

TAN, Qinyi, ZHANG, Simeng and TENG, Luyan. The temporal characteristics of online interest in after-school services: An Analysis of Baidu Index Data. *Pedagogy and Psychology of Sport*. 2025;24:64298. eISSN 2450-6605.
<https://doi.org/10.12775/PPS.2025.24.64298>
<https://apcz.umk.pl/PPS/article/view/64298>

The journal has had 5 points in Ministry of Science and Higher Education parametric evaluation, § 8. 2) and § 12. 1. 2) 22.02.2019. © The Authors 2021; This article is published with open access at Licensee Open Journal Systems of Nicolaus Copernicus University in Torun, Poland Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike. (<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

The authors declare that there is no conflict of interests regarding the publication of this paper.
Received: 29.07.2024. Revised: 29.07.2025. Accepted: 09.08.2025. Published: 20.08.2025.

The temporal characteristics of online interest in after-school services: An Analysis of Baidu Index Data

Qinyi Tan[†], ORCID <https://orcid.org/0000-0002-2291-4554>

E-mail qinyi.tan@outlook.com

Center for Studies of Education and Psychology of Ethnic Minorities in Southwest China,
Southwest University, Chongqing, China

Simeng Zhang[†], ORCID <https://orcid.org/0009-0008-3379-1722>

E-mail 1213453615@qq.com

Center for Studies of Education and Psychology of Ethnic Minorities in Southwest China,
Southwest University, Chongqing, China

Luyan Teng*, ORCID <https://orcid.org/0000-0001-7673-3217>

E-mail luyan.teng@outlook.com

College of International Education, Sichuan International Studies University, Chongqing,
China

[†] Equal contributors

*Corresponding Author

Abstract

Objective: This study aims to systematically quantify and analyze the temporal evolution of public online search behaviors regarding after-school services since the implementation of the Double Reduction policy. By thoroughly exploring the changing characteristics of public interest, the study seeks to reveal the potential impact of policy implementation on societal educational demands, providing data support and decision-making references for the optimization and implementation of education policies.

Methods: The Baidu Index is a publicly accessible database that accesses search query data in a systematic and quantitative manner for searches for after-school services as key terms. We queried the search volume for after-school services, identified the most commonly used terms, and extracted data from China for the period between July 1, 2021 and June 30, 2025.

Results: The study results show that in September 2021, when the Double Reduction policy began to be implemented across China, searches for the term after-school services peaked, followed by a downward trend. Public interest in the term was higher during the school season and lower during the winter and summer vacations.

Conclusion: The implementation of the after-school services policy has indeed brought convenience to the public, increased opportunities for student participation in activities, and promoted the holistic development of students. To better advance this policy, further optimization is needed to align with the United Nations' Sustainable Development Goals (SDGs).

Key words: After-school services; Search engine; Baidu Index; Big data; Temporal trends

1. Introduction

The development of after-school services in Chinese primary and secondary schools began in the 1990s and has undergone multiple stages of exploration and refinement (Gao et al., 2022). A significant milestone was reached in 2021 with the introduction of the Double Reduction Policy, which marked a new phase in the historical evolution of these services. The Opinions on Further Reducing the Burden of Homework and Off-Campus Training for Students at the Compulsory Education Stage highlight the importance of ensuring sufficient service duration and enhancing service quality to address the diverse needs of students (General Office of the CPC Central Committee & General Office of the State Council, 2021). After-school services, provided by compulsory education schools from Monday to Friday, require a minimum duration of two hours and are scheduled to align with the local standard off-duty time (Yu, 2022). Since the policy's implementation, regions across China have actively responded. These services not only ensure that students complete their homework efficiently at school but also offer ample opportunities to engage in hobbies and interests, thereby supporting their individual growth (Niu, 2023). The necessity for after-school services arose from two main challenges. First, the prevalent issue of “3:30 p.m. school dismissal”, particularly in primary schools, created difficulties for working parents managing pick-up schedules (Zhou & Qi, 2022). Second, off-campus training institutions, known for high fees and advanced curricula, imposed excessive learning burdens that adversely affected students' physical and mental health (Bu & Li, 2023). To address these concerns, the Double Reduction Policy aims to restructure the education landscape, reduce reliance on extracurricular training, and enhance on-campus learning experiences (Xue & Li, 2024). Promoting after-school services ensures that education remains centered within the school environment, ultimately fostering the healthy and holistic development of students (Xie & Zhang, 2023).

With the rapid expansion of the Internet industry, search engines have become indispensable platforms for public information access (Tan et al., 2024). Among them, Baidu and Google stand out as leading tools, offering users convenient and efficient access to information. In particular, the Baidu Index provides robust data analysis capabilities, allowing for in-depth examination of keyword search trends and offering valuable insights into public opinion, market demand, and user behavior (Zhang et al., 2017). The applications of the Baidu Index span multiple fields. For example, it has been utilized to investigate the impact of

investor attention on financial asset price volatility (Yan, 2020). It has also facilitated research on the relationship between investor attention and stock price crash risks (Bai et al., 2023) and has contributed to the analysis of public concerns related to wine consumption (Li et al., 2021). Furthermore, the Baidu Index has proven valuable in tourism research, aiding in the analysis of 5A-level tourism site attention in the Xinjiang Uygur Autonomous Region (Liang et al., 2021) and forest tourism trends in Guangdong Province (Lin & Xu, 2024). Collectively, these studies underscore the versatility and analytical power of the Baidu Index across diverse domains. Its ability to track and interpret public interest patterns reinforces its significance as a crucial tool for researchers, facilitating data-driven insights in fields ranging from finance and consumer behavior to tourism and public opinion monitoring.

This study aims to use the Baidu Index as a tool to explore the public's online interest to the topic of after-school services since the implementation of the Double Reduction policy. Here, we hypothesize that public interest in after-school services is on the rise.

2. Research methods

The Baidu Index, a public and free tool, derives its data from the behavior and interests of a wide range of Internet users. It is able to retrieve keyword search trends and geographic variability, which allows us to gain insight into the interests and behavioral patterns of Internet users (He et al., 2022). The Baidu Index is able to accurately reflect the level of interest a keyword receives on Baidu's search engine during a specific time period. On a demographic level, by investigating these online search results and searching for keywords, we can reveal the interests, salary needs, and behavioral patterns of Internet users (Tan et al., 2024). Trends research is an important research tool for the Baidu Index, which covers overall trends, PC trends, and mobile trends, providing us with a comprehensive and detailed analysis of search trends.

This study attempts to quantify the public interest in after-school services and online search behavior since the implementation of the double reduction policy, including overall trends, PC trends, and mobile trends. Data for this study were collected using Baidu Index, extracted from July 1, 2021 to June 30, 2025 in China. All searches were conducted on July 5, 2025.

3. Research results

Since the implementation of the double reduction policy, online searches for the keyword after-school services have exhibited an overall trend of first increasing and then decreasing (Figure 1). The search patterns on both mobile and PC platforms align with this overall trends (Figures 2 and 3). Notably, the peak in search volume occurred in September 2021, followed by a gradual decline. This fluctuation is closely linked to the academic calendar, particularly the start and vacation periods of schools. Search volume typically rises at the beginning of each new semester and declines during winter and summer breaks. In particular, during July and August—when the policy was first introduced—search volume remained relatively low due to the ongoing vacation period.



Figure. 1. Overall Search Trend of the Baidu Index (PC + Mobile) for “After-School Services” from July 1, 2021, to June 30, 2025.



Figure. 2. PC Search Trend of the Baidu Index for “After-School Services” from July 1, 2021, to June 30, 2025.



Figure. 3. Mobile Search Trend of the Baidu Index for “After-School Services” from July 1, 2021, to June 30, 2025.

4. Discussion

Currently, Internet information services are in a stage of rapid development, and the application of the Internet has affected all walks of life (Wang & Dong, 2024). The change of Internet users' search behavior for information have undoubtedly become an important wind vane reflecting the people's attitudes and thoughts about a certain thing. In the context of the double reduction policy, after-school services for primary and secondary schools have become an important part of the country to promote the all-round of development of students (Fu & Guo, 2024). This is not only an important project for the people's livelihood (Yang & Tan, 2023), but also a key initiative to promote equity in education (Liu, 2022). With the implementation of after-school services in schools across the country, this topic has quickly attracted widespread interest from all sectors of society. However, its subsequent development and the degree of sustained interest from all walks of life still need to be further explored and researched. In recent years, the rapid development of Internet technology has greatly changed the way people obtain information (Han & Pan, 2023). According to the Statistical Report on the Development of the Internet in China, as of December 2024, the number of Internet users in China had reached 1.108 billion, and the Internet penetration rate had reached 78.6% (CNNIC, 2025). This large group of Internet users has provided a great opportunity to utilize Internet information to obtain relevant data. The Internet has become a gathering place for public interest and discussion of hot topics, and Internet search data often reflect dynamic changes in the social environment (Lin & Wang, 2024).

This study examines public interest in after-school services using the online search volume of the Baidu Index as an entry point. The results indicate that the Baidu Index reached a significant peak in September 2021. Several factors contributed to this trend. First, the Double Reduction policy, introduced in July 2021, explicitly defined the duration, quality, and implementation channels of after-school services (Mai, 2022). Although the policy was issued during the summer vacation, initial search interest remained moderate. However, with the start of the new semester in September, extensive media coverage and promotional efforts by teachers and schools quickly brought after-school services into the public spotlight. Second, the Ministry of Education emphasized four core tasks related to after-school services: comprehensive coverage, guaranteed service duration, strengthened safeguards, and quality improvement. The ministry also set a goal to achieve full coverage of after-school services in

compulsory education schools by the beginning of the fall semester (General Office of the Ministry of Education, 2021). The release of this directive, along with the deepening implementation of the Double Reduction policy, further fueled public interest in after-school services. Furthermore, since the start of the fall 2021 semester, various regions have actively responded by implementing diverse forms of after-school services. Local governments have facilitated the integration of off-campus non-disciplinary educational resources and high-quality teachers into schools (Yang, 2023), aiming to enrich after-school service content, develop locally distinctive curriculum systems, and provide students with a more diversified and comprehensive learning platform. At the initial stage of policy implementation, the public had numerous questions regarding specific content and execution methods, prompting a surge in online searches and discussions. Notably, as schools intensified their publicity efforts and promoted after-school services after the semester commenced in September, public awareness increased, leading to a decline in search demand. However, over time, as different regions continued to refine and adjust implementation strategies, public interest in after-school services exhibited periodic fluctuations. Specifically, search interest tends to peak at the beginning of the spring and fall semesters, while declining during winter and summer vacations.

This study acknowledges several limitations. First, relying solely on search engine data to reflect public interest trends in after-school services may not fully capture the actual level of public concern. While search trends offer valuable insights, they may not precisely represent the depth or nature of public engagement. Second, the data from the Baidu Index is primarily based on users of the Baidu search engine. This introduces potential bias, as users with different search habits or preferences for other search engines may not be adequately represented, leading to possible gaps in data accuracy and coverage. Third, when searching for information related to after-school services, users may employ a variety of keywords, such as after-school care or after-school tutoring. This diversity in search terms could result in incomplete data collection. Lastly, while search data is highly valuable for understanding broad population trends, it may disproportionately reflect the behaviors and preferences of younger internet users, who tend to be more active online. Nevertheless, this study has taken measures to mitigate these limitations. It focuses on the most representative keywords related to after-school services and utilizes Baidu, the most widely used search engine in China, which accounts for 78.2% of Chinese netizens (CNNIC, 2022). This approach ensures a high

degree of relevance and representativeness in the data, thereby enhancing the validity of the research findings.

5. Conclusions

Since the implementation of the double reduction policy, public interest toward after-school services has risen significantly. Although this interest has slightly declined as understanding of the policy deepened, it has remained at a consistently high level. Given that after-school services have been in place for some time, their social prominence has somewhat diminished compared to the initial stage but continues to be a focal point of public interest. Notably, public concern tends to surge at the beginning of each academic semester and decline during winter and summer vacations. Nevertheless, despite the progress made, the implementation of after-school services still faces various challenges, necessitating continuous exploration and improvement to enhance their effectiveness and sustainability.

References

- Bai, J., Ren, Q., He, J., & Ren, A. (2023). Study on the Relationship between Investors' Attention and Stock Price Crash Risk. *Modernization of Management*, 5, 37-46. <https://doi.org/10.19634/j.cnki.11-1403/c.2023.05.005>
- Bu, X., & Li, H. (2023). On the Conceptual Transformation and Institutional Guarantee of Achieving Long-term "Double Reduction" in the New Era. *Journal of Shaanxi Normal University (Philosophy and Social Sciences Edition)*, 52 (6), 167-174. <https://doi.org/10.15983/j.cnki.sxss.2023.1112>
- China Internet Network Information Center (CNNIC). (2022). The 50th China statistical report on internet development. <http://www.cnnic.net.cn/n4/2022/0914/c88-10226.html>
- China Internet Network Information Center (CNNIC). (2025). The 55th China statistical report on internet development. <https://www.cnnic.net.cn/n4/2025/0117/c88-11229.html>

- Fu, W., & Guo, S. (2024). Construction of High-quality After-school Service System Under the Background of “Double Reduction”. *Journal of Shenyang Normal University Educational Science Edition* (04), 3-10. <https://doi.org/10.13972/j.cnki.cn21-1500/g4.2024.04.011>
- General Office of the CPC Central Committee & General Office of the State Council. (2021, July 24). Opinions on Further Reducing the Burden of Homework and Off-Campus Training for Students at the Compulsory Education Stage. https://www.gov.cn/zhengce/2021-07/24/content_5627132.htm
- General Office of the Ministry of Education. (2021). Notice of the General Office of the Ministry of Education on Promoting Innovative Measures and Exemplary Practices in After-School Services for Compulsory Education in Certain Regions. http://www.moe.gov.cn/srcsite/A06/s3321/202106/t20210621_539265.html
- Han, Y., & Pan, Z. (2023). Internet Use and Sense of Fairness: An Empirical Analysis Based on CSS 2019. *Zhejiang Social Sciences* (01), 76-85+158. <https://doi.org/10.14167/j.zjss.2023.01.005>
- He, Z., Teng, L., & Tan, Q. (2022). Utilizing Baidu Index to Track Online Interest in Influenza During the COVID-19 Pandemic in China, *Cureus*, 14 (8): e27582. <https://doi.org/10.7759/cureus.27582>
- Li, H., Zhu, X., & Wang, J. (2025). The Value Connotation, Problem Characterization and Countermeasures of After-school Services Under the Background of the Double Reduction Policy. *Education and Examinations* (01), 46-52. <https://doi.org/10.16391/j.cnki.jyks.2025.01.002>
- Li, S., Wang, C., Chen, H., & Yang, X. (2022). Research on Internet Attention on Wine Based on Baidu Index. *Liquor-Making Science & Technology*, 2, 137-142. <https://doi.org/10.13746/j.njkj.2021109>
- Liang, G., Gao, M., & Bai, Y. (2021). A study on the spatial and temporal distribution characteristics of the network attention degree of 5A tourist attractions in Xinjiang. *Journal of Northwest Normal University (Natural Science)*, 2, 118-126. <https://doi.org/10.16783/j.cnki.nwnuz.2021.02.019>
- Lin, B., & Xu, F. (2024). Analysis of Network Attention and Temporal and Spatial Differences of Forest Tourism in Guangdong Province Based on Baidu Index. *Taiwan Agricultural Research*, 01, 53-59. <https://doi.org/10.16006/j.cnki.twnt.2024.01.008>
- Lin, Z., & Wang, S. (2024). Research on the Correlation Between Web Search Data and the Macro-economic Prosperity Index. *China Journal of Commerce*, 33 (23), 113-116. <https://doi.org/10.19699/j.cnki.issn2096-0298.2024.23.113>

- Liu, H. (2022). After-school Service Governance: Theoretical Logic, Practical Problems and Solutions. *Journal of Hebei Normal University (Educational Science)*, 24 (01), 77-85. <https://doi.org/10.13763/j.cnki.jhebnu.es.2022.01.009>
- Niu, Y. (2023). A study on the problems and measures of after-school service in primary schools under the background of "Double Reduction": A case study of three primary schools in H city. [Master ' s Thesis, Northeast Normal University]. <https://doi.org/10.27011/d.cnki.gdbsu.2023.000327>
- Tan, Q., Ao, Y., & Teng, L. (2024). Utilizing Baidu Index Data to Investigate the Spatiotemporal Characteristics of Public Concern towards Lifelong Education. *Quality in Sport*, 27, 55688. <https://doi.org/10.12775/QS.2024.27.55688>
- Tan, Q., Yang, Y., Lu, B., He, H., & Teng, L. (2024). Use of the Baidu Index to Measure Public Attention in China on the China – Myanmar Border. *Sage Open*, 14(4). <https://doi.org/10.1177/21582440241303578>
- Wang, J., Liu, Y., & Li, J. (2024). The Difficulties and Solutions of After School Service in the New Era. *Journal of Shijiazhuang University*, 26 (5), 153-160. <https://doi.org/10.13573/j.cnki.sjzxyxb.2024.05.004>
- Wang, S., & Dong, H. (2024). The Effects of Internet Use on the Health of the Elderly: Based on Gender Differences and Intergenerational Support. *Population Journal* (02), 77-92. <https://doi.org/10.16405/j.cnki.1004-129X.2024.02.005>
- Xie, Y., & Zhang, Y. (2023). The Return of the Essence of Education Under the Background of "Double Reduction". *Education and Teaching Research*, 37 (11), 73-84. <https://doi.org/10.13627/j.cnki.cdjy.2023.11.001>
- Xue, E., & Li, J. (2024). The New Pattern of Education System Development under the "Double Reduction" Policy: Retrospective and prospective analysis based on the implementation of the "double reduction" policy. *Research in Educational Development*, 18, 36-45. <https://doi.org/10.14121/j.cnki.1008-3855.2024.18.003>
- Yan, K.,. (2020). The stock market realized volatility forecasting based on Baidu Index. [Master ' s Thesis, Tianjin University]. <https://doi.org/10.27356/d.cnki.gtjdu.2020.003930>
- Yang, W., & Tan, X. (2023). On the Public Welfare Nature of After-School Services. *Journal of Educational Science of Hunan Normal University* (05), 56-66. <https://doi.org/10.19503/j.cnki.1671-6124.2023.05.008>
- Yang, S. (2023). Analysis of Typical Practices and Problem of Implementing “Shuang Jian” by Local Governments in China: Based on Four Batches of Typical Cases Selected by the Ministry of Education. *Journal of Shanghai Educational Research* (06), 42-47. <https://doi.org/10.16194/j.cnki.31-1059/g4.2023.06.004>

- Yu, M. (2022). Challenges and Countermeasures of After-school Service in Primary and Secondary Schools under the Background of "Double Reduction": Based on the Analysis of Jiangsu Province. *Journal of Shanghai Educational Research*, 3, 11-16. <https://doi.org/10.16194/j.cnki.31-1059/g4.2022.03.015>
- Zhang, Y., Han, W., & Huo, M. (2017). A Study of Research Gate's Attention and Usage Based on Google Trends and Baidu Index. *Information Science*, 35 (7), 60-64. <https://doi.org/10.13833/j.cnki.is.2017.07.011>
- Zhou, H., & Qi, Y. (2022). Implementation of the "Double Reduction" Policy: Focus, Difficulties and Suggestions. *Journal of Xinjiang Normal University (Edition of Philosophy and Social Sciences)*, 1, 69-78. <https://doi.org/10.14100/j.cnki.65-1039/g4.20211022.001>