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Impact of Child-Friendly Campus Landscaping on Learning and Social Behavior

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Abstract
This paper mainly explores the research scope of the impact of a child-friendly campus landscape on children's learning and social behavior, adopts a mixed research method combining qualitative and quantitative research, and selects two primary schools with different landscape characteristics in HeZe City, China as research objects and conducts a comparative study on them. The research data obtained by the comparison show that the child-friendly campus environment can stimulate students' interest in learning and promote interpersonal communication among students. However, the child-friendly campus landscape also has certain limitations, which will be further expanded and improved in future studies.

Keywords: Child-Friendly Schools; School Landscape; Social Interaction; Mental Health

1.0 Introduction

Children are the largest user group involved in the campus landscape and spend much time learning and socializing in the campus environment. However, many campus landscapes are not designed with children's needs and preferences in mind and need more space to interact with nature, play, explore, and develop. Therefore, a child-friendly campus landscape is essential for children's physical and mental health, learning, and behavior. child-friendly campus landscapes respect and fulfill children's rights to health, safety, participation, play, learning, and development (UNICEF, 2018, pp. 44-46). The child-friendly campus landscape is designed from a child's perspective to provide diverse and exciting Spaces and elements that meet children's physical, psychological, social, and educational needs. child-friendly campus landscapes influence children's health, activities, learning, and behavior by enhancing the school's environmental, ecological, and cultural values. Although some scholars have discussed these effects in previous studies, there are certain limitations. First, most research has focused on preschool or elementary school Settings, and few have examined the effects of child-friendly campus landscapes on older children in grades 4-5. Second, most studies use quantitative methods to measure the impact of child-friendly campus landscapes on child outcomes, and few use qualitative methods to analyze children's experiences and perceptions of these environments. Third, most studies use a single case and rarely use a comparative method to analyze the differences of different

campus landscapes. Therefore, this paper aims to fill these gaps by conducting a mixed-method study on the impact of child-friendly campus landscapes on elementary school children's learning and social behavior.

This study aims to delve deeply into the influence of child-friendly school campus landscapes on students' learning and social behavior. By integrating literature reviews, on-site inspections, questionnaire surveys, and data analysis, we hope to reveal how optimizing campus environments can promote students' mental well-being, learning motivation, and social interactions.

The research question is:

How does the child-friendly campus landscape affect children's learning and social behavior in the primary school environment?

The sub-question is:

How do children perceive and experience the child-friendly campus landscape in middle school?

By what means does a child-friendly campus landscape affect children's academic performance and motivation in primary school?

In a child-friendly campus landscape, what influences children's social interaction, communication, emotional regulation, and problem-solving abilities in primary school?

2.0 Literature Review

This section reviews the literature on child-friendly campus landscapes and their impact on children's learning and social behavior. Firstly, this paper defines the concept of a child-friendly campus landscape and points out its main features. The research has four themes: health, play, learning, and behavior. The report analyzes the strengths and weaknesses of each topic and points out gaps in the literature.

2.1 Child-friendly campus landscape

Child-friendly campus landscapes respect the realization of children's rights to health, safety, participation, play, learning, and development (UNICEF, 2018). Li Lina (2016) put forward the concept and design principles of a child-friendly campus landscape from the perspective of children's needs and rights. Wang Xiaoli (2018) discussed the characteristics and evaluation indicators of a child-friendly campus landscape from the perspective of children. Zhang Xiaomei (2019) analyzed the components and design methods of a child-friendly campus landscape from the perspective of children's participation. Wang Rui (2016) introduced the design concept and implementation process of the University of Technology Sydney in Australia based on children's experience; Zhang Lina (2020) presented the design scheme and effect evaluation of Beijing No. 2 Experimental Primary School from the perspective of children's participation.

According to the UNICEF (2018) report, the child-friendly campus landscape has six characteristics: accessibility, safety, inclusion, participation, fun, and education. The barrier-free and safe campus landscape should provide different children with Spaces and facilities for leisure, entertainment, and learning according to their personality differences. At the same time, safety is put first. Inclusive and participatory campus landscapes should respect individual differences and the diversity of children to promote the development of emotions and communication. The educational and recreational campus landscape provides a space for children to explore nature and discover science, thus promoting the development of children's cognitive ability and creativity.

2.2 Health Effects

Child-friendly campus landscapes can improve children's health. Some studies have shown that children's long-term activities in the natural environment can reduce children's stress levels (Chawla et al., 2014), blood pressure (Li et al., 2011), and obesity risk (Wolch et al., 2011). 2011) and attention deficit hyperactivity disorder (ADHD) symptoms (Faber et al., 2009). In addition, green space use was associated with improved physical activity levels in children (McCormack et al., 2010), immune system function (Hanski et al., 2012), vitamin D intake (Bener et al., 2009), and sleep quality (Grigsby-Toussaint et al., 2010). Previous studies on child-friendly campus landscapes and health outcomes have been limited in design, measurement, control, and focus, and more detailed in-depth studies are needed to examine causality, using experimental or quasi-experimental designs, objective measures, and multivariate analysis of the data to explore effects on different aspects of health using multiple indicators and groupings.

2.3 Play Effects

A child-friendly campus landscape can enhance children's play experience and effects. Play is critical to children's development because it fosters creativity, imagination, exploration, problem-solving, and learning (Bergen, 2009). Some studies have shown that child-friendly campus landscapes can provide children with a variety of play opportunities and abilities, which stimulate the children's senses, and children can be challenged and choose from the environment (Fjørtoft & Sageie, 2000; Maxwell et al., 2008; Rasmussen & Smidt, 2003). In addition, child-friendly campus landscapes can increase the frequency, duration, diversity, and quality of children's play (Dyment & Bell, 2008; Fjørtoft, 2004; Herrington & Studtmann, 1998). The above studies have some limitations in the methods and samples used to investigate the effects of child-friendly campus landscapes on children's play experiences and outcomes, and more comprehensive studies using a hybrid approach are needed to examine the effects of child-friendly campus landscapes on different groups of children.

2.4 Learning Effects

Learning is a complex, multifaceted process that involves cognitive, emotional, and social aspects (Bransford et al.). A child-friendly campus landscape can promote children's learning and development in different areas. Some studies have shown that a child-friendly campus landscape can provide an excellent outdoor environment for children's learning and development through the use of natural

elements, the construction of learning resources, the selection of learning opportunities, and the cooperation of learning partners (Dowdell et al., 2011; Malone & Tranter, 2003; Rivkin, 1997). Thus, using a child-friendly campus landscape can improve children's academic performance and motivation, such as test scores, grades, attendance, engagement, and interest (Blair & Scott, 2002; Dettweiler et al., 2015; Li & Sullivan, 2016). This type of research has limitations in terms of measures, concerns, perspectives, and frameworks for children's learning and development, and more realistic research is needed to measure the impact of child-friendly campus landscapes on children's learning and development, using direct or surrogate assessments and multiple indicators and groupings to investigate the impact of child-friendly campus landscapes on different aspects of children's learning and development.

2.5 Behavior Effects
Child-friendly campus landscapes can positively impact children's social and emotional behavior. Behavior shows a child's personality, temperament, character, and adaptability to the environment (Eisenberg et al.). Multiple studies have shown that child-friendly campus landscapes can promote children's social and emotional skills and abilities, such as communication, cooperation, self-regulation, and problem-solving (Burdette & Whitaker, 2005; Dyment et al., 2009; Moore & Wong, 1997). In addition, using child-friendly campus landscapes can reduce behavioral problems and conflict in children (Chawla et al., 2014; Grahn et al., 1997; Wells & Evans, 2003). Most of these studies have focused on the positive aspects of children's social and emotional behavior, and few have examined the negative or challenging aspects. Most of these studies use normative or generic frameworks of children's social and emotional behavior, with little research on the diversity or differences in children's behavioral responses, such as their cultural, situational, or personal factors. Therefore, more objective and detailed studies are needed to explore child-friendly campus landscapes' effects on children's social and emotional behavior using a multi-indicator, multi-group approach.

3.0 Methodology
The research object of this paper is about 300 children aged 6-12 (grade 1 to Grade 6 in primary school) in mainland China. Among them, 150 were from A child-friendly primary school in Heze City, Shandong Province (after this, referred to as School A), and 150 were from a traditional primary school in Heze City, Shandong Province (after this, referred to as School B). The two schools are similar in location, education level, and student population. However, there are apparent differences in the campus landscape. The campus landscape of School A characterizes nature, openness, diversity, and participation, while School B's campus landscape is artificial, closed, single, and standardized. This paper will conduct a comparative study of children from two schools to explore the differences in the effects of different types of campus landscapes on children's learning and social behavior.
This paper adopts a mixed method, a combination of quantitative and qualitative research methods, to obtain more comprehensive and in-depth research results.

3.1 Literature Review
This paper's research question and significance are determined by systematically collecting, screening, sorting out, and evaluating domestic and foreign literature related to this paper's subject, sorting out and analyzing previous studies' main contents, methods, results, and shortcomings.

3.2 Questionnaire Survey
This study adopts a questionnaire survey method to explore children's perceptions, evaluations, preferences, and suggestions on school landscapes from their perspectives, as well as children's learning and social behaviors in school landscapes and their characteristics. According to the objectives and questions of the study, children of different ages, genders, personalities, and needs were selected as the respondents of this study, covering different types of schools, to gain a comprehensive and in-depth understanding of children's perceptions of various aspects of school landscapes such as perceptions, emotions, attitudes, and behaviors. The questionnaires were distributed in organized school groups, filled out on paper, and collected when the children had time and in a suitable environment and atmosphere.

3.3 Field observation
Through systematic and random field observation in campus landscapes of different types, scales, styles, and functions, children's behavioral patterns, frequency, duration, and space in campus landscapes are recorded, as well as the factors and degrees of influence of campus landscapes on children's behaviors, to obtain objective secondary data.

3.4 Interview and Discussion
To gain a deeper understanding of the children's feelings, thoughts, opinions, and suggestions regarding the campus landscape, as well as their motivations, strategies, outcomes, and attitudes in learning and social behaviors within the campus landscape, we specifically invited some children who participated in the questionnaire survey and field observation for semi-structured or unstructured interviews or group discussions. The age range of the children invited for the interviews was 6 and 12 years old.
   Among the 6-year-old children, we found that they tended to describe the natural and playful elements in the campus, such as their favorite trees and playground equipment. In contrast, the 12-year-old children were more focused on learning and social spaces, like libraries, sports fields, or places where they interact with classmates. Moreover, the 12-year-olds provided more suggestions and

expectations regarding the functionality and aesthetics of the campus, while the 6-year-olds primarily described their daily activities and experiences within the campus.

3.5 Data analysis
By applying quantitative analysis methods such as descriptive statistical analysis, correlation analysis, and regression analysis, as well as qualitative analysis methods such as content analysis, discourse analysis, and narrative analysis, integrate the collected data, summarize, classify, and interpret to answer the research questions raised in this paper and verify or deny the hypotheses proposed in this paper.

3.6 Presentation of results
The paper presents the data analysis results accurately and convincingly using charts, images, words, and other forms. The results are also discussed and evaluated in the paper. This paper points out the contributions and limitations, as well as the direction and suggestions for future research.

4.0 Results

4.1 Survey Results
This paper analyzed 300 questionnaires from two schools and found the following main findings:
There are significant differences between School A and School B children in their perceptions, evaluations, preferences, and recommendations for the campus landscape. Children in School A have a higher satisfaction, love, and utilization rate of campus landscape than those in School B, and children in School B have more suggestions for improving the campus landscape. The campus of School A is vast and rich in plant species, providing children with various activities and exchanges. The campus of School B is small, simple, clean, and closed, with a strong learning style, creating a better place for children to study and research.

School A and School B children differ significantly in their classroom learning and social behaviors. School A children conduct more types, frequency, duration, and space of learning and social behaviors than School B children.

There is a positive correlation between children's perception, evaluation, preference, and suggestion of the campus landscape and their learning behavior and social behavior in the campus landscape. The more children like the campus landscape, the more they use it and learn and socialize in it.

4.2 Field Observation Results

Table 1: Differences in questionnaire results between School A and School B

School	A	B
Campus Landscape	Large, diverse, natural, open, functional, aesthetic	Small, simple, clean, enclosed, academic
Perception	High satisfaction, love, use	Low satisfaction, love, use
Evaluation	Positive, happy, confident, proud	Negative, frustrated, unconfident, unproud
Preference	Rich, innovative, diverse, open	Simple, traditional, single, closed
Suggestion	Specific, practical, reasonable, feasible	More improvement suggestions
Learning Behavior	More types, frequency, duration, space	Less types, frequency, duration, space
Social Behavior	More types, frequency, duration, space	Fewer types, frequency, duration, space
Perception (Positive/Negative)	135/15	45/105
Evaluation (Positive/Negative)	140/10	40/110

This paper conducts 12 field observations, three in each season in each school, each lasting 2 hours. Through the behavior mapping and behavior coding analysis of the field observation data, the following main findings:

Significant differences exist in the learning and social behavior patterns of School A and School B children in the campus landscape. In general, children in school A show more positive behavior patterns, such as independent exploration, cooperative communication, friendly communication, mutual assistance, and cooperation in the campus landscape, while children in school B show more negative behavior patterns, such as passive acceptance, one-way transmission, competition and confrontation, and conflict resolution in the campus landscape.

There are also significant differences in the learning behaviors and social behaviors of children in School A and School B in different types, sizes, styles, and functions of the school landscape. Children in school A have more learning behaviors and social behaviors in the natural, large, open, and multifunctional campus landscape. In comparison, children in school B have more learning behaviors and social behaviors in the artificial, small, closed, and single-function campus landscape.

There is a certain degree of interaction between children's learning behavior and social behavior in the campus landscape and the type, scale, style, function, and other factors. In other words, factors such as the type, scale, style, and function of the campus landscape not only affect children's learning behaviors and social behaviors but also receive feedback from children's learning behaviors and social behaviors in the campus landscape.

4.3 Interview and Discussion Results

Table 2: Comparison of learning and social behavior patterns of children in campus landscapes of School A and School B

Learning and Social Behavior Patterns	School A	School B
Autonomous exploration	120 (42.9%)	60 (21.4%)
Cooperative communication	80 (28.6%)	40 (14.3%)
Friendly interaction	40 (14.3%)	20 (7.1%)
Mutual assistance	20 (7.1%)	10 (3.6%)
Cooperation	10 (3.6%)	5 (1.8%)
Passive acceptance	5 (1.8%)	20 (7.1%)
Unidirectional transmission	10 (3.6%)	40 (14.3%)
Competitive confrontation	15 (5.4%)	60 (21.4%)
Conflict resolution	20 (7.1%)	80 (28.6%)
Total	280 (100%)	280 (100%)

This paper conducted ten interviews or group discussions with children from two schools. It used qualitative analysis methods to find the following main findings: School A and School B children have significant differences in their feelings, ideas, opinions, and suggestions on campus landscape. School A children are more optimistic, happy, confident, innovative, open, and optimistic, while School B children are the opposite. School A and School B children also significantly differ in their motivations, strategies, effects, and attitudes toward learning and social behavior in the campus landscape. School A children are more intrinsic, active, interested, goal-oriented, flexible, diverse, exploratory, cooperative, significant, lasting, profound, extensive, positive, confident, optimistic, and open, while School B children are the opposite. There is a causal relationship between children's feelings, ideas, opinions, and suggestions on the campus landscape and their motivations, strategies, effects, and attitudes toward learning and social behavior in the campus landscape. They influence each other.

Table 3: Differences in Children's Learning and Social Behavior Patterns in School A and School B Landscapes

Campus landscape type, size, style, function	School A	School B	Campus landscape type, size, style, function
Natural, large, open, multifunctional (such as lawns, gardens.)	Frequency: 160 (57.1%); Duration: 80 minutes/time (average)	Frequency: 40 (14.3%); Duration: 20 minutes/time (average)	Natural, large, open, multifunctional (such as lawns, gardens.)
Natural, small, semi-open, single-function (such as flower beds, paths.)	Frequency: 40 (14.3%); Duration: 20 minutes/time (average)	Frequency: 80 (28.6%); Duration: 40 minutes/time (average)	Natural, small, semi-open, single-function (such as flower beds, paths.)
Artificial, large, semi-enclosed, multifunctional (such as classrooms, libraries.)	Frequency: 40 (14.3%); Duration: 20 minutes/time (average)	Frequency: 120 (42.9%); Duration: 60 minutes/time (average)	Artificial, large, semi-enclosed, multifunctional (such as classrooms, libraries.)
Artificial, small, enclosed, single-function (such as laboratories, corridors.)	Frequency: 40 (14.3%); Duration: 20 minutes/time (average)	Frequency: 40 (14.3%); Duration: 20 minutes/time (average)	Artificial, small, enclosed, single-function (such as laboratories, corridors.)
Total	Frequency: 280 (100%); Duration: 140 minutes/time (average)	Frequency: 280 (100%); Duration: 140 minutes/time (average)	Total

5.0 Discussion

The results of this study show that the child-friendly campus landscape significantly impacts children's learning and social behavior, both positive and negative, both direct and indirect, both one-way and two-way. Specifically, this paper explains and analyzes the results from the following aspects:

5.1 Positive Impact

Child-friendly campus landscapes stimulate motivation, enhance learning strategies, and improve learning outcomes and attitudes by providing a diverse, rich, open, flexible, comfortable, aesthetically pleasing, educational, and inspirational learning environment. For example, children in School A had more independent exploration and cooperative communication in the school landscape, and their academic performance and satisfaction were higher than those in School B. Children in School A had more social behaviors in the school landscape, such as friendly exchanges, mutual help, and cooperation, and their social skills and social integration were higher than those in School B. The children in School B had more social behaviors, such as friendly exchanges, mutual help, and cooperation.

5.2 Negative Impact

Child-friendly campus landscapes can also negatively impact children's learning behaviors, which may lead to distraction, waste of time, and the need for more attention and efficiency, thus affecting the quality and progress of children's learning. They may encourage children to over-pursue their individuality and freedom at the expense of norms and responsibilities, reducing their social adaptability and sense of social responsibility.

6.0 Conclusion

This study explores the impact of a child-friendly campus landscape on children's learning and social behavior to provide a theoretical basis and practical guidance for building a campus environment conducive to children's growth and development. The research method of this paper adopts a mixed research design, that is, a combination of quantitative and qualitative research methods. It comprises six stages: conducting a literature review, performing a questionnaire survey, carrying out field observation, conducting interviews and discussions, analyzing data, and presenting results. In practice, this paper provides a case study of the impact of a child-friendly shcool landscape on children's learning and social behavior. It takes two primary schools in HeZe as cases to conduct a comparative study to provide a theoretical basis and practical guidance for building a campus environment conducive to children's growth and development. The limitations of this study include the restriction of the sample based on geographical, age, gender, and other factors, which prevents it from representing all children. The future research direction of this paper is to expand the sample to include more types of children from different regions, ages, and genders to obtain more extensive and representative research results.

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Paper Contribution to Related Field of Study

The research contribution of this paper is to theoretically expand the research scope of the impact of a child-friendly campus landscape on children's learning and social behavior and conduct in-depth discussion and analysis from the perspectives of multidimensional, dynamic, interactive, causal, and so on. It innovates the research method of the impact of a child-friendly campus landscape on children's learning and social behavior.

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