

A Study of Chinese Researchers' Perception and Use of Preprint Platforms: Postprint

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Abstract

Purpose/Significance: The global paradigm of academic communication is undergoing profound transformation, and China is actively exploring pathways for preprint platform development, necessitating a comprehensive understanding of Chinese researchers' perceptions and utilization of preprint platforms. **Methods/Process:** A nationwide questionnaire survey was administered to researchers (including graduate students), encompassing three dimensions: awareness of preprints and preprint platforms, functional requirements and usage patterns of preprint platforms, and policy recommendations for preprint development. Survey results were analyzed across multiple dimensions, including demographic profiles, age, professional roles, and disciplinary backgrounds. **Results/Conclusion:** Chinese researchers demonstrate a moderate level of awareness regarding preprint-based communication, though the overall cognition remains relatively limited. Significant variations exist in preprint platform usage behaviors among researchers of different ages and disciplinary backgrounds, with foreign preprint platforms currently representing the primary choice for Chinese researchers. Chinese researchers generally concur that establishing formal preprint policies is crucial for advancing preprint communication and platform development in China. The construction of domestic preprint platforms should prioritize enhancing awareness among early-career researchers, addressing heterogeneous user requirements, refining platform functionalities, and developing a multi-tiered preprint policy framework.

Full Text

Research on Cognition and Use of Preprint Platforms by Chinese Researchers

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Abstract

[Purpose/Significance] The global scholarly communication landscape is undergoing profound transformation, and China is actively exploring pathways for preprint platform development. This necessitates a deep understanding of Chinese researchers' cognition and usage patterns regarding preprint platforms. **[Method/Process]** We conducted a nationwide questionnaire survey targeting researchers (including graduate students) to investigate three dimensions: awareness of preprints and preprint platforms, functional requirements and usage patterns, and policy needs and recommendations. The results were analyzed across multiple dimensions including demographic profiles, age, professional roles, and disciplinary backgrounds. **[Result/Conclusion]** Chinese researchers demonstrate a moderate level of awareness regarding preprint communication, though overall cognition remains limited. Usage behaviors vary significantly across age groups and disciplines, with foreign preprint platforms currently serving as the primary choice. Researchers widely acknowledge that establishing preprint policies is crucial for promoting preprint exchange and platform development in China. China's preprint platform construction should focus on enhancing young researchers' awareness, addressing diverse user needs, improving platform functionalities, and building a multi-tiered preprint policy system.

Keywords: Preprint; Preprint Platform; Researcher; ChinaXiv

1 Introduction

Preprints are scholarly manuscripts that researchers submit to journals before or during the peer review process, without having undergone rigorous formal evaluation. Preprint platforms are systems that receive and provide open access services for these manuscripts, offering distinct advantages over traditional publications. These include enabling rapid dissemination of research findings, securing priority claims, enhancing open scholarly communication, obtaining broader feedback, and accelerating scientific innovation [1]. Globally, preprint communication is experiencing vigorous growth. Since the launch of arXiv in 1991, preprints have gained widespread recognition across the international scientific community. *Science* magazine recognized the "rise of biology preprints" marked by bioRxiv as one of the top ten scientific breakthroughs of 2017, describing it as a "major cultural shift in scholarly communication." Preprint exchange has become a significant force transforming academic communication and an important mechanism for promoting research innovation [2].

China's preprint communication system is currently in a phase of rapid development, with over a dozen platforms established. Among these, the ChinaXiv Preprint Server, developed by the Chinese Academy of Sciences, represents the first domestic platform operating according to international standards [3]. Researchers constitute the primary agents of preprint communication, making it essential to understand their usage patterns and needs for effective platform development.

Internationally, numerous institutions and scholars have investigated researcher cognition and usage of preprints, primarily through questionnaire surveys. The nonprofit organization Accelerating Science and Publication in Biology (ASAPbio) has conducted continuous surveys since 2016 on various aspects of preprint perception [4], covering topics such as researcher awareness, policy challenges, barriers to participation, advantages and disadvantages, motivations for posting preprints [5], licensing issues [6], and expectations for receiving feedback [7]. ASAPbio also collaborated with the Confederation of Open Access Repositories (COAR) in 2021 to survey preprint sharing in institutional repositories. Other scholars have examined attitudes toward preprint credibility. For instance, Tenopir et al. (2016) investigated trustworthiness and authority in digital scholarly communication [8], while Courtney K. Soderberg and colleagues surveyed 3,759 researchers on evaluating preprint credibility [9]. These studies reveal persistent variations in preprint cognition across different periods and disciplines, though consensus exists regarding preprint benefits and recognized challenges. The future trajectory of preprint platforms remains uncertain [10], and scholarly communication models continue to evolve [11], necessitating more in-depth and diverse research on researcher cognition.

While international research on researcher perceptions of preprints is abundant, similar studies remain scarce in China. Current domestic scholarship covers various aspects including preprints' impact on scholarly communication [12], international platform development and policy trends [13], platform construction history [14], relationships between preprints and academic journals [15], mechanism design for preprint-based communication [16], peer review mechanisms [17], platform functionalities [18], stakeholder rights and interests [19], and impacts on academic evaluation [20]. However, comprehensive understanding of domestic platform usage and researcher needs remains insufficient, potentially hindering platform development and ecosystem construction. With the advancement of open science and China's open science innovation ecosystem, preprints are gaining increased attention as a novel scholarly communication form, presenting new opportunities for platform development. Effective scholarly participation is key to successful platform construction. In light of current international circumstances and evolving research paradigms, deeply understanding Chinese researchers' cognition and utilization of preprint platforms is crucial for proposing targeted recommendations and advancing platform development to meet China's scientific innovation needs.

Building upon the foundation of ChinaXiv platform development, our research

team conducted a large-scale questionnaire survey to comprehensively understand Chinese researchers' cognition and usage of preprint platforms. The investigation specifically examined awareness of preprints and preprint platforms, functional requirements and usage patterns, and policy needs and recommendations. The findings will provide valuable references for promoting platform development, constructing policy frameworks, and advancing China's open scholarly communication system.

2 Research Methods and Data Sources

Between April 20 and May 20, 2022, we conducted an online questionnaire survey titled "Preprint Platform Cognition and Usage Survey" targeting researchers nationwide (including graduate students). The survey was administered using the Wenjuanxing platform. Under the guidance of the Chinese Academy of Sciences' Bureau of Science Communication and with strong support from domestic academic associations, CAS institutes, scientific journals, and technology enterprises, the survey received active participation.

The questionnaire comprised four sections examining three dimensions of cognition and usage: (1) awareness of preprints and preprint platforms among researchers (including graduate students); (2) needs and usage patterns regarding preprint platforms; and (3) policy needs and recommendations. The survey included 29 questions of various types: multiple-choice, single-choice, and open-ended questions.

3 Results

3.1 Survey Participant Demographics

The obtained sample demonstrated broad representativeness, characterized by large participation, researcher predominance, and extensive disciplinary coverage, providing robust support for subsequent analysis.

3.1.1 Overall Response Rate and Data Preprocessing By 24:00 on May 20, we had collected 3,028 questionnaires. After screening and preprocessing, 116 invalid responses (3.83%) were eliminated, yielding 2,912 valid questionnaires (96.17% validity). Invalid responses were identified based on completion time, consecutive identical answers, and open-ended question content.

To facilitate analysis, we standardized respondents' disciplinary classifications and institutional roles. For disciplines, we applied the 14 disciplinary categories and 113 first-level disciplines specified in the *Regulations on the Establishment and Administration of Disciplinary Catalogues for Degree Conferral and Talent Training* issued by the Academic Degrees Committee of the State Council and

the Ministry of Education to standardize and categorize user-reported discipline names.

Based on research work characteristics, we defined five roles: researcher, master's/doctoral student, librarian, journal editor, and research administrator. Notably, due to the survey's broad participation, we consolidated several categories for analytical focus. Respondents identifying as researchers, faculty members, medical professionals, technicians, or engineers were grouped under "researcher" for this study.

3.1.2 Young and Middle-Aged Researchers Predominate, with Doctoral Degrees and Male Majority First, among the 2,912 respondents, 1,747 (59.99%) were researchers and 839 (28.81%) were master's/doctoral students, together accounting for 88.8% of all participants. This high participation rate from the target population ensures representative results. Librarians, research administrators, journal editors, and undergraduate students comprised the remaining respondents.

Second, regarding institutional affiliation, respondents primarily came from frontline research institutions, predominantly universities (1,835 respondents, 63.02%) and research institutes (735 respondents, 25.24%). Researchers from enterprises, medical institutions, public institutions, journal publishing houses, and academic associations also participated.

Third, respondents' ages concentrated in the 26-45 range, representing 58.93% of the total. Specifically, 886 respondents (30.43%) were aged 26-35, and 830 were aged 36-45. Respondents aged 46 and above accounted for 21.88%, with 559 (19.20%) aged 46-59 and 78 (2.68%) aged 60 and above. Younger respondents aged 25 and below numbered 559 (19.20%).

In terms of education, over half of respondents held doctoral degrees (or were doctoral students), totaling 1,712 (58.79%). Regarding gender, males predominated with 1,956 respondents (67.17%), while females accounted for 956 (32.83%).

3.1.3 Broad Disciplinary Coverage, Dominated by Natural Sciences Among the 2,912 valid questionnaires, respondents' disciplines primarily fell within natural sciences. Social science responses mainly originated from library and information science. This distribution reflects both the current state of domestic preprint platform development and the maturity of preprint communication awareness in China, which remains concentrated in natural sciences. The top five disciplines by response count were: Mathematics (211 responses, 7.25%), Clinical Medicine (174, 5.98%), and Physics (160, 5.49%). Biology and Psychology also showed substantial representation. [Figure 1: see original paper] displays the distribution of the top 30% of disciplines.

[Figure 1: see original paper]

3.2 Chinese Researchers' Cognition of Preprint Platforms

Researchers' cognition of preprint platforms can be understood through their awareness and user behaviors, including: familiarity with preprints, perceptions of preprints' importance in scholarly communication, platform usage experience, usage patterns, and frequency. Overall, Chinese researchers widely recognize the important value of preprint communication, though their understanding of preprint platforms requires improvement, particularly among young researchers and graduate students.

3.2.1 Moderate Awareness with Significant Variations Across Age, Role, and Discipline Overall, among the 2,912 researchers, 603 (20.7%) reported being very familiar with preprints, 678 (23.2%) somewhat familiar, and 728 (25%) moderately familiar. Meanwhile, 455 (15.7%) reported limited familiarity, and 448 (15.4%) were completely unfamiliar. These results indicate that approximately half of researchers are relatively familiar with preprints, while about one-third have low awareness.

Age analysis revealed that researchers aged 36-45 showed a “healthy distribution” of preprint awareness, whereas those aged 25 and below demonstrated lower understanding. Among those “completely unfamiliar” with preprints, 29.87% were aged 25 or below, predominantly master's and doctoral students. This suggests that early-career researchers have limited awareness of preprint communication, which will affect younger generations' participation. Therefore, strengthening preprint platform promotion among young researchers, particularly graduate students, is essential for building China's open scholarly communication ecosystem.

[Figure 2: see original paper]

Role-based analysis showed that researchers exhibited a “healthy distribution” of preprint awareness, indicating solid foundational knowledge. Journal editors demonstrated better understanding compared to librarians and research administrators. Master's and doctoral students showed the lowest familiarity, with 22.41% being completely unfamiliar—consistent with age-based findings.

[Figure 3: see original paper]

Disciplinary analysis revealed varying awareness levels across fields. Computer Science, Physics, and Mathematics showed “healthy” distributions, with the highest proportions of researchers being very familiar with preprints. Despite the rapid international growth of biology preprint platforms, Chinese biology researchers did not demonstrate universal awareness: only about 13% were very familiar, while over 14% were completely unfamiliar.

[Figure 4: see original paper]

The survey also examined channels through which researchers learn about preprint platforms. Results showed that “journal articles/books” (60.23%)

and “peer recommendations” (55.55%) were primary sources, with “academic conferences” (25.52%) and “policy documents” (5.68%) also providing some exposure.

3.2.2 Widespread Recognition of Preprints’ Important Value in Scholarly Communication Among all participants, the majority considered preprints “very important” (34.38%) or “somewhat important” (33.31%) for scholarly communication. This perception was largely consistent across age, role, and discipline. Notably, researchers with preprint platform experience showed higher awareness and greater recognition of preprints’ importance (as shown in [Figure 5: see original paper]), suggesting that platform usage positively enhances appreciation of preprint communication value.

[Figure 5: see original paper]

3.3 Analysis of Chinese Researchers’ Preprint Platform Usage

This study examined usage patterns from three perspectives: preferences for domestic versus international platforms, usage behaviors and frequency, and functional requirements, with in-depth analysis across age, role, and discipline dimensions. Findings indicate that Chinese researchers currently rely heavily on foreign preprint platforms. Usage pattern differences primarily manifest across age groups, with no significant associations with discipline or role. Researchers aged 26-45 represent “high-engagement” users, while those aged 46-59 and 60+ constitute “high-publishing” users.

3.3.1 Platform Usage Preferences (1) Widespread Reliance on Foreign Preprint Platforms

[Figure 6: see original paper] shows that among the 1,109 researchers who had used preprint platforms, arXiv was most frequently used (68.26%), with ChinaXiv ranking second (34.08%). [Figure 7: see original paper] reveals that arXiv was the preferred platform for posting research (62.22% had posted there), followed by ChinaXiv (55.56%). As the world’s largest preprint platform, arXiv serves as the primary hub for Chinese researchers’ preprint communication. The substantial posting volume on ChinaXiv may reflect overlap between survey respondents and ChinaXiv users, but also demonstrates domestic researchers’ recognition of indigenous platform development.

Additional platforms used include bioRxiv, Research Square, medRxiv, and ChemRxiv, with many researchers posting on these platforms as well. This pattern indicates that Chinese researchers’ global preprint communication is both concentrated and dispersed, with early research findings shared across multiple international platforms.

[Figure 6: see original paper]

[Figure 7: see original paper]

(2) Platform Usage Across Age, Role, and Discipline

Researchers across all age groups predominantly used arXiv and ChinaXiv, with generally higher usage of arXiv. As shown in [Figure 8: see original paper], researchers aged 60 and above used ChinaXiv more than arXiv. All age groups posted more on arXiv than ChinaXiv, though posting volumes were similar among those aged 25 and below and those aged 60 and above.

[Figure 8: see original paper]

Usage preferences across roles were relatively concentrated. Frontline researchers (researchers and graduate students) used arXiv more frequently, while librarians and research administrators used ChinaXiv more than arXiv. Researchers and graduate students preferred posting on arXiv, with graduate students showing similar posting volumes on both platforms. Other roles posted less frequently overall.

[Figure 9: see original paper]

Platform preferences were highly discipline-dependent. Biology researchers used bioRxiv far more than other platforms, while Library and Information Science was the only field showing usage of multiple platforms beyond arXiv and ChinaXiv. Library and Information Science and Biology posted slightly more on ChinaXiv than arXiv, while other disciplines favored arXiv for posting.

[Figure 10: see original paper]

3.3.2 Usage Behaviors and Frequency (1) Weekly Usage Predominates, Typically Under One Hour

Among the 2,912 respondents, 968 reported using preprint platforms, with 656 having posted papers and 312 never having posted. This study examined usage behaviors among platform users.

shows that usage frequency concentrated on weekly or monthly patterns, with most sessions lasting less than one hour. Among authors posting on preprint platforms, most published 1-2 papers annually. Notably, no significant differences emerged between those who had posted and those who had only browsed.

(2) Variations Across Age, Role, and Discipline

Age-based analysis revealed distinct patterns (see). Researchers aged 26-45 were “high-engagement” users, with usage concentrated weekly or monthly and session durations typically under 1-2 hours. Over 50% in this age group posted 1-2 papers annually. High-publishing users were primarily middle-aged researchers (46-59) and senior researchers (60+), who posted more frequently despite lower usage frequency.

Role-based differences were not pronounced (see). Except for librarians, all roles showed weekly/monthly usage patterns and session durations under 1-2

hours. Researchers and graduate students predominantly posted 1-2 papers annually, while other roles rarely posted.

Disciplinary differences in usage behaviors were also minimal (see). Usage frequency and duration patterns were consistent across fields, with most researchers posting 1-2 papers annually. Exceptions included “high-publishing” users in Computer Science and Physics posting 6-10 or 11+ papers annually.

3.3.3 Functional Requirements for Preprint Platforms The survey revealed that researchers’ strongest functional needs were basic features: browsing papers, downloading papers, and posting papers. Secondary priorities included 学术交流 functions such as open peer review, academic community interaction, and preserving different versions of research outputs. Extended features like plagiarism detection also garnered interest.

(1) Basic Scholarly Communication Functions Are Primary Requirements

This study examined the gap between expected and current usage patterns, with positive values indicating desired features used less frequently than desired. Matrix heatmaps further analyzed specific functional needs across age, role, and discipline.

[Figure 11: see original paper] presents overall usage patterns and expectations for major functions. Researchers expressed greater desire to post, browse, cite, and comment on research, while showing less interest in recommending platforms or papers to others.

[Figure 11: see original paper]

Based on investigation of domestic and international platforms, we identified 13 key functions, including mainstream and future features. [Figure 12: see original paper] shows demand for each function. Browsing papers (77.55%), downloading papers (68.8%), and posting papers (67.54%) were most valued. Researchers also prioritized peer interaction through open review (38.77%), academic community exchange (29.49%), and preserving research versions (25.07%). Additional valued features included plagiarism detection, journal recommendation systems, and citation statistics.

[Figure 12: see original paper]

(2) Usage Expectations and Requirements Across Age, Role, and Discipline

All age groups showed high expectations for posting personal research, particularly early-career researchers aged 25 and below. Senior researchers aged 60+ prioritized citing research over commenting. All ages showed low interest in recommending platforms to others.

[Figure 13: see original paper]

Age-based differences in functional requirements were minimal (see [Figure 14: see original paper]). All groups strongly valued basic functions (browse, download, post) and 学术交流 functions (open review, community exchange, version preservation). Younger (\$ 25) and older (\$60) researchers particularly valued plagiarism detection and journal submission assistance.

[Figure 14: see original paper]

All roles showed high expectations for posting research, particularly librarians, who also valued citing and commenting. Except for librarians, all roles showed low interest in recommendation features.

[Figure 15: see original paper]

Role-based functional needs showed some variation (see [Figure 16: see original paper]). Beyond basic functions, librarians, research administrators, and journal editors prioritized 学术交流 features and extended functions like platform statistics and real-time citation displays.

[Figure 16: see original paper]

All disciplines showed high expectations for posting research, with varying expectations for other functions. Overall interest in recommendation features was low.

[Figure 17: see original paper]

Disciplinary differences in functional needs were notable (see [Figure 18: see original paper]). Beyond basic and 学术交流 functions, Library and Information Science researchers showed relatively balanced demand across all features. Astronomy researchers valued public comments, while Mathematics, Computer Science, and Physics researchers prioritized plagiarism detection.

[Figure 18: see original paper]

3.3.4 Motivations and Barriers to Preprint Platform Usage (1) Tension Between Intrinsic Motivations and External Barriers

shows that “rapid publication and sharing of research findings” (60.78%) and “securing network-first publication rights” (60.69%) were the primary motivations. “Peer usage” (51.49%) and “expanding research dissemination” (48.96%) were also significant drivers. Conversely, the main barriers were “preprints cannot be used for academic evaluation” (47.25%), “concerns about subsequent journal publication” (42.93%), and “fear of plagiarism” (42.54%). Additionally, “lack of awareness” (29.25%) affected usage.

These results reveal that while researchers recognize preprints’ 学术交流 value, external environmental factors inhibit participation. Without effective academic evaluation and intellectual property protection policies, researchers’ enthusiasm for preprint communication is suppressed. Future development requires not only intrinsic scholarly drivers but also a robust ecosystem providing policy, property

rights, incentive, and technical support to achieve the goal of advancing research through 学术交流.

(2) Motivations and Barriers Across Age, Role, and Discipline

Overall, motivations and barriers were consistent across demographics, with minimal variation by age, role, or discipline.

Combined results from [Figure 19: see original paper] and [Figure 20: see original paper] show age has limited influence. All age groups identified “securing network-first rights,” “rapid publication,” and “expanding dissemination” as primary motivations. Regarding barriers, except for senior researchers’ concerns about “unreliable peer review,” other ages consistently worried about plagiarism, evaluation limitations, and journal publication concerns.

[Figure 19: see original paper]

[Figure 20: see original paper]

Role-based analysis revealed different motivation structures (see [Figure 21: see original paper] and [Figure 22: see original paper]). Researchers and graduate students were primarily driven by peer usage, network-first rights, and rapid sharing. Other roles showed more diverse motivations influenced by their positions in the 学术交流 system—for example, librarians and administrators valued free access, while journal editors sought broad feedback. Regarding barriers, except for administrators’ and editors’ concerns about peer review, other roles consistently worried about plagiarism, evaluation limitations, and publication concerns.

[Figure 21: see original paper]

[Figure 22: see original paper]

Disciplinary analysis showed “peer usage” as the primary driver across fields, highlighting preprints’ characteristics as informal communication (see [Figure 23: see original paper] and [Figure 24: see original paper]). All disciplines valued network-first rights, rapid sharing, and expanded dissemination. Barriers were consistent across disciplines, focusing on plagiarism concerns, evaluation limitations, and publication worries. Physics and biology researchers most worried about intellectual property, while biology, astronomy, and mathematics researchers showed greater concern about republication issues. Nearly all disciplines expressed concerns about preprints’ recognition in academic evaluation.

[Figure 23: see original paper]

[Figure 24: see original paper]

(3) Motivations and Barriers Specific to Domestic Platforms

To understand attitudes toward domestic platforms, we examined ChinaXiv usage. Among 179 researchers who had posted on ChinaXiv, the most valued feature was Chinese language support, as major international platforms do not accept Chinese manuscripts, limiting rapid dissemination and China’s academic voice. ChinaXiv’s bilingual support addresses this critical need.

However, these researchers identified key shortcomings: preprints' limited role in academic evaluation (graduation, promotion, project completion), lack of integration with journal systems, and absence of reliable peer review.

[Figure 25: see original paper]

[Figure 26: see original paper]

3.4 Chinese Researchers' Cognition of and Needs for Preprint Policies

The rapid global development of preprint platforms relies on supportive policy frameworks that address key concerns: whether preprint posting affects journal publication and whether preprints can be included in academic evaluation. Major publishers and funding agencies worldwide have issued preprint policies [21]. Leading publishers like Springer Nature and Elsevier generally support manuscript posting. Funding agencies such as the U.S. National Institutes of Health (NIH) encourage preprint use to accelerate dissemination and enhance rigor, implementing the NIH Preprint Pilot to share funded research via PubMed Central and PubMed [12]. Professional societies like the UK Medical Research Council actively encourage preprint sharing and permit citation in funding and job applications [22]. UNESCO's Open Science Recommendation and national open science plans also promote preprint sharing.

While some preprint policy practices have emerged in China's research and journal communities, the overall policy environment remains underdeveloped, characterized by unclear positioning, incomplete platform policies, absent high-level strategic policies, and low journal participation. Understanding domestic researchers' policy cognition and needs is essential for constructing a new 学术交流 system.

3.4.1 Strong Demand for National and Institutional-Level Policies

(1) Overall Policy Cognition and Needs

Over 97% of domestic researchers recognized the importance of preprint policies for promoting preprint communication. More than 40% considered policy formulation very important, over 30% somewhat important, and over 23% moderately important. Only about 3% considered it unimportant ([Figure 27: see original paper]).

Among those recognizing policy importance, both "national-level" and "institutional-level" policies were considered most urgent. Among those rating policies as very important, 70% prioritized national-level policies, followed by institutional and journal-level policies. Demand for society-level policies was relatively lower ([Figure 28: see original paper]). This indicates that researchers demand top-level design while prioritizing policies from their own institutions and relevant journals.

[Figure 27: see original paper]

[Figure 28: see original paper]

(2) Policy Cognition and Needs Across Age, Role, and Discipline

All age groups recognized the importance of preprint policies, with senior researchers (60 years old) showing the strongest support (over 50% rating as very important). All ages prioritized national and institutional policies, followed by journal-level policies ([Figure 29: see original paper], [Figure 30: see original paper]).

[Figure 29: see original paper]

[Figure 30: see original paper]

All roles similarly recognized policy importance, with librarians showing the strongest support (over 50% rating as very important), followed by journal editors, researchers, and administrators. Graduate students showed the lowest proportion (37%) rating policies as very important, likely due to limited awareness and incomplete immersion in research careers. All roles prioritized national and institutional policies ([Figure 31: see original paper], [Figure 32: see original paper]).

[Figure 31: see original paper]

[Figure 32: see original paper]

All disciplines recognized policy importance, with Computer Science, Library and Information Science, and Physics showing over 50% rating policies as very important. Mathematics, Astronomy, and Biology also showed 30-40% in this category. All disciplines prioritized national and institutional policies. Mathematics, Computer Science, Physics, and Astronomy researchers also valued society-level policies ([Figure 33: see original paper], [Figure 34: see original paper]).

[Figure 33: see original paper]

[Figure 34: see original paper]

3.4.2 Journal Acceptance and IP Protection Are Top Policy Priorities

[Figure 35: see original paper] shows that researchers most strongly demand policies ensuring “journals allow submission after preprint posting” (71.5%) and “clear intellectual property rights attribution and protection” (70.5%). Over half also expressed strong need for “preprints as recognized academic achievements for promotion, graduation, and project completion” (56.39%) and “network-first rights recognition and protection” (50.14%).

[Figure 35: see original paper]

Age influenced policy needs to some extent ([Figure 36: see original paper]). All ages prioritized journal acceptance and IP protection. Demand for academic recognition decreased with age, while demand for network-first rights protection increased with age.

[Figure 36: see original paper]

Role had minimal influence on policy needs ([Figure 37: see original paper]). All roles prioritized journal acceptance and IP protection. Librarians, administrators, and graduate students showed stronger demand for academic recognition, while researchers also demonstrated substantial need (51.17%).

[Figure 37: see original paper]

Discipline had limited influence on policy needs ([Figure 38: see original paper]). All disciplines prioritized journal acceptance and IP protection. Library and Information Science and Biology researchers showed stronger demand for academic recognition, while Computer Science and Physics researchers prioritized network-first rights protection.

[Figure 38: see original paper]

4 Conclusions and Recommendations

This study employed an online questionnaire survey to examine Chinese researchers' cognition and usage of preprint platforms across three dimensions, with in-depth analysis by age, role, and discipline. The following conclusions emerge:

Cognition: Chinese researchers demonstrate moderate awareness of preprint communication, though overall cognition remains limited. Approximately half of respondents were relatively familiar with preprints, while one-third showed low awareness, particularly master's and doctoral students under 25. Even in fields with well-developed international preprint communication (Mathematics, Physics, Biology), some researchers remain completely unaware. Among those familiar with preprints, most recognized their importance for scholarly communication.

Usage: Usage patterns vary across age and discipline, with foreign platforms being the preferred choice. Chinese researchers typically use preprint platforms weekly, with sessions mostly under one hour. Mathematics, Physics, Computer Science, Biology, and Astronomy researchers show higher usage rates. Basic 学术交流 functions (browsing, downloading, posting) are most valued. Researchers aged 26-45 are "high-engagement" weekly users with greater awareness, while those aged 46-59 and 60+ are "high-publishing" users with lower frequency but higher output. [Figure 39: see original paper] illustrates profiles of these two groups. Notably, while domestic platforms show growing usage and recognition, foreign platforms (primarily arXiv) remain dominant. The concentration of early research findings on a single foreign platform raises concerns about national academic discourse power and data security.

[Figure 39: see original paper]

Policy Needs: Researchers widely recognize that preprint policies are crucial for promoting preprint communication and platform development. "National-

level” and “institutional-level” policies are most urgently needed, followed by “journal-level” and “society-level” policies. The strongest policy demands are for “journal acceptance after preprint posting” and “clear intellectual property protection.”

Barriers: Significant obstacles hinder participation. “Rapid publication and sharing” and “securing network-first rights” are primary motivations, while concerns about “lack of academic recognition,” “journal publication barriers,” and “plagiarism risks” are major deterrents. Additionally, “lack of integration with journal systems” and “absence of reliable peer review” reduce enthusiasm for domestic platforms. Addressing these barriers would enhance participation.

Based on these findings, we propose four recommendations:

(1) Enhance Young Researchers’ Preprint Platform Cognition

The 学术交流 system is transforming profoundly. Improving young researchers’ awareness will increase open science participation, cultivate open sharing consciousness, enhance research reproducibility and transparency, and develop preprint literacy. This will expand information access channels, cultivate more preprint volunteers and reviewers, and facilitate international collaboration. Currently, “lack of awareness” is a dominant barrier, particularly among graduate students, reflecting gaps in research training. Even in fields with high preprint acceptance, some Chinese researchers remain unaware, likely due to varying international engagement, absence of an autonomous Chinese preprint community, and lack of integration with evaluation and journal policies. We recommend strengthening preprint literacy education for young researchers, particularly graduate students, to enhance their ability to participate in and benefit from preprint communication.

(2) Address Diverse User Needs Through Targeted Promotion and Services

Platform development depends on meeting researchers’ 学术交流 needs. This study reveals significant usage differences across disciplines, ages, and education levels, affecting platform scale and development. These variations stem from limited awareness, insufficient participation, and the incomplete domestic preprint ecosystem. For instance, high-energy physics developed preprint prototypes in the 1940s, while biomedicine only widely adopted preprints in the 2000s. Therefore, China’ s preprint platform construction should not adopt a “one-size-fits-all” approach. We recommend prioritizing fields with strong preprint awareness to expand influence gradually, strengthening promotion through journals, conferences, and policy documents, and attracting high-publishing senior researchers to influence early-career adoption.

(3) Improve Platform Functionality and Achieve System-Wide Interconnection

Platform functionality directly affects user experience and engagement. China should prioritize basic and 学术交流 functions, optimize posting processes, en-

hance usability and security, and improve interface friendliness. Strengthen quality control mechanisms to address peer review concerns and improve overall preprint quality. Develop 学术交流 communities and collaborate with academic communities to expand professional user bases.

Simultaneously, platforms should strengthen integration with journal submission systems and third-party academic services. As open science advances, integration among preprint platforms, open peer review, journal publishing, and indexing databases is becoming standard. Chinese platforms should lead 学术交流 system reconstruction by collaborating widely with academia, journals, and publishers to create a new open scholarly communication ecosystem.

(4) Establish a Multi-Tiered Preprint Policy System for Institutional Support

Policies are critical for promoting preprint communication. Researchers show strong consensus on policy importance and urgent demand for supportive policies. China should strengthen top-level design to create a multi-tiered, comprehensive policy system aligned with 学术交流 principles, evaluation needs, and researcher demands, particularly integrating preprints into academic evaluation systems to support rapid dissemination and utilization of high-quality research.

The multi-tiered policy system should focus on four aspects: First, promote national-level policies to guide platform development and overcome institutional barriers. Second, encourage institutions to develop tailored preprint policies that align with evaluation systems, guide platform usage, cultivate preprint literacy, and support platform construction. Third, collaborate with societies to raise awareness and encourage member participation. Fourth, support journals in establishing preprint policies that create effective linkages between manuscripts, reviewed preprints, and published papers, fostering coordinated development between platforms and journal publishing.

In conclusion, preprints are vital components of open science, and preprint platforms constitute essential elements of China's high-end 学术交流 platform construction. The scholarly community is the primary participant in preprint communication. Building influential preprint platforms that meet China's scientific innovation needs requires comprehensive understanding of researcher cognition, usage, and policy needs. This survey serves that purpose. Our research team will continue this study regularly to track evolving patterns and provide ongoing references for domestic preprint platform and ecosystem development.

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

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