between journals and limited platform support, making the shortage of external reviewers a major obstacle to quality improvement. Drawing upon the increasingly mainstream collaborative review platform models internationally could potentially optimize China's journal external review processes and enhance peer review quality [9-10]. This study analyzes international collaborative peer review models and platforms to propose a framework for a medical journal collaborative review platform, aiming to provide references for reforming medical journal practices in China.

1. Peer Review Model Analysis

Traditional peer review originated with the Royal Society of London in 1665 and has faced persistent criticism for peer bias, slow progress, and vague outcomes. Nevertheless, it remains a crucial quality control mechanism for most academic journals, as no better alternative has emerged [11]. With decreasing communication costs driven by information technology, new peer review approaches have emerged internationally, including journal-to-journal collaborative review and third-party collaborative platforms such as the Neuroscience Peer Review Consortium, Peerage of Science, JMIR Preprints, Open Letter of Intent, Publons, and ORCID. These have gained widespread application. We examine the innovative measures of these collaborative review platforms across three dimensions.

1.1 Review Information Management

To address the issue of peer bias, many international journals have experimented with open review, diverging from the dominant single- or double-blind models in China. In open review, manuscripts are publicly posted on platforms for open commentary, and upon publication, all submission information, review comments, and author responses are disclosed. This transparency encourages reviewers to be more cautious and objective in their assessments [12-16]. For instance, the Scholastica platform developed by the University of Chicago displays manuscript submission details, processing progress, time spent at each stage, average editor workload, rejection rates, and acceptance rates [17]. Finland's Peerage of Science platform not only makes review information public but also allows reviewers to evaluate each other's comments [18]. Some platforms have developed specific review standards to address issues of unfairness and inconsistency. The Rubriq platform, established by Shashi Mudunuri and Keith Collier, requires reviewers to score papers across four dimensions: innovation, research quality, presentation quality, and publication value, with multiple indicators under each dimension scored through selection, supplemented by optional comments [19]. Similarly, China Sciencepaper Online implements a scoring review mechanism, enabling immediate online posting after review, with subsequent

publication in affiliated print journals or other venues.

These approaches demonstrate that transparent review information and standardized evaluation criteria can improve review quality. However, pre-publication open review risks plagiarism, particularly for innovative research vulnerable to premature appropriation.

1.2 External Reviewer Engagement

Traditional external review relies on editors assigning reviewers based on manuscript content, which creates two problems: selected reviewers may lack expertise in the manuscript's specific area, or they may lack time or motivation, resulting in delayed or poor-quality reviews. Consequently, self-selection models have emerged where experts choose manuscripts to review. The Select Crowd Review platform, for example, allows reviewers to select manuscripts voluntarily, reducing review time to 2-3 days while improving quality and accelerating publication [20].

To address reviewer motivation deficits, various incentive measures have been developed. PeerJ offers active reviewers discounts on article processing charges; Elsevier provides discounts on services like translation and language editing; Peerage of Science annually recognizes outstanding reviewers with €1,000 cash awards; Publons distributes \$1,500 vouchers to new reviewers; some journals publicly acknowledge top reviewers and thank them in published articles, convert peer review activities into academic credentials, or provide certification reports [8]. These evolving incentive mechanisms and self-selection models have proven effective in enhancing reviewer willingness, shortening review cycles, and improving review quality.

1.3 Manuscript Publication

Regarding the relationship between peer review and publication timing, besides pre-publication open review models like Philica and PLoS ONE [12], post-publication review models exist, such as that of *Atmospheric Chemistry and Physics Discussions*, where published papers undergo open commentary, and authors revise based on discussions before final formal publication, as implemented by The Winnower platform [17]. To address the common practice of sequential journal submissions requiring multiple rounds of external review—often involving the same reviewers for the same manuscript, creating redundant work and slowing dissemination—cascade peer review has emerged. In this model, journals are hierarchically ranked, and manuscripts rejected by higher-tier journals automatically transfer to lower-tier journals until finding a suitable publication venue. This suits large publishing organizations with portfolios of journals in similar fields at different impact levels, such as Elsevier and AAAS [21]. Currently, Chinese scientific journals, particularly medical journals, lack such large publishing conglomerates, but collaboration among journals in related disciplines could achieve similar benefits.

Third-party review platforms also recommend manuscripts to different journals after evaluation, or journals may extend publication invitations to authors. These models share the common advantage of reusing a single review result multiple times to avoid redundant work and accelerate publication.

2. Collaborative Review Platform Model

Based on analysis of international peer review models and collaborative platforms, combined with in-depth expert interviews, we designed a collaborative review platform model for medical journals (hereinafter “the platform”).

2.1 Platform Infrastructure

Unlike commercial third-party review platforms abroad, this study proposes a non-profit, public welfare platform serving medical journal development. Jointly built, operated, and used by medical journals (“member journals”), it enables mutual benefits. Specifically, a journal society or research association would lead the initiative, coordinating medical journal editorial offices within a certain scope to establish a platform construction team. Based on external review workflows and collaborative principles, an internet-based collaborative review system would be developed. Construction and maintenance costs would be shared among participating editorial offices, while review fees would be paid by respective journals to their reviewers.

2.2 Expert Database Establishment

Given that most medical journals lack systematic reviewer recruitment and management procedures, establishing a multi-channel expert database is essential to increase “expert matching.” The process involves four steps: First, the platform construction team coordinates with member journals to define professional categories for the expert database, aiming for specialized reviewer matching. Second, member journals communicate with their existing reviewers and recommend them to the platform, sharing current experts across participating journals. Third, the platform formulates reviewer selection criteria and recruits experts through member journal publications and society communications, including direct outreach to verified domain specialists. Fourth, after platform launch, continuous self-recommendations from scholars are accepted through member journals and the platform itself, with selected experts added to the database.

2.3 Review Management

Collaborative review requires different management approaches from traditional or third-party models. The workflow comprises five stages: First, in expert selection, the platform displays reviewers’ specialized fields, average review turnaround, response rate, and total review volume, enabling targeted selection by editorial offices while motivating reviewers to improve efficiency. Second, in assignment, to increase response rates, manuscripts are simultaneously

sent to more reviewers than needed; those who first respond positively gain the assignment, while pending invitations are automatically withdrawn, with non-response statistics informing future selections. Third, upon reviewer acceptance, notifications are sent via SMS or WeChat, and reviewers must explicitly agree to review, reducing mismatches and enhancing reviewer autonomy. Fourth, in evaluation, reviewers must score manuscripts across dimensions like innovation, research difficulty, publication value, and credibility before providing detailed comments and indicating whether they wish to be publicly acknowledged upon publication, thereby improving review quality. Fifth, in publication, member journals can customize acceptance thresholds for each dimension. Manuscripts not accepted by their original journal but whose authors consent to transfer are automatically recommended by the platform to suitable journals based on review scores, avoiding redundant review, shortening publication cycles, and providing additional manuscript sources for member journals.

2.4 Reviewer Incentives

Drawing upon effective domestic and international practices and considering China's medical journal context, we propose the following incentive framework. First, maintain or eliminate current review fees to avoid undermining intrinsic motivation with extrinsic rewards [24]. Second, annually recognize outstanding reviewers through certificates and public acknowledgment across all member journals [25]. Third, provide official verification of review work and advocate to professional title evaluation institutions that review quantity and quality be considered for promotion, potentially even recognizing review work as research output. Fourth, provide timely feedback to reviewers on final decisions and publication status of reviewed manuscripts to enhance their sense of achievement. Fifth, assign different status levels based on reviewers' workload and performance, allowing senior reviewers to recommend manuscripts or topics, or even lead special issues, leveraging their influence to attract submissions while enhancing their professional honor.

Conclusion

Continuous innovation in peer review models, particularly the emergence of collaborative platforms, has improved review quality, shortened cycles, and accelerated scholarly communication. However, directly transplanting foreign models to China's cultural context risks maladaptation, while localized development requires careful exploration and collective effort from publishing practitioners. Medicine is an empirical science where appropriate treatment is literally a matter of life and death, making the dissemination of medical knowledge critically important. As vital vehicles for medical knowledge transmission, optimizing medical journals carries profound significance. This study provides a theoretical framework that requires empirical validation to advance medical journal peer review practices.

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