

Toward an Educational Landscape for Urban Kindergartens in China: A Thematic Literature Review

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Abstract

Against the backdrop of urbanization in China, kindergarten landscapes are increasingly recognized as key to enhancing children's quality of life. They are also viewed as vital spatial resources that support curriculum implementation and children's learning. However, systematic research on the integration of landscape and curriculum remains relatively limited. This study adopts a thematic literature review approach, analyzing 32 core Chinese and international studies published between 2015 and 2025. Using ATLAS.ti 8 software for open coding and thematic classification, the review identifies three major themes: current development status, educational functions, and practical strategies. The results reveal a global shift in the conception of educational landscapes from environmental aesthetics to pedagogical media. This shift provides China with a referable theoretical framework and actionable pathways for optimizing kindergarten landscapes in terms of conceptual orientation, functional configuration, and curriculum integration. The study recommends further empirical exploration to promote deeper integration between theoretical advances and local practices.

Keywords: Chinese Children, Kindergarten Landscapes, Learning Environments, Regional Landscapes, Kindergarten Education

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Introduction

In Chinese cities, most children aged 3 to 6 spend approximately 8 to 10 hours a day in kindergarten. As a critical developmental environment, kindergartens serve not only caregiving and educational functions but also play a foundational role in shaping children's cognitive abilities, emotional growth, and behavioral patterns. Existing research has shown that the spatial quality and organizational structure of early learning environments directly influence children's engagement in exploration, autonomous play, and social interaction (Johnstone et al., 2022). The *Guidelines for Kindergarten Education (Trial)* issued by the Ministry of Education emphasize that the environment is an integral part of early childhood education. It should be rich, engaging, and exploratory in nature to stimulate children's curiosity and desire to explore, thereby supporting the development of their sensory perception, thinking, emotional expression, and social competence (Ministry of Education, 2001).

With the advancement of urbanization, the coverage of early childhood education in China has steadily increased. However, challenges such as the uneven distribution of educational resources and spatial constraints within kindergartens remain significant (Rao et al., 2023; Qi & Melhuish, 2017). Within this context, there

is still a lack of systematic research on how to integrate nature-based education concepts into limited urban spaces to create outdoor environments that support learning. In recent years, international scholarship has increasingly emphasized concepts such as “child–nature interaction” and “learning through landscapes,” advocating for the use of natural elements as both teaching media and learning contexts. These approaches have been shown to effectively stimulate children’s intrinsic motivation to learn (Kuo, Barnes, & Jordan, 2022; Fraser et al., 2022).

Theoretically, Bronfenbrenner’s ecological systems theory identifies the “microsystem” including settings such as the home and kindergarten as the most immediate environment influencing a child’s development (Bronfenbrenner, 1979). Similarly, Piaget emphasized that children construct cognitive structures through active interaction with their surroundings (Piaget, 1952). From this perspective, the kindergarten landscape should not merely serve as a physical backdrop, but function as an educational medium that actively supports children’s cognitive, emotional, and social development.

While the positive effects of natural environments on children’s development have become a widely accepted consensus, current research on educational landscapes in China still faces three major challenges: (1) the educational potential of landscape elements has not been systematically revealed, as existing studies tend to focus on aesthetic or ecological values; (2) the pathways for integrating landscape with curriculum are unclear, lacking concrete strategies for effectively embedding spatial resources into learning objectives and educational activities; and (3) there is a lack of an education-oriented systematic design framework, making it difficult to clarify how landscapes can collaboratively support the developmental goals outlined in curriculum standards.

To address these gaps, this study adopts a thematic literature review methodology, analyzing 32 core Chinese and international studies published between 2015 and 2025. Through open coding and thematic categorization using ATLAS.ti 8 software, the research identifies and analyzes key themes and practical models in the field of educational landscape studies. The aim is to extract transferable concepts, strategies, and pathways from international research to provide both theoretical grounding and practical guidance for the development of educational landscapes in urban Chinese kindergartens.

Accordingly, the core research question addressed in this study is: How can international research on educational landscapes inform the theoretical direction and practical development of educational landscapes in Chinese urban kindergartens?

Methodology

To systematically explore the research question, this study adopts a thematic literature review approach and employs the SALSA framework (Search, Appraisal, Synthesis, and Analysis) as the analytical pathway. The literature was reviewed and synthesized in a staged process involving systematic searching, screening, and thematic integration.

In the first stage, the review was guided by the following central research question: *How can international research on educational landscapes* inform the theoretical direction and practical development of educational landscapes in Chinese urban kindergartens?

To ensure comprehensive coverage of both Chinese and international research, literature was retrieved from three major academic databases: China National Knowledge Infrastructure (CNKI), Scopus, and ScienceDirect. The search strategy was structured around three thematic dimensions, with corresponding keyword sets developed for each:

Table 1: Database Search Strategy

Database	Keyword Groups	Search Logic	Field Restriction
Scopus	- Landscape Design: "landscape design", "educational landscape", "outdoor learning environment", "schoolyard design" - Early Childhood Education Stage: "kindergarten", "early childhood education", "preschool", "nursery" - Educational Function: "learning environment", "child development", "curriculum integration", "play-based learning", "affordance"	("landscape design" OR "educational landscape" OR "outdoor learning environment" OR "schoolyard design") AND ("kindergarten" OR "early childhood education" OR "preschool" OR "nursery") AND ("learning environment" OR "child development" OR "curriculum integration" OR "play-based learning" OR "affordance")	TITLE-ABS-KEY
Science Direct	Same as Scopus	Same as Scopus	Full text
CNKI	Chinese-translated keywords: - kindergarten landscape design - outdoor learning environment - early childhood education - curriculum integration - child development	Combined using the same Boolean logic (AND/OR) to maintain consistency with the English search strategy	Full text

These searches targeted the title, abstract, and keyword fields using a fuzzy matching strategy. All results were manually screened to ensure alignment with the study's thematic scope.

The time frame for literature selection was limited to publications from 2015 to 2025. To ensure academic quality and relevance, the inclusion criteria encompassed peer-reviewed journal articles, conference papers, and doctoral dissertations.

An initial search yielded 97 relevant records. After removing 1 duplicate, a total of 96 articles were retained for the preliminary screening based on titles and abstracts. During the Appraisal stage, the following inclusion and exclusion criteria were applied to evaluate the academic merit and relevance of each study:

Table 2: Inclusion and Exclusion Criteria for Literature Selection

Category	Criteria
Inclusion	- The study focuses on outdoor landscapes in kindergartens or K–12 school settings. - Explicitly examines the relationship between landscape design and the learning environment. - Published in academic journals, peer-reviewed conference proceedings, or doctoral dissertations. - Grounded in theoretical analysis or empirical evidence, with attention to educational functions such as curriculum integration, spatial design, or nature-based learning.
Exclusion	- Studies unrelated to early childhood education or not set in kindergarten environments. - Research limited to horticulture, aesthetics, greening, or architectural engineering without educational focus. - Conference abstracts, review articles, news pieces, or other non-academic publications. - Studies lacking clear research methodology or educational perspectives.

After cross-review and consensus by two independent researchers, a final sample of 32 high-quality studies was selected for thematic extraction and analysis. (Figure 1 here)

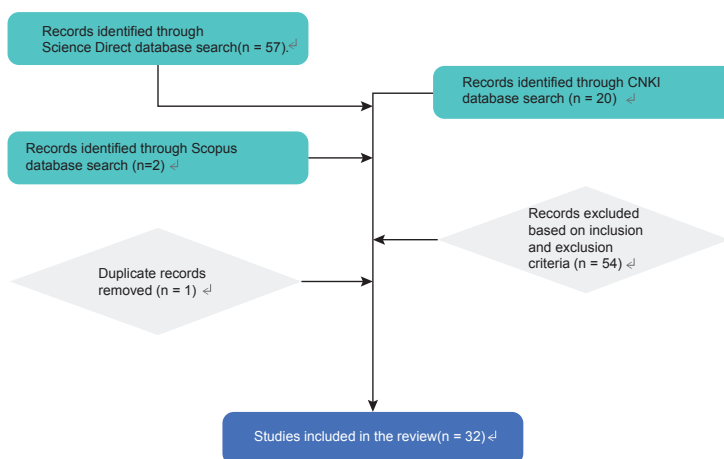


Figure 1: Inclusion and Exclusion Processes in the Thematic Review.

As a result, three core thematic clusters were identified, which serve as the theoretical basis for the strategic framework proposed in this study (see Results and Discussion section for details).

This section presents key findings from the thematic review. Both quantitative and qualitative analyses were conducted on the 32 selected articles to address the research question.

To preliminarily reveal the overall trends in research on kindergarten landscape development, a quantitative analysis was carried out across several dimensions, including word frequency distribution, year of publication, geographic region, journal source, and research themes.

The word cloud further reveals that children, nature, education, and environment constitute core themes in current research. The prominence of these keywords strongly aligns with the focus of this study on educational landscapes, reflecting a prevailing scholarly interest in the role of landscape in supporting child development and educational functions. (See Figure 2 for details)



Figure 3 illustrates the distribution of publications by year: 1 article in 2015, 3 in 2016, 3 in 2017, none in 2018, 2 in 2019, 1 in 2020, 6 in 2021, 4 in 2022, 5 in 2023, 5 in 2024, and 2 in 2025.

From a temporal perspective, research in this area experienced slow development between 2015 and 2020, with an average of only 1–3 publications per year. However, a significant increase occurred starting in 2021, indicating a growing academic interest in this topic.

This surge reflects a rising awareness of educational landscapes across fields such as early childhood education, landscape design, and environmental optimization. In particular, since 2021, the promotion of concepts such as “*educational environment enhancement*” and “*nature-based education*” has driven the research toward greater theoretical sophistication and systematic exploration, suggesting that the academic value and practical significance of this field are being increasingly recognized by scholars.

Year of publications

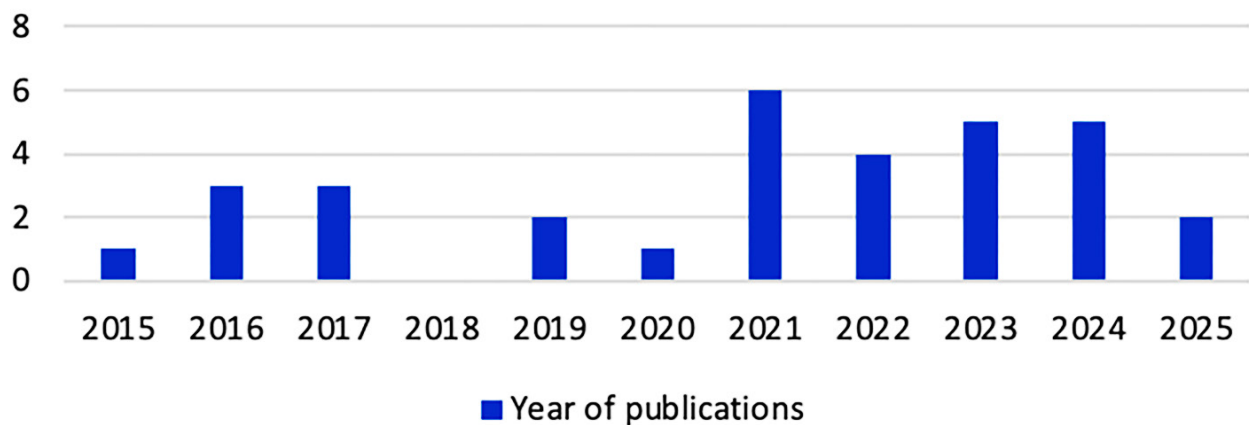


Figure 3: Number of Publications Per Year (2015–2025)

The 32 selected studies span 13 countries and regions, demonstrating a clear trend of internationalization in research on educational landscapes. The United States ranks first with 7 publications, reflecting its continued leadership in the fields of educational landscapes and early childhood learning environments. China follows closely with 6 publications, indicating a growing body of research and increasing academic engagement on this topic.

Other countries such as the United Kingdom, Australia, and the Netherlands also contribute consistently, forming a solid scholarly foundation in this domain. Notably, since 2023, there has been a marked rise in contributions from emerging countries such as Türkiye, Egypt, and Malaysia, suggesting the increasing global relevance and responsiveness of this topic in light of ongoing transformations in educational ecosystems.

In parallel, the sharp increase in publication volume since 2021 further indicates that the field has entered a period of heightened academic interest, laying a solid foundation for theoretical advancement and local adaptation in practice. (See Figure 4)

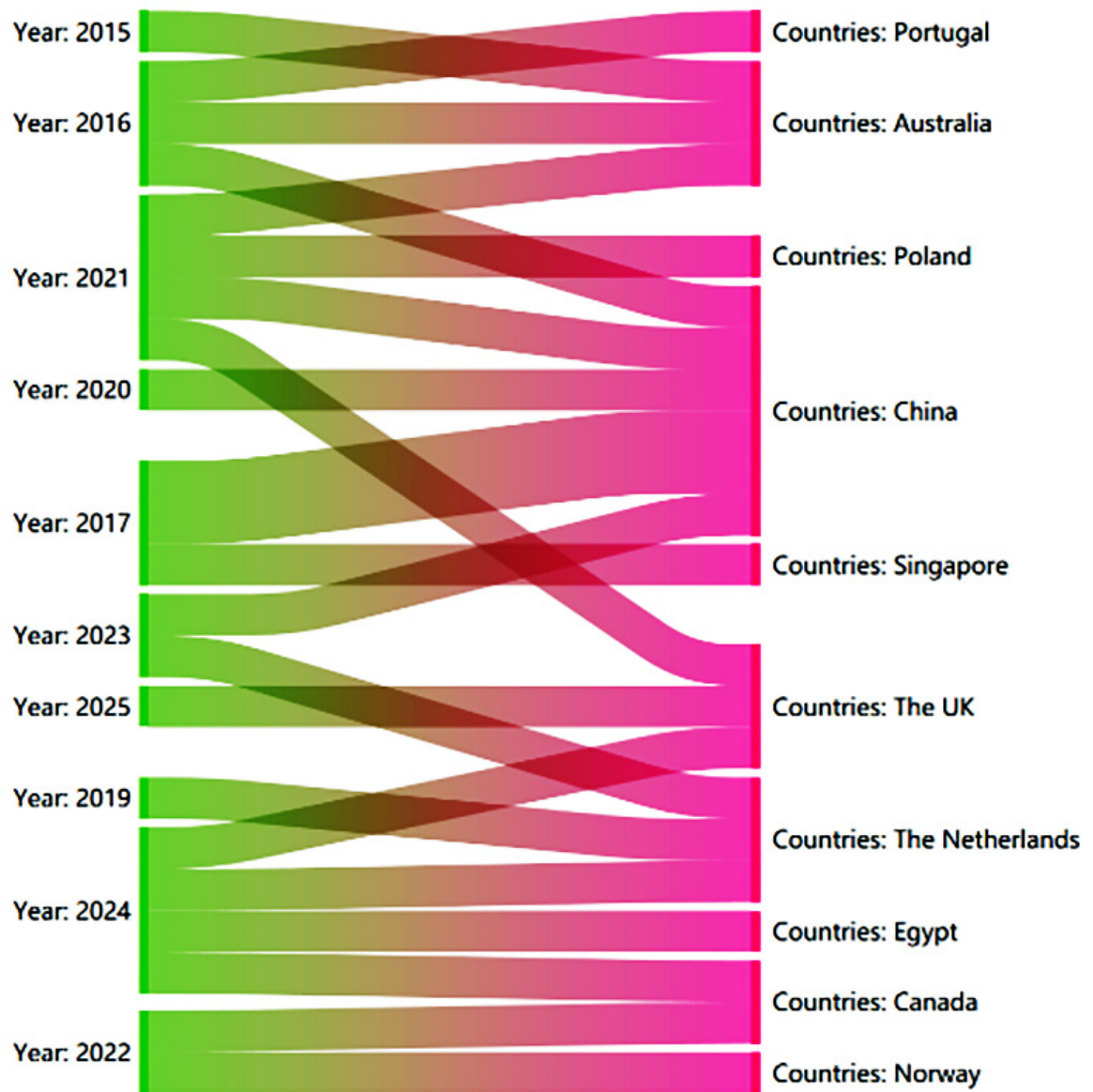


Figure 4: Country of Studies and Years of Publication with the Number of Articles.

Table 3: Summary of Themes, Research Domains, and Methods in the Reviewed Literature

Included Studies	T1: Kindergarten Landscape Development	T2: Educational Support Functions	T3: Practical Pathways for Integrating Landscape and Curriculum	Design Studies	Educational Studies	Environmental Psychology	Child Development Theory	Others	Research Types				Research Methods (Unique)
									Empirical research	Theoretical discussion	Case Study	Comprehensive review	
Speldewinde et al. (2021).	0	20	0						√				Quantify
Atkinson, et al. (2025)	0	4	0	√	√		√		√				Mix
Akarsu, (2025).	0	12	3	√	√				√				Quantify
Byrd-Williams, et al. (2019).	1	2	0		√				√				Quantify
Cosco, et al. (2021).	0	1	0	√	√				√				Qualitative
Cosco, et al. (2022).	0	2	1		√				√				Mix
Wells, et al. (2023).	0	5	3		√				√				Mix
Duque, et al. (2016).	0	1	2		√				√				Quantify
El-Aasar, et al. (2024).	3	7	4		√				√				Mix
Goldenberg, et al. (2024).	1	5	1		√	√			√				Quantify
Herrington, et al. (2022).	13	0	1	√	√			√			√		Mix
Hoover, et al. (2021).	7	1	0		√				√				Quantify
Hussain, et al. (2024).	5	11	2	√	√				√				Mix
Lyne Strachan, et al. (2017).	3	7	1		√				√				Quantify
Shi, (2017).	0	0	2		√				√				Quantify
Skalstad&Munkebye, (2022).	0	4	3		√				√				Quantify
Squires, et al. (2024).	0	0	2		√				√				Mix
Taylor&Butts-Wilmsmeyer, (2020).	0	2	4		√				√				Quantify
van den Bogerd & Maas, (2024).	0	0	2	√	√				√				Mix
Walker, et al. (2021).	6	6	0		√				√				Mix
Weeland, et al. (2019).	0	2	0						√				Quantify
Weiss, et al. (2023).	0	1	1		√				√				Quantify
Zucca, et al. (2023).	0	0	2	√	√				√				Quantify
Zwierzchowska & Lupa, (2021).	3	0	0		√	√		√	√				Quantify
Luo, (2023).	1	1	0		√				√	√			Quantify
Rouse, (2016).	0	2	0		√			√	√				Qualitative
Rouse, (2015).	0	0	2		√					√			Qualitative
Mart, (2023).	0	2	0		√			√		√			Quantify
Wen, et al. (2020).	0	7	2	√	√			√	√				Quantify
Xu, et al. (2021)	3	0	4	√	√						√		Quantify
Wang, & Wang, (2016).	2	0	1	√	√					√			Quantify
Wan, (2017).	4	0	0	√	√				√				Mix
Total	52	105	43	--	--	--	--	--	--	--	--	--	--

Based on Table 3, the analysis of literature distribution and thematic coding frequency indicates that “Educational Support Functions” currently represents the most prominent focus of research attention. This theme appears in 22 out of 32 articles, with a total of 105 coding instances, reflecting sustained academic interest and in-depth investigation into the educational functions of landscape environments.

In contrast, while “Practical Pathways for Integrating Landscape and Curriculum” is identified in 20 studies, suggesting a relatively high level of attention, it has only 43 coding instances, indicating that this theme is still in a conceptual and exploratory stage. Research in this area remains fragmented and lacks strong empirical grounding.

“Kindergarten Landscape Development”, as a foundational theme concerned with problem identification and current conditions, is found in only 13 articles, yet it accounts for 52 coding instances. This suggests that although fewer studies

explicitly center on this theme, some have conducted deeper analyses, providing a practical basis for the development of subsequent strategies.

Overall, the analysis of literature coverage and coding density validates the rationality of the research question design. All three core themes are represented to varying degrees across the selected studies, reflecting both the breadth of research perspectives and the multi-layered structure of the thematic framework.

These results provide empirical support for the thematic architecture and logical pathway adopted in this study, indicating that the research not only responds effectively to current practical challenges but also holds significant potential for theoretical development and scholarly advancement.

The 32 studies included in this review span a wide range of disciplines, including education, design, environmental psychology, and child development (see Table 3). Most of the literature adopts an educational perspective, focusing on children's learning and the organization of teaching activities, thereby providing a theoretical foundation for educational landscapes. Meanwhile, design-oriented studies emphasize how spatial configurations serve pedagogical goals, such as natural playground transformations and functional zone optimization, revealing a growing trend toward the integration of educational objectives and spatial construction. Several studies also incorporate theories from environmental psychology and child development to examine how natural environments influence children's attention, autonomy, and social behavior, thus enriching the conceptual understanding of educational landscapes from a mechanistic perspective. Notably, more than two-thirds of the studies demonstrate interdisciplinary characteristics, particularly in the integration of education with design or psychology, offering theoretical support for constructing a systematic educational landscape design framework. Overall, the research focus has shifted from single-disciplinary approaches to multidisciplinary integration, reinforcing the logic of landscape as an educational medium and affirming the core orientation of this study using landscape design to enhance early childhood learning.

Among the included studies, empirical research dominates, reflecting a strong emphasis on data-driven validation of practice in this field. Most studies employ methods such as field observations, surveys, intervention experiments, and case-based inquiries to systematically explore the relationship between landscape design and child development. In contrast, theoretical discussions and case studies are relatively limited, suggesting a lack of focus on conceptual frameworks and exemplary practices. Comprehensive reviews are even rarer, indicating a current gap in the systematic synthesis and advancement of knowledge within the field.

In terms of research methodology, quantitative approaches are most prevalent, followed by mixed-methods research, highlighting a growing demand for measurable outcomes and evidence-based policy support. However, the proportion of qualitative studies remains low, pointing to a need for deeper exploration of children's lived experiences and teachers' perspectives. Future research should aim to strengthen the integration of qualitative and quantitative methods to enhance both the depth and interpretive power of educational landscape studies.

Overall, the quantitative analysis in this section reveals emerging trends in the integration of kindergarten landscape design and education, underscoring the increasing academic attention to the potential of landscape interventions in supporting child learning and development. While current studies have addressed a range of dimensions, from physical activity and cognitive development to pedagogical practice. The pathways between landscape functions and curriculum integration remain inconsistent, and the underlying mechanisms by which landscapes support educational goals are still underexplored.

Despite growing recognition of outdoor space as a vital learning resource, its practical influence within education policy and site planning remains limited. As child-centered educational philosophies gain traction in the Chinese context, it is crucial to further investigate the mechanisms through which landscape environments contribute to learning quality, and to develop an educational landscape framework with strong local adaptability. Such efforts will be essential to achieving deeper integration between environmental affordances and curriculum objectives.

Qualitative Findings

This section presents the qualitative analysis based on a thematic review of the selected literature, aiming to answer the core research question. Three main themes were identified: Kindergarten Landscape Development, Educational Support Functions, and Practical Pathways for Integrating Landscape and Curriculum. These themes are not mutually exclusive, as overlaps were observed among the studies where some articles contribute to multiple thematic areas simultaneously. The following discussion explores each theme in depth, and where necessary, incorporates supporting findings beyond the reviewed articles to provide a more comprehensive response to the research question.

Kindergarten Landscape Development

Based on the reviewed literature, this study identifies five key dimensions of kindergarten landscape development: developmental disparities, resource provision and management mechanisms, educational orientation in design, natural element configuration and spatial organization, spatial structure and functional zoning. These dimensions reflect a broader shift in understanding kindergarten landscapes were not merely as passive background spaces, but as structured and participatory learning environments that actively shape children's educational experiences and developmental trajectories. (See Figure 5.)

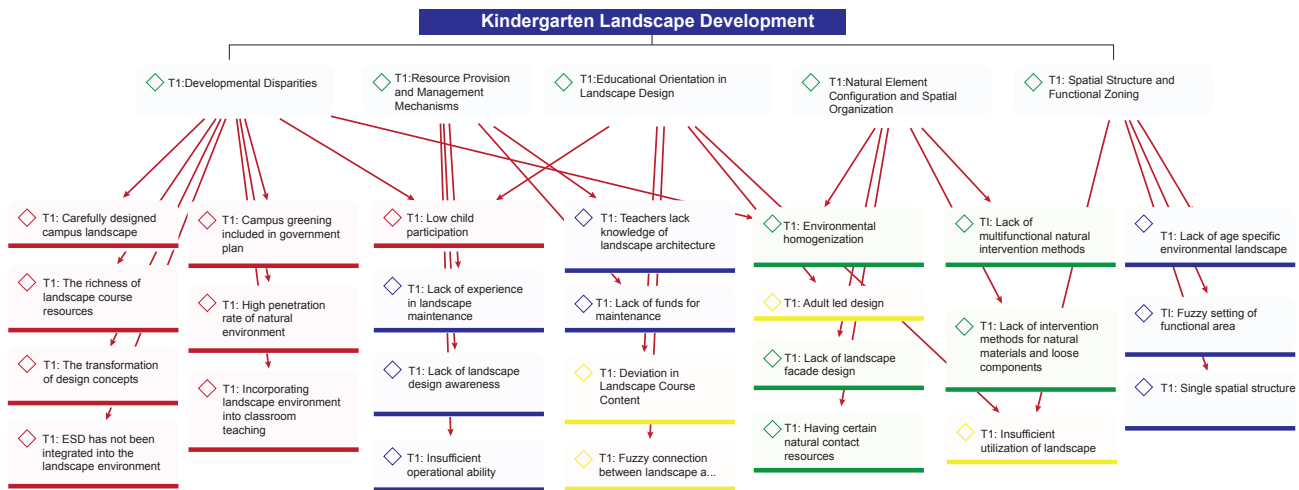


Figure 5: A Research Network on the Development of Kindergarten Landscapes

Developmental Disparities

In countries where early childhood education research has a longer history, educational landscapes have been gradually integrated into the curriculum system, forming design trends centered on Education for Sustainable Development (ESD) goals, child-led participation, and nature-based experiences as seen in Nordic countries and Australia (El-Aasar et al., 2024; Lyne Strachan et al., 2017). In these contexts, landscapes are not only carefully planned but also institutionalized as part of formal teaching resources (Hoover et al., 2021; Walker et al., 2021; Zwierzchowska & Lupa, 2021).

By contrast, countries like China and other developing regions are still in the early stages of aligning landscape design concepts with curricular integration and educational objectives. Child participation remains low, and ESD principles have yet to be meaningfully embedded into practice. Additionally, landscape homogenization is common, and there is a lack of diverse curricular resources and educationally guided spatial interventions (Xu et al., 2022).

Resource Provision and Management Mechanisms

Weak resource provision and management mechanisms have become a widespread bottleneck. Some kindergartens lack stable financial support and institutional awareness of landscape value, while also suffering from insufficient expertise in professional landscape maintenance and operational capacity (Hoover et al., 2021; Hussain et al., 2024; Lyne Strachan et al., 2017). Furthermore, many teachers lack basic knowledge of landscape design and function (Brussoni et al., 2015; Dymont et al., 2020), making it difficult for kindergartens to consistently optimize and maintain the quality of their outdoor environments.

Educational Orientation in Landscape Design

The educational orientation of landscape design remains insufficient. Most outdoor environments are designed predominantly by adults (Wang & Wang, 2016), with limited child participation and a disconnect between landscape content and curricular goals. This misalignment results in low spatial utilization efficiency and unclear pathways for integrating landscapes into the curriculum (Hoover et al., 2021; Hussain et al., 2024; Lyne Strachan et al., 2017; Xu et al., 2022). As a consequence, the potential of the landscape as an educational medium remains largely underutilized.

Natural Element Configuration and Spatial Organization

Although some regions possess a certain level of natural resource endowment (Luo, 2023; Zwierzchowska & Lupa, 2021), landscape environments remain highly homogenized overall (Xu et al., 2022). The use of natural materials and loose parts is limited, and there is a lack of three-dimensional, multifunctional natural interventions (Wan, 2017; Moore et al., 2021). These deficiencies restrict the depth and diversity of children's play and exploration and hinder comprehensive support for their cognitive, social, and physical development.

Spatial Structure and Functional Zoning

A number of studies report that spatial structures are overly simplistic, with ambiguous functional divisions and a lack of age-appropriate and systematic design (El-Aasar et al., 2024; Herrington et al., 2022; Hussain et al., 2024; Lyne Strachan et al., 2017). These issues obstruct the formation of clear activity organization and spatial flow, resulting in low overall efficiency in space utilization.

Overall, existing international research has reached a growing consensus on the construction of educational landscapes. In regions such as Northern Europe and Australia, landscapes have been systematically integrated into early childhood curricula, emphasizing sustainability, child-led participation, and nature-based experiences. These environments are increasingly institutionalized as pedagogical resources. At the spatial level, studies highlight the importance of functional zoning and the inclusion of natural elements, while at the institutional level, there is a focus on aligning design, pedagogy, and children's behavioral engagement.

However, current research remains largely conceptual, with limited empirical grounding and fragmented theoretical frameworks. In particular, the interaction mechanisms among landscape design, curricular objectives, and children's behaviors are still insufficiently explored.

Future research should prioritize the development of curriculum-oriented landscape frameworks that reinforce the synergistic relationship between space, behavior, and learning goals. It is also essential to enhance teacher participation and professional support, strengthen institutional backing, and promote context-specific empirical studies. In doing so, international insights can be effectively localized and validated within the Chinese educational context, providing adaptable design pathways for diverse regional conditions.

Educational Support Functions

With the growing emphasis on child-centered educational philosophies, the multifaceted value of landscape environments in supporting learning and teaching activities has gained increasing attention. Based on a systematic analysis of the selected literature, this study identifies four key pathways through which educational landscapes contribute to early childhood development. These pathways illustrate the comprehensive support functions of landscapes in promoting sensory and cognitive development, stimulating learning interest, facilitating teaching practices, and enhancing social interaction and overall well-being. (See Figure 6)

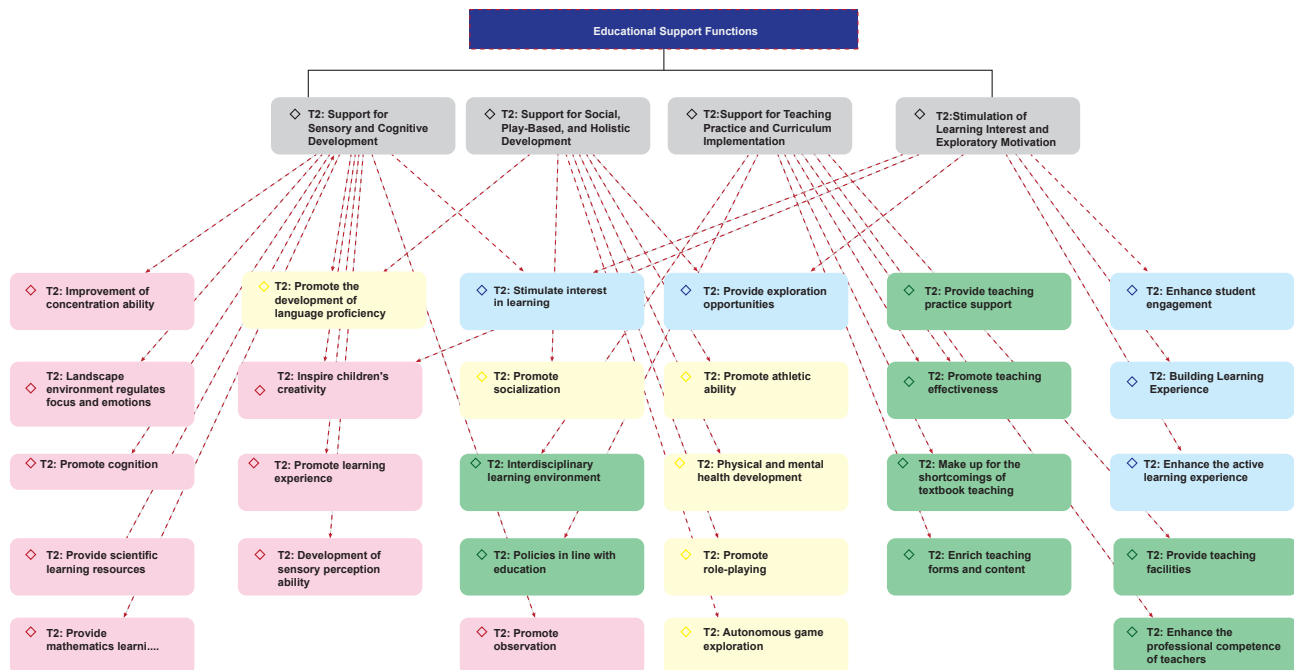


Figure 6: A Research Network on the Educational Support Functions

Support for Sensory and Cognitive Development

Educational landscapes, through diverse natural elements and spatial experiences, offer rich opportunities for sensory stimulation and cognitive engagement. Studies have shown that natural components in landscape design enhance children's observation, attention, learning interest, and creativity (Atkinson et al., 2025; Hussain et al., 2024; Skalstad & Munkebye, 2022; Taylor & Butts-Wilmsmeyer, 2020; Weeland et al., 2019). In practice, such elements are effectively utilized by teachers as media for exploring science, mathematics, and other subjects (Cosco et al., 2021; El-Aasar et al., 2024; Goldenberg et al., 2024; Lyne Strachan et al., 2017; Speldewinde et al., 2021), enriching students' learning experiences (Hoover et al., 2021; Hussain et al., 2024; Walker et al., 2021), and promoting children's cognitive (Skalstad & Munkebye, 2022; Walker et al., 2021; Weeland et al., 2019) and language development (Goldenberg et al., 2024; Lyne Strachan et al., 2017). The perceptibility and participatory nature of landscapes give them strong potential for curriculum integration, making them a meaningful auxiliary in cognitive construction.

Support for Social, Play-Based, and Holistic Development

The structure and material composition of landscape environments have significant impacts on children's social behavior (Akarsu, 2025; Duque et al., 2016; Speldewinde et al., 2021), autonomous play, and physical development (Cosco et al., 2022; Goldenberg et al., 2024; Hussain et al., 2024; Wells et al., 2023). Features such as open lawns, multifunctional play areas, and loose parts support collaboration and communication skills (Luo, 2023; Speldewinde et al., 2021), while free exploration enhances physical coordination and motor skills (Rouse, 2016; Walker et al., 2021). Moreover, landscape spaces that encourage role play, language interaction, and rule negotiation are recognized as key environmental elements for fostering children's social development and psychological well-being (Byrd-Williams et al., 2019).

Support for Teaching Practice and Curriculum Implementation

Numerous studies highlight that landscapes are no longer merely backdrops for teaching, but function as active tools and mediums for curriculum delivery. Teachers transform outdoor spaces into thematic teaching areas (Mart, 2023), interdisciplinary project platforms, and hands-on learning environments, thereby enriching both the form and content of instruction (Akarsu, 2025; El-Aasar et al., 2024; Hussain et al., 2024; Wells et al., 2023). Educational landscapes also align with policy trends promoting curriculum diversity and experiential learning, compensating for the limitations of textbook-based teaching (Akarsu, 2025; Hussain et al., 2024), and improving student learning outcomes (Goldenberg et al., 2024; Lyne Strachan et al., 2017; Taylor & Butts-Wilmsmeyer, 2020; Wells et al., 2023). From policy implementation to pedagogical transformation, landscapes have become foundational elements in driving educational reform.

Stimulation of Learning Interest and Exploratory Motivation

Research further indicates that naturalized, open-ended educational landscapes possess unique advantages in stimulating children's learning interest. Compared with traditional classrooms, these environments significantly increase engagement and agency (Akarsu, 2025; Atkinson et al., 2025; El-Aasar et al., 2024; Speldewinde et al., 2021), promoting the development of creative thinking and exploratory motivation (Hussain et al., 2024; Lyne Strachan et al., 2017; Skalstad & Munkebye, 2022). Through interactions with natural elements, children autonomously plan activities and construct personally meaningful learning experiences, thereby fostering intrinsic motivation and sustained learning behaviors (Rouse, 2016; Walker et al., 2021).

Existing studies suggest that educational landscapes play a multifaceted role in supporting children's cognitive, social, and physical development through sensory stimulation and spatial guidance. These landscapes extend the boundaries of traditional classrooms and, through natural and open environments, foster children's learning interest and self-directed exploration. However, current research remains largely conceptual, lacking systematic empirical analysis, particularly regarding the operational mechanisms linking curriculum, space, and behavior, as well as the contextual adaptation of such landscapes within China. Critical elements such as teacher involvement and institutional support also remain underexplored. Future research should focus on developing curriculum-oriented spatial design strategies, strengthening the professional role of teachers in landscape utilization, and advancing context-sensitive pathways for the development of educational landscapes across diverse cultural and policy settings.

Practical Pathways for Integrating Landscape and Curriculum

With the growing emphasis on child-centered educational philosophies, the role of kindergarten landscapes in supporting children's learning has become increasingly prominent. Existing studies propose various pathways for aligning spatial design with educational objectives, primarily focusing on four key dimensions: education-oriented design theories, support for children's behavior and development, strategies for functional integration and material configuration, and mechanisms that link teaching implementation with spatial support. (See Figure 7)

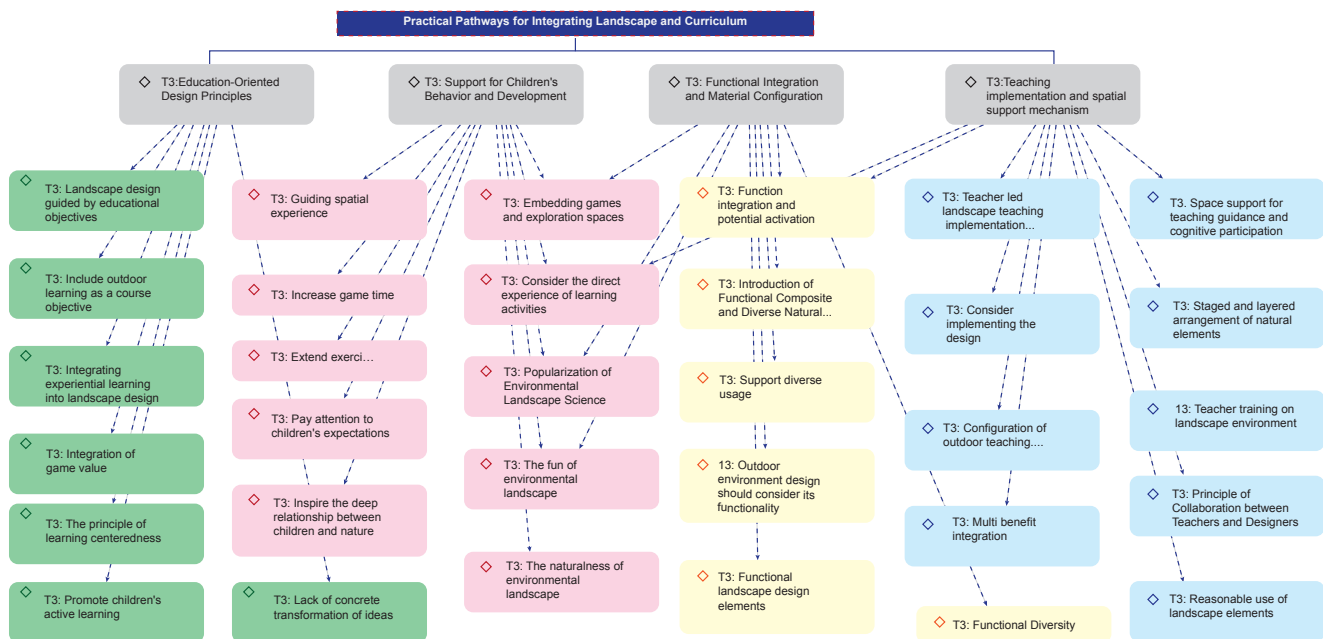


Figure 7: A Research Network on the Integration Strategies in Early Childhood Education

Education-Oriented Design Principles

Many studies emphasize a “learning-centered” approach to spatial construction (Rouse, 2015; van den Bogerd & Maas, 2024; Wen et al., 2020), advocating for an integrated design model that connects site–curriculum–activity (Wells et al., 2023). This approach seeks to unify curricular objectives, play value, and experiential learning within cohesive teaching environments (Cosco et al., 2022; Taylor & Butts-Wilmsmeyer, 2020). In regions where educational reform is more advanced, such as Northern Europe and Australia, this concept has been gradually translated into relatively mature practices (Herrington et al., 2022). However, in contexts with limited experience, such as China, there is still a lack of systematic methods to translate these ideas into concrete spatial strategies or operational design language (Wen et al., 2020). Existing research often remains at the level of conceptual advocacy, without offering detailed or implementable design guidance.

Support for Children's Behavior and Development

In practical pathways for integrating landscape and curriculum, existing literature consistently emphasizes the role of spatial design in supporting children's behavioral development and learning construction. Specific strategies include creating environments that enhance direct, experiential learning (Akarsu, 2025) and designing guided learning scenarios to improve children's perception and engagement (Skalstad & Munkebye, 2022). Studies also advocate for the integration of play-based and exploratory zones into curricula (Taylor & Butts-

Wilmsmeyer, 2020) and for extending physical activity time to support autonomous play and motor development (Squires et al., 2024).

Incorporating natural elements can foster emotional connections between children and the environment (Weiss et al., 2023), especially when landscapes are rich in natural attributes and playful aesthetics (Xu et al., 2021), enhancing both attractiveness and educational value. Some studies also stress the importance of responding to children's expectations (Shi, 2017) by incorporating child perspectives into spatial and curricular design. Others advocate for the dissemination of environmental knowledge to strengthen children's ecological awareness and achieve deeper integration between play, curriculum, and spatial experience (Xu et al., 2021). Collectively, these strategies point to a behavior-driven logic of educational landscape construction under a site–curriculum–activity integration framework.

Functional Integration and Material Configuration

Functional integration and material configuration are viewed as key strategies for enhancing the educational value of landscapes. Studies highlight the need to construct spatial systems that support diverse usage patterns (Duque et al., 2016; Lyne Strachan et al., 2017) through the integration of functional zones and activation of spatial potential (Shi, 2017). Embedding play and exploratory spaces (Taylor & Butts-Wilmsmeyer, 2020) increases the adaptability of landscapes to both educational activities and child behaviors.

To achieve this, research recommends reinforcing functional landscape elements (Hussain et al., 2024) and incorporating multifunctional, natural materials to enrich sensory experiences and cognitive stimulation (Taylor & Butts-Wilmsmeyer, 2020). Furthermore, studies call for systematic consideration of spatial functionality in outdoor design (Duque et al., 2016), and for the use of aesthetic expression and environmental knowledge dissemination (Xu et al., 2021) to enhance the educational appeal and curricular relevance of landscape environments. In sum, functional integration and material configuration represent a shift from single-purpose landscapes to multi-functional educational spaces, supporting both curriculum implementation and holistic child development.

Teaching Implementation and Spatial Support Mechanisms

Landscapes should provide spatial support for instructional guidance and cognitive engagement (Skalstad & Munkebye, 2022), through the rational allocation of teaching facilities (Taylor & Butts-Wilmsmeyer, 2020) and the layered integration of natural elements and functional zones (Shi, 2017; Skalstad & Munkebye, 2022), thereby maximizing the pedagogical potential of outdoor environments (van den Bogerd & Maas, 2024).

At the same time, effective teaching implementation depends on teacher-led mechanisms, including teacher participation in design processes, collaboration between educators and designers, and professional development in landscape literacy (El-Aasar et al., 2024; Goldenberg et al., 2024). Several studies also emphasize the importance of considering the feasibility of design implementation (Zucca et al., 2023) to ensure that pedagogical intentions are meaningfully translated into spatial realities.

Taken together, these practical pathways illustrate a significant shift in the role of educational landscapes, from static environmental backdrops to active pedagogical media. They reveal the multidimensional mechanisms through which education and space are integrated, offering operational strategies with strong potential for application in the context of Chinese urban kindergartens. However, most studies

still remain at the level of conceptual proposals, lacking empirically grounded, localized pathways and implementable spatial strategies. Future research should prioritize the contextual translation and validation of these approaches within the Chinese early childhood education system.

Conclusion

Summary of Key Findings

This study systematically synthesized key international research on educational landscapes from 2015 to 2025, focusing on three core themes: the current development of kindergarten landscapes, the educational functions of landscape environments, and practical pathways for landscape–curriculum integration. The analysis was guided by the central research question: *How can international studies inform the development of educational landscapes in Chinese urban kindergartens?*

The findings reveal a clear international shift in the conceptualization of educational landscapes, from aesthetic enhancements toward their recognition as pedagogical media. In many countries, learning-centered spatial orientations have emerged, emphasizing the integration of curricular goals, play value, and experiential learning. This conceptual transformation provides a valuable reference for addressing China's current challenges of outdated spatial thinking and functionally simplistic environments.

Functionally, landscapes are increasingly understood as active educational agents that support sensory development, social interaction, and learning motivation in early childhood. On a practical level, international studies highlight the critical importance of teacher participation, multi-functional design, and mechanisms for coordinating teaching and spatial use. These insights offer actionable strategies for constructing a more systematic and educationally aligned landscape framework in Chinese kindergartens.

Main Contributions

This study contributes to the scholarship and practice of educational landscape design in three main ways. First, it proposes an analytical framework for understanding educational landscapes through the thematic integration of international research. Second, it clarifies the multifunctional roles of landscapes in supporting curricula, stimulating learning, and fostering children's holistic development. Third, it provides both a conceptual foundation and feasible directions for the redesign and optimization of kindergarten spaces in the Chinese urban context. Together, these contributions advance the theoretical discourse and offer practical guidance for developing educational landscapes aligned with curriculum standards.

Limitations

Despite its contributions, this study has several limitations. The scope of literature is restricted to Chinese- and English-language publications, which inevitably excludes relevant studies published in other languages. Furthermore, as a literature review, the analysis lacks direct empirical comparison with Chinese kindergartens. These limitations suggest that the findings, while conceptually valuable, require further validation through localized empirical studies.

Future Research Directions

Future research should move beyond thematic synthesis toward empirical translation and contextualization. In particular, studies should focus on the localized construction of educational landscapes in China, paying attention to

the interplay between teacher engagement, curriculum integration, and spatial design. By exploring these synergistic mechanisms, future work can strengthen the dialogical relationship between international experience and local needs, ultimately contributing to the systemic development of educational landscapes for Chinese urban kindergartens.

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