

Analysis of the Design of Children’s Playgrounds in Urban Communities under the Concept of Nature Education

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Abstract: The article focuses on the design of children’s playgrounds in urban communities. The study points out that urbanization has led to “nature-deficit disorder” among children and the squeezing of playgrounds. This study elaborates on the origin of natural education thoughts both at home and abroad and analyzes the numerous problems faced by domestic children due to the lack of playgrounds, the “learning-only theory”, and so on. Through research, the author puts forward renovation ideas from various aspects such as preserving natural landforms, planning the site, designing traffic flow lines, selecting pavement materials, and configuring plant landscapes, aiming to create an exclusive space that conforms to natural education and helps children grow up healthily.

Keywords: Nature-deficit disorder; Natural education; Urban community; Children’s playground

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1. Introduction

Reinforced cement construction is consuming forests, vegetation, and hydrological systems, as modern urbanization mercilessly strips children of their right to receive nature education. Urban children are now facing a newly identified health issue “nature deficit disorder”. Research shows that children’s growth and development benefit significantly from increased interaction with the natural environment, which not only enhances physical fitness but also promotes the development of their sensory organs, and even aids in cognitive development and psychological healing. Today, the settings for children to learn and play have quietly transformed. In urban communities, access to an authentic natural environment is notably scarce. The author believes that since children’s playgrounds in urban areas are the primary venues for children’s daily play activities, and given that environmental designers can change these settings, it would be more pragmatic to bring nature back to our doorsteps rather than seeking to impart nature education in distant suburban areas.

2. Concept of nature education

Urban children's play areas are increasingly encroached upon by adults, leading to the fragmentation and obliteration of natural playgrounds in urban communities. This scenario is unimaginable to those who grew up in rural settings. Youths raised in such conditions increasingly exhibit a lack of physical activity and a detachment from basic natural concepts, posing significant risks.

Upon close examination of current neighborhoods, it becomes apparent that spaces are predominantly dedicated to adult activities such as gyms, basketball courts, and even bars and nightclubs. These venues become the sanctuaries for adult engagement. In stark contrast, the living space available for children is profoundly inadequate. Compared with children, adults can not only adapt to the environments but also dominate them. Studies support the "personal control" theory, applicable in architectural contexts, which posits that the degree of control or influence individuals believe they have over their environment correlates with their well-being. Children, however, have minimal influence over their surroundings and lack the proficiency in language necessary to articulate their needs or craft environments that reflect their interests. Indeed, it is fair to say that children are unwittingly thrust into an adult-created "Truman Show", where they must acquiesce to imposed values with scant opportunities for personal expression ^[1].

The question of what constitutes an appropriate environment for children's development, or what kind of growth environment people should endeavor to create for them, merits serious reflection. Surely, people do not aspire for children to mature surrounded by electronics, machinery, or synthetic materials. Humans, after all, are naturally part of the animal kingdom.

In his seminal work "Emile", 18th-century French philosopher Rousseau articulated the concept of naturalistic education. Rousseau proposed that the primary goal of naturalistic education is to reintegrate children into the natural environment. He believes that education encompasses three dimensions: education by nature, education by objects, and education by human interaction, asserting that only their seamless integration can fulfill the intended educational objectives. Rousseau championed the principle of returning "to nature," encouraging adherence to one's intrinsic biological dispositions. Later, Rousseau's ideas profoundly influenced 19th-century Western educators such as Pestalozzi, Herbart, Froebel, and Spencer, who explored the nexus between education and nature through a psychological lens. John Dewey, a famous American educator, absorbed the new theory of biological evolution and functional psychology at the turn of the 20th century. On the foundation of a critical continuation of modern nature education philosophies, Dewey developed his own theory of growth-oriented nature education. Regarding the implementation of nature education, Western countries have had an early start and exhibited rapid development. Around 2016, the United Kingdom boasted approximately 800 sites dedicated to nature education, while the United States had over 3,000 nature education centers. In Japan, nature education gained momentum towards the end of the previous century, culminating in the establishment of about 3,700 nature education institutions ^[2].

"Nature education" has a long-standing history in China. As articulated in "The Analects": Confucius advocated, "Why should one not study poetry? Poetry can inspire, observe, unite, and express discontent. It involves managing familial duties and serving the ruler; it also entails understanding the names of birds, animals, and plants." This educational philosophy emphasizes the observation of nature and the popularization of scientific knowledge through natural phenomena. Laozi in the "Tao Te Ching" encapsulated the fundamental laws governing the universe with the maxim, "Humanity follows the Earth, the Earth follows Heaven, Heaven follows the Tao, and the Tao follows nature", underscoring the essential harmony between

humans and nature. Under the influence of this context, the art of Chinese garden architecture profoundly reflects Daoist principles, epitomized by the idea that, though human-made, it seems naturally formed, a goal pursued through the ages. Mencius said, “The noble person teaches for five reasons: to transform like timely rain, to cultivate virtue, to achieve wealth, to answer questions, and to personally mentor. These encompass the noble person’s educational methods.” This approach respects individual nature and creatively extends Confucius’ philosophy of tailoring teaching to the learner’s needs, positing that “the path to learning requires nothing but a tranquil mind”, suggesting that minimal guidance allows students, like flowers nourished by rain, to thrive independently, reflecting the essence of nature education. “Zhibei You” by Zhuangzi said, “Heaven and earth possess profound beauty yet remain silent, the four seasons follow clear laws without debate, and all things have inherent logic yet do not speak.” Zhuangzi advocates for the sustainable use of natural resources, emphasizing not exhausting the lakes while fishing. His philosophical perspective on nature, drawing from Lao Zi’s Daoist essence, innovatively proposes a theory of harmony between humanity and nature, facilitating self-awareness through natural engagement. He expands on the notion of “nature” found within Mencius’ theories. Wang Shouren, an educator and thinker in the Ming Dynasty, predated Rousseau by nearly 200 years with his theory of “nature education.” He posited that educating children should align with their intrinsic temperaments, respecting their physiological and psychological traits, and allowing their nature to guide their development freely. “Children generally enjoy playful activities and shy away from strict control, similar to young plants where ease promotes growth, while constraint leads to deterioration.” Children, inherently active and playful, flourish when allowed to grow naturally, unimpeded by excessive control, which could undermine their foundational vitality, resembling branches that wither quickly when shaken. Thus, he advocated for an education that respects and adapts to the natural tendencies of children without imposing undue restrictions. The crux of nurturing children’s educational nature lies in sparking their interest in learning, “In teaching children today, one must inspire enthusiasm and joy at the core, thus fostering an irrepressible desire to learn; akin to the timely rains and spring breezes that stimulate plants to sprout and flourish continuously.” When children genuinely love learning, they engage with focus and delight, lively and spirited, progressing unstopably like plants invigorated by spring rain. Neglecting children’s intrinsic motivation can dampen their enthusiasm and interest in learning, making educational advancement exceedingly challenging, akin to plants that languish under premature frost, leading to desolation and decay ^[3].

Due to the lack of natural settings and a joyful, healthy childhood, urban children frequently develop several issues, such as Internet addiction, mental exhaustion, emotional emptiness, and depression. The education one receives in childhood can significantly impact their entire life. As ancient wisdom states, “To forcibly accelerate growth is to damage it; not only is it unhelpful, but also detrimental.” Education is not to get high marks; it necessitates results, but it also requires efficiency and engagement. If education is rushed merely to improve grades, it can lead to detrimental effects. Even if children succeed academically, they might still suffer from various mental health issues. It is akin to artificially ripened fruits, which may look bright and fresh on the outside, but are rotten inside. The severe incidence of Internet addiction among Chinese teenagers is largely attributable to the lack of adequately equipped urban community playgrounds. Children in these communities need playgrounds that are guided by principles of nature education, which would increase the time they spend in outdoor activities, thereby reducing their dependency on the Internet and promoting a healthy cycle of behavior ^[4].

“All pursuits are inferior, only scholarship is esteemed.” Constrained by millennia of cultural norms, in the eyes of the Chinese, “studying” has become paramount. Under the rigid imprint of a “learning-centric ideology”, parents widely believe that “excellence comes from diligence and dereliction from diversion”, making “play and recreation” antithetical to “diligence and eagerness to learn.” “Children are the future.” Our future depends on today’s youth to forge and innovate. The “learning-centric theory” assesses students by their test scores. Unfortunately, children bear pressures and expectations unsuitable for their age. Studies have shown that playtime for Chinese children is among the lowest globally. For example, Germany’s education system, which contrasts with China’s, enrolls children in school at the average age of 6, similar to many other countries. Before this, most children attend kindergartens, known as KITA, where there is no structured academic curriculum, and play is prioritized. In Germany, children enter primary school at the age of six and typically attend for four years (except in Berlin, where it lasts six years). Moreover, primary school students attend only half-day sessions, spending their afternoons engaged in outdoor activities.

The antiquated educational paradigms have precipitated a marked decrease in playtime among community children, accompanied by a severe imbalance in the provision of playgrounds. The community children’s playgrounds ought to cater to the intrinsic educational needs of nature education. This approach could alleviate the prevailing challenges in China’s education and ease the burden of antiquated and cumbersome educational ideologies held by parents. Childhood represents a critical period for foundational development for future growth. Before embarking on formal education, children should ideally possess robust physical health, acute sensory perceptions, and a stable psychological state. For children, play constitutes their primary occupation; they require ample time for play but also need play and opportunities for interaction with peers, which are vital for their holistic development. “Play is the quintessential activity for children, and toys are their guardians.” posited Rousseau in his book, *Emile*. He notably relocated *Emile* from an urban setting to a rural one to foster educational growth. In fact, children’s play behavior does play an important role in education in the early stage; the activity of “play” itself is a deeply engaging activity for both the mental and physical aspects of children. Through games, children can not only become acquainted with their bodies but also develop self-awareness and fortify their physical health. In the natural playing settings, children further engage in observing, recognizing, and understanding the natural world, thereby acquiring knowledge about nature. From this point of view, the role of “game” extends well beyond simply providing physical and mental pleasure; through the game, children can even learn to obey the rules, cultivate their moral sense and the spirit of adventure, and ignite their creativity. Play effectively mirrors children’s exploration of their surroundings. At the beginning of their growth and development, engaging in scientifically sound and appropriate play activities can generate invaluable benefits for the healthy development of children’s bodies and minds. In addition, American psychologist Bronfenbrenner put forward the ecosystem theory, which believes that individuals are nested in a series of environments where biological and environmental factors interact to affect human development. As is shown in the research, according to Brown, the various environments in which children are situated—social, ecological, political, and cultural—impact their physical and mental development to varying degrees. In addition, Brown posits that nature is one of the key influences on children’s growth, yet it is often ignored by scholars.

3. Renovation proposals

The concept of nature education should not merely remain at the theoretical level but should be put into practical activities. How can children truly be exposed to nature education? From the perspective of the author's major, the author has conducted research on children's playgrounds in urban communities from the angle of the nature education concept and put forward some renovation proposals, thereby creating the necessary hardware conditions for children to meet the requirements of the nature education environment, enabling urban children to get close to nature and experience happiness.

According to the investigation, most of the existing children's playgrounds in cities are of the "KFC" type, that is, a monotonous combination of equipment, fences, and pavements. Not only are the activity forms monotonous and highly mechanical, but they also have little integration with natural landforms. The activity forms are dull and boring, and the ecological benefits brought by the plant landscapes have not been fully exploited.

Starting from the concept of nature education, the author believes that in the design of children's playgrounds, based on fulfilling basic functions, people should try their best to preserve the original natural landforms of the site, respect the original textures, and carry out reasonable renovations according to local conditions. People should make full use of advantageous elements such as local topography and hydrology. For example, natural water areas can be introduced to meet children's needs for getting close to water. The slopes in the natural landforms can be retained, and game facilities can be combined with the ground at different heights to create richly layered spaces. The principle of micro-topography design should be fully utilized. Diverse landforms can be set up in the ground game area to simulate the forms of nature, enhancing children's desire to explore and making them feel as if they are in the midst of nature. In the dynamic area, the changes in landforms can be highlighted, and in the static area, small mounds can be used to incorporate designs such as slides and caves. The height difference of the ground can be utilized to create interesting and separated spaces, such as using gentle slopes, enclosed plants, and the distances between plants of different sizes to create various spaces for climbing and resting.

Although the urban community playgrounds are open to all residents, children, as a special group, need to be treated specially. Infants and young children are weak and lack independence, while older children's games are spontaneous and their behaviors are not restricted by adult rules. Therefore, in aspects such as the site planning, traffic flow line design, and ground pavement of children's playgrounds in the community, special considerations are required.

In terms of site planning, children's playgrounds should be located in the center of the community green space and far away from vehicular traffic, residential buildings, and unit door entrances, to better create a relatively independent and private space, avoid disturbing residents, and ensure children's safety. The traffic flow line design should mainly follow the principle of safety, constructing independent and convenient traffic routes while meeting the traffic needs of children of different ages (such as walking, cycling, running, etc.). Characteristic plants can be used as guiding signs, and the pavement lighting and safety design should be improved to eliminate blind spots, allowing parents and residents to monitor reasonably and ensuring children's travel safety.

Nowadays, urban children are often overprotected and have had little contact with natural environments such as mud and grass since birth, making them seem "out of touch with reality." At present, the ground surfaces of children's playgrounds in urban communities are mostly made of materials such as cement, tiles, and asphalt. The advantages are that they are convenient for later maintenance, solid and durable, and

can create relatively large sites. However, the disadvantages are that they are not conducive to children's running, jumping, and climbing. These hard paved surfaces also sever the connection between children and the land, which is extremely unfavorable for children's interaction with the natural environment. They are extremely dull, resulting in a high rate of idle use and completely ignoring children's need to get close to nature. Therefore, the author believes that in the choice of pavement for playgrounds, soft and nature-friendly natural materials such as soil, vegetation, and sand should be used to replace hard pavements. These materials are not only loose and have excellent drainage properties but can also achieve the purpose of protecting children. Besides road pavements, different natural materials with various textures should also be used as much as possible in the site environment to enable children to experience rich and diverse sensory changes and promote the natural development of their senses. The loose sand is more suitable for children's jumping activities and can protect their tender knees. Large open lawns allow children to run freely. The changes in terrain should be as rich as possible while ensuring that the slopes are gentle and there are no deep puddles to ensure drainage, enabling children to perceive the height difference and play safely in the natural environment.

In the configuration of plant landscapes, a natural layout should be adopted to enrich the plant layers as much as possible, select unique and interesting plants to enhance the overall natural atmosphere and attractiveness of the playground, allowing children to better integrate into the natural environment, feel the beauty of nature in the game, harvest knowledge and happiness, and truly make the playground a good carrier of nature education to promote the healthy growth of children.

4. Conclusion

In conclusion, the design of children's playgrounds in urban communities needs to comprehensively consider the educational needs in aspects such as physical, emotional, intellectual, social, and moral, especially to meet the requirements of nature education, creating an exclusive space that is both safe and comfortable and full of interesting and natural elements, allowing children to play heartily in an environment close to nature. The various natural elements in the playground can enable children to cultivate their sentiments, purify their innocent hearts, and subtly infiltrate natural knowledge and ecological awareness while playing happily, combining education with entertainment, making up for the regret of children's lack of exposure to nature at present, and laying a good foundation for their growth. "Those who soar up to the sky will calm their minds when they look at the peaks; those who are engaged in worldly affairs will forget to return when they peek into the valleys." An ideal children's playground in an urban community should become an important bridge connecting children with nature and art, laying a good foundation for their growth and becoming a game paradise that enlightens the mind and leads the future.

Disclosure statement

The author declares no conflict of interest.

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