

CHAPTER 02

LITERATURE REVIEW

This chapter examines three major concerns in providing an outdoor play area for preschoolers in Malaysian kindergartens. First, are on the relationship of children with the outdoor environment particularly the kindergarten children. Second, is the discussion on kindergarten outdoor play area, the issue and what have been offered in Malaysian kindergarten to the preschooler. And third, also is clarification of Malaysian local authority requirement in setting up a kindergarten. The Petaling Jaya City Council is selected as reference as the case studies selected are from this locality. At the end of the section, the comparisons of stakeholder's requirements are evaluated. The appraisal from aspect of children's need, outdoor playground offered by kindergarten and local authority requirements that lead to enhancement of kindergarten design of outdoor play area are identified in order to support this study to produce new design parameters to kindergarten outdoor play area in Malaysia.

2.1. Children Performances in Outdoor Environment

The study on children and environment has been endeavour for the last three decades. Many scholars agreed that children have a particular attraction to natural environments (Malone and Tranter, 2003). Numerous studies have found that children often prefer to play in natural or wild spaces (Maxey 1999; Cunningham, Jones and Taylor 1994). Such spaces appeal to children because of their diversity and their feeling of timelessness (White and Stoecklin 1998). Children's access to nature provides an important aspect of growing up, with many adults remembering natural or outdoor environments as the most significant places in their childhood (Sebba 1991).

Children development theories established by Piaget (1983), Vygotsky (1986) or Erikson and Phillip (1975) showed the learning stage which is commonly acknowledged to be a powerful foundation for learning. Olds (1989) elucidated that activity and movement is fundamental for children intellectual, social and physical development. Striniste and Moore (1989) agreed that the child shapes the environment and is in turn shaped by it. The process of interaction with the environment is enhanced by motivation that help the children to manipulate an object, and manipulation of objects is central to the development of cognitive, physical and social competence.

Early studies by Hart (1979), Moore (1986), Moore and Wong (1997), Rivkin (1990; 1995), Titman (1994) and others described the value of complex environments and wild lands for children, and how children perceive and experience wild lands as places of their own area. Recently scholars have focused their attention on how the natural environment affords possibilities and challenges for children to explore their own abilities for exercise, playing and skill mastery. Focus has been directed on learning effects from the natural environment and its impact on children's development.

Bronfenbrenner (1979) in the child development research suggested that a child's environmental experience is influenced by maturation, and also by geography, society, culture and nationality (UNICEF, 2004). There is now a growing body of research that stresses the formative importance of environmental experience in childhood in developing relationships with the environment and environmental concern (Chawla, 1988, 1998, 1999; Thomas and Thompson, 2004; Wells and Lekies, 2006) and in relation to children's physical and mental health and well-being (Taylor and Kuo, 2006). Further, there is increasing evidence from medical and environmental health researchers that contact with nature and natural environments is important for human well-being and can have a positive effect on human health (Frumkin, 2001). Active activities like running, swinging, climbing, jumping, hopping, biking, digging in the sand are the outdoor fun and the favourite parts of any young child's day. Eventually, children have a unique and direct experiential way of knowing the natural world. This affinity with nature is judged not by its aesthetics but rather by the nature of their interaction with it (White and Stoecklin 1998).

2.2. Preschool Children in Early Childhood Stage

Scholars of childhood development agreed that the stage of early childhood spans from birth to age 8 years. This is a time of critical change and development as a child attains the physical and mental skills she or he will use for the rest of their life. Child psychologist Jean Piaget (1983) developed a theory of cognitive learning to explain why children learn differently than adults. He considers that the children as between the age of 2 to 7 years old as the pre-operational stage (Smith et.al, 1999). Children in this stage are very imaginative as well as self-oriented. Kellert (1993;2002), Kellert and

Kahn (2002:132) explained when responses to nature, children at this stage (3 to 6 years) are emphasis on satisfying the child's material and physical needs, avoiding threat and danger, and achieving feelings of control, comfort, and security. They also display more initiative and assume more responsibility in exploring and affecting their environment with various sense of wonder. Early childhood is important in developing core capabilities such as physical or motor skills that directly affect later performance.

In the perspective of child development, McDevitt and Ormrod (2002) hypothesized that early childhood is a period of incredible fantasy, wonder, and play. They learnt the world as a forum for imagination and drama that is they reinvent the world, try on new roles, and struggle to play their parts in harmony (Said, 2006). Through sensorial and motoric activities with peers and adults the children rapidly develop their language and communication skills. Their physical movement is much influenced by the functions of the features that they get in contact including furniture and toys in the indoors (Olds, 1987), and plants and animals in the outdoors (Kellert, 2002). Their responses to the environments are immediate and inseparable from the sources of stimulation around them (Old, 1987). In environmental psychology studies by Kellert (2002) explained that young children experience of nature is classified in three categories, (i) direct, (ii) indirect and (iii) vicarious (symbolic) experience.

- i. Direct can be explains as experience involves actual physical contact with natural settings and nonhuman species, for example, children taking bath in a river in which they encounter with the running water, vegetation and perhaps animals at the riverine setting. Direct contact involves a child spontaneous play or activity in a house garden such as climbing a fruit tree grasping the branches with his hands.

- ii. Indirect experience of child involves actual physical contact but in regulated and managed settings or contexts. The nature setting or context is extensive modified by human mastery and manipulation. For example children encountering plants and animals in parks, gardens, zoos and aquariums. They get contacts with flowers and trees, cultivated crops and orchards, and domesticated farm animals. Thus, the habitats and creatures will be reliant on human intervention and control. In aspect of children and environment, the harmony of setting and composition of elements including plants and structures will help children to experience the environments. Here the children are exposed to the sunlight, wind and natural temperatures of the environment. Their perception is dominated by a variety of planting composition and man-made features of diverse forms, colours and textures.

- iii. Vicarious (symbolic) experience occurs in the absence of actual physical contact with the natural world but a representation of nature. Sometimes, the representations are realistic but can be symbolic, metaphorical, or stylized characterizations. Such interactions with nature are represented in communication technologies like television or computers and print media such as books.

Kellert (2002) also stressed that increases in indirect and vicarious contacts with nature do not appear to offer an adequate alternative for diminished direct encounters in ordinary and accessible natural environments. Therefore, the early stage of childhood is the finest phase to develop their physical skill through experiencing direct natural environment. However, nowadays children with working parent spent almost the whole day time in kindergartens have to depend on the early stage design and planning of the

kindergartens area so that they should be able to gain the same direct experience like others.

2.3. Children and Play

Children's play is a complex concept that eludes precise definition. Stoecklin (2010) in one of the articles of White Hutchinson Leisure & Learning Group² express play as typically pleasurable, self-motivated, imaginative, non-goal directed, spontaneous, active, and free of adult-imposed rules. Play can also be defined as the physical contact with the elements of the environment and social interaction with peers (Olds, 1989; Striniste and Moore, 1989; Kellert, 2002). In young children, play describes as movement (Hart, 1979; Moore, 1986; Gallahue, 1993; Kellert, 2002), locomotion (Gallahue, 1993), or mobility (Kytta, 2003). Movement is essential in children's lives (Gallahue, 1993). Through movement the children perceive a lot of information about the environment (Gibson, 1979) that develops their cognition capacity (West, 1992; McDevitt and Ormrod, 2002). Therefore, play involves both movement and perception. According to Cobb (1969) perception is a kind of chronological scanning, a translation of spatial into temporal patterns. Time and space dominate all perceptual activities of the children (Cobb, 1969; Graue and Walsh, 1995). As such, engagement with the physical objects, for example, touching a leaf or hold a ball, sensitised the body of a child (Said, 2006). The feedback is passionate enjoyments (Cobb, 1969) which result to having many positive feelings including satisfaction (Kellert, 2002), being relaxed, comfort and calm (Korpela, 2002).

² <http://www.whitehutchinson.com/children/articles/outdoor.shtml>

According to Rubin et al, 1983 (cited from Hughes, 2010) before an activity can be depicts as play, it must contain five essential characteristics. First, play is *intrinsically motivated* which is an end in itself and done only for the satisfaction of doing it (Hughes, 2010). Next characteristic of play is that it must be *freely chosen* by the participants. As Vandenberg (1998) experiential the excitement of play results from the sheer exercise of freedom over necessity. If children are forced to play something that they are refused to, they may not regard the assigned activity as play at all. A third essential characteristic of play is *pleasurable*. To illustrate, a child who reluctantly agreed to play football only because his parent wanted him to, becomes apparent that his activity on football fails to satisfy any of the characteristic of play. Then, the fourth characteristic of play is that it must be *non-literal*. This is relevant to the preschool years that when the children spend much of their time experimenting with new roles and playing out imaginary scenes. It involves a make-believe element (Hughes, 2010). Lastly, play is *actively engaged* in by the player. The children must be involved physically, psychologically or both rather than passive or indifferent to the play activities.

The prominent child psychologists, Vygotsky (1986) and Piaget (1983) believed that play gives children valuable practice in adult-like behaviour (McDevitt and Ormrod, 2002). Playing with landscape element (natural and man-made) as well as the climatic factor stimulates children sense that triggers their cognition (Old, 1989). Thus playing in an outdoor space allows children to identify, name, classify and learn about rudimentary features and behaviours of the natural and man-made environments (Said, 2005).

In context of kindergarten children and play behaviour, the school should provide the best environment for children's physical, cognitive, and social development. Kindergarten outdoor play spaces must offer opportunities for wide range of children

behaviours and functioning. These different aspects of development are interrelated and interdependent. For example, Johnson et. al. (1980) cited from Marcus and Francis (1998) approved that gross motor play aids physical fitness as well as being critical in perceptual development and serving as a basis for later cognitive development. Connections between how a child develops socially, physically, emotionally, and cognitively, and the particulars of their outdoor environment are paramount for identifying processes and methods that will produce quality outdoor environments for children specifically in kindergarten. To illustrate, a child who performed solitary play such as running and jumping apart from peers at a distance greater than one meter or with their back to the other children will normally be engaging in a different activity and pay little attention to the peers' behaviour (Malone, 2003).

2.3.1. Types of Play

Playing is a learning process. Play is the child's way of dealing with her or his social and physical surroundings. Hartle and Johnson (1993) categorized children's play into four types: (i) functional, (ii) constructive, (iii) socio-dramatic and (iv) game with rules. Briefly, functional play is the activity of the children exercising their muscles and practising the component of a skill. In context of playing in nature, Fjortoft (2004) adds functional play comprises gross-motor activities and basic skills like running, jumping, throwing, climbing, crawling, rolling, swinging, and sliding. Constructive play characterized as manipulation of objects for the purpose of constructing or creating something (Pellegrini and Nathan, 2010). Children use materials to achieve a specific goal in mind that requires transformation of objects into a new configuration. In short, the play involves manipulating the elements of a setting such as sand and forming a

feature. Socio-dramatic play is directed or spontaneous pretending that allows children to communicate with peers (Hartle and Johnson, 1993). The communication generates attention and affiliations suggesting that the children are improving their cognitive abilities. Finally, games with rules play is the activity of children agreeing on prearranged rules, for example, playing hide-and-seek (West, 1992).

In the context of outdoor play space or playground, Wolff (1979) added two more play types, solitary and parallel. Wolff (1979) defined solitary play as an activity that a child plays alone. The child is completely engrossed in playing and does not seem to notice other children (Parten, 1933). The play offers no social skills with peers such as communication or turn-taking but affords privacy (Hartle and Johnson, 1993). The second type is an activity when children play alongside with others, frequently looking to see what the peer is doing but interacting only briefly (Lansdown, 1996), for example, playing sand in a pit. It affords many social skills such as communication and sharing. Parten (1933) explain this as the child mimics other children's play but doesn't actively engage with them. For example they may use the same toy. In short, both activities are intense, bursts and repetition becomes important (Said, 2006). Additionally, there is also a mutual play in which children play together by taking turn to play (Ladd and Coleman, 1993).

In the context of this study, the types of play explained previously contribute to two major performances of children which are active play and passive play. The former measures the energetic performances such as running, jumping, chasing, hopping, and sliding, while the latter evaluates the submissive performances like sitting, looking to peer, talking, walking and resting. Both active and passive activities are evaluated either performed alone or with peers (see Table 5.6, 5.7 and Figure 5.23).

2.3.2. The Impact of Children Physical Performances During Play

Based on previous discussion on 2.3.1 subsection (Types of Play), it is clearly that play activities promote physical performances in children. In fact, Fjortoft and Sageie (2000) agreed that children, who play regularly in natural environments show more advanced in motor fitness, including coordination, balance and agility, and they are sick less often. Physical development is often necessary for a child to meet specific milestones. For instance, the leg and arm muscles must develop before a child can crawl, and the leg muscles must continue to strengthen as a child learns to walk. Walking also includes an ability to balance. Play certain games such as hula hooping, as well as most sports, not only promote physical development in children but also teach them skills such as taking turns and balance. Allowing the children to play games give them the chance to understand rules, develop good judgment and learn strategies for success. Additionally, sports and active games help children develop physically, using their muscles and improving their aerobic capacity. Children learn many things through imaginative play, including problem solving and critical thinking. Rationally, some imaginative play can also help physical development such as role-playing games. Children get exercise running around in a game of "war" or pretending to be horses or cats, for example can help improve fine and gross motor skills.

On the other hand, Lindholm (1995) found a relationship between the presences of natural environments in or around schoolyards and students' activities during their breaks were remarkably more creative. This shows that the natural environments setting in children play space encourages variety of play activities in children and promotes more physical skills. Moreover, Baranowski et al. (1993) found a consistently higher activity level among three and four year-olds outdoors than indoors, and the

environment seemed to be the strongest predictor of physical activity in pre-school children.

2.3.3. Kindergarten's Outdoor Play Space

Generally, kindergartens in Malaysia reserve some spaces in outside area for purpose of outdoor activities. This is one of the Ministry of Education's (MOE) requirements in setting up a kindergarten. The kindergarten's outdoor play space provided has to meet the purpose of physical exercises course including in the preschool's curriculum syllabus. Traditionally, outdoor playgrounds are designed to facilitate children's play and are intended to enhance their physical, social, emotional and cognitive development (Hart 1993). For that reason, the MOE required every kindergarten to equip the outdoor play space with play ground equipment which can stimulate children physical, social, emotional and cognitive skills (National Preschool Curriculum, 2001).

A good kindergartens and preschools playground should provide enough space and sturdy equipment that a child can use his or her imagination while exercising. For instance, the jungle gym structure might have connecting slides, fire-fighter poles to shimmy down and then inch up, tunnels to crawl through, a swinging bridge that connects one side of the apparatus to the other. A child may use multiple skills and create dozens of scenarios as he plays on this one structure. There should be equipment for digging, hauling, building, and riding.

Frost (1989) explained in his work that Friedrich Froebel who was the originator of the first kindergarten in Germany in 1837, had set the stage for changing the emphasis on play as valuable merely for physical development to emphasizing play as the total development of a child. Thus, the stage was set for the invention of a 'child

development playground'. As such, kindergartens suppose to offers play spaces that affords children to create, organize, and control their own play experiences. This allows them to not only learn and practice important social skills but also to exercise decision-making and other practical skills that will be used across the life span.

What has been initiated in Malaysian kindergarten's outdoor play spaces are traditional playgrounds. Even though traditional playgrounds are anticipated to promote children's play, the design does not meet children's needs for exploring their environment (Fjortoft, 2004). The traditional playground is typically flat, barren, covered with asphalt, and equipped with climbing bars, a swing, a sandpit, a seesaw, and a slide. Such playgrounds have not been found to be very challenging and even very young children or those with motor behaviour deficits do not explore their potential on these playgrounds (Frost 1992). In contrast, natural environments represent different play opportunities for children. The rough surface provides movement challenges, and topography and vegetation provide a diversity of different designs for playing and moving (Fjortoft, 2004). Therefore, experiencing the environment is an essential, critical and irreplaceable dimension in the growth and functioning of children (Kellert, 2002) and it should be taken into consideration when designing an outdoor play spaces for kindergarten children.

2.3.4. Children Bonding with Outdoor Play Space

Places provide three types of satisfaction: security, social affiliation, and creative expression and exploration (Chawla, 1992). According to Said (2006), children relationship with the environment develops four types of bonding with the landscape which are sense of place, place preference, place attachment and favourite place.

i. Sense of Place

Wilson (1997) believed that places shape the stories of our lives. These stories become ongoing “ecological conversations”. A sense of place describes a particular kind of relationship between an individuals and localities (Matthews, 1992). The affecting bond is generated by repetitive encounters, either visually or physically, with the place (Tuan, 1974; Chawla, 1992). For example, young children perceive the adventure playground, with features such as woods, or ropes that can be used in a variety of ways as a place for solitary play with its features as well as positive interactions with peers (Wolff, 1979; Matthews, 1992). Through play the children develop a bonding that the playground is a place for them to explore, manipulate and fantasize and arouse their curiosity (Wolff, 1979). The bonding allows the children to value the place as a utility to get feedbacks including physical movement and social interactions (Kellert, 2002). Sense of place consists of three phases: the first phase is belonging to a place, the middle phase is attachment, and the third (and most intense) phase is commitment to a place (Shamai 1991). Tuan (1980) has observed that we cannot, by taking thoughtful and deliberative steps, maintain a state of rootedness, whereas a sense of place can indeed be thus achieved and maintained. Sense of place on the other hand implies a certain distance between self and place that allows the self to appreciate a place.

ii. Place preference

Studies of place preferences suggest that the natural landscapes and private places that linger in adult memories are already salient in childhood (Chawla, 1992). Preference is a value by an individual to like a place more than another (Reber and Reber, 2001). The

preference to a place reflects the children attitudes and feeling about the place (Malinowski and Thurber, 1996). It is strongly related to one's ability to function effectively in a place (Messer, 1996). Sebba (1991) in an empirical study found that middle childhood children's preference of place was dependent on their personal needs and on the properties of the place. The children preferred natural places such as parks and agricultural farms because to them the places stimulated their senses, their actions and their feelings (Sebba, 1991). Furthermore, Sebba (1991) found that the children preferred the natural place more than man-made places because: (i) natural forces such as wind, light and temperature simultaneously assault and continuously stimulate the children senses at an uncontrolled strength, (ii) natural environment exerts forces to move inanimate objects such as movement of clouds and trees in the wind, the water running in a stream, and (iii) shapes of natural elements are mostly ambiguous, infinitely varied and usually soft and rounded. Said, Abu Bakar, and Salleh (2005); Sebba (1991) and Olds (1989) allocated the same findings that children perceived natural settings as comfortable when the settings provide moderate and varied levels of stimulation for the senses.

iii. Place attachment

According to Spenser (2005), place attachment would seem to function by providing the individual with a sense of stability amid change. Place attachments involve the individual's behaviour, cognition and affect, and they may operate at several levels of scale. In the aspect of environmental psychology, Altman and Low (1992) explained that place attachment is the interaction of affect and emotions, knowledge and beliefs, and behaviours and actions in reference to a place. In other words, it is an emotional

relationship of children with the environment, and it changes in accordance with changes on the people or activities (Manzo 2003). Loss of place attachment or bonding to a place is link with stress and a variety of affective disruptions (Low and Altman, 1992).

In childhood perspective, Chawla (1992) refers place attachment to preferences, happiness, satisfactions and fondness for places. These are positive evaluative of children towards an environment (Korpela, 2002). Moreover, Chawla (1992) conceived that children are attached to place when they show happiness at being in it and regret or distress at leaving it, and when they value it not only for the satisfaction of physical needs but its own intrinsic qualities. Such place arouses their curiosity and trigger imaginative associations (Moore et al., 1992). Thus attachment is affecting children's emotions, feelings, knowledge acquisition, beliefs and behaviours. Further, children are found to take high delight and sensations to attach to natural places such as adventure parks (Wolff, 1979), residential greenery (Wells, 2000), and forest (Fjortoft, 2004).

Studies on children's mobility in local environment by Hart (1979), Moore (1986), and Chawla (1992) reveal that children's attachment to place when the place provides security, social affiliation and creative expression and exploration. Ulrich (1983, 1999) emphasised that children would enter to play in place when it conveys a sense of security. Such place affords the children privacy and serenity and allows them to display their personal actions (Sebba, 1991).

iv. Favourite place

Studies of adults' memories of childhood favourite places (Lukashok and Lynch, 1956; Ladd, 1977; Cooper-Marcus, 1992, Hester, 1979; Wyman, 1985; Sobel, 1990) indicated

that they provided feelings of security, privacy, and control. They also revealed similarities between what children relate now and what adults remember about experiences in their favourite places. Favourite places are where children encounter routinely and having memorable experiences (Moore, 1986). The places afforded the children to escape from social pressures with associated freedom of expression and control (Korpela et al., 2001). These places are both natural and man-made settings. According to Korpela (2002) children most often associated their favourite places with the emotional feelings of being relaxed, calm and comfortable. Therefore, favourite places are used to regulate not only the experience of self but emotions as well (Korpela and Hartig, 1996; Korpela, 2002). Sometimes these places are hidden from the knowledge or attention of the children's parents, and sometimes a socialized space shared with friends (Korpela et al. 2002; Moore, 1996; Sebba, 1991).

Children define their favourite places in many terms. In English residential neighbourhoods, Moore (1986) found the favourite places are the lawns, playgrounds, schoolyards and homes. In Finland communities, Korpela et al. (2002) found favourite places of urban children are residential (home yard, one's homes or own room, a friend's home), sport settings (playing grounds not dominated by vegetation, track and field settings, basketball courts, swimming halls), commercial or retail settings (shops), and community service settings including libraries. Korpela et al. (2001) illustrated that the composition of favourite place is characterized with high level of coherence and compatibility. For example, a play space with several play equipment is covered by lawn as base for play, and subdivide by foliage or flowering trees and shrubs offers the children to get fascination. Thus, the selection of equipment and plant species should be compatible to the play mode of the children; new equipment elicits excitement and exploration whereas similar equipment draws the sense of familiarisation.

In summary, research indicates that children hold particular perspectives, knowledge and understanding of the environment and that they view and engage with environments in different ways to adults (Sebba, 1991; Hyun, 2005).

2.4. Affordances of Phenomenal Landscape for Kindergarten Children

Playing in the landscape is a dynamic interaction of a child as play involves perceptual and physical actions. It seems clear that during play the children gather and process the information through direct perception while moving in the landscape space.

Childhood play involves three actions which are performatory, exploratory and productive (Chawla and Heft, 2002). Performatory elucidate actions that are directed towards some object or other individual within some setting for an intended purpose. Exploratory is an action directed toward discovering new properties in the environment and, productive is an action of transforming a feature into new environmental structures. These actions with affordances were occurred in kindergarten children while playing. To illustrate, performatory action is when a child running over the field, then his action let him to discover the width and surface of the field, is an exploratory activity and finally, digging sand with chip on the field is a productive action because the child manipulates the sand into a mound. In childhood development, these activities stimulate the children and allow them to get feedbacks such as dexterity and satisfaction (Olds, 1989).

Kytta (2003) and Fjortoft (2004) in their studies on children experiencing the outdoor environment found that the children value a place is not determined by its appearance but by its potential for affording play activities. In other words, the perception and movement of children are influenced by the functional properties of the

environment (Heft, 1999; Said, 2006). This is according to children experience the environment in a deep and direct manner, not as background for events, but, rather as a factor or stimulator (Sebba, 1991). Moreover, children perceive and interpret the landscape not as forms but as functions (Gibson, 1979). Indeed, the children recognise the functional properties (affordances) of the outdoor environment.

2.4.1. Theory of Affordances

Cosco (2007:127) quoted from Gibson and Pick (2000) enlightened that a key of understanding the implications of the built environment and children's active living is the concept of affordance. It helps us to understand the impact of the physical environment on children and to identify environmental attributes that are associated with specific behavioural responses. Gibson (1979) defined the affordances of the environment as what it offers the child, what it provides or furnishes, either for good or ill. Affordance is the perceived functional significance of an object, event or place for an individual (Heft, 2001). To demonstrate, Kyttä (2003) gave explanation that the affordances of a playground seem different for each individual and they can again be different for the same individual in different situations. Their existence is potential, independent of users, and they are "waiting" to be actualized. Therefore, the theory of affordance views perception as a sensorial activity and mobility as a motoric activity, and division between them disappears (Kyttä, 2003). Hence, affordances include properties from both the environment and the acting individual (Kyttä, 2002).

2.4.2. Types of Affordances

Kytta (2003) categorized affordances in two types; *positive* and *negative*. Both of these types are determined by the kindergartens outdoor play environment that can be perceived through their senses. Positive affordances involve children's movements and their perceptions of the environment, resulting in them offering satisfaction, finding it appealing and friendly, whereas negative affordances generate adversities such as feelings of avoidance, danger, escape and fear (Heft, 1999; Kytta, 2003). Nonetheless, Hart (1979) and Kytta (2003) claimed that children might also be interested in engaging with behaviour settings that are unsafe as they like to take risks when they are active in their surroundings. Examples of positive affordances include a slide affords climbing, looking-out-from, and sliding (Hartle and Johnson, 1993), a shelter affords hiding is a positive affordance (Kytta, 2002), a pet affords love and affection (Heerwagen and Orians, 2002) and a toy affords grasping (McDevitt and Ormrod, 2002). On the other hand, a negative affordance constrains the activity of a child (Heft, 1999).

In this study, example of negative affordances found was the asphalt area that restricted children running fast because of the rough surface while shaded areas offered place to gather with peers is positive affordances found in the case studies. It is an environmental feature that affords undesirable stimuli that permits a child to be away from it (McDevitt and Ormrod, 2002).

2.4.3. Level of Affordances

Kytta (2003) has classified the affordances into two level; *actualised* and *potential*. Actualised affordances give an idea of what the children encountered during their

independent mobility, perception and engagement with the environmental features (Heft 1999; Kyttä 2002, 2003, 2004, 2006) while potential affordances are different for each individual and each specific group of people, depending on how their physical skills or bodily proportions, social needs and personal intentions are matched with the environmental features (Kyttä, 2002, 2003, 2006).

According to Kyttä (2003), potential affordances become qualities of the environment and actualised affordances become individual relationships with the environment. All environments have countless numbers of potential affordances (Kyttä, 2003), for example, playgrounds afford physical play including running, walking, jumping, sitting, climbing, sliding, and throwing, and social play such as communicating and turn-taking (Hartle and Johnson, 1993). Whereas, actualised affordances of an environment are what the children have experienced through movement and perception (Heft, 1999; Kyttä, 2002, 2003).

In this study, the actualised affordances measured the activities users commence that afforded by the outdoor play space while the potential affordances evaluated the physical responses during play activities in the outdoor play space of each kindergarten.

2.4.4. Taxonomy of Affordances

Heft (1999) categorizes 10 types of environmental qualities that support affordances: flat, relatively smooth surfaces; relatively smooth slopes; graspable/detached objects; attached objects; non-rigid, attached object; climbable feature; aperture; shelter; mouldable material (dirt, sand, snow) and water. For example, “an object that is smaller than the hand-span of a particular individual is perceived by that person to be graspable; it affords grasping (Heft, 1999). A study on children’s outdoor environments by Kyttä

(2002) improves the taxonomy by adding a category of affordances for sociality and play, and subtracting category of aperture.

In this study, which concerns on affordances of outdoor play space in kindergarten for children functioning, extends the taxonomy with relevant environmental affordances that support natural and man-made landscape properties and attributes. The taxonomy tells what categories afforded the most or fewest functional properties to the children during their play activities. Table 2.1 shows the classification of environmental qualities for children's outdoor environment by Heft (1988, 1999), Kytta (2002, 2003) and similar adaptation to this study.

Table 2.1: Functional taxonomy of children’s outdoor environment Source: Kytta (2002, 2003) and Heft (1999)

| The categories used by Heft (1988, 1999) | | The categories used by Kytta (2002, 2003) | | The category of activities used by author (2011) | |
|--|---|---|---|--|--|
| Flat, relatively smooth surfaces. | Affords: walking, running, cycling, skating, and skateboarding. | Flat, relatively smooth surface. | Affords: running, cycling, skating, skiing, playing hopscotch, skipping, and playing games. | Flat surface (lawn, pathway, playground area, asphalt open space) | Affords: running, walking, skipping, crawling, jumping, walking fast, hopping, chasing. |
| Relatively smooth slopes | Affords: drawing, rolling, sliding, running down, and rolling objects down. | Relatively smooth slope | Affords: coasting down (e.g. on bike, wagon), sliding, skateboarding, rolling, and running down, rolling objects down. | Smooth/rough surface (sand, turf, asphalt, cement, and tiles rendered) | Affords: running, stepping, skipping, sitting, jumping, walking, chasing, and standing. |
| Graspable/detached objects | Affords: drawing, scratching, throwing, hammering, batting, spearing, skewering, digging, cutting, tearing, crumpling, squashing, building of structures. | Graspable/detached object | Affords: throwing, building structures (e.g. raw materials for forts), digging, playing with animals, using plants in play. | Graspable/ Detached object (Animals: bees, butterflies, birds, bugs, cats. Plants: groundcovers, shrubs, palms, trees) | Affords: catching, burying, watching, looking, communicating, sniffing, smelling, plucking, touching, jumping over, collecting, searching etc. |
| Attached objects | Affords: sitting on, jumping-on, jumping-over, jumping-down-from. | Attached object | Affords: jumping-over, jumping-down-from, sitting-on. | Attached object (textured wall, boulders, bollard, wood edge etc.) | Affords: touching, stepping on, balancing, sitting, hiding, climbing on, and jumping from. |
| Non-rigid, attached object | Affords: swinging on and hanging. | Non-rigid, attached object | Affords: swing on (e.g. tree branch), hanging. | Non-rigid, attached object | <i>Not related to site studies.</i> |
| Climbable feature | Affords: exercise/mastery, looking out from, passage from one place to another, and climbing. | Climbable feature | Affords: climbing, looking out from. | Climbable feature (log, balance beam, rock sculpture etc). | Affords: touching, stepping on, balancing, sitting, climbing on, jumping from. |

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|--|---|---------------------------------------|---|---|---|
| Shelter | Affords: being in peace and quiet, hiding. | Aperture | Affords: locomoting from one place to another, looking and listening into adjacent place. | Shelter (open stage, hall, pavilion, shady tree, canteen, corridor, building etc) | Affords hiding, privacy, passing through, walking, running, sitting, resting, chasing. |
| Mouldable materials (dirt, sand, snow) | Affords: moulding something, building of snow structures. | Shelter | Affords: microclimate, prospect/refuge, privacy. | Mouldable materials (sand, chipping, fallen leaves, twigs etc.) | Affords: throwing, digging, moulding, scooping, scratching, collecting etc. |
| Water | Affords: swimming, fishing, playing with water. | Mouldable materials (e.g. dirt, sand) | Affords: construction of objects (e.g. pottery), pouring, modification of its surface materials (e.g. sculpting) | Water (water feature, paddling pool) | Affords: splashing, pouring, sprinkling, washing hands, feeling water; hand dipping, throwing stones, fear of getting wet, touching, squatting. |
| Affordances for sociality | Affords: role-playing, playing rule games, playing house, playing war, and being noisy, following/sharing adult's business. | Water | Affords: splashing, pouring, floating objects, swimming, diving, boating, fishing, and mixing with other materials to modify their consistency. | Microclimate (thunder, rain water, sun, wind) | Affords: listening, pouring, sprinkling, scooping, and feeling. |

Table 2.1, continued.

2.5. Standard Requirement from Local Authority

Local authority in Malaysia such as Petaling Jaya City Council (MBPJ) has set guidelines for certain developments in their management district. This administration body of a state is responsible for local development such as town planning, environmental protection, building control, and urban infrastructure including the development of kindergarten. The local authority has set requirements on such important matters of location, type of building, ventilation, building safety, size and utilization of space, lavatory, planning approval, and renovated building plan.

The local authority allow a kindergarten to be developed at any kind of premises such as single houses, semi-detached houses, terrace houses (end or corner lot), flat houses (ground floor), building offices (ground floor), or at any reserve area purposely for kindergarten. There are some type of building and premises which are restricted to develop a kindergarten such as (i) intermediate lots of terrace houses, or terrace house (end lot) without open lawn, (ii) building or houses that are located at the road junction or near overcrowding traffic area. Certainly, the state government gives the priority for development of kindergarten which is near to the public open space or public playground (refers Appendix A).

The location of kindergarten should also consider the access route including the ingress and egress of 33' (feet) or 10 meters from the main junction. And, the contextual issue must be put into consideration so that there will be no complaint from neighbourhood regarding the noise and traffic congestion happen nears the kindergarten area. In spite of providing the good ventilation and enough light to the building, the government also required the kindergarten to provide an outdoor play space equipped with play apparatus for the kindergarten children.

2.6. Summary

From this chapter, it appears that children engagement with natural environments encourages progressiveness in their physical responses. Thus, the children recognized the functional properties of their outdoor environment through active activities such as free play. Kindergarten children play progressively involving physical and social encounters with the features and forces of the phenomenal landscape as well as with peer. Generally, during the play all of their five senses are stimulated which affected not by the appearance or aesthetic but by the affordances of the physical features. Hence, children's play in the phenomenal landscape begins with cognitive functioning resulting to physical and social functioning. However, if these needs are not met, a child may feel frustrated and even threatened, thus it will add to their fears and apprehension (Kaplan et al., 1998).

In this research perspective, the kindergarten children should be allowed to spend more time to explore in their outdoor play space specifically in kindergarten play area since they spent almost the whole day in school. Thus, the kindergarten should provide a wide-ranging outdoor play space with approach of natural element for children to play. This has approved by Fjortoft and Sageie (2000) that a child who play regularly in natural environments show more advanced in their physical fitness including health.

The local authorities also give attention to kindergarten development by deposit certain guidelines for that purpose. However, the demand of landscape features in kindergarten outdoor play area is mistreated. This is illustrated by rapid growth of kindergarten and preschool association in Malaysia that finalized by adult preferences such as developing a kindergarten in the middle house of terrace house without any

space for children to explore active activities outside, place some play structure in their barren flat area in their kindergarten which restricted the children to be active and finally limiting the play time and force children emotionally spent more time in classroom for vicarious learning.

Currently in Malaysia, those children's need, kindergarten's outdoor playground and government requirement are still far way short in providing an extensive outdoor playground for kindergarten children in order to achieve a specific milestone in developing a child through play. The potential to integrate the natural environment features as part of the children exploratory play area in school is measureless because of these factors (i) the kindergarten development become as one of an industry issue and (ii) the understanding of children engagement with natural environment is poor.

Therefore, experiencing the environment is an essential, critical and irreplaceable dimension in the growth and functioning of children (Kellert, 2002) and it should be taken into consideration when designing an outdoor play spaces for kindergarten children. What is needed is to provide evidence that the natural landscape features can foster the children development process by increasing the cognitive, physical and social functioning of the children. Hence, an empirical study is required to examine the shift of functioning of the children; comparing the children's physical responses in the four outdoor play area of Malaysian kindergarten in case studies.