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## LANDSCAPE FOR CHILDREN TO PLAY AND LEARN: A CONCEPTUAL COMPARISON BETWEEN NATURAL STREAM AND PLAYGROUND

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**Abstract.** Playing and moving are the central of young children's lives. Allowing the children to experience the natural and man-made elements in their living environment would generate cognitive, physical, and social skills development. To them natural forces such as rain and wind, natural features such as vegetation, animals and landform, and man-made elements such as buildings and road are ubiquitous elements in their living environment. By playing with those elements, they learn to perceive their benefits or adversities. Mobility and perception in the landscape stimulate the children's senses and generate feedbacks as well as affordances. Through movement, the children perceive the landscape through three modes of learning which are cognitive, affective, and evaluative. Two contrasting landscape settings, a stream and a playground, are compared to explain the similarities and differences of stimulations, feedbacks, and affordances, and the modes of learning. The landscape is described as an ecological dynamic entity that through direct experience would generate the cognitive, physical and social developments of the children. In conclusion, it is important to design and develop landscapes for children that stimulate their senses, provide feedbacks and afford functional meanings to their cognitive, physical and social skills.

**Keywords:** Children, natural landscape, playground, cognition, play, affordances

**Abstrak.** Bermain dan bergerak adalah asas kehidupan kanak-kanak. Bermain dengan elemen landskap semula jadi dan buatan membangunkan kemahiran kognitif, fizikal dan sosial kanak-kanak. Pada persepsi kanak-kanak, semua elemen fizikal dan kuasa iklim di dalam alam lingkungan berupaya merangsang deria mereka. Hanya dengan bermain, kemanfaatan atau keburukan elemen atau kuasa tersebut dapat difahami. Kanak-kanak memahami landskap sebagai alam lingkungan secara tiga cara: kognitif, afektif, dan penilaian. Apabila seorang kanak-kanak bergerak, deria mereka dirangsang secara langsung lantas mereka mendapat *feedback* dan *affordances*. Dua set landskap yang berbeza iaitu sungai dan taman permainan dianalisa untuk menghuraikan perbezaan dan persamaan ransangan, '*feedback*' dan '*affordances*'. Penghuraian ini jelas menyatakan bahawa landskap adalah satu entiti ekologi yang dinamik. Pengalaman secara terus dengan landskap menghasilkan pembangunan kognitif, fizikal dan sosial kanak-kanak. Adalah wajar bagi kita meneliti kesan ransangan, '*feedback*' dan '*affordances*' apabila mereka bentuk landskap untuk kanak-kanak untuk pembangunan kemahiran kognitif, fizikal dan sosial mereka.

**Kata kunci:** Kanak-kanak, landskap semula jadi, taman permainan, kognitif, bermain, affordances

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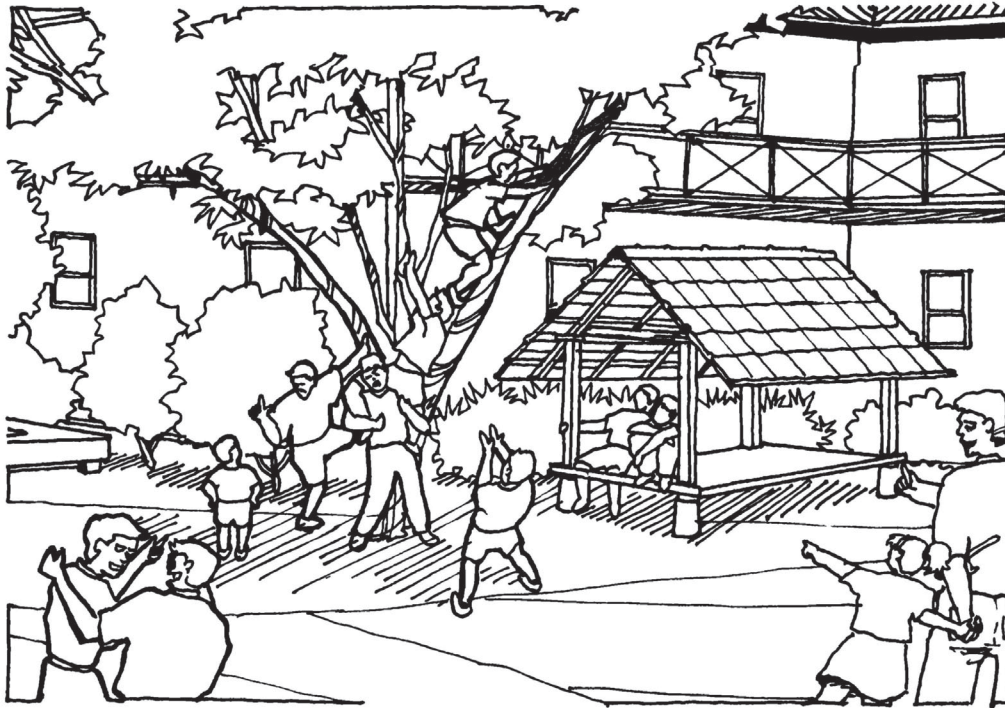
## 1.0 INTRODUCTION

In the perspective of ecological perceptual psychology and child development, outdoor space is an ecological platform for children to move and play [1]. It is a landform composed of living organisms, vegetation and animals, and sustained by climatic factors. It provides space for children to play and move around in a variety of directions and patterns. Playing allows children to stretch themselves cognitively and physically. In play activities, children rely on their imaginations as much as real objects and in the process, they learn to use their thoughts to guide their behaviours [2]. Two prominent child psychologists, Vygotsky and Piaget, believed that playing gives children valuable practice in adult-like behaviour [2]. Olds [3] pointed out that playing with landscape elements (natural and man-made) and climatic factors stimulate their senses, leading to cognitive development. The information gathered from the stimulation is interpreted and applied as a concept or idea, suggesting that the landscape elements provide benefits or adversities. A bunch of fruits on a papaya tree, a rope swing in a garden, and a pavilion in a park are interpreted differently, according to their potentials. Thus playing in an outdoor space allows a child to identify, name, classify, and learn about the rudimentary features and behaviours of the natural and man-made environments. Stephen Kellert [4] recognised this mode of learning as cognitive development in childhood.

Being aware and sensitive to the benefits or adversities of a landscape, a child later reacts by giving value to the landscape elements. An orange papaya is valued as food, a swing as a play tool to play alone or share with a peer, a pavilion is a place to take a rest, and a friend is a buddy to communicate and play. The child is attributing worth or importance to the elements that reflects clear and consistent preferences and commitments [4]. If he has tasted a ripe papaya, his preference to pluck and eat the fruit will be high. Therefore, he is behaving to a consistent pattern or a set of value that the fruit is a food. Likewise, having acquaintance with a neighbour in his playground setting allows him to form a relationship. This is another mode of learning with the environment, termed as affective development [4].

The third and final mode of learning with the landscape is called evaluative development that is judgement on the elements or conditions. In a natural landscape, Kellert [4] defined nine values including aesthetic, dominionistic, humanistic, moralistic, naturalistic, negativistic, scientific, symbolic, and utilitarian. As can be seen in Figure 1, children utilise playground features according to their utilitarian values. Additional examples include the instances when a child values a papaya as a food is a utilitarian judgement, whilst having a friend as a peer for relationship as a moralistic judgement. Intellectual development of the children is facilitated by direct contact with the nearby landscape settings, “where a world of exploration, imagination, and discovery becomes increasingly evident to the child” [4].

Is the urban living environment designed and constructed to encourage the children learning mode? In other words, is the outdoor an effective learning environment for



**Figure 1** Children use a playground according to its utilitarian values

children? This paper aims to discuss on what and how children interact in the landscape for playing and learning. It draws the importance on how adults (including landscape architects) have allowed or restricted the play-learning capabilities of children in the living environment. In addition, the paper also focuses on how adults should view children's interactions with landscape elements and transactions with peers in children's perspective, rather than adults.

## **2.0 ROLE OF ENVIRONMENT FOR CHILDREN TO PLAY AND LEARN**

The topic of children interaction with the landscape and transaction with peers is discussed in ecological perceptual psychology [1] and activity theory [5]. The landscape of the living environment is an ecological and dynamic system sustained by physical and climatic factors for the benefits of people including children. Its role for the children to play and learn is viewed in three approaches: (1) environment as a source of stimulation and feedback, (2) environment as a source for social play and (3) environment as a set of affordances [1,6,7]. Children's responses or behaviours in the living environment are viewed from a comparative analysis, on how they interact in a

natural setting versus man-made setting. A stream in a village represents a natural setting whereas a contemporary playground in a housing community represents a man-made setting. The responses or behaviours are analysed in three modes of learning—cognitive, affective and evaluative [4].

## 2.1 Environment as a Source of Stimulation and Feedback

Participation with landscape features such as a stream or a playground is a sensory experience for children [8]. Trees, animals, sand and stones, temperature, wind, and water are natural elements that can trigger the five senses. People affinity to nature begins from childhood through perceptions, interactions and behaviours relating to biological diversity [4]. Similarly, pavement, play equipments and toys, and small structures affect their senses, either positively, such as preference to play or negatively, such as avoidance to play due to fear. This cause-and-effect phenomenon is employed by child psychologists in the designing of children playing space and care centres [3].

A natural stream affords a child with plenty of functions. Through movement in the stream setting, he may use it as a place for swimming, fishing, meeting friends, climbing trees, shoveling sand etc. His visual and audio capabilities permit him to gather information on the natural setting that it is a place for swimming or fishing. As he moves into the stream, his other senses such as tactile and olfactory (smell) are stimulated by its contents such as flowing water, wind or movable equipment. Dipping his body into the stream allows him to feel the movement of the water. Furthermore, he has to coordinate all his limbs and body to encounter the current without being carried downstream. For those who have bathed in a pond or a swimming pool would be able to differentiate the dynamic of a stream water. When moving upstream, his feet have to grip the streambed and exert force against the current. A variety of movements including swimming, drifting, walking upstream, diving, and jumping are afforded at the stream. Movement generates motor skills that are useful in sensing more potentialities of the stream setting [2]. These motions permit him to locate himself freely in the water environment, assume different body postures, create his own boundaries to bath or swim, manifest his power and explore his abilities [3]. Furthermore, he has accessed to a diverse natural territory to explore and get fascinated. His feet and knees can sense the textural qualities of the stones, pebbles and sand grains as well as feel the drifting sand grains due to the current. He may even differentiate the taste of stream water from the one that he drinks from the house tap. On a hot windy day, he will be fascinated by the cooling effect of the flowing water and more so when the wind blows on him. From the experience, he will get fascinated and satisfied. Fascination is a sense of psychological well-being [9] or harmony [3]. He may even smell the refreshing effect of the wind in a natural setting. Bathing under the shade of trees such as *neram* (*Dipterocarpus oblongifolia*) and *jambu air* (*Eugenia speciosa*) will be felt cooler and more comfortable than in open part of the stream. The direct and immediate outcome of the children's actions in the stream is termed as feedback

[6,7]. It is a close-ended behaviour that generates fascination and satisfaction to the children [6].

Similarly, the children may perceive a contemporary playground as a place to play with a variety of man-made and natural features. The man-made features are mainly play equipment in various forms and colours to attract their attentions. Composite play equipment is the favourite feature because they cater multi-functions including sensorimotor play, pretend play and game with role play [10]. The equipment are laid on lawn, sand or rubber mats for children's safety and comfort. They may be shaded by trees and decorated by flowering shrubs. Like the elements in the stream setting, the play equipment stimulates the perceptual and physical senses of the children [7]. Climbing, swinging, sliding, hopping, running, and rocking are some of the activities that play equipment afford to the children. These are feedbacks that the children gain during participating in the playground, either alone or with peers. Although the playground is also an ecological platform for playing, its diversity is predictable because most features are fixed. There will be little or no change in its forms, colours or textures. This is because adults finalise its design and layout. Thus the children perceive it as a place that does not offer new opportunities or challenges in future play. This is one of the possible reasons why children deserted their neighbourhood playgrounds after several months of use [11]. On the contrary, the stream and its vegetation are dynamic elements that change in shapes, colours, textures, and sometimes aroma. At a stream landscape, the children can see fluffy flowers of *jambu air* (*Eugenia speciosa*) which later turn into fruits. They can also observe *gapis* tree (*Saraca thalipengensis*) with large, sword-like fruits that hang from its branches, overarching the stream. Moreover, the stream levels fluctuate according to the rain, resulting in different depth, velocity and turbidity of its water. The currents gradually erode its concave bank and deposit the sand on its convex side. These are the rhythmic patterns of the stream environment that trigger attachment and affiliation to the children [3,12].

Children engage in exploratory interactions with landscape features only when they feel comfortable and secure in their physical surroundings [3]. To village children, a stream is a favourite playspace. Through repetitive visits they can predict that its current is not too swift and thus safe to play. This would later develop into a sense of bonding to the stream setting. They sense excitement, fun and feel safe to be in it even though their parents may not know the places [12]. Likewise, the playground affords the children to play and generate bonding. The children perceive the outdoor setting as a comfortable place when it provides moderate and varied levels of stimulation for the senses. They are stimulated by its play equipment and vegetation that triggers preferences and fascination. Both settings, stream and playground, are perceived comfortable when they provide moderate and varied levels of stimulation for the senses. However, the stream setting allows them to manipulate the elements more than the playground. For example, sand and clay from the streambed or its bank can be moulded into a desired shape, allowing children to create a worthy attribute to the stream element. Hence, their fascination and satisfaction are extended to a higher level [8,12].

## 2.2 Environment for Social Play

Experiencing the outdoor generates social perception which is the immediate interactive situation with peers [1]. This perception later generates social play which is the open-ended and generative feedback in which, children gain reciprocal relationships such as sharing, cooperating, turn taking, and the ability to understand the rules of play [7]. Developing peer relationship is an important factor in their growth and development [2]. For example, before going to the stream, the children may have prepared fishing gears and dug for earthworms for baits. This phenomenon requires cooperation and communication. Upon arriving at the stream, they may discuss the safe and best spot to fish, perhaps on the branches of *jambu air* (*Eugenia speciosa*) cantilevered over the stream. After bored with fishing, they may engage in swimming, allowing more transactions as the stream setting is vast enough for such varied transactions. In as much, motion and socialisation are two fundamentals of all intellectual development for children [2,8].

Cooperative, associative, mutual, and functional plays are also happening in the playground. The children may cycle together to the playground or they may set a rule on how to climb rope play equipment and reach to its top. They take turn to use a slide or a swing. They take rest in pavilions or under the trees. Perhaps, they climb a fruit tree and pluck its fruits such as hog plum (*kedondong*) and mango.

In comparison to the stream setting, the playground offers less opportunities including: (1) smaller space to play together, (2) less elements to manipulate, (3) less dynamic features such as vegetation, water and animals. Therefore, the children gain less opportunities for social play and little to change their socialisation patterns resulting in lesser fascination and satisfaction. Despite these shortcomings, an open lawn which offers free play may generate lots of fascination because it is a multi-purpose space, where many manipulables can be drawn into it [13]. To the children, it is a space for running, flying kites, throwing and catching balls, playing football, and so forth. As such, neighbourhood playground should be in abundance of open lawn for social play.

## 2.3 Environment as a Set of Affordance

More differentiation between the stream setting and the playground is in their affordances. Affordance is the functional meaning of the setting and its content for the children to play and perceive its benefits and adversities [6]. Thus a slow flowing stream affords them to swim with excitement whereas a swift one affords fear of drowning. Their perceptual functioning is being stimulated by the surrounding elements. This functioning leads to physical play generating locomotion and motor skills [14]. The flowing water, vegetation, animal, sand and pebbles, and microclimatic factors afford a variety of meaning to the children. The stream setting affords them to swim, drift, dive, jump into, fish, look out from, feel the coolness of water, hear sounds

of animals, feel the wind, play games in water, and watch peers. “A child can have his or her own affordance preferences” [1]. The child may first watch older peers play in the water. His enthusiasm and courage develops in the observation process.

The first author had observed this behavior when he took 12 children, his own children and nephews and nieces, to bath in a wildlife sanctuary stream. Within a short time, the children gained competence with the stream. They were able to swim, dive and drift successfully from one spot to another. They also made easy transitions from walking on the bank and into the water and back to the bank in an endless mobility. The competence is quickly achieved because the stream offers a variety of affordances [3]. Mobility in the stream allows the children to perceive the outdoor affordances. Olds [3] postulates that mobility permits the children to locate themselves freely in space, assume different body postures, create their own boundaries, have access to diverse territories, manifest power, and explore their abilities. Movement in a natural landscape setting such as the stream helps the children to perceive combination of predictable sameness with moderate diversity [3,8].

Moreover, the affordances are not only in the form of interaction with the stream elements but also in transaction with others. “Perception of shared affordances is an essential part of socialisation” [1]. Toddlers tend to take bath in shallow waters whereas young children, aged 6 to 10 years, swim and drift in deeper waters of the stream. Thus the stream affords them to define their boundaries and permit them to push their limits and capacities, demonstrating a principle for child psychological and physiological harmony [3]. There are plenty of communications between them indicating their cheerfulness and fun they gained from the social play. The products of the interaction and transaction are fascination and satisfaction which stimulate them to come again for more exploration. Speculatively, the stream is their favourite place where they can relax, feel comfortable and calm.

Children playing in the playground also perceive plenty of affordances. According to Heft [6] functional taxonomy of affordances, the outdoor environments afford walking, running, cycling, sliding, running down, rolling, throwing, digging, tearing, squashing, feeling microclimate and so on. The functional possibilities are endless for new users but gradually their fascination diminish because of the repetitive play on similar objects. The playground contents are fixed with far less manipulables than the stream setting. Apart from the microclimate factors, it affords little or no change in its form, colour and texture. Speculatively, most children would not select it as their favourite place where they can gain emotional release [15].

In short, children perceive the natural setting with more utilitarian, aesthetic, humanistic and naturalistic values than the man-made settings. In utilitarian value, they gain more material and physical rewards from nature. Aesthetically, nature is more appealing because of its diversity and it possesses the quality of difference-in-sameness [3]. In humanistic term, they prefer to create bond with nature because it is not man-made and has endless diversity and beauty [16]. And, in naturalistic perspective,

the children view nature as an exploratory platform for discovery, fascination and satisfaction [4].

### 3.0 SUMMARY AND IMPLICATIONS

Children like to affiliate with nature for their cognitive, physical and social developments [17]. Direct experiences with natural elements generate optimal interaction and allow children to develop transaction with peers. Edith Cobb [18] argues that “a child body is erotized and highly sensitized by the necessities of nurture and touch, is the tool of his mind, and serves with a passionate enjoyment in a creative engagement with the forces of nature”. Ironically, our built environments especially the residential areas, have little or even void of natural elements. Inconsiderate planning for the children by many professionals including urban planners, architects and landscape architects have detached the children from gaining direct contact with nature. This is because professionals presumably understand their needs and values, and finalise the contents of their outdoor environments. Their views or opinions are ignored. Even when professionals applied their childhood memories in the designing of the children environment, it is still insufficient to achieve the optimal product. Therefore, it deems necessary for urban designers to allow children to participate in the design of living environment [19]. The United Nations Convention on the Rights of Children stipulates in articles 13 and 14: “The child shall have the right to freedom of expression and freedom of thought, conscience and religion.” Let us listen to the children as well as to the land.

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