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REVIEV ARTICLE

A Review on the Role of Function Landscape in Encouraging the Psychomotor and Cognitive Development of Pre-School Children

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Abstract. Learning from outside of the classroom includes physical activities and self-exploration that help in developing positive children's psychomotor and cognitive. Given that the learning process in childhood is important for the development of physical and cognitive, the activities in the form of physical game and self-exploration deemed to be a natural mean for the age level to develop their talents and creativity potentials. The environmental landscape factor that is conducive, impacts the cognitive and learning of early childhood education. However, it is deemed to be lacking in the execution of out of class activities in Malaysia's early childhood learning that uses elements of functional landscape aligned with concept of self-exploration through learning environment. The objective of this study is to explore the functional landscape elements in an exploration park to improve children's physical development. In doing so, this study carried out a literature review involving the analysis of documents related to the importance and ability of the landscape to improve children's cognitive development. This action study is also expected to contribute as reference to schools, institutions, and related parties in emphasizing functional landscape elements in the design of learning centre areas outside the classroom.

1. Introduction

The environment of pre-school education includes the teaching and learning process (TnL) of a specific discipline whether inside or outside the classroom. This process of TnL may not always be something measurable or seen but it should give a deep impact to a person such as gaining knowledge, be able to make reasonable judgment, thinking and assessing, as well as it is important for a child's cognitive development. Nadmilail and Sivasubramaniam (2011) added that the TnL process that is implemented outside the classroom can increase the level of mastery and interest of children to participate in any activity in the process. This is supported by Ahmad (2019) who stated that such implementation can be a stimulus for children's development of education and well-being. However, the planning of TnL activities are bounded to the guidance contained in the *Dokumen Standard Kurikulum dan Penaksiran* (DSKP) under *Bahagian Pembangunan Kurikulum* (2016), which also stipulates that TnL activities need to be diverse and balanced. This is so that the pupils' learning is more effective and meaningful including the indoor and outdoor activities, active and passive activities, individual, group and classroom activities, as well as activities based on pupils' initiatives and ones planned by the teachers.

In addition to learning in the classroom which has long been a common practice of TnL in Malaysia, TnL that is conducted outside the classroom can increase the level of mastery and interest of the pupils to participate in any activity. This is supported by Ahmad (2019) where the implementation of TnL outside the classroom can be a catalyst for children's education and well-being.

The development of pupils' mastery of learning is said to be increasing through activities carried out outside the classroom through experiences from the five senses which are tasting, seeing, touching, smelling, and hearing contextually (Nadmilail & Sivasubramaniam, 2011). This is also supported by the non-governmental organization The Miracle (2020), which stated that learning based on sensory experiences is important for cognitive development for all children. The same report also stated that one of the best places to promote the development of sensory experiences and intelligence among children is in the playground, regardless of age or physical and cognitive development ability. Rasli and Hussain (2021) supported the notion that the role of the landscape outside the classroom or in the surrounding area helps the cognitive development and physical fitness of the pupils. This is especially the ones that involve TnL outside the classroom, which is also able to create the spirit of place. A landscape environment outside the classroom that includes a playground or functional landscape space will encourage the development of skills such as thinking, exploration, and problem-solving, and assessing risks that are important for children's cognitive development (Ahmad, 2019).

However, there is a gap in the children's interest to access the functional landscape environment outside the classroom especially those in pre-school level. This is because, children have been dominated by technological games and gadgets as

well as they are hindered by the lack of construction of a game landscape that is conducive for the TnL process. This had put aside the children's interest to continue exploring and learning new things outside the classroom. In contrary, a case in the United Kingdom proved that a conducive environment that emphasizes functional landscape elements successfully attracts pupils to learn and explore their environment (Ahmad, 2019). The same author also stated that pupils are free to explore knowledge through sensory experiences outside the classroom and are more motivated to share views as they mingle around and develop creative thinking by questioning their experiences with what are in the environment. From other observation of a study carried out by Learning through Landscapes, United Kingdom, it was found that children's learning outside the classroom guided by the environmental landscape is able to increase their sensitivity to the environment about personal safety, they are happier to involve themselves in every activity carried out and more enthusiastic to explore a new world outside the classroom whether in a natural or artificial environment (Learning Through Landscape , 2020; Hussain et al., 2021). At this stage, children's learning experiences in the environment can shape thinking and the ability to learn, socialize and respond to daily challenges (UNITAR International, 2022).

Shifting the lens to Malaysia, the education system in Malaysia is under the umbrella of the National Education System (SPK). The Category of Government Educational Institutions (KIPK) consists education in nurseries, kindergartens and equivalent, primary education, secondary education and post-secondary education (Kementerian Pendidikan Malaysia, 2019). According to Nazarudin and Tan (2020), the education system in Malaysia especially for early childhood education in this country is said to be at only a satisfactory level with the existence of pre-school programs such as nurseries and kindergartens. There are also questions raised on the level of the local early childhood education system as compared to other developed countries in the west in terms of TnL aspects inside and outside the classroom (Nazarudin & Tan, 2020). Rasli and Hussain (2021) argued that the TnL system in the classroom in Malaysia is already at a satisfactory level where teachers take advantage of the basic facilities provided by the school. However, there are apparent lacking in learning outside the classroom. The constraints are due to the lack of environmental landscape facilities, especially functional elements that are vital to accommodate children's physical activities outside the classroom. This is in line with the research findings of Basir et al. (2020), who outlined that three of the common factors that hinder the physical activities outside of classroom namely, 1) the teacher factor, 2) the pre-school environment factor, and 3) the physical activity equipment factor. In addition, the tendency is also caused by the concern that the teachers are putting on the level of safety of the pupils if TnL activities carried outside the classroom. This might be due to the factor of the physical features of in the landscape, which is feared to be hazardous for the pupils, especially considering the early stages of children in learning (Ahmad, 2019).

Regardless, Ahmad (2019) and Rasli and Hussain (2021) are in the same page that TnL should not be solely gravitated towards within classroom format. In fact, the school with the cooperation of the teachers and the parents should dare to make take risk for betterment by making education patterned within the environment landscape work as a new medium of TnL process in early education. Although this effort is considered to be small, insignificant, and may be new in the TnL scene of Malaysia's, children are the future talents who will lead the country towards developments and refinements. It is therefore crucial for the present to take the initial step by empowering learning outside the classroom through the environmental landscape to expose them to the practice of sensory contextual learning.

Acar (2014) stated that, TnL in the past was considered as a passive activity that it had only be carried out in the classroom with the pupils act as empty objects who seek knowledge and only garnered what was given by the teachers. However, Nazarudin and Tan (2020) and Isa et al. (2018), argued that education including the TnL process is such a special expertise not only bounded to activities inside the building but outside too. The same researchers also confirmed that this process may not be visible or measurable with regards to the idea, but its development will indirectly affects to personal level to the children such as the self-development in knowledge, thinking, and self-reliance. In the opinion of Slavin's (2020), learning can happen in many ways whether intentional or not. Pupils are always learning regardless of anything, but of teachers on the other hand prioritize knowledge, skills and concepts in the intention of having the pupils mastered and be used in their future. According to Hill et al. (2009) learning is achieved when experiences resulted and caused a relatively permanent change in a person's knowledge or behavior. These changes may occur intentionally or unintentionally, for better or worse, right or wrong and conscious or unconscious purposes. Hussain et al. (2020) stated that, the experiences will be more meaningful and thus, form sensory stimulation when it involves the influence of the environment as guides and references. Furthermore, Littledyke (2008) emphasized that children's learning will be more active and enjoyable when it involves game activities that are influenced by different environmental factors. Furthermore, these active children will indirectly develop physical fitness. Needless to say that individual physical fitness is closely related to the individual's ability to perform physical activities without feeling tired and can provide an overview of the individual's health (Basir et al., 2020). Therefore, the role of the environmental landscape is important in the learning process for holistic development of children.

According the Hello Doktor Malaysia website, the development of mental and environmental psychology is very important as the basis of the need for children's cognitive development in early childhood development. Ahmad (2019) argued that, within the scope of the environmental and environmental psychology discipline, psychological ecology, mental development and environmental psychology become the main pillar in cognitive and social learning between humans and the environment. This learning will indirectly develop cognitive and psychomotor elements for each child. Furthermore, Acar (2014) asserted that this concept is the best in connecting and evaluating the relationship between children and the environment through psychological disciplines based on the environment, whether natural or artificial. The Miracle (2020) discussed a research where children who are exposed to the elements of environment whether natural or artificial at an early age, will think further about solving problems, be more active and intelligent in any activity that follows. In fact, they are also capable of making decisions that they feel are necessary. Positive improvement was also seen in

children who carried out activities outside the classroom in highlighting their ability to adapt according to the needs of the environment and think in line with their goals so that the activities carried out can be realized. This factor is caused by the response of human behavior and their environment that requires humans to think in continuity to survive where it is known as the factor "humans learn and adapt from the behavior of life" so that they recognize themselves when they learn (Proshansky, 1976; Day & Midbjer, 2007). Francis (2008) argued that, the children's cognitive and physical development occurs when they begin to socialize and participate in every activity that is carried out, especially involving relationships with the environment and physical surroundings that which then forming a valuable experience. Apart from that Bluma and Lipowska, (2018) stated, children's cognitive function is not only focused on the IQ, but also involves a high level of executive functioning (motivation, ability to determine goals, and self-control). This is the result of engaging in active physical activity and also sports. Based on this factor, it is justified to be necessary that the landscape elements are vital to be included in the TnL environment, especially with the focus of improving the physical fitness of children in the early stage. Functional landscape elements that meet the needs of children's psychomotor and cognitive development are very essential to provide them experiences from different activities and learning opportunities.

2. Methods

This study uses a systematic literature review method. There are several systematic literature reviews writing methods introduced by Kitchenham and Charters, Okali and Schabram, Denyer and Tranfield, and Levy and Ellis. The writing of this systematic literature review article is based on Kitchenham and Charters (2007) which came out with steps in writing a systematic literature review including planning, implementing, and reporting. The planning process begins by identifying the objectives of the search and producing a review protocol. The implementation step selects relevant primary sources, assessing their quality, extracting data, and synthesizing data before finally writing the report (Kitchenham & Charters, 2007).

Search Strategy

The search was carried out using keywords in Malay, namely *landskap berfungsi* (functional landscape), *persekitaran* dan *pembelajaran kanak-kanak* (Children's learning and environment), *kepentingan landskap berfungsi* (the importance of functional landscape), *landskap luar bilik darjah* (landscape out of the classroom), as well as several other related keywords to enrich the data collection. The sources search used combinations of keywords above was done without limiting the year of publication through databases like Science Direct, Google Scholar as well as public university databases throughout Malaysia. Titles and abstracts were examined to identify articles related to functional landscape elements in improving children's physical development, especially using the Google Search. Findings from the search results using the systematic literature review method have been used as a guide for the writer to analyses in detail the findings of this study.

3. Result and Discussion

This section presents and discusses the findings of the study through the literature review that has been collected and analyzed by the authors in order to review the role of function landscape in encouraging the psychomotor and cognitive development of preschool children. With an eye on the systematic research flow, the consistency of discipline throughout a uniform system helps keep the authors focused on the aim of this study. Hence, the order of the findings and discussion is as follows;

The Importance of TnL to Include Functional Landscape Elements

According to Ali et al. (2015), the role of the landscape outside the classroom area can contribute to the diversity of TnL, especially in the development of pupils' academic achievements. The importance of landscape is not only able to help the TnL process but also strengthen elements of the pupils' personalities, such as developing an awareness of appreciating the environment. Functional landscape that includes hard landscape elements, soft landscape elements, living elements of flora and fauna, as well as artificial landscape elements can increase the level of physical and mental development of pupils as well as fostering appreciation for the environment. It is helping directly or indirectly to the TnL process to be

Table 1. Benefits of Functional Landscape in TnL Process

Importance of Functional Landscape	Benefits of Functional Landscape in TnL Process
1. Health	Invigorates pupils' movement with games while learning about the nature and landscape of their environment and avoid the effects of obesity due to lack of movement in the classroom. (Horváth et al., 2023; Hussein et al., 2008).
2. Social Skill	Initiates urges to socialize and query about their environment during the class, especially on the functional landscape (hard landscape, soft landscape, and its role in the local environment). This positive social interaction among pupils is very important to avoid them becoming passive individuals in the classroom or outside the classroom (Hussain et al., 2022).
3. Tactile Sensory	During TnL sessions outside the classroom, games involving all pupils will activate their senses. Soft landscape elements such as varying plants that have either rough, soft, hairy, and even thorny texture will encourage pupils to be more sensitive to every element found in their environment. The function of the games involves the sense of touch indirectly encouraging their mental and physical growth. (Hojer et al., 2020; Hussein et al., 2008)

more effective. The creation of functional landscape elements around the area is not only able to beautify the surrounding area, indeed also serves as a mean for teachers to carry out TnL activities outside the classroom. Rifin (2020), Ismail (2021) and Musa et al. (2018), asserted that the variety of functional uses of the surrounding landscape space is not only able to attract pupils' interest in learning outside the classroom, but it also creates a fresher and calming natural environment for better future sustainability in the education world.

According to a study conducted by researchers from Australia on the development of children, especially at the school level, landscape elements are very important in their lives and physical and mental development (Hanfi, 2013). The functional landscape fulfills half of the needs in ensuring that children growth and appreciate their environmental factors that act as a canvas of knowledge for their cognitive and psychomotor development. Hanfi (2013) also stated that the landscape area works around the living space and will act as the best play space for them besides being the first place for them to feel close to nature. Rasli and Hussain (2021) and Ali et al. (2020) supported the notion that landscape elements existed within the area such as hard landscape elements, soft landscapes, living elements of flora and fauna and artificial landscape elements able to influence the mental and physical health of pupils. It is also encouraging the pupils to continue exploring and be aware of their environment. One of the advantages of implementing TnL outside the classroom by applying the use of functional landscape elements is also able to stimulate their cognitive development two years ahead compared to their age (Chandler, 2017; Hanfi, 2013). Other advantages as stated by Chandler (2017) and Hanfi (2013) are as follow in Table 1.

Additionally, Dekker Perich Sabatini (2019), winner of the outdoor learning environment award USA, said that each pupil has his own degree of ability, and it is different for each individual. They emphasized that pupils who seem disengaged in the classroom sessions may be more proactive outside the classroom that hypothetically enthuses their learning and acceptance process. For example, lesson about the photosynthesis process of plants is practically and visually excite the pupils to experience with the nature outside. Learning in the classroom may only be cognitively understood by a few pupils, but learning outside the classroom and practically experience the topic will make it easier for the pupils to understand. In addition, the functional landscape outside the classroom will also allow pupils to be aware of their surroundings and explore the world outside the classroom (Torres, 2022). As they are growing up, the perception through the senses experienced are also developing and simultaneously, the pupils will adapt to the environment. In ensuring the TnL process successful in improving the pupils' cognitive and psychomotor development, the selection of activities, soft and hard landscapes elements, and design are also play a very important role. Ali et al., (2020) and Shaojie et al., (2019) suggested that the functional landscape aspects must emphasize elements such different variety of plants (color, texture, size, appearance and function), water elements (shower pools, mini waterfalls), diversity of garden furniture (resting areas, spaces for social activities), open spaces to carry out TnL activities (mini garden, greenhouse), and variety of appropriate activities that can be done in each space provided. In relation to that, basic functional landscape elements listed and elaborated in Table 2 can be considered.

Based on the literature review, the elements that exist in the landscape system hold benefit to be useful in creating a functional landscape atmosphere, especially within the school area. There are five important elements in a functional landscape that can create a fitting design for TnL purposes outside the classroom. Among them are plants, play space with a mix of bold and soft landscapes, water elements, soft landscapes, and bold landscapes. However, in Malaysia, the level of attention to functional landscape elements in the mentioned context is still only at a relatively satisfactory level (Nazarudin & Tan, 2020). The world has begun to emphasize the functional landscape especially in the process of improving the cognitive and psychomotor development of children. It should strengthen the children's development with regards to experiential exercises within their environment. According to the writing of the international paper Forest School Lou (2021), scholars have emphasized the benefits and importance of learning through the approach of conducting activities outside the classroom. The same writer deduced that learning outside the classroom may vary according to the culture and environment, but it is centered on a common goal which is for the individual to understand the world around them and be sensitive to the environment outside the classroom. Therefore, a functional landscape is seen to be able to integrate all these elements under one theme. According to Edutopia (2020), learning outside the classroom can help pupils become more independent by making the environment a reference source. In addition, the same paper also asserted that, with a combination of appropriate landscape outside the classroom, the pupils can indirectly transfer and practice the skills learned in the classroom to the outside environment. The use of these functional landscape elements will indirectly create a diverse continuum in the world of TnL especially in the outdoor classroom, visualize in figure 1 show below.

4. Conclusion

In conclusion, functional landscape elements are well-researched, justifying the benefit of increasing children's psychomotor and cognitive levels in improving children's physical development. Functional landscape can be classified into five main elements such as varying plants, spaces with hard and soft landscape elements, water elements, soft landscape, and hard landscape. In terms of the landscape concept and design, the functional landscape should evaluate and take into account the five elements because spending time outside the classroom based on a functional landscape is proven to offer a more effective, lively, fresh, and diverse learning environment. Therefore, the researchers hope that the findings of this survey can help relevant parties in the field of education in Malaysia, field researchers, and stakeholders to take into account and evaluate the importance of the functional landscape in the TnL area, as well as acknowledge its relationship with the cognitive and psychomotor development of children.

It is recommended that future studies use a larger sample size and extend the duration of the study to draw more meaningful comparisons between this approach and other methodologies used. Future researchers can also compare how outdoor landscapes can contribute to the quality of education among pupils, which is not limited to kindergarten only.

The study was conducted by collecting documents from online platforms such as Google Scholar that have discussions related to outdoor landscapes theory and kindergarten theory either as the main discussion or have issues related to the

Table 2. Basic Functional Landscape Elements

	Functional Landscape Elements	Function
1.	Varying plant varieties	The type of plants used in the functional landscape can create an atmosphere of exploration for pupils. These plants can be used as teaching aids where labeling their names, types, and functions helps cognitive engagement, types and functions of each plant among the pupils will mobilize their cognitive and psychomotor systems in carrying out activity outside the classroom area. In addition, they can also learn the laws of nature and how natural processes are linked to their environment and daily learning. According to a statement from Shaojie et al. (2019), the process of tree growth, size, color and variety of plant textures can attract pupils' interest in learning and become a source of inspiration for them in exploring new worlds around their learning space. In addition to the purpose of beauty and stimulation of the pupils' senses, the plants planted can also create a space for edible plants (pot horticulture). The pupils will be exposed to the food crop system and become an inspiration for the sustainability of food security (Yusop et al., 2020).
2.	Playground incorporating landscape elements (softscape and hardscape)	A spacious and comfortable functional landscape space will encourage children to explore and play in it. Useful elements such as water, ground, and plant will attract children to take advantage of the space. In addition, every activity and game facility created in this space will meet the needs of children to think and be inspired. In addition, it will form an experience space for them to express their creativity while playing and thinking. Competitive games in this space will indirectly encourage them to socialize and develop their learning. At the same time, play and think activities in this space also can encourage pupils to think of ways to solve problems through play. Besides fostering the spirit of helping each other, this is also fostering the spirit of working together in the team (Ying et al., 2021; Hussein et al., 2008).
3.	Waterscape element	The main role of the water element in designing functional landscape is very important. According to Hussein et al. (2008), the element of water can cool the surrounding space in addition to being able to control harsh and soft spaces. Water elements such as fishponds, water fountain, or even water channels can create aesthetic and unification between two elements, namely building elements and plants. For a functional landscape space, the water element plays a role as an element that affects human feelings and thoughts. This element is very important especially for children in developing their cognitive and psychomotor aspects. Psychologically, the sound of running water will attract children to explore the area as well as providing tranquility to the mind. The sound of the waterfall or splashing of the pool will change the atmosphere of their learning. There are many benefits that can be obtained through the use of this element of water. One of them is providing a space to carry out TnL activities outside the classroom, play games and so on. Such activities can enliven the atmosphere of TnL outside the classroom (Allahyar & Kazemi, 2021).
4.	Softscape Element	Soft landscape usually refers to elements of plants, animals and topographic surfaces. In designing a functional landscape especially in the area, plants are the most important element. Since the art of landscape design works to emphasize a healthy and stable environment especially for children, the use of plants can help children's cognitive and psychomotor development. Apart from acting as an aesthetic element in the area, the soft landscape also affects a deep impression not only to their sights, but also tastes, touches, hearing, and smell (Theobald & Brod, 2021).
5.	Hardscape landscape	The main function of the landscape in the functional landscape is to beautify the surrounding area in addition to aid the TnL aspect outside the classroom. Examples of natural resources that can help the TnL processes outside the classroom are bricks, concrete, iron or wooden structures (waqf, gazebos, playgrounds, etc.), sculptures, and buildings. According to Hussain et al. (2020), the use of appropriate landscape elements outside the classroom can encourage children's interest in learning. Children will begin to explore the existence of these elements and be able to query and think about matters surrounding them (Hami & Abdi, 2019).

theory. Moreover, the use of the Google Scholar database has limitations because the database cannot distinguish between quality manuscripts and general manuscripts.

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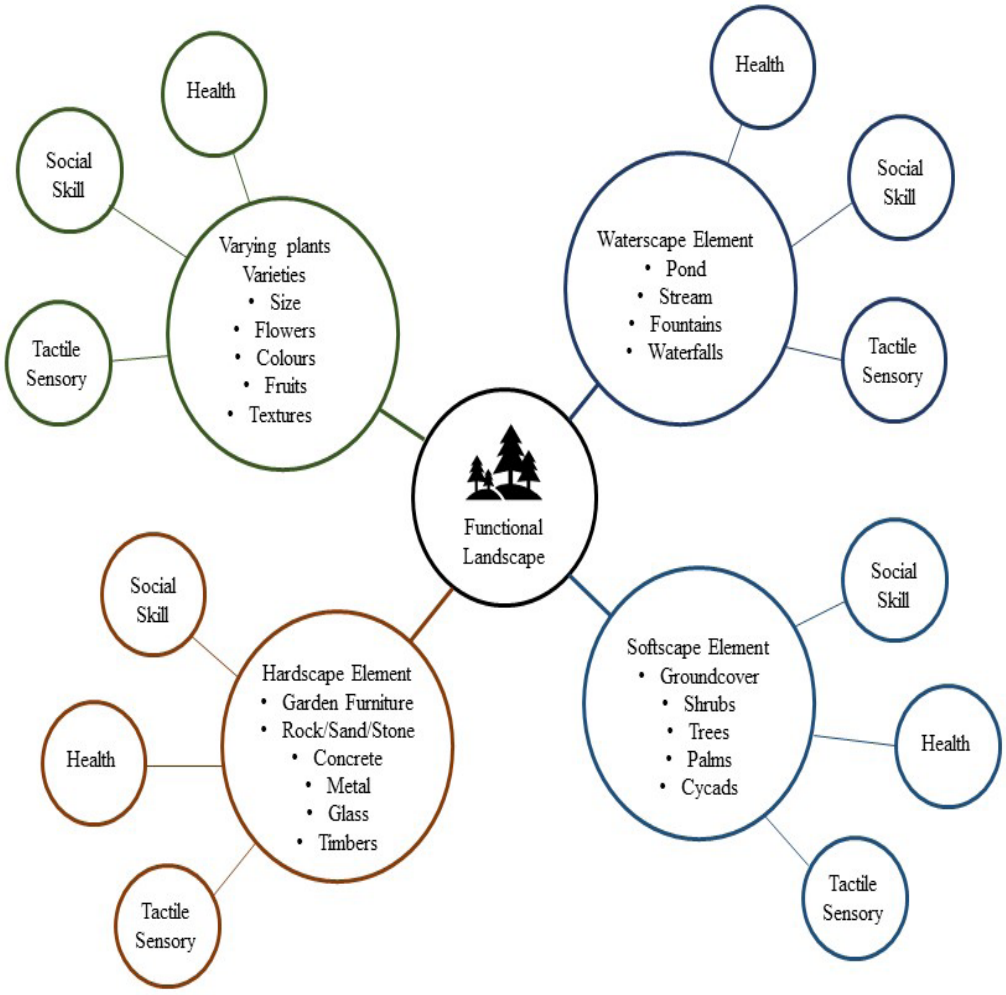

Figure 1. Mind map in designing the functional landscape for TnL in an outdoor classroom

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