Current Status, Problems, and Optimization Strategies of Publishing and Dissemination Platforms for English-Language Scientific Journals in China: A Case Study of Five Platforms Supported by the China Science and Technology Journal Excellence Action Plan

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Abstract

Purpose To review the construction practices of English-language scientific journal publishing and dissemination platforms in China, explore the challenges faced in their development, and propose optimization strategies to inform the building of world-class platforms. Methods Multi-dimensional data were collected through web-based ethnography, systematic literature review, and in-depth interviews. A mixed-methods approach was employed to conduct descriptive statistical analysis of foundational data and qualitative content coding, examining the development status, characteristics, and issues of five major platforms. Results China's English-language scientific journal publishing and dissemination platforms have experienced rapid recent growth, focusing on clustered content dissemination for specialized disciplinary journal groups, actively embracing global open science trends, establishing a multi-platform knowledge dissemination matrix, and transitioning toward lightweight publishing models. Conclusion Optimization strategies for platform construction are proposed regarding adaptation to and leadership in international standards, integration into the international academic publishing ecosystem, and scientific research service capabilities, offering insights for developing world-class journal publishing and dissemination platforms and securing international academic discourse power.

Full Text

Current Situation, Problems, and Optimization Strategies of Chinese English-Language Sci-Tech Journal Publishing and Communication Platforms: A Case Study of Five Platforms Supported by the "China Sci-Tech Journal Excellence Action Plan"

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Abstract

[**Objective**] This study examines the construction practices of English-language sci-tech journal publishing and communication platforms in China, identifies key challenges in their development, and proposes optimization strategies to inform the building of world-class journal publishing platforms. [**Methods**] Employing a mixed-methods approach, we collected multidimensional data through walk-through methods, systematic literature reviews, and in-depth interviews, conducting descriptive statistical analysis and qualitative content coding of foundational data to analyze the current status, characteristics, and problems of five major platforms. [**Results**] Chinese English-language sci-tech journal publishing platforms have developed rapidly in recent years, focusing on cluster-based content dissemination for specialized disciplinary journal groups, actively aligning with global open science trends, establishing multi-platform knowledge dissemination matrices, and achieving a transition toward lightweight publishing. **Conclusion** We propose optimization strategies centered on improving adaptation to and leadership of international standards, enhancing integration into the international academic publishing ecosystem, and strengthening research service capabilities, providing reference for constructing world-class journal publishing platforms and securing international academic discourse power.

Keywords: English STM journals; STM journal publishing; Publishing and communication platform; Optimization strategy

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Sci-tech journals serve as critical vehicles for disseminating research findings and constitute essential media for academic exchange, theoretical innovation, and scientific advancement. The internationalization of sci-tech journals not only signifies expanded circles of academic communication and enhanced influence but also points to competition among nations for relative status in the international knowledge system and academic discourse power. In recent years, China's Central Propaganda Department, Ministry of Education, and Ministry

of Science and Technology have issued policy documents such as *Opinions on Deepening Reform to Cultivate World-Class Sci-Tech Journals* and *Opinions on Promoting the Prosperous Development of Academic Journals*. The China Association for Science and Technology and six other ministries have jointly implemented the "China Sci-Tech Journal Excellence Action Plan," all of which require international communication platforms to actively host academic journals and accelerate their entry into the international academic community.

Building sci-tech journal publishing and communication platforms with international influence and Chinese proprietary brands has become an urgent priority [1]. On one hand, among the 226 Chinese SCI-indexed journals, 194 cooperate with foreign publishing platforms [2]. In 2021, Chinese SCI-indexed papers totaled 642,300, yet only 32,000 (4.98%) were published in domestic Chinese journals [3]. Outstanding academic papers face the dilemma of paying to publish and then paying again to access, with the outflow of academic achievements becoming increasingly severe. Consequently, constructing English-language sci-tech journal publishing platforms represents an essential requirement for enhancing international academic discourse power and scientific competitiveness. On the other hand, international publishers such as Elsevier and Springer Nature have made platform construction a core strategic priority, transforming platforms into new academic infrastructures that reconfigure norms, technologies, and institutions underlying traditional scholarly communication through ecosystem development encompassing services, protocols, standards, regulations, and software, thereby firmly controlling the global order of scientific communication and scientific evaluation systems [4-5].

To change this imbalanced situation, five selected entities under the "China Sci-Tech Journal Excellence Action Plan" have successively launched or upgraded international journal publishing and communication platforms to strengthen the international communication capacity of academic journals. These five platforms are: Science Press's "SciEngine," Tsinghua University Press's "SciOpen," China Laser Press's "Researching," Higher Education Press's "Frontiers," and Chinese Medical Association Publishing House's "MedNexus."

Existing literature primarily focuses on introducing single-platform construction experiences and case studies [6-8] or summarizing development paths for Chinese English-language sci-tech journal publishing platforms [9-11]. However, systematic reviews of mainstream platform construction status and updated foundational data remain lacking. While some studies identify problems in platform construction, research on solutions remains relatively scarce.

Therefore, this study has two main objectives: first, to examine the construction status of English-language sci-tech journal publishing platforms represented by the five major platforms; and second, to propose optimization strategies for platform construction, providing reference for Chinese platforms to rapidly integrate into the international scientific community. Data were collected and analyzed through walk-through methods, in-depth interviews, systematic literature reviews, and web searches.

Data Sources and Research Methods

According to the *China Sci-Tech Journal Development Blue Book (2022)*, publishing and communication platforms are categorized into four types: digital publishing platforms, scientific data repositories, preprint platforms, and academic social platforms [12]. Accordingly, this study's research objects are refined to include journal websites, database platforms, official accounts, mobile apps, and community exchanges encompassed by the five major English-language sci-tech journal publishing platforms.

This study employs a mixed-methods approach, collecting data across four dimensions. First, using the walk-through method from March 2022 to September 2023, the authors logged into the five platforms at three-month intervals, navigating interfaces, clicking buttons, and exploring menus to conduct longitudinal tracking and record platform architecture, organizational modules, functional features, content updates, and technical upgrades. This yielded 30 sets of foundational data (see Table 1). The walk-through method is an emerging digital experience research approach that enables researchers to grasp platform interface design, functional structure, content, ideal users, and specific practices through detailed examination of digital applications, thereby comprehensively understanding platform ecosystem characteristics [13]. This method is also suitable for comparative studies of different digital applications of the same type.

Second, a systematic literature review was conducted by searching CSSCI-indexed journals in journalism and communication studies, as well as library and information science, using keywords including the five platforms' names, publishing platforms, publishing and communication platforms, and international communication platforms in the CNKI database from January 1, 2020, to September 1, 2023. After removing duplicates and irrelevant literature, 40 relevant articles were retrieved. Third, web searches using the Chinese and English names of the five platforms were conducted on Baidu during the same period, collecting 52 relevant reports including official platform documents and coverage by industry institutions and academic observation sites. Fourth, from January 2022 to September 2023, the authors conducted in-depth interviews with 7 university faculty members and researchers, and 3 publishing practitioners (4 female, 6 male). Interview protocols covered submission and review experiences, platform usage insights, platform evaluations, and identified problems in current platform construction.

The collected literature (40 articles), reports (52 articles), and interview transcripts (10) were analyzed using NVivo computer-assisted qualitative analysis software through two rounds of coding to summarize current problems facing English-language sci-tech journal publishing platforms.

Current Status and Problems of the Platforms

Current Status of the Five Platforms

Based on data collection, this section summarizes and analyzes the construction status of SciEngine, SciOpen, Researching, Frontiers, and MedNexus, examining aspects including the number and coverage of published journals, publishing models, platform architecture, and functional features (see Table 2).

Science Press's "SciEngine Academic Journal Full-Process Digital Publishing and Knowledge Service Platform," launched in 2016, is a full-chain digital publishing and knowledge service platform integrating manuscript submission and review, content production, data warehousing, resource publishing, academic promotion, marketing, and scientific evaluation. As of September 17, 2023, SciEngine published the largest number of journals among the five platforms—442 journals with over 380,000 articles—comprising four journal clusters in physical sciences and engineering, life sciences, health sciences, and humanities and social sciences, with 190 journals adopting open access (OA) publishing models. The platform offers rich functionalities, enabling submissions from preprint platforms such as arXiv and SciPrePrint and supporting one-stop data submission integration with the ScienceDB data platform.

Tsinghua University Press's proprietary international digital publishing platform for sci-tech journals, SciOpen, began trial operation in April 2022. By mid-September 2023, SciOpen had launched 70 English-language journals organized into four clusters: physical sciences and engineering (26 journals, 20 OA), information science (13 journals, 12 OA), life sciences and medical science (27 journals, 25 OA), and humanities and social sciences (4 journals, all OA). The platform architecture comprises search, journal, article, conference, and service modules. The service module is categorized from author, reader, and publisher perspectives, with the author sub-module providing service process introductions for submission, manuscript submission, peer review, and academic promotion. Each article's full-text page provides citation analysis from Crossref, Web of Science, Scopus, and CSCD.

China Laser Press's Researching platform, launched in 2019, is China's first English publishing platform for professional disciplinary journal clusters, attracting overseas journals from Cambridge University Press and World Scientific Publishing. As of September 2023, Researching published 69 journals in optics, physics, geography, and other disciplines, with 12 English-language journals adopting OA publishing models. The platform architecture includes journal navigation, article navigation, conferences, and news sections, with functional upgrades focusing on accelerating publication speed, enhancing citations, and adding academic videos.

"Frontiers" is a domestically developed online publishing platform serving the *Frontiers* series of journals. The platform emphasizes openness, standardization, and internationalization, collaborating extensively with overseas sci-tech news

release platforms and achieving cross-platform article promotion through partnership with TrendMD [14]. As of September 17, 2023, the platform published 38 journals covering natural sciences, engineering, life sciences, and humanities and social sciences.

In 2020, the Chinese Medical Association Publishing House partnered with Wiley's Atypon to co-build MedNexus, an independent medical English-language journal publishing and communication platform based on the Literatum platform architecture through an "independent design + commissioned construction" model, officially launched in December 2021. The "independent design" involved the publishing house completing business selection, functional design, artistic design, and component selection based on its development needs, while "commissioned construction" involved developing all website functions based on the partner's mature foundational platform and construction system [15]. As of September 17, 2023, MedNexus included 24 English-language journals, all adopting OA publishing models. Organizationally, the platform breaks the physical volume/issue concept by linking content through topics/thematic collections and offers rich multimedia formats including academic salon video sharing.

Overall, Chinese English-language sci-tech journal publishing platforms share several common characteristics. First, they feature cluster-based journal operations, with the five platforms reorganizing and integrating resources around high-quality academic journals to assemble clusters of academically oriented, high-quality, resource-efficient, and core-competitive journals focused on specialized disciplinary content dissemination. Second, they align with global open science trends, with open access becoming the preferred publishing model. Third, they have established multi-platform knowledge dissemination matrices comprising websites, databases, and official accounts to achieve academic knowledge diffusion and traffic guidance. Fourth, they have achieved digital, mobile, and social communication, with online-first publishing becoming standard and journal publishing transitioning to lightweight models. Platforms such as SciEngine, Researching, and SciOpen employ adaptive terminal technology, enabling convenient access across all devices, with WeChat mini-programs and mobile message reminders supporting synchronized mobile usage.

Current Problems Facing the Platforms

Despite rapid recent development, analysis of collected literature, reports, and interview transcripts using NVivo 11 computer-assisted qualitative data analysis software through two rounds of coding revealed that platform construction still faces challenges. Specifically, the first round of open coding identified node categories relevant to research objectives. The authors then organized the main categories, confirmed patterns and connections among codes, conceptualized these categories into themes relevant to journal publishing and communication platform construction, and distilled the problems facing Chinese English-language sci-tech journal publishing and communication platform construction. The study found that Chinese English-language journal publishing

and communication platforms still exhibit deficiencies in international standard adaptation capability, ecological integration capability, international communication capability, and research service capability. Specific coding categories are shown in Table 3 .

First, platforms demonstrate weak adaptation to and leadership of international standards. China's academic journal communication system does not fully align with Western countries, making it difficult to grasp international publishing standards and resulting in lagging adaptation to international publishing platform standards. Improvements are needed in joining international standardization organizations such as CrossRef and connecting with third-party database service institutions. Consequently, enhancing platform adaptation to international standard systems and unifying industry norms and technical standards represent critical next steps.

Second, platforms face difficulties integrating into the international academic publishing ecosystem. The purpose of sci-tech journal publishing platform construction is not merely transferring content from traditional print media to digital platforms but rather deeply integrating this digital content into the international academic ecosystem by keeping pace with global platform development trends. As digital technology advances and open science gains global momentum, the complexity of the academic communication environment continues to deepen, making active integration into the international academic ecosystem urgent. Both existing literature and interviews with seven respondents noted that international journal communication has become an inevitable trend, yet platforms still exhibit insufficient access to overseas academic exchange communities and inadequate localization of preprint platforms and academic exchange communities [16]. Additionally, Chinese English-language sci-tech journal publishing platforms have limited active participation in international journal evaluation systems and industry organizations across the upstream and downstream industrial chain, constraining global development. They have few opportunities to actively participate in establishing academic journal evaluation systems and still lack high-impact academic publications and autonomous evaluation systems.

Third, research service capabilities require enhancement. Multiple interviewees noted that gaps remain between Chinese platforms and international mainstream platforms in improving end-to-end publishing and reading experiences for researchers, meeting diverse research service needs, providing research skills and English academic writing training through platforms, and collaborating with open-access databases to build academic exchange and industry-university-research cooperation platforms.

Optimization Strategies for English-Language Sci-Tech Journal Publishing Platform Construction

In response to the identified problems, this paper proposes the following strategies to accelerate platform construction and align with international academic journal communication patterns.

First, accelerate standard system construction and open interface planning to accommodate international journal communication data exchange standards and promote the establishment of institutional infrastructure for platform sharing. A globally connected, inclusive, open, and mutually trusted academic research infrastructure is transforming all processes of the research lifecycle, representing a consensus of the global scientific community. Therefore, building mutually trusted publishing standards, academic evaluation systems, transaction systems, academic community norms, and service tools has become increasingly important for platform development. Mature international publishing platforms have long established mutually trusted standards with upstream and downstream technology service providers, alliance organizations, and industry associations. For example, the Literatum platform provides independent data delivery channels for Google Scholar's search engine optimization to ensure immediate indexing upon publication [17]. Consequently, Chinese English-language sci-tech journal publishing platforms should commit to participating in, formulating, and even leading the development of international academic content standard systems, entity identification systems, and publishing standards. They should track and research the latest developments in domestic and international academic journal publishing standards, copyright licensing methods, conflict of interest and ethical declarations, article processing charge pricing models, and corresponding waiver mechanisms to improve standard adaptation capabilities, enhance the competitiveness of Chinese sci-tech journals from a global perspective, and advance the internationalization of Chinese academic journals. Meanwhile, China's scientific academic communities and learned societies should collectively integrate numerous international standards, industry standards, and third-party technologies and services to formulate group standards, unify standard development across platforms, and provide new standard guidelines for the journal industry. Building upon existing national digital publishing standards, they should supplement and formulate relevant technical standards.

Second, enhance network connections among diverse actors to accelerate integration into the global publishing ecosystem. International journal communication represents a typical transnational, cross-regional, and cross-organizational collaborative multi-actor network. This network is not a simple unidirectional connection but a complex network structure involving multiple cooperative subjects, levels, and domains. Diverse human and non-human innovation elements—including government agencies at all levels, publishing houses, universities, research institutions, third-party technology solution providers, organizations, talent, material resources, environment, culture, and cooperation mechanisms—constitute a constantly evolving, mutually influential, and co-developing rela-

tional network in international communication platform construction. Therefore, a key challenge lies in how platforms connect, interact with, and influence the multiple subjects within this communication network.

Under the open-access journal development environment dominated by international publishers, Chinese English-language sci-tech journal publishing platforms must strengthen interconnectivity with third-party identification systems, international search engines, publishing standardization organizations, important academic index databases, data banks, data repositories, open-access resource index platforms, initiative alliances, academic professional networks, and social media platforms to actively integrate into the international publishing ecosystem. Only through such integration can they enter a rapid development track in securing high-quality manuscript sources, ensuring academic quality, improving international visibility, and applying for database indexing. Publishing platforms can connect dispersed components of the scientific community (researchers, libraries, journals, etc.) through API architecture to achieve effective connectivity throughout the workflow.

Additionally, platforms should keep pace with international academic innovations in open transformation agreements, open ecosystem construction, and research policy reform. Platforms represented by preprint servers and academic social networks are profoundly deconstructing the publisher-dominated academic communication model and gradually establishing a new scientist-governed academic exchange system. Chinese English-language journal publishing platforms should learn from foreign experiences, strengthen development and collaboration with new academic exchange models such as preprints, academic social networks, and data repositories, enhance the stability of China's academic journal publishing ecosystem, and build efficient ecological chains.

Third, empower platforms intelligently to enhance their capacity to serve the entire research lifecycle and transform them into one-stop research service platforms. In recent years, sci-tech journal publishers such as Elsevier and Springer Nature have transformed into integrated service platforms covering research management, data analysis, research collaboration, and academic exchange through commercial integration and mergers, conducting ecosystem construction of services, protocols, standards, regulations, and software, and reconfiguring the norms, technologies, and institutions underlying traditional academic exchange to become major players in global academic ecosystem construction [18]. Therefore, Chinese English-language sci-tech journal publishing platforms should transcend traditional distribution channels by deeply embedding business segments into researchers' workflows from topic selection to publication, transforming platforms into service platforms involving multiple stakeholder communities and deeply embedded throughout the research lifecycle. In the context of digital intelligence, platforms should actively apply, develop, and govern cutting-edge technologies such as artificial intelligence and big data to build publishing AI systems centered on communication frontends, knowledge middle platforms, and data backends [19], providing comprehensive

services for resources, data, norms, editing, publishing, evaluation, communication, and sharing throughout the research lifecycle. Simultaneously, platforms should build intelligent hubs for integrated publishing, improving service integration capabilities and developing knowledge service components including resource acquisition and integration tools, research output publishing tools, and research management and performance evaluation tools to comprehensively enhance their capacity to serve scientific innovation.

Conclusion

In recent years, under the guidance and promotion of various Excellence Action Plan projects, China's international publishing platform construction for English-language sci-tech journals has demonstrated accelerated development. As a critical convergence point of China's current international strategy (international communication capacity building) and the enhancement of international academic discourse power, the Chinese path of English-language sci-tech journal publishing platform construction bears important historical missions and profoundly influences China's competition for international academic innovation discourse power and intellectual property rights, representing a key issue requiring urgent resolution. Therefore, proposing and validating effective construction pathways suited to China's national conditions constitutes one of the challenges in building international communication capacity for sci-tech journals.

This study focuses on five full-process integrated journal publishing platforms supported by the "China Sci-Tech Journal Excellence Action Plan," investigating their construction status, problems, and optimization strategies. The development path for Chinese English-language academic journal publishing platforms should neither simply replicate the integrated development practices of overseas large publishing groups nor remain complacent by merely copying existing platform construction experiences. Through data organization and analysis, this paper argues that Chinese English-language sci-tech journal publishing and communication platforms have actively aligned with global open science trends in recent years, establishing a digital system oriented toward the entire sci-tech publishing process and a multi-platform knowledge dissemination matrix, with journal publishing and communication achieving a transition to lightweight models. However, this paper also points out that English-language sci-tech journal publishing and communication platforms still face problems such as weak adaptation to and leadership of international standards, difficulties integrating into the international academic journal publishing ecosystem, and the need to enhance research service capabilities. This paper subsequently proposes targeted strategies around these issues to provide more specific recommendations for further platform improvement.

This study has several limitations: (1) More comprehensive details of platform construction have not been fully collected, lacking more thorough research and

analysis. (2) The scale of data collection is relatively small, and the identified problems lack validation through large-scale empirical data. (3) The study fails to dynamically consider the needs of international journal publishing and communication within broader social, cultural, institutional, and economic dimensions. Future research should further promote active participation of various entities in the global academic publishing ecosystem, enhancing English-language sci-tech journal publishing platform construction through mutual adaptation among multiple subjects, coordination of resources, and interaction of institutions to support the high-quality development of China's sci-tech journals.

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Note: Figure translations are in progress. See original paper for figures.