Original Paper

Research Hotspots and Development Trends of Theme Activities in Kindergartens since 21st Century—Based On Visual Co-word Analysis

Huiqing Xu[1]

[1] Inner Mongolia Honder College of Arts and Sciences, Hohhot 010000, China
E-mail: 18292676250@163.com

Abstract

In order to accurately and objectively understand the composition and development trend of research hotspots on kindergarten theme activities in the past decade, China National Knowledge Infrastructure (CNKI) was used as the literature search source. The Co-word analysis software Bicomb2.0 and data statistical software SPSS27.0 were used to conduct time-series, research strength, high-frequency key, cluster analysis, and multidimensional scale analysis on 1674 literature on kindergarten theme activities from 2005 to 2023, and to draw knowledge graphs at different time periods. Research has found that the study of kindergarten theme activities generally revolves around five major areas: research on the selection of theme activity content, research on the connotation and characteristics of theme activities, research on the design of theme activities, research on the implementation and value of theme activities, and research on the theory and reform of theme activities. Strengthening the construction of theme activities in kindergartens is an effective breakthrough for achieving high-quality preschool education curriculum. Therefore, future research should focus on the combination of educational theory workers and educational practice workers to form a research community; Exploring diverse perspectives, deep learning and STEAM courses will become new academic growth points for themed activities; Innovative research paradigm, emphasizing the combination of theoretical research and empirical research.

Keywords

Kindergarten themed activities, Hotspot focus, Co-word analysis, knowledge graph

1. Problem Posing

Building a high-quality education system is the main policy orientation and basic requirement of China's education reform in the new era. Against the backdrop of promoting the construction of a high-quality preschool education system in the new era, curriculum is the key lever to leverage the improvement of preschool education quality. (Hou & Liu, 2023) Theme activities, based on the consideration of children's age, interests, and physical and mental development laws, revolve around certain core themes and derive theme networks. This is the most common way to achieve comprehensive curriculum, which has important value for children's exploration and practical abilities and inspiring teachers' wisdom. It demonstrates the horizontal connection of knowledge, integration of multiple educational resources, emphasis on pre disciplinary knowledge and experience, flexible planning and life oriented, gamified learning, and other characteristics. (He, 2012) The research on theme activities in kindergartens by foreign scholars began with W.H. Kilpatrick's proposal of the Project Method, which advocates using themes to enable children to learn and collaborating with teachers and students to set activity goals. In the 1980s, early childhood education experts represented by American educator Lilian Katz further explained program teaching, believing that it should be based on children's interests and life experiences. In the 1990s, a famous educator from a small town in northern Italy created his distinctive Reggio Emilia curriculum with mature teaching methods. The proposal and practice of theme activities in China can be traced back to the 1920s and 1930s. It was advocated by Mr. Chen Heqin as a "unit theme activity", which advocated selecting nursery rhymes, stories, picture books, handicrafts, music and dance activities with the same theme around a certain textbook, regardless of the subject. After experiencing the borrowing and specialization in the 1950s and 1960s, until the 1980s, the Early Childhood Education Research Office of Nanjing Normal University and Nanjing Experimental Kindergarten collaborated to emphasize children's independent exploration and learning, and explored the practical mode of "comprehensive theme curriculum" through thematic organization. (Han, 2018)

To this day, theme activities are widely applied in practice in kindergartens, and their theories are becoming increasingly perfect. In the new journey of high-quality development of preschool education, theme activities in kindergartens are the key and important breakthrough to improve the quality of preschool education. This study uses visual Co-word analysis to explore the current research status of theme activities in kindergartens, which helps to better grasp the direction of theme activity development from the perspective of big data. It is committed to exploring the research hotspots of theme activities in preschool education in China and providing early research support for promoting the development of high-quality curriculum in kindergartens in the future.

2. Research Methods

2.1 Data Source

Enter the Chinese Academic Journal Network Publishing Database (www.cnki.net) and search for all

162

literature on the topic of "Kindergarten Theme Activities", covering the period from 2005 to 2023. Non research articles such as duplicate publications, conference notices, and no authors were excluded. A total of 1674 articles were searched (as of December 15, 2023), including titles, authors, source publications, abstracts, literature types, keywords, and mailing addresses, which were saved in TXT text.

2.2 Research Tools

Bicomb2.0 and SPSS27.0 were used as the main research tools. The Bicomb2.0 Co-word analysis software was developed by Professor Cui Lei from the Department of Informatics at China Medical University and Shenyang Hongsheng Computer Technology Co., Ltd. It is a visual analysis software that combines bibliometric, statistical, and information science data. (Guo, Zhou, & Fang, 2014)

3.3 Research Process

The specific steps are as follows: first, use Bicomb2.0 software to collect research literature for keyword and co-occurrence statistics; Secondly, use SPSS 27.0 software to perform cluster analysis and multidimensional scaling analysis on keyword discourse; Thirdly, conduct statistical analysis on high-frequency keywords in research literature and create knowledge graphs for each time period; Fourthly, sort out the above to gain a more accurate understanding of the current status of research on theme activities in kindergartens, the composition and evolution of hot areas, and propose developmental suggestions.

3. Research on Bibliometric Statistics

Using Bicomb2.0 software, a statistical analysis was conducted on the research literature on theme activities in Chinese kindergartens. The study explored the temporal distribution of research power and the frequency statistics of key words, providing basic data support for future research.

3.1 Study the Temporal Distribution of Power

Academic papers are important carriers for demonstrating the academic status and characteristics of a discipline. Temporal changes can effectively predict research progress, clearly detect the development of the topic, and are an important indicator for measuring the progress of research on kindergarten theme activities. Figure 1 shows a statistical analysis of the annual publication volume of academic journals and theses on kindergarten themed activities since 2005. The overall number of articles published on themed activities in China is on the rise, and can be roughly divided into three stages based on the number of articles published. From 2005 to 2012, a total of 289 articles were retrieved, from 2013 to 2019, a total of 977 articles were retrieved, and from 2020 to present, a total of 655 articles have been retrieved. From the distribution of literature, the number of papers on kindergarten theme activities from 2005 to 2019 has shown a steady increase year by year, while the number of papers on kindergarten theme activities has fluctuated since 2020. In 2014, the journal experienced its first research peak, breaking through 100 articles for the first time. By 2019, the number of literature reached its peak at 319 articles, but in 2020, the number of studies rapidly decreased. This result

suggests that research on kindergarten themed activities may encounter bottlenecks and show a downward trend. This result generally reflects that the research strength of kindergarten theme activities is increasing year by year, and there is growing attention to the development needs and changes of high-quality preschool education curriculum. This is closely related to China's vigorous development of preschool education. Due to the impact of the epidemic, research on theme activities has shown a downward trend.
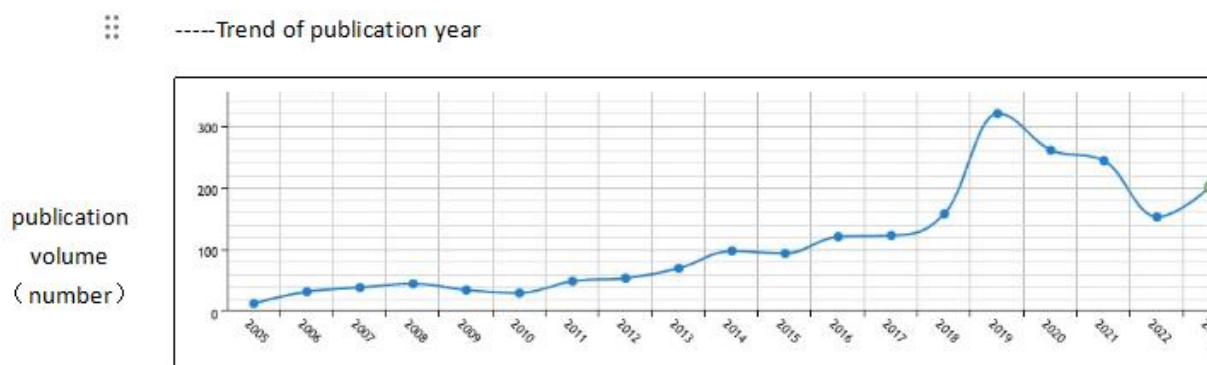

Figure 1. Distribution of Research Results on Kindergarten Theme Activities (2005-2023)

3.2 High Frequency Keyword Frequency Statistics and Analysis

Keywords reflect the author's highly condensed theme and core content, and are the core epitome of a paper. In this study, Bicomb2.0 Co-word software was used to statistically analyze the keywords of kindergarten theme activities. There were 6151 keywords in Chinese literature. In order to ensure accurate data and more meaningful research results, standardized materials were used, such as merging "theme activities" into "kindergarten theme activities". According to Price's calculation formula M=0.749+, the threshold for article frequency was determined, and the threshold for keyword frequency was ≥ 12. Finally, 35 keywords were extracted, with the highest frequency displayed as 1651, and sorted in descending order (see Table 1 for details).

Table 1. High Frequency Keyword Ranking Results of Kindergarten Theme Activity Research

S. N.	Keywords	Freq.	S.N.	Keywords	Freq.	S.N.	Keywords	Freq.	S.N.	Keywords	Freq.
1	Kindergarten themed activities	1651	10	Picture book	37	19	Child participation	16	28	Generate activity	13

2	District corner activities	140	11	Theme wall	24	20	Preschool life	15	29	Kindergarten area activities	13
3	Theme teaching	135	12	Exploratory themed activities	24	21	Senior kindergarten	15	30	Book reading	13
4	Preschool learning	97	13	Action research	23	22	Steam education	15	31	Deep learning	12
5	Kindergarten curriculum	88	14	Rural kindergarten	21	23	Local resources	15	32	Lifestyle oriented	12
6	Implementation strategy	81	15	Practical exploration	19	24	Integration	14	33	Theme network	12
7	Environmental creation	45	16	Community resources	19	25	Drama themed activities	14	34	Traditional festival	12
8	Game activities	45	17	Multimedia technology	17	26	Effectively carry out	14	35	Daily life	
9	Garden based courses	41	18	Family resources	16	27	Small class children	13			

According to Table 2, the top 35 high-frequency keywords in the research on kindergarten theme activities account for 45.11% of the total frequency. Excluding the search keyword "kindergarten theme activities", the keywords are corner activities (140), theme teaching (135), preschool learning (97), kindergarten curriculum (88), implementation strategies (81), environment creation (45), game activities (45), etc. The above keywords are hot research topics, which can be vaguely summarized as the research on kindergarten theme activities mainly revolves around the content, characteristics and values of theme activities, the objects of curriculum setting, the influencing factors of theme activities, and the guiding strategies of theme activities. Descriptive statistics on high-frequency keywords cannot accurately analyze the intrinsic relationships between research hot topics. Co-word analysis is needed to further reveal the deep connections and implicit information between high-frequency keywords, and clarify the relationships between various topics.

4. Research Results and Analysis

4.1 Analysis of high-Frequency Co-word Ochiai Coefficient Dissimilarity Matrix

Co-word analysis can determine the close relationships between different keywords. (Guo, Fang, & Chen, 2012) To explore the relationships between various topics in depth, Bicomb2.0 software was used to create a discourse matrix for 35 keywords. Through co-occurrence matrix, Ochiai coefficient was selected to establish a 35 × 35 co-occurrence approximation matrix. The closer the value is to 0, the closer the distance between keywords and the greater the degree of similarity (Guo, Fang, & Chen, 2012) (see Table 2 for some results).

Table 2. Approximate Matrix of Ochiai Coefficient for Kindergarten Theme Activities Keywords (Local)

	Kindergarten themed activities	District corner activities	Theme Teaching	Preschool learning	Kindergarten curriculum	implementation strategy	Environmental Creation	Game activities
Kindergarten themed activities	1.000	0.240	0.227	0.172	0.167	0.193	0.142	0.167
District corner activities	0.240	1.000	0.073	0.043	0.037	0.141	0.101	0.038
Theme Teaching	0.227	0.073	1.000	0.061	0.009	0.096	0.026	0.026
Preschool learning	0.172	0.043	0.061	1.000	0.055	0.011	0.015	0.091
Kindergarten curriculum	0.167	0.037	0.009	0.055	1.000	0.012	0.032	0.129
implementation strategy	0.193	0.141	0.096	0.011	0.012	1.000	0.033	0.000
Environmental Creation	0.142	0.101	0.026	0.015	0.032	0.033	1.000	0.000
Game activities	0.167	0.038	0.026	0.091	0.129	0.000	0.000	1.000

According to Table 2, the keywords with a frequency higher than 45 times are ranked in descending

order of distance from kindergarten theme activities as follows: environment creation (0.142), kindergarten curriculum (0.167), game activities (0.167), early childhood learning (0.172), implementation strategies (0.193), theme teaching (0.227), and corner activities (0.240). This result indicates that scholars are accustomed to discussing "kindergarten theme activities" from the perspectives of "environment creation," "curriculum," "games," and "children's learning." At the same time, it was found that the coefficient values in the research were relatively small, and the key words were not closely related, presenting a relatively loose and independent state overall.

4.2 High Frequency Keyword Clustering Analysis

The clustering results of high-frequency key can be classified based on the affinity and structure between keywords, in order to further reflect the inherent connections between kindergarten theme activities. This study imported the co-occurrence matrix table from Table 2 into SPSS 27.0, and generated a high-frequency keyword clustering tree for kindergarten theme activities through "analysis classification systematic clustering". The numbers at the bottom of the tree represent the names of high-frequency keywords, and the left represents the distance between classification objects. The results are shown in Figure 2.
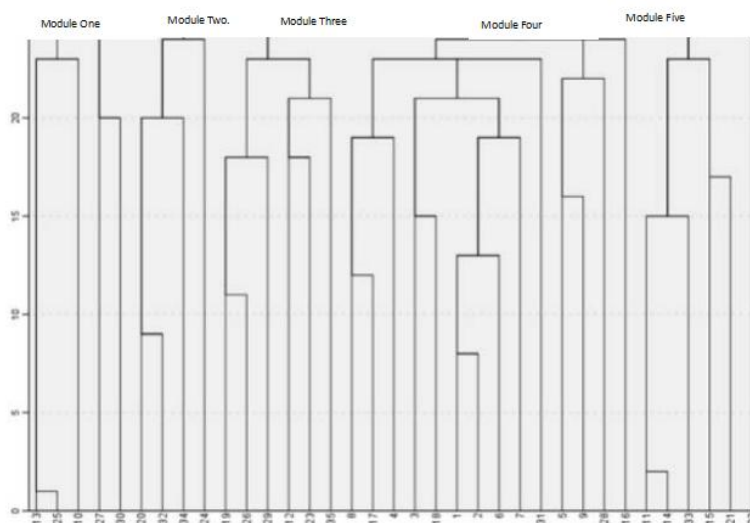

Figure 2. Tree Diagram of Keyword Clustering for Kindergarten Thematic Activities

According to Figure 2, observing the structure of the cluster diagram macroscopically, it can be intuitively seen that the overall distribution of kindergarten theme activities is uneven, and they are divided into five categories: theme activity forms and picture books, theme activity connotation and characteristics research, theme activity development research, theme activity value and influencing factors research, and theme activity design and practice research. The specific classification is shown in Table 3.

167

Table 3. High Frequency Keyword Clustering Results

Category 1	Action research, drama themed activities, picture books, small class children, picture book reading
Category 2	Preschool life, lifestyle, traditional festivals, integration
Category 3	Child participation, effective implementation, kindergarten regional activities, exploratory themed activities, local resources, daily life
Category 4	Game activities, multimedia technology, early childhood learning, themed teaching, family resources, kindergarten themed activities, corner activities, implementation strategies, environmental creation, deep learning, kindergarten curriculum, school-based curriculum, generative activities, community resources
Category 5	Theme wall, rural kindergarten, theme network, practical exploration, kindergarten senior class, STEAM education

Category 1 is the content selection for themed activities, with the main keywords including "action research", "drama theme", "picture book", "small class children", and "picture book reading". The relevant research on kindergarten theme activities is mostly based on the introduction and experience summary of practical cases of kindergarten theme activities by frontline kindergarten teachers. As the most recognized book suitable for children's reading in the world, picture books play a unique value in the selection of kindergarten theme activity content and play an important role in the growth of young children.

Category 2 is a study on the connotation and characteristics of theme activities, including keywords such as "children's life", "life oriented", "traditional festivals", and "integration". Kindergarten themed activities are a new modern education model centered on "life" and "children", with comprehensive, integrated, and life oriented characteristics. The integration of theme activities has been deeply rooted in the naturalistic educational ideas of educators such as Rousseau and Froebel, who proposed the organic integration of children's autonomous activities and social culture. The generation logic of theme activities is that children generate their own lives through in-depth exploration, emphasizing their direct experiences.

The research on the design of Category 3 themed activities mainly focuses on "child participation", "effective implementation", "kindergarten regional activities", "exploratory themed activities", "local resources", and "daily life". Theme activities are based on the dynamic life experiences of young children, emphasizing their participation. Theme activities are designed according to the logical sequence of children's development, life, and psychology. Teachers should strengthen their learning to enhance their ability to design and effectively carry out theme activities..

Category 4 is the implementation and value of theme activities, mainly focusing on keywords such as

"game activities", "multimedia technology", "early childhood learning", "theme teaching", "family resources", "kindergarten theme activities", "corner activities", "implementation strategies", "environment creation", "deep learning", "kindergarten curriculum", "kindergarten based curriculum", "generative activities", "community resources", etc. It is also a current research hotspot for theme activities in kindergartens. Category 4 is divided into three sub clusters. The first cluster mainly describes the implementation of theme activities, discussing games, teaching, implementation strategies, etc. The second sub cluster mainly describes the value of theme activities, discussing "deep learning for young children". The third sub cluster mainly describes the design of theme activities, focusing on "environment creation", "kindergarten curriculum", "community resources", etc. Theme activities fully reflect the views of kindergarten children, curriculum, and education. The design and implementation of theme activities are essential key links for kindergartens to carry out theme activities and achieve educational goals. The values held by the implementers affect the quality of theme activity design and implementation. Therefore, the improvement of the teaching quality of theme activities requires relevant research on the implementation of theme activities in kindergartens.

Category 5 is the evaluation and reform of theme activities, focusing on theme walls, rural kindergartens, theme networks, practical exploration, kindergarten senior classes, and STEAM education. The evaluation of theme activities can diagnose and regulate the development direction of theme activities, pay attention to the development and improvement of theme walls, rural kindergartens, theme networks, and other aspects, construct a diversified evaluation system, and at the same time, open up new perspectives for STEAM based kindergarten science education.

4.3 Hotspot Knowledge Graph and Analysis

To further explore the hidden connotations between keywords, this study uses multidimensional scale analysis of keywords and standardized methods to select Z-scores, obtaining Euclidean distance scatter plots and drawing research hotspot knowledge graphs to visually display the main directions and hotspots of kindergarten theme activity research. (An, 2014) In this strategic coordinate diagram, the horizontal axis represents centripetal force, which represents the strength of mutual influence between domains, and the vertical axis represents density, which indicates the strength of internal connections within the domain. In the strategic coordinates, each small circle represents the position of each keyword. The more keywords are clustered, the closer the distance between circles, indicating a closer relationship between them and a higher similarity, making it easier to form research hotspots. Conversely, the vertical axis represents density, indicating that this part should be given more attention. (Guo & Chen, 2012) Refer to Figure 3 for details.

As shown in Figure 3, high-frequency keywords are mainly distributed in different positions in the four quadrants. The first quadrant is the focus and hotspot of research on theme activities in kindergartens in China, with high density and centripetal force, mainly focusing on aspects such as daily life, traditional festivals, and effective development. The relationship between keywords within the domain structure of the second quadrant is relatively loose, mainly focusing on STEAM education, family resources, early

169

childhood life, kindergarten curriculum, etc. There is great room for development and it is easily influenced by research in other fields.
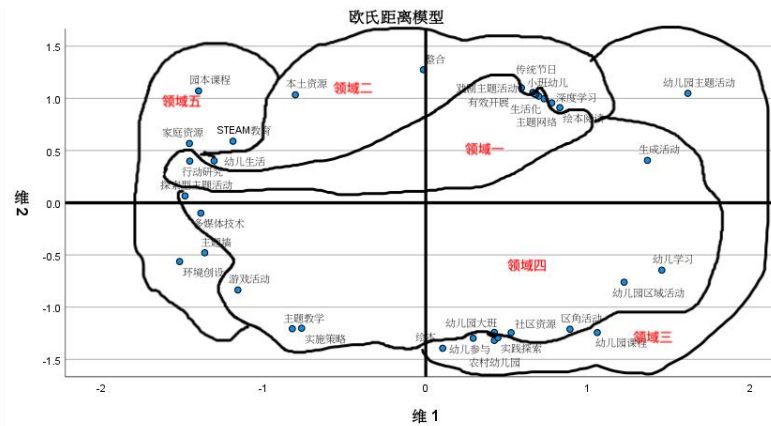

Figure 3. Knowledge Graph of Kindergarten Theme Activity

The third quadrant indicates ongoing research in this field, with the main keywords being multimedia technology, themed walls, environment creation, game activities, implementation strategies, etc. The fourth quadrant has relatively few research results and is currently on the margins. The research includes kindergarten curriculum, rural kindergartens, community resources, etc., which need to be taken seriously and further increased in this area.

5. Conclusion and Prospect

The high-quality development of preschool education in the new era is an important foundation for building a high-quality education system. The development and research of high-quality themed activities are necessary to promote the high-quality development of preschool education. Through analyzing the literature on kindergarten themed activities, a conclusion and outlook are drawn. Firstly, in terms of research results, there have been remarkable achievements in theme activity research in recent years, but in 2019, research results encountered bottlenecks and showed a downward trend. In the existing research results, most of them are summaries of personal experiences of educational practitioners, and there is relatively little theoretical research. Future research should strengthen the cooperation between educational practitioners and educational theorists, gather multiple forces, and form a research community. Secondly, in terms of research content, current research in the field of kindergarten theme activities mainly focuses on the following five areas: "content selection of theme activities", "connotation and characteristics of theme activities", "design of theme activities", "implementation and value of theme activities", and "evaluation and reform of theme activities". Research hotspots focus on the implementation and value of theme activities, and deep learning and STEAM curriculum will become new academic growth points for theme activities. Future research

should explore multiple perspectives, and relevant studies can grasp the future development direction of theme activities from multiple angles such as psychology, economics, and phenomenology, explore the value of high-quality theme activities, and deepen research depth. Thirdly, in terms of research methods, traditional review theory research and case analysis methods alone are no longer sufficient to meet the development needs of kindergarten theme activity research. Efforts should be made to innovate research paradigms, adopt scientific and effective research methods, go beyond theoretical conceptual debates and scattered individual practices, integrate theoretical research with empirical research, and expand the breadth of theme activity research.

Reference

An, X. R. (2014). Research on high-frequency word threshold of word frequency analysis method based on normal distribution. *Intelligence Magazine*, *2014*(10), 129-136.

Guo, W. B., & Chen, Q. Z. (2012). Knowledge Graph of Hot Topics in Special Education Research. *Journal of East China Normal University (Education Science Edition)*, *30*(3), 49-54.

Guo, W. B., Fang, J. M., & Chen, Q. Z. (2012). Research on hot topics of autism in China based on keyword Co-word analysis. *Journal of Northwest Normal University (Social Sciences Edition)*, (1).

Guo. W. B., Zhou, N. L., & Fang, J. M. (2014). Knowledge Graph of Research Hotspots in Preschool Education in China. *Preschool Education Research*, (1).

Han, Y. Y. (2018). *Action Research on the Design and Implementation of Kindergarten Theme Activities from the Perspective of Curriculum Integration*. Southwest University.

He, Y. (2012). Basic Perspective of Kindergarten Theme Activities: Children's Experience. *Research on Preschool Education*, (07), 35-39.

Hou, L. M., & Liu, Q. (2023). The Era Value and Path Orientation of Achieving High Quality Development of Preschool Education in China. Preschool Education Research, (06), 1-10.

Pan, J. J., & Peng, X. P. (2017). Research on International Teacher Educator Hotspots from 2007 to 2016: Based on Hotspot Knowledge Graph Analysis J. *Educational Theory and Practice*, *37*(25), 41-45.