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THE BEST HEALTHY SPATIAL DESIGN REQUIREMENTS FOR PRESCHOOL CHILDREN IN CHINA

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ABSTRACT

In China, preschool education is the initial educational Environment for children. Early childhood education focuses on six key aspects of children's development: religious and moral values, physical activity, cognitive skills, social skills, language skills, and creativity. Therefore, many researchers believe that one way to nurture these six areas is to create an atmosphere that meets children's requirements, such as providing comfort, safety, and stimulation. Nevertheless, the state of many Preschool children needs more joyful school hood in China nowadays. This situation has resulted in the deterioration of the children's well-being and development. This study conducted a systematic literature review synthesis process to evaluate the trend, identify the gaps, and recommend the best healthy spatial design requirements for preschool children in China. This study covers current healthy spatial design requirements for children regarding kinaesthetic learning, preschool children's healthy spatial design activities applications such as cultural games, and successful design requirements for preschool children's healthy development in China. This study conjectures that when cultural game spaces are designed to strengthen pre-schoolers' kinaesthetic learning in an educational environment, it could strengthen pre-schoolers' happiness, fun, and enjoyment. The findings would benefit policymakers and stakeholders in designing a fun, positive, and cultural engagement Environment for preschool children's thorough physical activity space criteria that can improve the overall well-being of preschool children.

Keywords: cultural games, healthy development, preschool children, preschool space design

1.0 INTRODUCTION

Since July 2, 2001, the Chinese government has implemented school policies such as the Guideline for Kindergarten Education and the guidelines for assessing the quality of kindergarten care and education (Li, 2001; Zhuang Bi et al., 2015). These guidelines prioritise towards age-specific features and development that emphasise pre-schoolers' comprehensive and continuous growth. The policy's directive requires incorporating teaching games for pre-schoolers to support children's physical and cognitive growth. Unfortunately, few preschools in China provide age-specific features and development, emphasising pre-schoolers' comprehensive and continuous growth. This feature can be seen in how preschool children reflect on their schoolhood, happiness, and well-being.

In 2020, a study (Guan et al., 2020) of China's children indicated that 11.1% of China's children

are overweight and 7.9% are obese, and this is a rising trend (Ji et al., 2004; Daniels et al., 2005; Abarca-Gómez et al., 2017; Zhao, 2018; Chen et al., 2020). This serious condition has made China's government realise that there is underlying instability in Health issues of children aged 3 to 6 and the physiological risks (Fu, Xiaolan, et al., 2023). These health issues have a direct impact on the growth and development of children. Policies, infrastructure, organisational structures, and environmental protections affect preschool children's migration (Lubomira, 2004; Hao et al., 2021).

China is a culture-influence-society that could affect one's worldview, values, and conduct, and it is believed that it would enhance cognitive skills, self-esteem, and society's adaptability (Hu et al., 2021). A positive social environment and culture would aid preschool children in learning to follow norms and create a sense of identity and belonging. This situation could benefit their physical and mental health and development and provide preschool children with safer and healthier spaces, facilities, and services to promote the harmonious development of their bodies and minds. Similarly, it would allow preschool children to enjoy a healthy and interesting environment for cultural and physical activities (Ingold, 2002). Therefore, this study saw a need to provide fun school spaces for a better preschool experience, particularly in China. Here, the study seeks the best healthy spatial design requirements for preschool children in China.

2.0 RESEARCH METHODOLOGY

Masiran et al. (2020) developed a Systematic Literature Review Synthesis Process based on Ibrahim and Mustafa Kamal (2018). This is a typology of literature review that elucidates existing literature during the initial stages of research ideation (Rousseau et al., 2008; Yu & Watson, 2019; Templier & Paré, 2015). Ibrahim (2011 & 2020) suggested three RQ structures— “who”, “what”, and “how”—to establish research themes. The “who” is the affected factor, the “what” is the required knowledge, and the “how” is the target impact of the study. Based on the kinaesthetic learning of pre-schoolers, the identification of cultural game preferences for healthy pre-schooler development, and the recommendation of space design features needed for healthy pre-schooler development in China, this study recommended the optimal space design requirements for healthy pre-schooler development in China. A systematic literature review synthesised and identified pertinent papers. The literature review program finds papers that could answer critical research topics. The selected papers will be studied in more depth to better understand the important findings of the study and provide support and areas of development for future research. This exercise produced a summary of the best narratives, which were later cross analysed to incorporate possibilities and prioritise how to incorporate cultural games into the optimal design of preschool spaces needed for the healthy development of pre-schoolers in China, how to enhance kinaesthetic learning while bringing fun and enjoyment to pre-schoolers while they are in preschool. The “Point of Departure (POD) Tree Diagram” by Ibrahim and Mustafa Kamal (2018) summarises the important findings. The study recorded the synthesis process using the EAGLE Navigator online system and reported the results.

3.0 LITERATURE REVIEW

This literature survey study investigates preschool children’s kinaesthetic learning, identifies cultural game preferences for pre-schoolers' healthy development, and recommends the

spatial design characteristics needed for healthy preschool development for children in China. Through selecting literature from the Web of Science and Google Scholar, using the keywords, this study recommends the best healthy spatial design requirements for preschool children in China. Towards its conclusion, this study presents descriptive findings that lead towards the potential theoretical direction of how spatial design of experiential-cultural spaces requirements for pre-schoolers could strengthen kinaesthetic learning whilst giving fun and enjoyment to the pre-schoolers during school hours.

3.1 Healthy Spatial Design for Preschool Children

Early childhood education is a critical factor in the subsequent development of preschool children's cognitive abilities, social interactions, and emotional intelligence. It is the initial stage in their overall growth and is pivotal in shaping these aspects. At this level, learning encompasses not only acquiring knowledge but also serving as the foundation for cultivating competencies and abilities. During this phase, there is a specific focus on developing and honing their spatial thinking abilities. This thinking significantly impacts their ability to comprehend spatial relationships, solve problems, and exercise their creative imagination (Hatira & Sarac, 2024). Gardner and Hatch (1989) proposed that cognitive science and education increasingly focus on the motor components of learning. Motor participation in learning has received significant study in cognitive science and educational research. This focus is evident in theoretical investigations and the creation and execution of practical exercises designed to help learners better understand and utilise information. Specifically, studies on physical education and kinaesthetic learning indicate that including movement and contact in the teaching and learning process is beneficial. Notable research has been conducted on physical education (Williams et al., 2008) and kinaesthetic learning (Lengel & Kuczala, 2010). These studies indicate that incorporating suitable physical activities and interactive communication into the educational process can significantly improve students' involvement and enthusiasm for learning. By employing this approach, intangible ideas may become tangible, and comprehension can be enhanced by making information more vivid and accessible.

3.2 Preschool Children’s Kinaesthetic Learning

Kinaesthetic learning is crucial for young children (Lengel & Kuczala, 2010), such as pre-schoolers. The kinaesthetic methods are for children to acquire knowledge through engaging in active physical activities instead of passive listening (Yıldız et al., 2024). Kinaesthetic learning involves fundamental, potent, and widespread methods for acquiring knowledge (Grønbæk et al., 2007). Often, kinaesthetic learning in young children could cause stress due to the physical learning process of gaining knowledge and skills (Agustia & Arifin, 2018). However, auditory learning (Agustia & Arifin, 2018), hands-on kinaesthetic practice (Fitzpatrick & Flynn, 2010), and personal experience (Gomez et al., 2000) could enhance learning in children (Lengel & Kuczala, 2010). This technique not `only promotes the enjoyment of learning but also enhances learning efficiency (Lengel & Kuczala, 2010). Sivilotti and Pike (2007) highlighted that kinaesthetic learning is a fundamental and potent learning method that transcends age, topic, and cultural barriers and is universally relevant in all educational systems. This study agrees with Wehrwein et al. (2007) that when a child possesses distinct learning style preferences, he or she will encompass visual learning through diagrams, charts, and flowcharts; auditory learning through phonics (Hanafiah et al., 2018);

literacy learning through reading and writing (Yahya & Noor, 2015); and kinaesthetic learning through touch, hearing, smell, taste, and sight (Kwon & Iedema, 2022). Based on the above arguments, this study conjectures that exploration stimulates children's senses and experiential learning is a direct experience. This method can improve children's healthy development during free play and the spatial characteristics of preschool indoor space.

The importance of exploration in preschool child development could boost healthy kinaesthetic learning. Studies (Van Liempd et al., 2018; Varman et al., 2021) found that during exploration, pre-schoolers learn new skills by watching and reacting to action possibilities, sensory, game stimulation (Ma et al., 2022), and experiential learning (Thompson, 2009). These learning methods boost children's cognitive and social development and curiosity about learning philosophically and pedagogically (Breathnach & O'Gorman, 2017). This study agrees with scholars that factors such as traditional festivals (Woodman, 2010) and Chinese traditional culture (Li, 2022) could aid pre-schoolers' understanding and respect and nurture children's cultural self-confidence (Li, 2022). In school spatial design, measures such as culturally themed play environments (Pui-Wah et al., 2015; Singh et al., 2016) could improve children's physical activity and socialisation. This study agrees with scholars (Li, 2022; Woodman, 2010) that when preschool spatial design is injected with cultural activities, it could boost kinaesthetic learning and grow culturally respected play areas tailored to children. Cultural exploration spaces, sensory, and games stimulation could boost healthy cognitive, moral, and stimulation for preschool children. This study foresaw that cultural games, kinaesthetic learning, and cultural game space design could support healthy spatial design for preschool children. Hence, these preferences give fun kinaesthetic pre-schoolers' learning spatial design programs and activities vis-a-vis promote a dynamic and inclusive learning environment. Therefore, this study conjectures that high-quality cultural game spaces are crucial to developing, nurturing, and supporting children to learn healthily.

3.3 Cultural Games for Pre-schoolers' Healthy Development

The design of preschool spaces directly impacts the healthy development of preschool children. Physical and mental health are among preschool children's healthy development areas. Physical health implies a healthy body; responsive, cognitive awareness, coordination, and adaptability (Carson et al., 2017; Lloyd et al., 2010; Cote et al., 2013; and Umer et al., 2017); and lifelong health (Telama et al., 2014). Here, this study foresaw that a good physical environment or spaces could prevent preschool children's obesity; a harmonious interpersonal environment or spaces could engage positive and stable emotions among children; and a healthy lifestyle will benefit children for life. The paper agrees with scholars (Bull et al., 2020; Kohl et al., 2012; and Bouchard et al., 2012) that Preschools in China involve daily activities, playful games, and sports for exercise (Li et al., 2022). Pre-schoolers need to have everyday activities of walks and household chores (Lipnowski et al., 2012), leisure play and dancing (Umo et al., 2019), and outdoor physical sports such as swimming and football to exercise (Tashpulatov & Shermatov, 2021). These activities are further categorised by Guan et al. (2020) to address pre-schoolers' energetic daily activities. (Refer to Table 1).

Table 1: Categorisation of physical activities typology for pre-schoolers (Adapted from Guan et al., 2020)

Type	Activities
Daily activities	Daily living skills (Soden, 2020) (eating with chopsticks, tying shoelaces, dressing, etc.)
	Household chores (washing small items, wiping the table, sweeping the floor, organising toys and your belongings, etc.)
Play games (basic motor skills development)	Posture-control games (Kovač et al., 2019): Golden chicken stand-alone, cross the log bridge, forward rolls, cartwheels, etc.
	Fine physical control games (Olabi, 2012): stringing beads, kneading playdough, origami, building blocks, etc. d. Physical fine control games: beads, playdough, origami, building blocks, etc.
	Sensitivity (Caillois, 2001): Eagle catching chickens, catching games, handkerchief throwing, etc.
	Coordination (Council, 2003): Climbing (climbing walls, climbing frames, and ladders, etc.), small animal crawling
Physical activities	Swimming, Gymnastics, Football, Basketball, Taekwondo, Wushu, Table Tennis, Baseball, Skating, etc.

Many early childhood educators need to emphasise game learning. The Learning and Development of Children Guidelines state pre-schoolers aged three to six need intuitive cognition, experiences, and play (Pan et al., 2018; Lin, 2014). This is due to children at that age learning about their environmental preservation and enhancement through adventurous skills development (Mou & Yingxue, 2003). This would allow preschool children to explore their Environment, practice their actions, discover new possibilities, and progress in all aspects of early childhood (Oudgenoeg-Paz et al., 2016). However, when teachers interject with structured education games, these games do not help preschool children's skills but worsen them (Mou & Yingxue, 2003). Here, this study agrees with Scholars those indoor games with sensory (Van Liempd et al., 2018), fun activities and interaction motivations (Tan & Rao, 2017), and folk games (Mok & Li, 2006) can encourage pre-schoolers to explore knowledge, build critical thinking and problem-solving skills. In the Chinese context, folk games have been fun and have encouraged explorative motivation and cultural learning. This study identified appropriate folk games for pre-schoolers that can enhance exploration and problem-solving skills. Meanwhile, Mok and Li (2006) believe that folk games can be categorised into four types: folk sports games, folk intellectual games, folk art games, and folk rhymes and raps. Therefore, Folk game resources are integrated into preschool's daily education, and corresponding folk game types of equipment are placed in various areas or classrooms in preschool environments to carry out related experiential, cultural game cognitive learning.

China is a multi-ethnic country, and it has accumulated various folk game resources (Long & Liang, 2011). The authors concur with Woodman (2010) and Choy (2017), who contend that children cannot grow up without a cultural context and that cultural environments have a significant ecological impact on children's development. The three main environments for a child's development are the home, the school, and society; the school is the greatest place for a youngster to spread culture. Children can more naturally engage with traditional Chinese culture through folk games (Lubomira, 2004). Nevertheless, in selecting the appropriate folk

games for pre-schoolers, any local school may need to identify the cultural values and symbols of the local community (Hofstede, 2001), for instance, in China. The lion dance has become a cultural value and symbol of the local community (Ji & Sirisuk, 2024). It has the merit of game-based teaching learning (Wang et al., 2024), physical activity (Xu et al., 2017), and interesting early childhood education (Yap, 2017). The lion dance can become popular again due to amusement and enjoyment passed down from generation to generation ethnically (Chen, 2017) and promote the children's well-being and health development (Varman et al., 2021; Mei & Luen, 2023). By engaging pre-schoolers with hands-on experience and reflection, they would be able to connect visual education to real-time experiential learning (Piscitelli & Penfold, 2015). Therefore, experiential learning can enhance fun cultural learning and entice preschool education. Hence, using experiential-cultural games learning space design could help children grow healthy and enjoy schoolhood.

3.4 Spatial Design Needs for Preschool Healthy Development in China

Integrating cultural games into pre-schoolers' school spatial design would boost their cultural awareness. Through these cultural spatial designs in school, consideration of national culture (Hofstede, 2001) needs to be critically viewed. This is because the national culture serves as the contextual and practice platform for programming cultural knowledge spatial design settings for pre-schoolers in China (Ghafar, 2018). For example, Chinese nations tend to have an authoritative figure, such as a teacher, to guide children in selecting what they can and should not do in school (Hofstede, 2001), whilst adventure-oriented school spaces could promote idea exchange (Lubomira, 2004). Since China is a collectivist country, it is keen on practical activities that emphasise community interests, a sense of belonging, and a willingness to contribute (Hao et al., 2021). This study denotes that the pre-schoolers' experiential-culture design spaces may need to be adventurous, respect the contextual culture, and contribute to being cheerful.

Since the 1950s, China has emphasised that their preschool children's intellectual program is cultivating curiosity, senses, and scientific traits (Maxwell, 2018). Preferences such as asking many questions, independent thinking, and pragmatism vision are among prudent traits needed in preschool learning (ibid.). However, when children have learning difficulties, they must deal with perception, feeling, and mobilities, interrupting their cognitive function and deteriorating their psychology and educational reasoning (Ayres, 1972). Here, this study foresaw that sensory integration spatial design (Zhou, 2021) could be one of the successful preferences to stimulate learning for pre-schoolers. Scholars recommended that bright colours (Lam & Ripman, 1977); odd-shaped activity spaces (Wang & Qin, 2017); and controlled hearing sensory (Zhou, 2021; Qian & Shih-Shi, 2021) could influence children's sensory and cognitive emotions (Maxwell et al., 2000; Lercher et al., 2002). In this case, alternatives such as Montessori's sensory teaching (Kenya, 2007), such as touch, sight, and smell (Li, 2019), could enhance pre-schoolers' muscle memory and stimulate them to learn new knowledge. This study agrees with Tarman and Tarman (2011) that there is a need for an experiential-cultural spatial design integration with the kinaesthetic-cultural games space for pre-schoolers. Therefore, when creating experiential-cultural game spaces in preschool, sensory integration is crucial in diversifying the kinaesthetic learning environment for pre-schoolers, which could stimulate their senses, adventurousness, and cultural dimension. They would enjoy and have fun in these cultural learning spaces during school hours.

Preschool children are keen and active in their natural outdoor surroundings (Storli et al., 2010). They are particularly keen on slopes (Kleppe, 2018), psychomotor learning games and equipment, and open spaces (Terrón-Pérezetal, 2021; McPhee et al., 2020). These preferences, when adhered to in their spatial Environment, could stimulate their happy feelings (Sutton-Smith, 1997), physical and mental health (Wisneski & Reifel, 2012), autonomous exploration (Van Liempd et al.,2018), and support learning and creativity opportunities (Gass et al., 2012). For instance, a cultural maze (Uttal, 2017) in preschool spaces, by using numerous cultural symbols or features, could instil pre-schoolers' learning behaviour of cultures (Dudek, 2005; Costantini, 2022). This cultural, spatial design could instil in children's thinking programming and behaviour harmony that respects cultural values, standards, and expectations. This study agrees with Click (2011) that cultural education should be part of healthy preschool environments. Five senses enhancement (Wang & Qin, 2017), such as vivid colours and visual arts (Thompson, 2009), would foster inquiry and engagement in children. This study foresaw that preschool experiential-cultural spaces could give joy, good well-being, and a comprehensive approach to their overall health. Kinaesthetic learning approaches are crucial for designing experiential-cultural preschool spaces that aid children's healthy development. Therefore, this study uses the Point of Departure (POD)Tree Diagram tool to integrate and summarise the conclusions of when experiential-cultural spaces have adhered to preschool spatial design in school; it could strengthen pre-schoolers' kinaesthetic learning in their educational Environment whilst giving fun and enjoyment to the pre-schoolers in Figure 1.

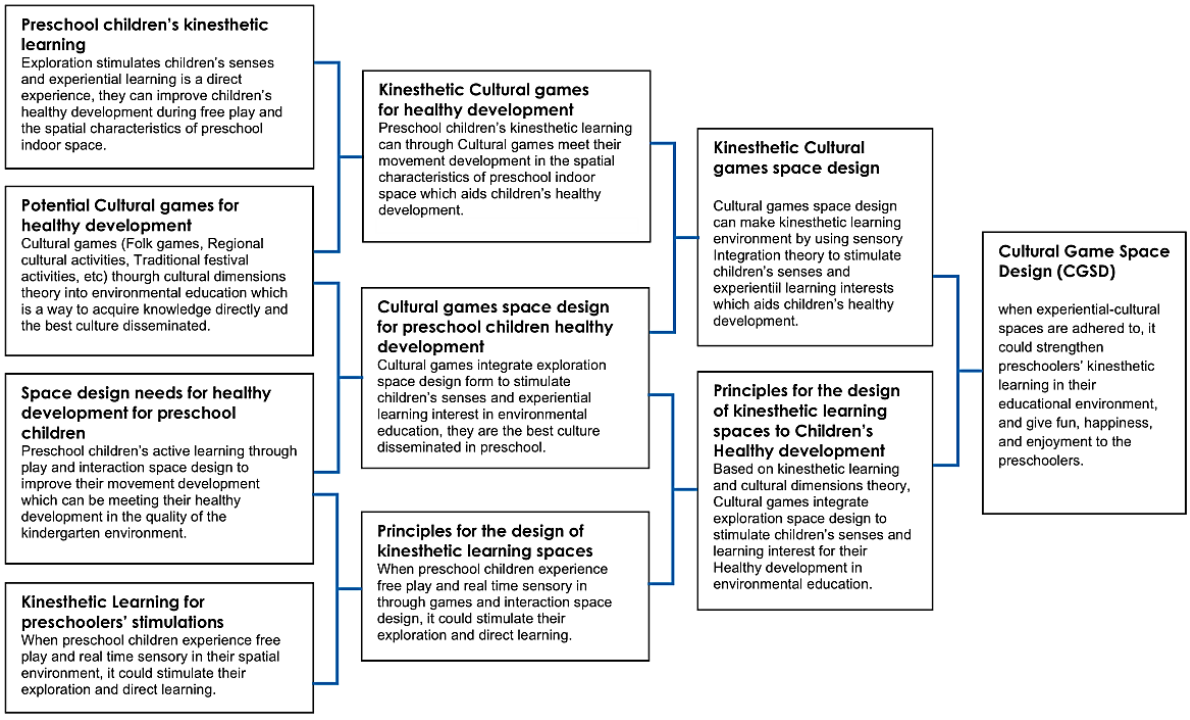

Fig 1: Point of Departure (POD) Tree Diagram for Study on healthy spatial design requirements for preschool children (Adapted from Ibrahim & Mustafa Kamal, 2018)

4.0 DISCUSSIONS

4.1 Designing Experiential-Cultural Spaces for Pre-schoolers' Kinaesthetic Healthy Development

In kinaesthetic-cultural spatial design, five sensory approaches (touch, hearing, smell, taste, and visual) are crucial to enable engagement, cognition, and joyous learning. Various forms of kinaesthetic-cultural spatial design that provide diverse teaching and learning methods (cultural games and physical activities) could accommodate children's needs and preferences in feeling adventurous and fun. Pre-schoolers engaged with kinaesthetic learning spatial design could extend their cognitive and mental well-being beyond the conventional classroom setting. This Experiential-cultural space and its realms could nurture adventure and fun spaces. Adhering to hands-on kinaesthetic activities such as lion dance could empower pre-schoolers' enthusiasm and reverence for cultural heritage. This study denotes that through kinaesthetic-cultural learning spaces, pre-schoolers could develop healthy learning development through cultural games.

4.2 The Preferences for Experiential-Cultural Space Design

This study recommends that owners provide pre-schoolers with the best learning environments to encourage cultural and experiential learning when building a preschool. Experiential-cultural learning spaces programming could potentially solve conventional preschool learning spaces. When experiential-cultural spatial design fits preschool needs, it enhances pre-schoolers' excitement to learn and go to school. At the same time, it would encourage spontaneity, curiosity, and communication that could stimulate pre-schoolers' five sensory adventures and fun within their Environment. Through experiential-cultural spatial design, pre-schoolers' children will be analytical, evolve, and have high morale. The injection of cultural values and symbols in the spatial design could stimulate children’s cultural learning interests as part of their early education.

4.3 Recommendation for Cultural-Kinaesthetic Spatial Design Requirements

Kinaesthetic learning is frequently employed in educational spatial design, particularly museums and cultural preservation settings, to cater to wider educational initiatives. In the preschool context, this education space setting could aid pre-schoolers in learning using their five senses. Visual art, for example, when injected into kinaesthetic learning, could receive cultural aesthetics, emotion, and recognition, then turn into joyous and experiential activities. This sensory would boost pre-schoolers' self-confidence and stimulate fun experiences during school duration. Therefore, constantly strengthening the kindergarten experiential-cultural spatial design can promote young children's physical and mental health and long-term physical exercise. The following six points are experiential-cultural spatial design requirements:

1) A recirculation feature ought to be included. Pre-schoolers can chase one another around the playground in a manner akin to the handkerchief game. The game should have a migratory trajectory.
2) The safety features of the experiential, cultural game track should be adaptable and changeable.
3) iconic spatial symbols for multi-sensory experiences should be included.

4) Pre-schoolers should be able to experience vertigo thanks to this spatial construction. For instance, by incorporating several cultural symbols or aspects into the design of a "pathway" or "labyrinth," a "cultural labyrinth" can be produced. It provides pre-schoolers with the fortitude and motivation to conquer obstacles.
5) Modular and adaptable space: the area must be able to change to accommodate various cultural activities, including performances, exhibitions, and festivals.
6) The materials are secure and safe for the Environment.

5.0 CONCLUSIONS

This paper seeks to answer the question of what the best healthy spatial design requirements for preschool children in China are. The kinaesthetic-cultural spatial design requirements are recommended in preschool's spatial design to enhance their cultural cognition, happiness, and learning stimulation. The injection of cultural game characteristics in preschool learning space through the five senses could critically affect their healthy learning environment. Free play spaces, cultural games equipment such as lion dance, and contextual culture could influence children's education and pedagogy. In this way, it could boost healthy and joyous learning in school environments. This study also proposed that combining multiple forms of cultural games and environmental settings, such as the experiential-cultural spatial design (ECSD) and kinaesthetic learning in school spaces, could strengthen children's physical fitness and give happy feelings to the children. This study identified that cultural games such as lion dance could be instilled in the school spaces by integrating China's contextual education in preschool. This study recommends that the ECSD requirements aid China's education ministry and designers in successfully designing the best contextual preschool education spatial design for preschool children and promoting children's happiness in school.

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