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Affordances of Homeschool Journey in Rural Environment for Children's Performances

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Abstract

The study investigated children's performances during homeschool journey in a rural environment through their actualized affordances at a village in Johor, Malaysia. The study was conducted with fifty-four middle childhood children through drawings, interviews and participant observation. The data were analyzed using qualitative content analysis. Children engaged more with natural elements rather than manmade elements and positively perceived, utilized and shaped the affordances. Therefore there is evidence to suggest that children recognized homeschool journey as their play spaces allowing them to interact with nature and developed their physical, social and cognitive skills, especially for children with high independent mobility.

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Keywords: Children performances; natural environment; independent mobility; homeschool journey

1. Introduction

In recent years, children accessibility and engagement with natural environment was gradually declined. They are more exposed to technological entertainment such as video games, television and computer (Tai, MsLellan and Knight, 2006; Spencer and Blades, 2005). Moreover, children are just being taught at school and had limited hands-on experience on natural environments. This situation certainly affected children's performances of physical, social and cognitive. Various studies on children's environment found that nature is the most significant place to develop children's performances (Tai et al., 2006; Malone, 2003; Chawla and Heft, 2002; Kellert, 2002). Previous studies suggested children

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everyday's lives engaged with three important places which were children's home, school and recreational area (Pooley et al., 2005; Rasmussen, 2004). However, among these places, children spend a large proportion of their time at school (Londal, 2010), and they need to travel from home to school almost everyday. Therefore, homeschool journey becomes part of children's everyday routine (Pooley, et al., 2005, Joshi et al. 1999) and rural area is identified as the best setting that comprised nature elements and able to encourage children's performances. They walk, cycle, chat with friends, and even play along the journey. Therefore, the journey has been considered as an explorative and self-testing play (de Monchaux, 1981) which stimulates the physical (Spinney & Millward, 2011), social and cognitives performances (Spencer & Blades, 2005) among children.

Children in urban and rural area may have diverged homeschool journey experiences. Rural children have more affluent engagement with the natural environment as compared their urban counterparts (Pooley, et al., 2005). Therefore, this study aimed to investigate children's experiences during homeschool journey in the rural environment in order to identify the actualized affordances which stimulate their performances. The aspects taken into consideration included the children's types of mobility during their homeschool journey and the elements they encountered along the homeschool journey. To support this aim, two objectives were formulated: (1) to investigate children's experience during homeschool journey, and (2) to identify children physical, social and cognitive performance during the journey. Affordances of homeschool journey were measured, concerning its ability to support children's performances: physical, social and cognitive (Malone, 2003; Tai et al., 2006). Previous studies have suggested that most of affordances in environment involved engagement with living things because many children love to play in natural environments, besides they are the heaviest user of outdoor places (Sobel, 1993; Chawla, 2002; Malone, 2003; Chartterjee, 2005; Veitch et al., 2007; Wilson, 2008). Therefore, children in the rural area were observed to have greater opportunity to engage with the natural elements in their play.

2. Literature Review

Interaction with natural environment provides fundamental learning and play opportunities for children. Play is a fundamental vehicle for children's learning and play in nature can enhances the potential for learning through play(Wilson, 2008). The natural setting provides a more diverse play spaces for learning opportunities for children as compared tobuilt play spaces (Bagot, 2005). In turn, more play implies greater physical activities among children, and simultaneously improved their physical health (Meire, 2006)as an outcome of active outdoor play. Beyond the physical play affordances of natural settings as children's playspaces, the manipulability of natural material also promotes the sense of agency and place which creates a deeper sense of connectedness with nature. Children learn experientially through active, physical and sensory engagement in their surroundings. Through direct engagement and play in nature, children. In summary, there are notable physical, cognitive and social benefits for children who play in natural setting. A natural setting has the degree of complexity, manipulability, diversity, dynamic, timelessness which allows a child to experience many developmentally significant play behaviors. These characteristics of natural settings afford children to investigate and manipulate the elements for their play through their imaginative.

From ecological perceptual psychology perspectives, the relationship between person and environment is look into the theory of affordances. According to Gibson (1979), affordances of an environment are associated with the elements which offered or provided to the users. Affordances of functional meaningful units of an environment that are perceived through direct action and manipulation (Heft, 1988) which connected with indirect learning process. For example, a tree can afford climbing branches,

picking leaves, and breaking twigs which permits children's physical, social and cognitive skills. Gibson (1979) also stated that "We must perceived to be able to move around, and we must move around to be able to perceive" (p.223). Movement means play to children which involve perceiving the environment through the children's senses including sight, audio, touch, smell and taste. Hence, it is clearly shown that perception and mobility are closely connected. Perception is focused on finding the affordances of an environment. Perception and action are interrelated which through action, a person can reveal new affordances and vice versa (Kytta, 2003).

Affordances are categorized into (1) levels of affordances, (2) taxonomy of affordances, and (3) types of affordances. There are three levels of affordances; perceived, utilized and shaped (Kvtta, 2003). The affordances were divided into actively and passively actualized affordances (Kytta, 2004). Active affordances include utilized and shaped affordances, whereas affordances that was actualized passively includes perceived affordances. The level of affordances is different based on the place that affords different functional properties. Perceived affordances are associated with the senses, especially sight or hearing. Utilized affordances are an ability to use something, especially to find a profitable or practical use of certain elements. While, shaped affordances is an ability to give a particular form or to create things. The level of affordances is normally interrelated with each other. For example, children will perceived, used and transformed the environment and the features in different ways at different stages of the child's development (Malone, 2003). Taxonomy of affordances were categorized based on children's action in various environments. Taxonomy explained the most or fewest functional properties to the children in the environment. Based on Heft (1988), the affordances of the natural environment can be categorized into 10 categories of environmental quality including flat, relatively smooth surface, relatively rough slopes, greenery and wildlife, graspable or detached objects, attached objects, non-rigid attached objects, climbable features, aperture, microclimate, moldable material and water. Sincethe environment are divided into different contexts, it will be perceived both positive and negative for the children. Therefore, the children interaction with the environment involved with two types of affordances including positive and negative. The positive affordances associated with the preference elements, while negative affordances associated with the elements that children avoided or disliked in the environment (Kytta, 2003). The environment will be considered affording children's play and learning activities when the positive affordances dominated the environment. Therefore, the Gibson's theory of affordances is useful for the study in determining the functional properties of the homeschool journey environment and how the children used the environment as their play spaces which enhancing their physical, social and cognitive performances.

3. Method

3.1. Subject

The experiences of children's homeschool journey were explored among 54 middle childhood children, aged between 9-11 years old, at Sri GunungPulai village in Johor, Malaysia. They were attending an elementary school, the Sri GunungPulai Elementary School, which was located in the village. The study focuses on the elementary school children since it is at this age that children begin to travel unaccompanied on the school journey (Joshi et al, 1999). Types of children's mobility to school in the village have been classified into two categories including independent and dependent mobility. Independent mobility involves walking and cycling to school, either alone or with peers without adult supervision. Whereas, dependent mobility includes carting to school by parents with cars or motorcycles.Before the study was conducted, a permission to conduct research in school was obtained from the school's headmaster and informed parental consent was obtained from all participants.

The research task was divided into two; firstly, drawings and interviews, and secondly, participant observation. Ninety eight percent of the children participated on the first task, while 2% of the children were not included because of insufficient communication skills. Only 8% of participants of the task 1 were selected to be observed in the task 2 especially children with independent mobility. The selection was based on their abilities to have more apparent experiences and engagement with the elements especially the natural elements including trees, animals, stream and undulating landform. The selection also considered the routes taken by the children which each of them took different routes consist of every corner of the village. The rational was to identify the affordances in various settings of the village. Table 1 shows the number of subjects, according to their age and gender, who participated in each task.

Table 1. Subjects participated in the study

Age	Drawing and interview			Particip	Participant observation		
(Years old)	Girls	Boys	Total	Girls	Boys	Total	
11	8	6	14	1	2	3	
10	8	12	20	0	1	1	
9	10	10	20	1	1	2	
Total	26	28	54	2	4	6	

3.2. Site

Kampung Sri GunungPulai in Johor has been chosen for the study because it comprises with abundant sources of natural elements including stream, hillside forest, orchard, and plantation. The elementary school located about 400 meters from the village's main entrance, and surrounded by orchard. The hillside forest can be seen from the school, and the stream is located within 10 minutes walking distance. It means that the village possesses many potential spaces for discovery, exploration and socialization for the middle childhood children during homeschool journey. The various settings of rural environment permit different play and learning behaviors among children.

3.3. Measures

Affordances of the homeschool journey and children's experiences were investigated by using visual methods which included drawing and video recording methods. The drawing method was designed to identify the elements that children have encountered along the journey. Children were asked to draw their routine homeschool journey on A3 size paper. The task required the children to recall their journey and experience, and then draw any important elements along the journey including their home, elements that they have encountered, and their school. Therefore, to explore what are the elements offered for children's cognitive, physical and social skills, a semi-structured interview was conducted. This interview was conducted to avoid misinterpretation of drawings during the analysis process, and the conversation was recorded using a voice recorder. While, to assess more data on children's activities along the journey, children were observed in three days and their journey were recorded using a video camera. Twelve categories of avoidancewere developed based on Heft's (1988) and Kytta's (2002) functional taxonomy of children's outdoor environment which include flat, relatively smooth surface, relatively rough slopes,greenery and wildlife, graspable or detached objects, attached objects, non-rigid attached objects, climbable features, sociality, microclimate, moldable material and water.

3.4. Procedure

The first task, which included drawing and interview, was conducted in the classroom during one hour lesson; the first 45 minutes were allocated for drawing session and another 15 minutes for the interview. The task was assisted by four field researchers. Whereas the second task, the participant observation, was conducted during children's homeschool journey by six researchers. The observation lasted from 3 to 7 minutes of video recording. The task was assisted by field researchers and local residents. All the survey tools and instruction was translated from English to Malay.

3.5. Analysis

The aim of this study was to analyze the affordances of homeschool journey and its association with children's performance and learning skills. For qualitative data analysis, the study used content analysis technique. Children's words on their experiences during the homeschool journey were bracketed and coded into twelve categories based on the categories of affordances by Heft (1988). While, the drawing was analyzed for the frequency of elements appeared in the drawing and only significant elements were coded into the categories. The responses were considered as affordances which were later classified into three categories including level of affordances, types of affordances and taxonomy of affordances.

3.6. The limitation acknowledged

Several limitations of this study exist. The first limitation was the time to conduct the survey. The study was conducted during school hours which limited time was given by the school's headmaster due to his concerns on children's learning session during school hours, especially for the core subjects. A second limitation was the study's methodology. The method followed the rules of conducting surveys with children (Ennew, 2009; Boyden and Ennew, 1997) including to respect the children by asking permission in whatever we do. Therefore, the participant observation method was conducted with children's and parent's permission. The children who are cycling to school were followed by field researchers, which assisted with residents by motorcycles. The children were informed that their journey will be recorded and they will be observed along the journey. This limitation influenced the data validity because the children may feel uncomfortable being followed, recorded and observed by the field researchers.

4. Finding and Discussion

The affordances of homeschool journey are discussed in three categories including level of affordances, taxonomy of affordances and types of affordances.

4.1. Level of affordances

The actual affordances of homeschool journey were divided into actively and passively actualized affordances (Kytta, 2004). As shown in Figure 1, homeschool journey afforded 124 perceived affordances, 89 utilized affordances and only 3 shaped affordances for rural children. It means that children engaged with passively activities such as scanning, viewing, watching and hearing the elements along the homeschool journey more than direct physical actions such as cycling, running and climbing. Therefore, cognitive performances dominate the children's functioning travelling from their homes to the school.



Fig. 1. Level of affordances in homeschool journey

The result suggests that children demonstrated less physical performance in their journey resulting in lower levels of actively actualized affordances. The children were commonly engaged with perceived affordances, for examples seeing Hornbill, searching for fruits, sniffing durian fruits to select a ripe one, recognizing trees, chatting with peers and hearing the bird's song. While, the utilized affordances were associated with perceived ones such as childrenfeeling uncomfortable while cycling in the rain and feeling a jerk when cycling over a speed bump. Children mentioned a small number of shaped affordances in which they only managed tomanipulate oil palm leaves to make pointer for reading the Quran, rubbing oil palm fruits to extract its oil, and plucking leaves as the false money for pretend play. The result also suggests that children create and play games and explore interesting sites during their homeschool journey (Mitchell, et al, 2005). However, the opportunity for children to play during their homeschool journey was related to the limited duration of time they spent during the journey and types of children's mobility to school. The result was in contrast to the study by Said (2008) which found that the children involved more with utilized affordances that perceived ones. The findings were due to the context of the study which were conducted at home garden and neighborhood area. Children's play in home garden and neighborhood did not involved time constraints in performing their activities. Therefore, there is evidence to suggest that the context of study may influence children's level of affordances.



Fig. 2. Children's mobility to school

There is also evidence to suggest that types of children's mobility to school influenced by the opportunity for the children to play that influenced their perception on the affordances during the journey. Children with independent mobility performed 203 affordances; 112 perceived, 88 utilized and 3 shaped affordances (Figure 2). The result suggests that children who were going to school independently have

greater experiences of their homeschool journeys than children with dependent mobility. It was due to their ability to independently explore the surrounding environment without restriction (Romero, 2010) which gives them opportunities to make decisions about where to go, what to do and who to see, they gain more experiences, and have little fear going out alone (Prezza, 2007). In addition, children with independent mobility are more sensitive to the potential play possibilities offered by the surroundings (Romero, 2010). For independent children who went to school with peers, the journey was more focused on communication skills such as chatting about school matters and greeting peers.

As compared to children with dependent mobility, they only performed 84 perceived affordances and 22 utilized affordances (see Figure 2). The result suggests that children with dependent mobility engaged more with passive affordances in the environment including observing the outdoor environment from the car windows. Children who are accompanied by parents to school are having restricted opportunities to engage and explore the environments because they were normally driven straight away to school by their parents. The finding was consistent with the study by Mitchell et al. (2005) who found that children with adult accompaniment may prevent the simplest of outdoor activity which can build skills and attitude. In sum, the children level of affordances in homeschool journey was influenced by the context of the study and the types of mobility to school. The context of the homeschool journey comprising of various physical elements which will be discussed in the taxonomy of affordances.

4.2. Taxonomy of affordances

Children's engagement with the elements in rural area were classified according to Heft's and Kytta's taxonomy of affordances (Heft, 1988; Kytaa, 2002). However, the study concerns on the taxonomy of affordances of homeschool journey for children functioning in a rural area has been modified and extended. It includes topography (surface, slope and earth elements), graspable object, attached objects, non-rigid attached objects, climbable feature, water, sociality, microclimate, animal, vegetation, transportation, and manmade elements. The taxonomy of affordances for homeschool journey was analyzed in 12 categories. The finding shows that children were more frequently engaged with manmade elements (n=35), followed by vegetation (n=31), graspable object (n=31), microclimate (n=25) and animal (n=24). However, when the number of affordances for vegetation and animal were combined as natural elements, a total of 55 affordances represented this category. This indicates that children have more engagement with the natural elements than the manmade elements due to the unique characteristic of natural elements that is fit to children's play and learning activities. The unique characteristics of natural elements include the complexity, dynamic, flexibility, abundant (Prescott, 1987) and the feeling of timelessness (Malone, 2003) of natural elements. The result was parallel to the numerous studies which found that children often prefer to play in natural spaces (Veitch et al., 2007; Charterjee, 2005; Malone, 2003; Chawla, 2002; Sobel, 1993).

Children engagement with manmade elements (n=35) were categorized into residential, shop, community building, shelter, agricultural factory, and landscape elements. The residential house affords highest affordances including seeing friends, neighbor and relatives, and recognizing the types of house. While the community building, landscape elements and shelter were perceived as a place for relaxing, playing and a waiting area which provides shelter for them during hot or rainy days. The small shops affords children buying snacks and having breakfast before and after school. The result was consistent with the study by Joshi et al. (1999) suggesting that smaller shops were likely to be very interesting for children buying snacks. The finding obviously shows that children were familiar with the neighborhood area due to their ability recognizing friends' and relatives' houses, the location of a community hall, school, shop and factory, and they even mentioned about a haunted bungalow. There are evidences suggesting that homeschool journey encourages the development of children's spatial knowledge.



Fig. 3. Taxonomy of children's homeschool journey

The affordances of vegetation (n=31) were categorized into fruit trees, plantation trees, shaded trees, agriculture, ornamental, and field. The result suggests that the children were familiar with the vegetations around the village through their ability of recognizing different trees. Most of the fruit trees are recognized by their fruits, and the oil palm tree was recognized by its shaped. Vegetation afforded multiple activities for children including climbing, searching and eating fruits, and seeing small creatures. For example, for durian tree, they experienced seeing its flowers dropping onto the ground suggesting that the tree will bear fruits. The children even mentioned that they can identify a quality of durian fruit by smelling it. Children also can recognize characteristic of trees through climbing experience. For example a bendable trait of tree branches. The most interesting experienced with the vegetation was the mission of children finding bats in the furling leaf of banana tree. This finding suggests that the children was recognized a hiding place for bats that inside the furling leaf. This suggests that the journey gives opportunity for the children to explore nature freely and discover new knowledge. The natural elements offered various performances for children to discover because of their constant change of shape, texture, color and smell (Tai et al., 2006) permitting children to fulfill their various instinctive play behaviors such as climbing trees, breaking twigs, and balancing on the branches. In addition, the vegetative elements enabled them to experience bendable, breakable, stickable and edible characteristics of the vegetation for play and learning.

Some of the elements that demonstrated children's engagement with graspable objects (n=31) included flat pebbles, fruits, leaves, twigs, as well as manmade element such as an umbrella. Their engagement with the elements involved utilized and shaped affordances. For examples, they throw pebbles into the river, collecting pebbles for slingshot monkey and wild boar, plucking fruits, and breaking twigs. While, an example of shaped affordances for graspable objects was manipulating oil palm leaves as pointer for reading the Holy Quran. It shows that graspable objects affords active affordance for children's activities because its characteristic was moveable that can be easily found along the journey and manipulable by children in their play. Children playing with graspable objects or loose parts are involved with constructive play (Meire, 2006; Fjortoft, 2004).

The affordances of microclimate (n= 25) includes children's experiences during sunny, rainy, windy days, and also during flood season. Rainy day affords the highest number of affordances for microclimate including playing in the rain, seeing puddle and mud along the routes, seeing lightning and hearing thunder, feeling wet and slippery, seeing fast moving of stream, and even feeling hurt by raindrop while cycling. Whereas sunny day affords children feeling hot and thirsty, sweating and feeling

uncomfortable, and having opportunities to see different patterns of shadow.While windy day affords feelings of the breeze and feeling dragged by the wind while cycling. Flood season affords seeing increased levels of stream and feeling worried if crocodiles would appear. It clearly shows that children perceived different experience and the changes that occurred in the environment during different weather conditions. It means that the environment offers a variety of climatic affordances. Therefore, microclimate factors permits more affordances in addition to the natural and manmade elements. Children engagement with animals involved 24 affordances which were categorized into birds, pet, livestock and wildlife. Children frequently mentioned their engagement with wildlife animals including slingshooting wild boars and monkeys, crossing over a dead snake, and playing with squirrels. The diversity of animals encountered by the children was due to the proximity of the village to the hillside forest. The result also suggests that children in the rural area have an ability to recognize birds by its color. For example, they recognized blue kingfisher, brown eagle, and black crows. Therefore, children are fascinated by the natural world due to various living things including animals (Wilson, 2008).

In summary, the homeschool journey in the rural area is perceived by the middle childhood children as a play area which can stimulate their play, learning and development. The homeschool journey afforded many opportunities for children to interact more with natural rather than manmade elements which expand their physical, social and cognitive skills.

4.3. Types of affordances

As illustrated in Figure 4, homeschool journey afforded six times more positive affordances (n=187) than negative ones (n=81) to the children. The positive affordances includes swimming and bathing in stream, recognizing fishes in the river, cycling over puddles and feeling the splash, and cycling over speed bumps and feeling like flying. The examples of negative affordances included fearing of monkey and ghost, hearing noisy sound of machine, runningaway from dog and feeling tired of cycling uphill. The positive affordances were more than negative affordances suggesting that the functional properties of homeschool journey were positively perceived, utilized and shaped by the children. Thus, the result suggests that children perceived the homeschool journey in the rural area as their playscape and learning spaces. This happens to the children with high independent mobility. The result is consistent with a study by (Cooper et al., 2003) which found that walking to school was associated with higher physical activity after school.



Fig. 4. Types of affordances in homeschool journey

Therefore, the study suggests that natural elements affords more positive affordances for children during their homeschool journey. This finding was parallel with other studies at natural setting as such by Fjortoft (2004) at small forest who found that natural landscape influences children's physical activity and motor development. While a study by Bjorklid and Nordstrom (2007) suggested natural environment has a strong positive emotional value for children. The natural environment was viewed as a playground for children due to its ability that afford challenging and stimulating play environments.

The implication of this study is to emphasize the importance of providing a friendly environment for children to travel from home to school independently. Besides, there is also a need to organized some initiatives or programs that promote independent mobility during homeschool journey, since children with independent mobility shows higher performances during homeschool journey's experience; physically, socially and cognitively.

5. Conclusion and Recommendation

In summary, homeschool journey at the rural area is a suitable place for children to develop their physical, social and cognitive performances. Most of their activities involved performatory and exploratory performance such as seeking, searching, climbing, sliding, plucking, collecting, and throwing. However, there were less activities that involved productivity performance which are creating new things from natural elements due to the time constraints. The journey inspired the children feeling of excitement, wonder, joy, challenge and even fear. Apart from this, experiencing the homeschool journey make the children become familiar with the place by recognizing the landmarks, friend's home and developing independence. It means that the homeschool journey in a rural area affording a variety of elements allowing them to express their physical, social and cognitive skills. However, the methods applied to this study need further improvements and should be tested in the urban environment in order to make a comparison of children's performances at their homeschool journey.

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