

A Comparative Study of Researchers' Perceptions and Usage Motivations of Academic Social Networks: Postprint

Authors: Bi Deqiang, Shiqing Huang, Dong Ying, Wang Jue

Date: 2023-07-26T00:00:00+00:00

Abstract

[Purpose/Significance] To investigate the awareness of social networks among Chinese and foreign researchers, and to conduct a comparative study on the purposes, motivations, and needs of academic workers in using social networks. [Methods/Process] Using a questionnaire survey method, data on awareness, usage motivations, and access information regarding social networks were collected from 707 respondents from major domestic universities, and the survey results were compared with Nature's research findings. [Results/Conclusions] The results show that the usage rate and awareness of academic social networks among Chinese researchers are not very high. Domestic researchers tend to prefer socially-oriented websites, while using academically-oriented websites less frequently. Among foreign mainstream ASNS platforms, Chinese users have a certain level of awareness of ResearchGate.

Full Text

Preamble

A Comparative Study on the Cognition and Use Motivation of Academic Social Networks Among Scientific Research Users

Bi Deqiang¹, Huang Shiqing², Dong Ying¹, Wang Jue¹

¹Library of Harbin Normal University, Harbin 150025

²School of Media, Harbin Normal University, Harbin 150080

Abstract

[Purpose/Significance] This study investigates Chinese and foreign researchers' awareness of social networks and compares the purposes, motivations, and needs of academic workers using social networks. [Method/Process]

Using questionnaire surveys, we collected data on 707 respondents from major domestic universities regarding their awareness of social networks, usage motivations, and access patterns, and compared these results with findings from *Nature*. **[Results/Conclusion]** The results show that Chinese researchers' usage rate and awareness of academic social networks are not particularly high. Domestic researchers tend to favor socially-oriented websites, while using academically-oriented sites less frequently. Among foreign mainstream ASNS platforms, Chinese users demonstrate a certain level of awareness of ResearchGate.

Keywords: social network; awareness; usage analysis

Classification Number: G252

DOI: 10.13266/j.issn.0252-3116.2019.06.012

The rapid development of social media has transformed how people interact, access, and share information. Social Networking Sites (SNS) are Web-based services that enable individuals to build connections, construct personal profiles, and view others' profiles [1]. Researchers can use SNS to expand their professional networks, learn from peers, locate experts to solve problems, and identify potential collaborators, with academic communities being specific users of these professional SNS platforms. Academic Social Networking Sites (ASNS) refer to online services, tools, or platforms that help researchers establish professional networks with peers and support their research activities, including platforms such as ResearchGate, Academia, and Mendeley. In general, researchers visit both general-purpose social networking platforms like Twitter and Facebook, as well as specialized academic social networking platforms to share academic resources, exchange ideas, follow peers' research, track recent trends, and build professional networks.

The academic use of social networking sites has attracted increasing attention. In May 2014, *Nature* conducted a survey on social networking tools, investigating researchers' purposes, motivations, and needs for using social networks [2]. Building on this research, we conducted a comparative analysis with Chinese researchers' usage of social networking tools. This study's significance lies, first, in providing guidance for constructing academic social platforms in China. Compared with foreign platforms, China's academic social platforms lag in both social functionality and resource openness, and bridging this gap requires understanding Chinese users' awareness and needs regarding academic social platforms. Second, although academic social platforms are becoming increasingly popular among academic communities and playing a growing role in scientific collaboration formation, comprehensive research on users' cognition of these platforms remains limited. This paper aims to explore and identify Chinese researchers' usage patterns across different academic social platforms, clarifying their awareness, needs, and motivations for using academic social platforms. The survey questionnaire helps understand Chinese researchers' awareness and usage of academic social platforms, and through horizontal comparison, reveals obstacles and challenges Chinese researchers encounter when using academic

social networking platforms.

2. Related Research Progress

Existing research indicates that researchers' usage of academic social platforms is relatively low. H.M. Bik's 2013 study showed that only 2.5% of researchers in the UK and US had created Twitter accounts [3]. In 2013, Li Lingli et al. investigated academic social network usage on Academia, finding that student groups constituted the main user base, with limited participation from other user roles [4]. Spanish scholar J.L. Ortega proposed the penetration index concept in 2015, calculated as the number of users who established profiles on an SNS platform from an institution divided by the total number of faculty members at that institution. His research found that Spain's CSIC had an overall PI of 39.2%, with variations across research fields—humanities and social sciences and natural sciences reached the highest PI at 53%, while biology and materials science were lower at 31.4% and 35.2%, respectively. The institution's PI values across various ASNS platforms were: RG (54.9%), GSC (21.4%), Mendeley (12.8%), and Academia (10.7%) [5].

In 2017, Zhang Yaokun et al. surveyed 378 Chinese Changjiang Scholars on four academic social websites—ResearchGate, Mendeley, Academia, and Xueshuquan—finding that the overall registration rate of Chinese high-impact researchers on major academic social networks did not exceed 50% [6]. Beyond low usage rates, several studies indicate uneven user distribution across platforms. For example, humanities scholars primarily use Academia [7], computer and information scientists prefer GSC [8], and ResearchGate has become the target platform for biologists. In 2011, A.C. Bullinger et al. concluded that the boundaries between most ASNS were becoming increasingly blurred [9].

In 2011, O. Almousa classified users and identified usage patterns on the Academia platform. At that time, while user behavior research existed for social platforms like Twitter and Facebook, academic social platform user behavior research remained in its infancy [10]. Philosophers and anthropologists were the most active users on the platform, with faculty and graduate students showing similar usage patterns. Further, M. Thelwall downloaded resume information from 30,167 philosophy users to study gender differences in academic social website usage, finding no significant gender differences in research reading behaviors [7].

A.Mas-Bleda et al. studied the performance and usage behaviors of European highly-cited scholars on Google Scholar, Microsoft Academic Search, Mendeley, Academia, LinkedIn, and SlideShare, selecting 1,517 highly-cited scientists from 21 disciplines across 22 European countries from the ISIHighlyCited.com platform, dividing disciplines into engineering, physics, medicine, life sciences, and social sciences. The results showed that if scientists registered on one social platform, they were more likely to create personal profiles on additional platforms, particularly in life sciences and engineering [11].

Deng Shengli from Wuhan University analyzed disciplinary differences in user reading behaviors on academic social networks, finding significant differences in reader identity and affiliation fields. ResearchGate showed higher document reading counts than Mendeley generally, with soft disciplines like social sciences showing greater relative advantages in document reading, while hard disciplines like physics showed lower consistency [12].

Academic social networks have become a research hotspot in library and information science, with academia producing a series of representative literature focusing primarily on development status, usage needs and service functions, operational performance, research performance, and altmetrics, with less exploration of deeper patterns. Research on academic social network user behavior primarily selects researchers from universities and research institutes as survey objects—the main gathering places for researchers. Selecting comprehensive universities or research institutes as survey objects ensures representativeness to some extent. Based on existing research, this study first uses questionnaire surveys to investigate Chinese scholars' awareness, usage, motivations, and needs regarding academic social networks, comparing these with existing findings on foreign scholars' cognition and usage motivations for SNS.

3. Questionnaire Design and Distribution

3.1 Questionnaire Design

The questionnaire primarily explores how Chinese scientists and scholars use social networking platforms to support their career development. The survey consists of three parts: 1. Basic information, including research interests, age, education, and professional title; 2. Social network registration and access information, including registration and visit frequency, whether they have a personal website, and how often they update personal profiles; 3. Researchers' cognitive usage motivations for social networks, including purposes, motivations, needs, and satisfaction levels.

The survey of social network awareness uses a three-level scale with options representing users' awareness levels: "aware and visit regularly," "aware but do not visit frequently," and "unaware." The surveyed social networking platforms include Twitter, Facebook, Frontiers, Academia.edu, ResearchGate, LinkedIn, BioMedExperts, Google+, Mendeley, Pubchase, MyScienceWork, Google Scholar, Microsoft Academic Search, ORCID, ResearcherID, Figshare, MLA Commons, Baidu Scholar, DXY.cn, Xiaomuchong, ScienceNet, and Scientist Online.

Drawing on comprehensive literature regarding usage motivations, this survey examines nine motivations: having registered but not purposefully maintaining a profile; regularly maintaining a profile to establish research connections; posting work-related content; discussing research issues and expressing opinions; seeking job opportunities; searching for funding opportunities; searching for

and contacting senior researchers in one's field; following discussions on other academic issues; and tracking personal academic performance.

Finally, two 5-point Likert scale questions collect overall user satisfaction: (1) "I think I should use these platforms to do more to promote my research"; (2) "I do not think registering on such platforms is very important for a researcher." Response options of "strongly agree," "agree," "neutral," "disagree," and "strongly disagree" represent users' overall satisfaction levels with social networks.

3.2 Questionnaire Distribution and Recovery

The questionnaire was edited through Wenjuanxing and distributed via email and WeChat to user groups at universities nationwide, receiving 707 responses between May 10 and May 25, 2018. In terms of age distribution, the top three age groups were 35-44, 25-34, and 18-24. Among respondents aged 45 and above, the number decreased with age, with those aged 55+ comprising only 2.4% of the total. Regarding education, master's students accounted for 41.7%, doctoral students 38.9%, and undergraduates 20.2%. In professional titles, students were the largest group at 42.7%, followed by associate professors/associate researchers/senior professionals at 23.7%, lecturers/assistant researchers/intermediate professionals at 20.5%, while professors/researchers/principal professionals, junior professionals, and post-doctoral researchers comprised only 13.1% combined. By discipline, humanities and social sciences accounted for 41.7%, engineering 31.1%, sciences 14.8%, medical sciences 8.4%, and agricultural sciences the smallest at 4.0%.

For comparative study, *Nature* distributed questionnaires via email to over 10,000 researchers, receiving 3,500 responses from 95 countries.

3.3 Questionnaire Reliability Analysis

The study verified questionnaire reliability by calculating Cronbach's alpha coefficient. The overall questionnaire reliability coefficient α was 0.855, with all subscale reliability coefficients α exceeding 0.725.

4. Comparative Analysis of Chinese and Foreign Academic Workers' Social Network Cognition and Usage

4.1 Analysis of Academic Workers' Social Network Awareness

Figure 1 [Figure 1: see original paper] presents the analysis of domestic and international academic workers' awareness of mainstream social networks. *Nature*'s survey results show that among foreign researchers, LinkedIn as a professional job-search website has awareness levels consistent with Google Scholar, both exceeding 90%. ResearchGate, as a dedicated academic social website, is well-known among researchers, with over 88% of respondents aware of the platform—second only to Google Scholar and higher than tools like Twitter and

Facebook. Among regular ResearchGate users, 29% have registered and created profiles on the platform.

Regarding Chinese academic workers' awareness of social networks, results are generally consistent with foreign patterns: nearly 70% of respondents know Google Scholar, 50% know LinkedIn, and ResearchGate awareness stands at 36%. However, in overall SNS awareness, domestic scholars lag behind foreign scholars, particularly in regular visits, showing a significant gap with foreign researchers.

4.2 Usage Motivation Analysis

Figure 2 [Figure 2: see original paper] analyzes usage motivations between domestic and international users. Among Chinese respondents, the top three motivations are: acquiring and downloading others' academic achievements (41%), following discussions on other academic issues (35%), and discussing research problems and expressing opinions (20%). Among foreign respondents, the top three motivations are: posting work-related content, searching for and contacting senior researchers in one's field, and following discussions on other academic issues—all within the 40-50% range.

Nature's survey indicates researchers have varying purposes and motivations for using social websites. ResearchGate and Academia are primarily used for contacting collaborators and uploading papers, Mendeley for finding new papers, and GSC for viewing citations.

Chinese research users' needs and motivations for academic social websites focus primarily on retrieving and downloading academic resources. Analysis results across different education levels, professional titles, and disciplinary fields all show that users emphasize acquiring academic information resources through academic social network platforms, while showing lower demand for more important academic social website functions and services such as research collaboration and online communication. Additionally, foreign scholars utilize academic social website functions more fully, valuing academic sharing and online communication functions, whereas Chinese research users' engagement with academic social networks remains at the information acquisition stage, requiring improved utilization of ASNS platform functions.

4.3 Access Duration and Frequency

Figure 3 [Figure 3: see original paper] statistically analyzes users' experience with academic social networks. The results show that 30% have over two years of experience and 30% have less than three months; those with 1-2 years and those with more than three months but less than one year each account for about 20%. This indicates that academic social networks are gradually gaining popularity among scholars. Regarding visit frequency, most users access platforms at least once weekly, while those who never visit account for 19.54% of all respondents.

Nature respondents show significant variation in SNS access duration and frequency: 40% visit dedicated academic social websites at least weekly; about 10% visit at least daily; over half have used ASNS for more than two years. Respondents show more prominent usage on public social media like Twitter and LinkedIn, with most users visiting at least daily.

4.4 Overall Satisfaction Analysis

The questionnaire collected overall user satisfaction through two questions: “I think I should use these platforms to do more to promote my research” and “I do not think registering on such platforms is very important for a researcher,” with responses on a 5-point scale. As Figure 4 [Figure 4: see original paper] shows, both domestic and foreign respondents affirm SNS tools’ supportive role in research, with over 70% considering SNS very important for researchers. Among Chinese respondents, those holding neutral attitudes are generally higher than foreign respondents, consistent with the finding that Chinese scholars have lower SNS awareness than foreign scholars.

Chinese research users’ needs and motivations for academic social websites focus on retrieving and downloading academic resources. Analysis across different user attributes shows consistent emphasis on acquiring academic information through these platforms, with lower demand for research collaboration and online communication. Foreign researchers utilize academic social website functions more comprehensively, valuing academic sharing and online communication, while Chinese users remain at the information acquisition stage, requiring enhanced utilization of ASNS platform functions.

Compared with foreign research, literature surveys indicate that academic social network usage rates, initially low, are gradually increasing, suggesting these platforms are gaining popularity among scholars. However, foreign researchers show stronger awareness and usage of international mainstream academic social networks than Chinese scholars, whose awareness and usage are relatively weaker—related to language barriers, restricted access to foreign websites, and poor system stability.

5. Problem Analysis of Chinese University Users’ Academic Social Website Usage

5.1 Usage Barrier Analysis

Research on social networks’ academic support functions originated from researchers using Web 2.0 tools and social media service platforms for information resource sharing and academic communication. These tools and platforms have broadened traditional academic networks based on academic publishing, significantly shortening academic communication cycles.

Although non-academic social networking platforms are increasingly popular for researcher communication and collaboration, they present problems and limita-

tions when building professional networks. Research users struggle to establish boundaries between personal and professional lives on such platforms, resulting in privacy loss and necessitating multiple platform accounts [13]. In-depth analysis of 140 non-users from this survey shows that most (69.77%) had never heard of academic social networks. Other reasons include: too busy (19.53%), unable to find platforms meeting personal needs (17.67%), concerns about personal information leakage (10.7%), skepticism about academic social networks' usefulness (5.58%), concerns about misuse of personal research achievements (5.12%), perceived inconvenience (4.19%), distrust of academic social networks (2.79%), and unwillingness to communicate and share with others (0.93%).

Additionally, China currently lacks internationally influential, specialized, comprehensive academic social networking platforms. While Baidu Scholar provides maximally open resource sharing, it lacks interactive features essential to social networking, and other platforms overemphasize Q&A services. This also contributes to Chinese users' low awareness of academic social networks.

5.2 Cognition and Usage Motivation Issues Requiring Improvement

Literature surveys show academic social network usage rates, initially low, are gradually increasing, indicating growing popularity among scholars. Chinese research users' utilization of academic social websites correlates with user role distribution: males show higher usage 倾向 than females; younger groups higher than middle-aged and elderly; students higher than faculty; doctoral students higher than master's and undergraduates; professors, students, and postdocs generally higher than other professional titles; agricultural and engineering fields higher than other disciplines; and those with overseas study experience higher than those without.

Chinese scholars show relatively high usage frequency, indicating increasing researcher dependence on academic social tools for broader academic communication. Most users report that their primary purpose is acquiring academic achievements, related to the fundamental research activity of reading references. However, usage rates among Chinese university users require further improvement. Compared with foreign research, Chinese scholars show lower awareness of international mainstream ASNS platforms. Foreign researchers frequently use Google Scholar and ResearchGate, while Chinese scholars' awareness and usage of international mainstream academic social networks are relatively weak—related to language barriers, restricted access to foreign websites, and poor system stability.

Regarding usage needs and motivations, Chinese scholars exhibit a phenomenon of emphasizing acquisition while neglecting interaction: they focus more on acquiring academic information resources, while foreign scholars utilize academic social website functions more fully, valuing academic sharing and online communication. This indicates Chinese university users remain at the information acquisition stage, requiring improved utilization of ASNS platform functions.

In summary, Chinese research users' engagement with academic social websites remains primarily at the academic resource acquisition stage, with limited utilization of more important functions and services such as research collaboration and online communication—related to low awareness of international mainstream ASNS and the scarcity of specialized domestic academic social websites.

References

- [1] BOYD D M, ELLISON N B. Social network sites: definition, history, and scholarship[J]. *Journal of Computer-Mediated Communication*, 2010, 38(3): 16-31.
- [2] NOORDEN R V. Online collaboration: scientists and the social network[J]. *Nature*, 2014, 512(7513): 126-129.
- [3] BIK H M, GOLDSTEIN M C. An introduction to social media for scientists[J]. *PLoS biology*, 2013, 11(4): e1001535.
- [4] 李玲丽, 吴新年, 张甫. 开放型科研社交网络应用调查与分析——以 Academia.edu 为例 [J]. *情报资料工作*, 2013, 34(1): 90-93.
- [5] ORTEGA J L. Disciplinary differences in the use of academic social networking sites[J]. *Online information review*, 2015, 39(4): 520-536.
- [6] 张耀坤, 张维嘉, 胡方丹. 中国高影响力学者对学术社交网站的使用行为调查——以教育部长江学者为例 [J]. *情报资料工作*, 2017(3): 96-101.
- [7] THELWALL M, KOUSHAK K. Academia.edu: social network or academic network?[J]. *Journal of the Association for Information Science & Technology*, 2014, 65(4): 721-731.
- [8] ORTEGA J L, AGUILLO I F. Science is all in the eye of the beholder: keyword maps in Google scholar citations[J]. *Journal of the Association for Information Science & Technology*, 2012, 63(12): 2370-2377.
- [9] BULLINGER A C, HALLERSTEDE S H, RENKEN U, et al. Towards research collaboration? a taxonomy of social research network sites[C]////Sustainable IT Collaboration Around the Globe. 16th Americas Conference on Information Systems. Lima: AMCIS, 2010: 12-15.
- [10] ALMOUSA O. Users' classification and usage-pattern identification in academic social networks[C]//Applied Electrical Engineering and Computing Technologies. Piscataway: IEEE, 2012: 1-6.
- [11] MAS-BLEDA A, THELWALL M, KOUSHAK K, et al. Do highly cited researchers successfully use the social web?[J]. *Scientometrics*, 2014, 101(1): 337-356.
- [12] 邓胜利, 向阳. 基于学术社交网络的文献阅读及学科关注点差异研究 [J]. *图书情报工作*, 2017, 61(6): 99-106.

[13] GRUZD A. Non-academic and academic social networking sites for online scholarly communities[M]//NEAL D R. Social media for academics. London: Woodhead Publishing Limited, 2012.

Author Contributions

Bi Deqiang: Conceptualized the topic outline, wrote and revised the paper;
Huang Shiqing: Conducted empirical operations, data processing and analysis;
Dong Ying: Data processing and paper writing;
Wang Jue: Data collection and processing.

The Comparative Study on the Cognition and Use Motivation of Academic Social Network of Scientific Research Users

Bi Deqiang¹ Huang Shiqing² Dong Ying¹ Wang Jue¹

¹Library of Harbin Normal University, Harbin 150025

²School of Media, Harbin Normal University, Harbin 150080

Abstract: [Purpose/significance] This paper investigates the cognition of Chinese and foreign researchers on social networking, and makes a comparative study on the purpose, motivation and needs of academic workers using social networks. [Method/process] Based on questionnaires, users' awareness of social networks, use motivation, and access information from 707 Chinese respondents are collected. The results are compared with the investigation from *Nature*. [Result/conclusion] The result shows that Chinese scholars are not very aware of the use of the SNS, and tend to use Google Scholar. In foreign main SNS platforms, Chinese scholars have a certain degree of awareness of ResearchGate. In addition, Chinese scholars mainly use SNS to acquire academic information and less for more important functions, such as research cooperation and communication.

Keywords: social network awareness usage analysis

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

Source: ChinaXiv — Machine translation. Verify with original.