LANDSCAPE DESIGN TO FOSTER APPRECIATION OF NATURE AMONG PRESCHOOL CHILDREN

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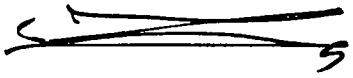

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ABSTRACT

This study aims to explore the potential of landscape design to foster nature appreciation among preschool children. The study site is located at Tadika Pelangi Methodist Sandakan. The objectives of this study are to assess stakeholders' input on the planning of Tadika Pelangi Methodist Sandakan landscape design; conduct site inventory and analysis at Tadika Pelangi Methodist Sandakan; and produce design recommendations which promote pro-environmental behaviour among preschool children. This study employed qualitative methodologies which were 1) site inventory and analysis; 2) Mosaic approach; 3) interviews with parents and staff; and 4) focus group with teachers. Data collection involved the participation of 30 preschool children, nine parents and seven staff. Based on the findings, the existing landscape at Tadika Pelangi Methodist Sandakan can be improved to offer better visual appearances and inculcate pro-environmental behaviour among preschool children through edible gardening activities. The proposed site was divided into four zones namely Zone A, Zone B, Zone C and Zone D. Master plan, perspective views of zones and planting palette were produced by the end of study as landscape design recommendation. In conclusion, a landscape design with an edible garden was proposed to be established in Tadika Pelangi Methodist Sandakan to further develop an appreciation of nature among preschool children. This research project has successfully explored the viewpoints of children using Mosaic approach in devising a landscape design that enhances their physical and mental development needs.

CADANGAN REKABENTUK LANDSKAP UNTUK MEMUPUK PENGHARGAAN TERHADAP ALAM SEKITAR DALAM KALANGAN KANAK-KANAK PRASEKOLAH

ABSTRAK

Kajian ini bertujuan untuk meneroka potensi rekabentuk landskap untuk memupuk penghargaan alam sekitar dalam kalangan kanak-kanak prasekolah. Tapak kajian terletak di Tadika Pelangi Methodist Sandakan. Objektif kajian ini adalah untuk menilai input pihak berkepentingan terhadap perancangan rekabentuk landskap Tadika Pelangi Methodist Sandakan; menjalankan inventori tapak dan analisis di Tadika Pelangi Methodist Sandakan; dan menghasilkan cadangan rekabentuk yang menggalakkan tingkah laku pro-alam sekitar dalam kalangan kanak-kanak prasekolah. Kajian ini menggunakan kaedah kualitatif seperti 1) inventori tapak dan analisis; 2) 'Mosaic Approach'; 3) temu bual dengan ibu bapa dan kakitangan prasekolah; dan 4) perbincangan kumpulan berfokus dengan cikgu. Pengumpulan data telah melibatkan penyertaan 30 orang kanak-kanak prasekolah, sembilan ibu bapa dan tujuh kakitangan prasekolah. Berdasarkan dapatan kajian, landskap yang sedia ada di Tadika Pelangi Methodist Sandakan boleh ditambah baik untuk menawarkan penampilan visual yang lebih baik dan menggalakkan tingkah laku pro-alam sekitar dalam kalangan kanak-kanak prasekolah melalui aktiviti-aktiviti taman kebun. Tapak cadangan telah dibahagikan kepada empat zon iaitu Zon A, Zon B, Zon C dan Zon D. Pelan induk, pandangan perspektif setiap zon dan palet penanaman telah dihasilkan sebagai hasil akhir cadangan rekabentuk landskap. Kesimpulannya, rekabentuk landskap dengan taman kebun telah dicadang di Tadika Pelangi Methodist Sandakan untuk mumupuk penghargaan terhadap alam sekitar dalam kalangan kanak-kanak prasekolah. Kajian ini telah berjaya meneroka pandangan kanak-kanak menggunakan 'Mosaic Approach' bagi merangka rekabentuk landskap yang memantapkan keperluan perkembangan fizikal dan mental mereka.

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LIST OF SYMBOLS, UNITS, AND ABBREVIATIONS

%	Percentage
2D	Two-dimensional
3 R's	Reduce, Reuse, Recycle
3D	Three-dimensional
ADD	Attention Deficit Disorder
ADHD	Attention Deficit and Hyperactivity Disorder
CAD	Computer-aided design
CDC	Child Development Centre
ECE	Early Childhood Education
et al.	*et alia*
ROI	Return On Investment
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Children are the symbols of joy, carefree, playful and curiosity in a community. They learn and develop as they explore their world enthusiastically on their inquisitiveness and vibrancy. Children learn by playing, adapting and experimenting their senses in indoor and outdoor environments. They interact with the objects and their surroundings while adjusting to their preferences and needs in their imagination. During these learning time, children gain the opportunities to build their self-esteem by socialising with their friends and feel good about themselves. According to a recent study conducted by Cvencek *et al.* (2016), children establish their self-esteem as early as five years old. Adults can, therefore, prepare a well-constructed play to children to boost their self-esteem so that they can be better at managing peer pressure, taking up responsibilities and coping with challenges.

These days, children living in urban areas have less play time especially in the outdoor environments compared to children living in suburban or rural areas. The average hours spent in outdoor play among children of the current generation decreases by three times compared to their parents (Karamelo, 2013). The main reasons behind such issues are due to working parents living in urban areas who are worried for their children's safety in outdoor environments and have little or no time to bring their children to the neighbourhood park. The availability and proximity of a park may also influence the prospect of parents spending time with their children in the outdoor environments. The provision of urban green space is now limited in urban areas to make way for industrial and commercial purposes. Besides, parents prefer to provide their children with screen devices. These gadgets impacted their children's health and well-being due to the excessive exposure; causing profound addiction to the gadgets (Christakis and Zimmerman, 2006).

An ideal solution to overcome children's disconnection from nature is by providing the opportunity to engage in nature at the preschool. Learning experiences in preschool can be balanced between academics and outdoor play using the preschool landscape settings. An ideal preschool landscape should provide varieties of elements and contexts to allow children with different behaviours and characteristics enjoy playing in the outdoor environments. Within this space, children will be able to explore and learn about their world while developing a connection with nature and foster pro-environmental behaviours. At the same time, children also experience physical, emotional, cognitive and social developments by spending time in outdoor activities such as running around, contacting with nature, role playing and play games with peers during their early childhood. These developments are vital to ensure their success in the society in the future. They are influenced by external factors including the educational environment where the children are exposed during the first six to eight years of their life (Bowman *et al.*, 2001).

Early Childhood Education (ECE) can be a guidance to facilitate children activities in the outdoor setting. It plays the role to deliver the required educational environment for children through the preschool curriculum. It is found that ECE increases school readiness for primary school and school readiness is a significant predictor of early school achievement (Forget-Dubois *et al.*, 2007). Furthermore, positive economic and social impacts have been observed among adults who previously joined ECE. The impacts include higher educational achievement, higher social status, higher salaries and less involved in crimes (Schweinhart, 2007; Sparling *et al.*, 2007).

1.2 JUSTIFICATION

There are public and private preschools available in Malaysia. The public type is funded and governed by the Ministry of Education, the Ministry of Rural and Regional Development and the Department of National Unity and Integration (UNESCO International Bureau of Education, 2006). The private preschool charges fees and administered by the private sector and non-governmental organisations. The latter allows their administrators to choose their curriculum and medium of instruction (Majzub, 2003). The ECE programme in Malaysia emphasises on curriculum components of language and communication; cognitive developments; spiritual and morality; socioemotional developments; creativity and aesthetics; and physical developments (Kementerian Pendidikan Malaysia, 2001). Environmental education is minimal in this curriculum framework as the preschool children are only taught to take care of animals, raised awareness about environmental pollution and informed of the importance of plants. There is a potential for this curriculum framework to be improved by exposing preschool children to more hands-on experiences on environmental education. A well-designed landscape in preschool with diverse natural elements and creative use of outdoor features is a conducive environment to realise such potential.

The site selected for this study is Tadika Pelangi Methodist Sandakan, a preschool for children between the ages of four to six. Despite the presence of a playground, the preschool itself lacks an outdoor space that fits the concept of play-based learning. The landscape design in a preschool should support play-based learning by providing children with the opportunities to learn while playing under minimal supervision from teachers. This study will serve the purposes to propose a landscape design to improve the existing landscape of the preschool and promote play-based learning, as well as to introduce potential module to inculcate pro-environmental behaviours among preschool children. It is hopeful that this study can integrate children's opinions and views in the recommendation of the landscape design, as opposed to traditional school landscape which planning involves only design professionals and school administrations. The challenge that lies in this study is finding the best way to gain positive feedbacks and opinions from the children.

1.3 OBJECTIVES

The objectives of this research are:

1. To assess stakeholders' input on the planning of Tadika Pelangi Methodist Sandakan landscape design.
2. To conduct site inventory and analysis at Tadika Pelangi Methodist Sandakan.
3. To recommend a landscape design which can encourage pro-environmental behaviour among preschool children.

CHAPTER 2

LITERATURE REVIEW

2.1 Children and the Outdoor Environment

2.1.1 Children of Today's Generation

The outdoor environment provides explorative experience for children. The nature in an outdoor environment can stimulate children's imagination and create a sense of curiosity compares to being in an indoor environment. The outdoor elements that are available in a variety of colours, textures and sizes can offer creative play that promotes confidence, imagination, motor and communication skills (Yerkes, 1982). Children participate in the outdoor environment with natural landscape as their play space through various physical movements such as climbing, crawling, dodging, jumping, running and swinging as exemplified by Moore and Wong (1997). Children who spend their time playing and learning in an outdoor environment are more likely to retain their memories and knowledge as the experiences are perceptible and personal to them (Ormrod, 1997).

However, children as young as one-year-old are exposed to the use of screen devices such as televisions, smartphones, tablets and handheld game consoles throughout the past decade. There is a trend among preschool children from the age of two to five spending an average of 2.2 hours to 4.1 hours per day using these devices (Rideout, 2011; Tandon *et al.*, 2011). This worrying trend could affect children's sensory, motor and attachment development which results in physiological and psychological disorders such as developmental delay, obesity, mental illness, attention deficit and illiteracy.

Moreover, children are frequently bombarded with food advertisements on the television. 84% of these advertisements do not meet basic nutritional standards (Sims *et al.*, 2011) and 86% are unhealthy food high in fat, sugar, or sodium (Powell *et al.*, 2011). Exposing children to less nutritional food will affect food preferences, increased consumption and develop more positive attitudes toward unhealthy foods (Dixon *et al.*, 2007; Chamberlain *et al.*, 2006). Such change of food preferences resulted in increasing overweight and obesity issues among children, thus posing a serious global problem (Navti *et al.*, 2014).

In addition to unhealthy eating lifestyle, children nowadays are spending less time outdoor and confined within the comfort and security of supervised indoor activities. Louv (2005) highlighted four factors that contribute to the lack of outdoor activities which consequently leads to limited opportunities for children to connect with nature. Firstly, the danger of the outside world especially the increased crime rates has forced parents to secure their children indoors. Secondly, poor urban planning dismissed the provision of green spaces, or the location was not properly planned to be within acceptable walking distance in a neighbourhood. Thirdly, children nowadays spend more time on electronic devices indoors. Lastly, children are discouraged to spend time outdoors due to fear of wilderness and outdoor spaces. Parents have neglected the importance of outdoor activities to promote children's health, development and well-being. The lack of outdoor physical activities poses a risk factor for many health problems among children such as obesity, respiration problems, cardiovascular diseases and bone health problems. The importance of allowing children to play and explore in the outdoor environment is thus crucial so as to foster their physical, emotional, cognitive and social developmental needs.

2.1.2 Nature Deficit among Children

The exposure of children to nature is essential yet diminishing since the past decade. The lack of exposure of children to nature is triggering a condition, which Louv (2005) coined as "Nature Deficit Disorder". Children with Nature Deficit Disorder experience disconnection from nature, fear or dislike being in the outdoor environments, as well as obsessed with media and electronic devices. As a result, they are more likely to experience health problems such as obesity, Attention Deficit Disorder (ADD), Attention Deficit and Hyperactivity Disorder (ADHD), depression and vitamin D deficiency (Holmes *et al.*, 2006). Furthermore, language and cognitive developments are

interrupted as children spend more time using electronic devices (Jusoff and Sahimi, 2009). Children with delayed cognitive development may have their thinking skills challenged in term of memorisation, problem-solving, reasoning and learning.

Children who lack exposure to nature feel disengaged from nature. They tend to express fear towards the natural environments (Simmons, 2006), which results in negative perceptions. Such disengagement will further impact attitude towards nature in their adulthood. Studies have shown that adult who are willing to join nature-based activities were previously exposed adequately to natural environments during their childhood. (Chawla, 2007; Thompson *et al.*, 2008; Wells and Lekies, 2006). Mustapa *et al.* (2015) made aware that children who appreciate nature will diminish in the future if there is no remedial action taken against 'Nature Deficit Disorder'. Reconnecting children with nature can help them to develop positive attitude and behaviour which eventually strengthen their pro-environmental behaviour in their adulthood.

2.1.3 Benefits of Children Spending Time in Nature

According to the World Health Organization (WHO), health is defined as "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948). Children's health can be positively impacted by spending time in the outdoor environment. Children who participate in outdoor activities experience an intense and active physical movements as they interact with different elements in the outdoor environment. They can learn a language better when exposed to nature (Miller, 2007). Moreover, they can further develop their motor fitness, balance and coordination by participating in outdoor activities involving natural landscape compares to a conventional playground setting (Dyment and Bell, 2008). Play space involving natural environments can encourage different levels of physical activities in the form of non-competitive, open-ended play. Outdoor activities also help children to cope with ADD, ADHD, depression and vitamin D deficiency (Holmes *et al.*, 2006).

The connection between children and nature can be promoted together with health and well-being by spending time in the natural environments. Such connection can stay for a lifetime once children are exposed. As children learn about nature, they will begin to appreciate and explore the wonders and possibilities out there especially by appropriate engagement through play-based learning in the nature and

development of natural playgrounds. DuBay (1995) who wrote North Carolina Environmental Education Plan 1995 believes experiential learning is the best way for a student to understand the environment. Children are likely to have increased environmental awareness, understand the ecological systems and embrace responsibilities they hold towards the environment (Klein, 2012).

Furthermore, spending time in nature with their peers can positively improve children's social skills. Social interaction is a crucial element in early childhood as children are learning to develop relationships with other people. Such development will help them to interact with their peers and establish friendships. Lack of social interactions among children can lead to loneliness, depression, withdrawal and anxiety which later result in low education grade, school dropout as well as potential mental health and behaviour issues (Ladd, 1999). Social interaction takes place in environmental education as children interact with one another by discussing environment-related topics and participating in the outdoor activities (Figure 2.1). They will learn to share, cooperate and respect each other. Environmental education in the form of gardening can improve social skills and self-esteem as children involve themselves in the outdoor works. Hands-on learning in the outdoor environment will develop a profound effect on the children's knowledge and skills enhancement as they can remember their experience with friends and instructors, subsequently improve their self-esteem. Social interaction also helps to develop preschool children's readiness for primary school.

Moreover, children's active involvement in outdoor activities encourages the development of pro-environmental behaviours. Pro-environmental behaviours are defined by Kollmuss and Agyeman (2002) as the behaviours that are intended to reduce the adverse effects caused by one's actions on the environment. The fact that today's children are slowly disconnected from nature as well as from each other emphasises the necessity to inculcate pro-environmental behaviours among them. The integration of environmental education and sustainability in early childhood education (ECE) helps children to develop nature appreciation (Chawla, 2008) and pro-environmental behaviours. It will also encourage a sense of ownership and tendency to protect nature (Landry, 2005). Tooth and Renshaw (2009) suggest five practices that help to foster environmental stewardship namely: (a) being in the environment; (b) real life learning; (c) sensory engagement; (d) learning by doing; and (e) local context.

Figure 2.1 Children interacting while engaging in outdoor activities
Source: NYMetro Parents, n.d.

2.2 Early Childhood Education

2.2.1 Children Developmental Needs

The developments of children include four aspects namely physical, emotional, cognitive and social to promote self-sufficiency and further develop their survival skills. Table 2.1 tabulated suitable activities to facilitate children's developmental needs.

Table 2.1 Activities related to children's physical, emotional, cognitive and social developments

Aspect	Activities		
Physical	• Climb • Dig • Run • Jump	• Balance • Hang • Grasp • Swing	• Push • Pull • Fall down • Stretch
Emotional	• Have daily contact with nature • Explore natural areas • Plant tree • Tend a garden • Develop an emotional bond with nature • Appreciate and care for the environment		

Table 2.1 Activities related to children's physical, emotional, cognitive and social developments (continued)

Aspect	Activities
Cognitive	• Involved in decisions about their play space • Perform and role play • Retreat and hide but at the same time see between branches, from behind the tall grass • Engage in fantasy play • Be quiet and observe the world around them • Explore, discover, reflect
Social	• Socialise • Talk • Laugh • Share • Play games • Engage in free play • Walk and run together • Hang-out together

Source: Toronto District School Board and Evergreen, 2013

Physical development can be achieved by outdoor plays to develop children's motor skills, physical stamina and confidence while gaining health benefits. Physical development promoted through physical activities is the key to developing healthy musculoskeletal, cardiovascular and neuromuscular system among children. Malina (1991) suggested that the physical development gained by preschool children serves as the foundation for acquiring of complex skills in the later stage of their life related to health and behaviour. This makes the need for physical development in ECE even more significant.

Emotional development fosters creativity, expression and emotional connectedness among children. Through appropriate play, they can learn about empathy and responsibilities. These are necessary to help children to understand feelings of other people, control their emotions and behaviours, as well as getting along with people around them. Emotional development leads to nurturing of emotional competence which can help children to cope with different situations in their life positively (Shield *et al.*, 2001). Emotional competence needs to be developed together with cognitive development. Early childhood, therefore is a crucial phase to develop emotional competence among children.

Furthermore, cognitive development refers to the progressive development of children's cognitive skills related to learning, problem-solving, attention, observation, memory and creativity. ECE benefits children in term of cognitive development. Preschool children start to think logically of how the world around them works. A study conducted by Tandon *et al.* (2016) mentioned that exposure to physical activities in early childhood provides cognitive development among children through aerobic activities that promote goals, require complex motor movements and develop short and long-term physiological changes in the brain. However, their cognitive skills are still immature and limited. Teachers need to play their role to support cognitive development among preschool children by understanding their limitations. The connection between children and nature should be taken into account as part of children's cognitive development.

Social development takes into account on interaction, cooperation and sharing among children and the people around them. Through interactions with people such as family members, school staff and their peers, children get to learn about the social world in indoor and outdoor environments. Social development is related to emotional development. McDowell *et al.* (2000) suggested that children are liked by their peers as they understand emotions better. As they form relationships and connections with other people, they build a sense of their identity and the social roles they fit in. During this time, family members and teachers can work together to help children to learn about cooperation, responsibility, respect, honesty and care for others.

2.2.2 Play-based Learning in Early Childhood Education

Play-based learning can be used as the basis for pedagogy because it can provide children opportunities of exploration and discovery (White *et al.*, 2007). Play-based learning available in ECE engages in developing understandings about their world. Researchers have been examining the extent of which children can gain knowledge through play-based learning (Gibbons, 2007; Hedges and Cullen, 2005). Adults play a vital role to supervise and interact with children during their play sessions; however they should not limit the methods and sources for children to gain knowledge especially when related to environmental education.

Cutter-Mackenzie and Edwards (2013) suggested that play-based learning in environmental education comprises of three play types: (1) open-ended play; (2)

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