



Analysis of Research Hotspots in Preschool Education and Exploration of High-Quality Development Pathways

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Abstract. In order to solve the current problem of lacking a systematic and comprehensive analysis of hotspots and dynamics of preschool education at home and abroad. This paper builds a document database based on CNKI's document database and the core data set of Web of Science, using CiteSpace6.1R1 software makes statistical and visual analysis from the number of documents, authors, institutions, keywords, hot spots, etc., and analyzes the research progress, hot spots and evolution trend in this field. In general, Research of preschool education in China should not be limited to the basic fields, such as methods, systems, policies, fairness, teachers, legislation, etc.. At the same time, we should pay more attention to the deeper and broader research fields, such as the impact of preschool education on adults' personality behavior and comprehensive development.

Keywords: Preschool Education; CiteSpace; Graph; Visualization

1 Introduction

Preschool education exerts a significant influence on children's language, emotions, social skills, competencies, as well as their future academic and career prospects, making it a priority for educational development in various countries. In China, the gross enrollment rate for three-year preschool education has risen from 62.3% in 2011 to 88.1% in 2021, and is expected to exceed 90% by 2025 ^[1]. The issuance of the "Several Opinions on the Current Development of Preschool Education" has notably promoted China's active development of preschool education and addressed long-standing issues such as equity, teacher quality, and legislation ^[2]. Furthermore, the release of the "Action Plan for the Development and Improvement of Preschool Education During the 14th Five-Year Plan Period" in 2021 has further intensified research interest in this field ^[3].

Currently, there is a lack of comprehensive summarization of specific research hotspots, directions, and development trends in preschool education, leading to an absence of systematic analysis on the research hotspots and dynamic development trends in this field. This makes it difficult to guide the high-quality development and

innovation of preschool education. Therefore, this paper employs bibliometrics and CiteSpace software to analyze aspects such as publication volume, authors, institutions, keywords, and hotspots, based on the CNKI literature database and the Web of Science core dataset. For the CNKI search, keywords such as "preschool education," "early childhood education," "early education," "pre-school education," "youjiao," and "zaojiao" were used. Journals indexed by core journals, EI, CSSCI, and CSCD were selected for screening, yielding 3,213 valid articles. For the WOS search, the topic search terms were "early education" or "preschool education" AND "childhood," with the document type set to Article, resulting in 14,331 valid articles retrieved on January 1, 2023. The study aims to objectively reveal the research dynamics and trends in preschool education, identify the main existing issues, and provide reference pathways for the high-quality development of preschool education.

2 Results

2.1 Analysis of Publication Volume Results

The annual publication count reveals that the first Chinese publication in this field appeared nearly half a century later than international publications, reflecting the limited emphasis China placed on preschool education in its early stages. The first Chinese publication was a study by Zhang Rongjian in 1992 on the leading countries in ten educational fields. In the same year, a series of studies were also conducted, including Chen Heqin's educational thoughts and practices, an overview of international preschool education institutions and management systems, a survey of problem behaviors in young children, development trends in international early childhood education, the theory and practice of early education curricula in the United States, and the development pattern of kindergarten teachers in Fujian Province. These indicate that China had begun to attach importance to preschool education at that time^[4].

In terms of the number of publications, China's publication count has been on an upward trend since 1992, starting with 14 articles. A significant increase was observed after surpassing 100 high-quality articles in 2003, which may be attributed to the release of the "Guidelines for Kindergarten Education (Trial)" (2001) and the "Guiding Opinions on the Reform and Development of Early Childhood Education" (2003). Internationally, although the first article was published in 1939, it was not until 1991 that the number of publications saw a noticeable increase. The largest annual growth in new publications for China and internationally occurred in 2019 and 2017, with 44 and 600 articles respectively. This can be linked to China's issuance of the "Several Opinions on Deepening the Reform and Standardizing the Development of Preschool Education" (2018) and the Organisation for Economic Co-operation and Development's initiation of the "International Study on Early Learning and Child Well-being" (2016), indicating a significant influence from policies. Overall, research on preschool education has emerged as a hot topic in recent years, and it is expected to maintain high levels of interest in future studies.

2.2 Analysis of the Results Regarding the Authors of the Publications

An analysis of the publication volume by authors can help identify major research teams, facilitating the recognition of primary research directions and development trends. Both in China and internationally, distinct author teams have emerged. In China, the primary contributing teams include those led by Pang Lijuan, Feng Xiaoxia, Liu Jingbo, and Huo Liyan. Notably, Pang Lijuan's team has made outstanding contributions to preschool education legislation, equity in preschool education, the construction of the preschool education system, and the development of kindergarten teachers. Their research on preschool education legislation and institutional guarantees for the development of preschool education are among the most highly cited documents in the field (with thousands of cumulative citations), reflecting the team's significant influence. Feng Xiaoxia's team has conducted in-depth research on the financial system for early childhood education and government investment in preschool education, making significant contributions and garnering high citations. Liu Jingbo's team has engaged in in-depth discussions on topic selection for preschool education projects. Huo Liyan's team focuses on research related to kindergarten construction, including the Montessori method, the transition from kindergarten to primary school in Japan, and high-quality preschool education systems [5-7]. These studies represent major research areas domestically.

Internationally, teams led by Justice L, Li H, Hu B, and Reynolds A have a higher publication volume. Justice L's team mainly conducts research on the impact of kindergarten teachers' qualities on preschool children's language and literacy skills, as well as education for special needs children. Li H's team primarily carries out practical research on various teaching methods through case studies of kindergartens in Hong Kong, Shanghai, Shenzhen, and Singapore. Hu B's team focuses on the quality of early childhood education in China and the development of assessment scales for early childhood education environments. Reynolds A's team investigates the relationship between early childhood interventions and outcomes in adulthood, including well-being, health, academic achievement, and delinquency [8-9].

Overall, there is no close connection between high-publishing teams in China and those internationally, which is related to the differences in their research directions. However, these excellent teams play an important role in guiding and promoting the high-quality development of preschool education.

2.3 Analysis of Publishing Institutions

An analysis of publishing institutions reveals that Normal Universities in China, including Beijing Normal University, East China Normal University, Nanjing Normal University, Northeast Normal University, Southwest University, Central China Normal University, and Hunan Normal University, have the highest number of publications. The respective counts of high-level research papers related to preschool education are 299, 147, 145, 101, 98, 58, and 53. Among these, Beijing Normal University has relatively close ties with Capital Normal University, Central China Normal University, and the China Academy of Educational Sciences. Nanjing Normal University collaborates

with Jinhua Polytechnic, East China Normal University, and Huaiyin Normal University. East China Normal University cooperates with Beijing Normal University, the World Organization for Early Childhood Education, and Xinjiang Normal University. Southwest University collaborates with Beijing Normal University, Chengdu University, China West Normal University, and Chongqing Academy of Educational Sciences. These institutions primarily cooperate with geographically proximate research institutions. Internationally, the institutions with the highest number of publications are the University of North Carolina, Columbia University, University College London (UCL), Ohio State University, University of Michigan, University of Helsinki, University of Melbourne, Monash University, and Harvard University, with 281, 231, 225, 194, 184, 179, 179, 161, and 146 papers respectively, mostly from European and North American countries. Among these, Harvard University, the University of North Carolina, Columbia University, and the University of Michigan have the highest betweenness centrality. These highly productive institutions play a significant role in promoting the high-quality development of preschool education.

A statistical analysis of the geographical locations of the publishing institutions revealed that in China, the main concentrations are in the provinces of Beijing, Shanghai, Jiangsu, Chongqing, Jilin, Hunan, Zhejiang, Hubei, and Guangzhou. The primary institutions within these regions have each published more than 50 articles, with the top five provinces each having published over 100 articles. Overall, there is a marked "high in the east and low in the west" pattern, which is closely related to the economic disparities, family investments, and the level of emphasis on preschool education between the eastern and western regions. This indicates that the research level of preschool education in eastern China is generally higher than that in the west. Internationally, the main concentrations are in the USA, Australia, England, Canada, People's R China, Germany, Sweden, Spain, Finland, Turkey, Norway, the Netherlands, New Zealand, Brazil, South Africa, Denmark, Italy, South Korea, India, France, Scotland, Ireland, Greece, Switzerland, Portugal, Belgium, Israel, Singapore, and Japan, with each having published more than 90 articles. Among these, the top five countries have published 6,097, 1,558, 1,225, 767, and 613 articles respectively, indicating that these countries attach great importance to the development of the preschool education sector. This suggests that their experiences are worth learning from and adapting for China as it promotes high-quality development in preschool education.

2.4 Analysis of Keywords and Timeline Diagram

The keyword results show that in China, the most frequently occurring terms are "preschool education" (1228), "early childhood education" (798), "early education" (215), "kindergarten" (189), "preschool teachers" (89), "the United States" (49), "educational equity" (40), "education policy" (28), and "compulsory education" (28). Internationally, the most frequently occurring terms are "infant/child" (6545), "early childhood education" (3724), "health" (1080), "intervention" (765), "risk" (750), "nursing" (729), and "behavior" (692), which represent the current main research contents and directions in this field. At the same time, it indicates that there are differences in research foci internationally. Due to the late start of preschool education in

China, more attention is paid to learning from the experiences of European and American countries and comparing them with the current situation in China. Extensive research has also been conducted on preschool teachers, educational equity, education policy formulation, and optimization of educational methods. Internationally, due to a longer development history and a more advanced research field, more attention is paid to studying the relationship and mechanisms of the impact of preschool education on future adulthood. Considerable research has also been conducted on educational methods and forms.

The timeline map of keywords can analyze research hotspots and development trends. In China, there are major clusters such as "preschool education", "countermeasures", "early childhood education", "education quality", "kindergarten", "preschool teachers", "early education", "government responsibility", "difficulty in enrolling in kindergarten", "government investment", "Chen Heqin", and "preschool children". Among these, "early childhood education", "kindergarten", "preschool education reform", and "preschool education cause" were the early research hotspots (during 1993-2007), and then the research shifted towards "educational equity", "rural education", "education policy", "government responsibility", "difficulty in enrolling in kindergarten", "the United States", "education quality", and "financial investment" (during 2007-2017). Currently, "inclusive preschool education" and "education reform" have become the focus of scholars' attention (since 2014). In the cluster of "preschool education/early childhood education/early education", keywords include "Freud", "Montessori", "Hong Kong", and "New Zealand". In the "countermeasures" cluster, keywords include "preschool teacher staffing", "curriculum reform", "Tao Xingzhi", and "professional development". In the "education quality" cluster, keywords include "education development", "transition from kindergarten to primary school", "international comparison", and "teacher-child ratio". In the "kindergarten/preschool teachers/infants/preschool children" cluster, keywords include "community co-education", "public policy", "kindergarten management system", and "teacher-child relationship". In the "government responsibility" cluster, keywords include "government-led", "public services", "financial investment", and "universalization". In the "training objectives" cluster, keywords include "basic education", "quality supervision", and "Australia". In the "Chen Heqin" cluster, keywords include "1990s", "nursery", "traditional culture", and "quality evaluation". Abroad, there are clusters such as "infants", "preschool education", "school readiness", "parents", and "risk". Early intervention, infants, mortality, and population were the early research hotspots (before 2010), and then more research was conducted on risk factors, development, prevention, parents, school readiness, the United States, and overweight (before 2018). Currently, the focus is on research related to teachers, professional development, experience, preschool classes, and early childhood education (since 2017). In the "infants" cluster, keywords include "environmental factors", "early special education", "inequality", and "daily care". In the "preschool education" cluster, keywords include "health education", "early interference", "early advantages", and "perception". In the "school readiness" cluster, keywords include "quality", "cognitive development", "support", and "performance". In the "parents" cluster, keywords include "skills", "environment", "family", and "abilities". In the "risk" cluster, keywords include "preschool intervention", "toddlers", "efficacy", and

"trends". In summary, the keywords contained in these clusters reflect the current main research methods and directions, which are conducive to a clear understanding of past, current, and future research characteristics and development trends, and are beneficial for guiding the high-quality development of preschool education.

3 Paths for Achieving High-Quality Development in Preschool Education

Preschool education lays the foundation for early childhood development, and its high-quality development holds significant practical importance. This paper proposes key pathways to promote high-quality preschool education, focusing on the following four aspects.

3.1 Different Scholars/Institutions Should Strengthen Communication and Cooperation

Authors and institutions publishing research papers reflect a noticeably fragmented state of current research, with low levels of connectivity among different author teams and institutions. The field is in a phase of diverse development and continuous exploration. However, collaboration and exchange among different research directions within the same field can complement each other's strengths and better promote innovation in preschool education methods and content. For example, there is potential for collaboration between the teams of Pang Lijuan and Huo Liyan in the area of preschool education systems. By drawing on research findings from various teams in areas such as the Montessori method, educational equity, and legislation, they can better advance the development of the preschool education system. Therefore, in the future, author teams and institutions should be encouraged to increase communication and cooperation. Scholarly teams in western China should proactively engage in exchange and collaboration with those in the east, enhancing research capabilities in the west and providing references for promoting high-quality development of preschool education.

3.2 China Should Focus on Learning from Advanced International Experiences

From the analysis of the aforementioned keywords, it can be seen that current international research is no longer limited to the basic fields of preschool education such as methods, systems, policies, equity, teacher training, and legislation. Instead, there is a growing focus on the broader and deeper research areas of how the level of preschool education impacts adult habits, personality, academic performance, health, and social development. This shift is conducive to the healthy development and continuous innovation of preschool education. Furthermore, there is significant international emphasis on the role of early education intervention, as well as a high level of attention paid to the importance of family and school readiness. Research on the relationship between preschool education and adult psychological and physical health is relatively

in-depth, which helps to enhance the value and practical significance of preschool education. China should focus on learning from advanced international experiences to promote the high-quality development of preschool education in China.

3.3 China Should Increase its Support for the Western Regions

The high-quality development of preschool education cannot be achieved without support at the national level, particularly in terms of projects and funding, where certain preferences need to be given. Currently, the main funding sources for preschool education research in China come from the National Education Science Planning Projects, the National Social Science Fund, the Humanities and Social Sciences Research Projects of the Ministry of Education, and the National Natural Science Foundation of China. These projects can significantly promote research work in related fields and improve the quantity and quality of research outputs. At present, due to the strong teaching staff in the eastern regions of China, most projects are initiated in the east, further widening the gap in research capabilities between the east and the west. Increasing support for the western regions from the perspective of project approval is conducive to alleviating the inequality of preschool education in the western regions, enhancing regional research capabilities, and better addressing the key issues existing in the high-quality development of preschool education at both the national and local levels.

3.4 In the Future, High-Quality Development Should Be Promoted in Conjunction with the Reform of "Three Educations"

The "three educations" reform is a major strategy implemented by China to promote the high-quality development of higher education teaching. Since its proposal in 2019, it has been a hot topic, and extensive research has also been conducted in the field of preschool education, particularly in the teaching of preschool education majors. Preschool education research covers a wide range of topics. In light of China's emphasis on the "three educations" reform, research should focus on the construction of preschool education professional courses, the development of the 1+X certificate system, the exploration of university-enterprise cooperation models, the cultivation of "dual-qualified" teaching staff, and the development of modular textbooks. By continuously enriching and improving the connotation of preschool education in these aspects, we can promote the high-quality development of preschool education.

4 Conclusion

This paper analyzes the research progress, hotspots, and evolutionary trends in preschool education, and proposes a high-quality path for preschool education. The following conclusions are drawn: 1) The number of publications on preschool education continues to rise and remains a hot topic; 2) There is relatively little collaboration among scholars/institutions in China, with a notable "high in the east, low in the west"

pattern, while internationally, research is dominated by European and American countries; 3) Chinese research focuses more on preschool teachers, educational equity, policy formulation, optimization of educational methods, and the absorption of international experiences, whereas international research pays more attention to the impact of preschool education on adults' habits, personality, academics, health, and social development. Future research will delve deeper into teacher competence, professional development, experience absorption, and educational equity. Based on these findings, Chinese research should not be limited to the basic fields of preschool education such as methods, systems, policies, equity, teaching staff, and legislation. Instead, it should promote the high-quality development of school education by strengthening exchange and cooperation, learning from international experiences, increasing support for the western regions, and integrating the "three educations" reform.

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