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MONTESSORI PRESCHOOL CURRICULUM ON LEARNING THROUGH PLAY (LTP) APPROACH THROUGH QUALITY LEARNING SPACES DESIGN

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Pang Ling Xiang[1*], Alice Sabrina Ismail[2], Siti Sara Binti Mohd Ariff[3]

[1] Faculty of Built Environment & Surveying, Universiti Teknology Malaysia, pangxiang@graduate.utm.com*
[2] Faculty of Built Environment & Surveying, Universiti Teknology Malaysia, b-alice@utm.my
[3] Faculty of Social Science and Humanities, Tunku Abdul Rahman University of Management and Technology, sitisara@tarc.edu.my

**Corresponding author:*
Pang Ling Xiang
Corresponding author's email:
pangxiang@graduate.utm.my

ABSTRACT

Learning through play (LTP) has emerged as an integral part of the early childhood education system and has profound impacts on children's learning and holistic skills development. Throughout Montessori history, play has been applied as a learning approach in the Montessori classroom. Quality spatial design is beneficial to support LTP in preschool. However, LTP isn't integrated effectively into formal preschool in Malaysia as the spatial design of preschool does not support children's play. Furthermore, there is a dearth of evidence on how LTP can be employed effectively in quality spatial learning environments where the workforce's training and curriculum development are mainly concerned. The focus of this paper is to evaluate how spatial learning environments in Montessori preschools support LTP as curricula that may emerge across preschools in Malaysian contexts. This paper adopts interpretivism to frame the overall research and implements case studies through explanation building supported by data collection from document analysis and observation on spatial design of two case studies of Montessori preschools which are based upon prominent and established Montessori preschools in a global context. The findings are analyzed with a comparative analysis method based on the determinants of the spatial design features: - articulated space and form; outdoor learning space; social spaces; personalized environment; and anthropometric design, which are supported by Gibson's Theory of Affordance. Findings indicate that the quality learning space design to support LTP, and open-plan design space is important because of having flexible partitions for creating different areas and integrating with the dynamic external learning environment. Besides, the furniture and facilities all are child-size. Therefore, children are freely moving around and actively involved in either group or individual work. This study is beneficial to designers, educators, and policymakers as it highlights the role of LTP pedagogy in spatial design for developing children's play behavior patterns in preschool for Malaysia's future education.

Keywords: LTP (learning through play), preschool, Montessori, quality spatial design.

1.0 INTRODUCTION

Learning through play (LTP) is a playful experience that creates learning opportunities for children. Renowned psychologist Jean Piaget says that "Play is the work of childhood". Without controversy, play is the foundation and beneficial to children's development (Pyle et al., 2015; Smith & Pellegrini, 2023; Wallerstedt & Praming, 2011; Myck-Wayne 2010). Playtime is the greatest moment for children to learn as the play experience helps them to engage in deeper learning, applying knowledge, concepts, and skills to different environments

(Zosh et. al., 2017) and stimulating the development progress. Montessori pedagogy shares the ideology of play learning and it has been shown to have a positive outcome in enhancing children's positive attitude toward learning, self-developing in their pace where they are in joy and able to be independent, and confident.

The quality-built environment of preschool is one of the important sector's challenges with the advent of the 2030 Agenda for Sustainable Development Goals (SDG) set by the United Nations on SDG Goal 4: Quality Education. Numerous studies have shown that the quality-built environment of preschool should be equally prioritized as part of the evaluation of the overall quality of preschool. The space design of preschool plays a dominant role in the successful delivery of LTP. Montessori believes that a well-designed environment has been deemed essential to the educational process and will enhance the children's learning and development (Yalçin, 2018). Indeed, Montessori is putting effort and careful in preparing the space design.

Presently no design guidance governs the planning framework for the spatial design for early childhood education (ECE) in Malaysia (Rahmatullah, et. al., 2021; Lim & Bahauddin, 2019; Mohd Shahli & Akasah, 2019). The only guideline stated for private preschools in Garis Panduan Perancangan Dan Penubuhan Tadika dan Taska (2017) is to have a minimum $15ft^2$ ($1.4m^2$) required space per child and the design shall follow the universal design. National Standard Preschool Curriculum (NSPC) also only short outline on space management for certain teaching and learning activities that could be conducted in the spaces. The built environment in the current preschools in Malaysia has been concluded would be unsuitable as a learning environment for the children and it isn't able to contribute towards a positive valued outcome which is to enhance children's development and wellbeing. Furthermore, preschools in Malaysia have often been under-emphasized in the discourse on spatial quality (Shaari et. al. 2020). The preschools are under the purview of the Ministry of Education (MOE), which is the policy maker, mainly concentrated on the social environment, such as workforce and staff training and curriculum and program development.

Thus, the spatial learning environment in the preschools that apply Montessori education is evaluated in this paper for the benefit Malaysian context. To understand in detail the above, this study is divided into four important sections as follows. First, the significance of LTP for children's development will be described. Secondly, will describe the implementation of LTP in Montessori Education; then followed by the role of Gibson's Theory of Affordance in quality learning space for LTP; and finally, the quality learning spaces for LTP implication in preschool will be elucidated in the following literature.

2.0 LITERATURE REVIEW

2.1 Significance of LTP for Children's Development

From the philosophers Plato to Kant, from pedagogue Froebel to psychologist Piaget, there is a long history of the study of play. In this century, researchers have concluded that play is not frivolous. Play is often known as child-directed with context and children's play is based on their personal interests, knowledge, and skills (Yahya & Wood, 2017). Therefore, play is a normative behavior of a child (Fehr, et. al., 2020) and has been recognized and identified as an important instrument in the ontogeny, especially in a child's development (Smaldino et. al., 2019; Smith, 2010; Hirsh-Pasek & Golinkoff, 2008). Undeniably, engagement in play can

enhance the children's development where through play, the children can explore and experience (UNICEF, 2018; Yogman et. al., 2018; Zamani, 2014; Vygotsky, 1967; Piaget, 1962).

Generally, most children play. Children spend 3% - 20% time and energy playing (Smith & Pellegrini, 2013). Besides, children are ready to learn through play from born (Zosh et. al., 2017). Indeed, play and learning are inextricably linked. The scaffolding concept happens during playtime when the child can explore new skills from time to time (Yogman et. al., 2018). Moreover, a child's development is inseparable from play behavior. Kathy Hirsh-Pasek and Roberta Golinkoff, contemporary American psychologists, state that, "Play is the primary way children were designed to learn." Furthermore, children learn across the development domains during playing – physical social, cognitive, and emotional (Loebach & Cox, 2020) then grow to form their personality. This was agreed by the American Academy of Pediatrics (AAP) in 2007, they stated that the "critical importance of play in facilitating parent engagement; promoting safe, stable and nurturing relationships; encouraging the development of numerous competencies, including executive function skills; and improving life course trajectories" (Loebach & Cox, 2020, pg1). Withal, neuroscience has provided strong evidence that plays will stimulate the brain and this development is very important during the childhood period (Yogman et. al., 2018; Zosh et. al., 2017). Therefore, play is not just for passing time for fun but it is vital activities that play a central role for children in learning and preparing them for adulthood (UNICEF, 2018; Zosh et. al., 2017).

Undeniably, LTP has been integrated as part of the ECE system to enhance children's learning and development (Gestwicki & Bertrand, 2011). Children need to prepare themselves with certain skills and mindsets to embrace the ever-changing world in the future, therefore play serves as a powerful mechanism that will create opportunities for children to learn through life happily and healthily (Zosh et. al., 2017). Zosh et. al. (2017) have established that LTP can be identified if the children are having fun and excitement with the play activities (joyful). Besides, the children will know what they are learning while playing (meaningful). The play activities enable the children to be hands-on and minds-on concurrently (actively engaging). Moreover, children can think critically and creatively with the play activities (interactive). Lastly, the play activities involve social interaction.

In Malaysia, preschools or Tadika is a formal ECE center that enrolls children aged four to six based on National Preschool Standard Curriculum (NPSC) as a teaching and learning curriculum under the subsection 22(1) National Education Act 1996 (Act 550) (Masnan, et. al., 2021). The NPSC incorporates six learning strands namely: Communication, Spirituality, Attitudes and Values, Humanity, Personal Competence, Physical Development and Aesthetics, and Science and Technology (NPSC, 2017). Even though LTP has been adopted in NPCS as part of the preschool essential teaching and learning approach providing opportunities for the children to learn in a free, safe, enjoyable, and meaningful environment supports the children's learning and development (Lim et al., 2015), unfortunately, most of the Malaysia preschools are still implementing teacher-centered teaching and learning approach (Abdullah, et. al., 2017) and focusing on academic development due to the non-supportive design physical environment in preschool context. Moreover, there are some other challenges encountered by Malaysian preschools in implementing a child-centered approach, such as teacher training, curriculum adaptation, extracurricular offerings, and policy support (Rusli, 2024; Vettiveloo, 2008). Therefore, it is worthwhile to refer to

Montessori education in this paper to further understand how LTP is well implemented. In this sense, the next section will elaborate on Montessori education in detail to serve as a basic framework for developing the indicators for the methodology section.

2.2 The Implementation of LTP in Montessori Education

Montessori education is an educational philosophy and approach that was developed by Italian physician and educator Dr. Maria Montessori in the 1900s. Dr. Maria mentioned, "Education must begin at birth" (Montessori, 1946). In the early twentieth century, the Montessori method has been widespread all over the world for more than a hundred years and it has become one of the most visible models applied in most of the ECE systems in the world to support the learning and development of children (Kiran, et. al., 2021).

Montessori observed that children develop through spontaneous sensory activity, which occurs without unnecessary interference from adults. She also believed that the child is the architect who has an inbuilt capacity and tendency to seek out learning by himself (Bahmaee, et. al., 2016). Therefore, the Montessori approach embraces child-led learning and self-discovery where the "one-size-fits-all" education helps children develop independence, self-discipline, and a sense of responsibility for their learning (Lillard, 2013). It likely recognizes that each child is unique and teachers tailor the curriculum to meet the individual needs and interests of each student, ensuring that they progress at their own pace and rhythm (Rathunde, 2001). Play is part of an integral component of Montessori education. The Montessori approach to play has been called "real pretend" where the children play and learn to mimic real-life situations without rules or restrictions. Children have the freedom to choose their play activities in the classroom towards established certain learning goals where subtly guided by teachers (Lillard, 2013). In a Montessori classroom, children won't be forced to participate in any activities, they enjoy and have stress-free moments during playtime, and they can focus on the activities in the prepared learning environment. Dr. Maria (1949) once stated, "The child who concentrates is immensely happy" (Kelly, 2022, pg3).

Montessori believes that a well-designed environment will enhance the children's learning and development (Yalçin, 2018). The Montessori classroom which is known as a "prepared environment" is designed based on the physiognomies of children of different ages with special learning materials (Badiei & Tajularipin, 2014) guided by teachers to create the optimal learning environment for children and stimulate children's learning (Kiran, et. al., 2021). The "prepared environment" is described as "simple but graceful" (Al, et. al., 2012). The learning environment for Montessori pedagogy is carefully prepared and specially designed to cultivate and support child-led hands-on activities for developing sensory sensitivity, focus, independence, self-exploration, and self-discovery (Kiran, et. al., 2021; Mavrič, 2020).

Consequently, this study will employ Gibson's theory of affordance to understand the correlation between the quality of the learning environment and children's play in a preschool context to create quality learning spaces to promote a positive and constructive LTP approach for the children.

2.3 Gibson's Theory of Affordance

The Theory of Affordance by James Jerome Gibson is an ecological psychology that describes the relationship that exists between an individual and their environment (Chong & Proctor, 2019). This concept shows what the environment possibly offers to the individual to possess possible actions and behaviors (Sando & Sandseter, 2020).

Play is an important childhood activity and it is a normative child's behavior where the affordances of the environment may support this behavior (Sando & Sandseter, 2020). In general, researchers used the theory of affordances in the studies of children and the environment to explore how children value the elements in the surrounding environment in terms of "playability" values and how the children perceive the function of the environment through their experiences (Aziz & Said, 2015). According to Gibson, affordances mean the functionally significant characteristics of the environment, explaining in terms of psychology to analyze the child-environment relationships (Kyttä, 2003). With children, the shaping of the environment depends on the environmental affordances interpreted by them (Aziz & Said, 2015).

Inarguable, there is some literature established that spatially defined areas will directly influence the positive behaviors and development of children. Therefore, learning spaces in preschool need to be designed with thoughtful consideration to offer rich and developmentally appropriate opportunities to support the holistic development of children and foster a positive and engaging LTP experience. The following section will describe on quality learning space and its indicators that will be used for analyzing the case study in this paper.

2.4 Quality Learning Spaces for LTP Implication in Preschool

Preschool is a society of miniature which is a lived "workspace" for children. Aleksić (2015) concludes that preschool should be attractive, responsive, and protective in both indoor and outdoor spaces, intertwined with the curriculum, to create the best childhood memories for the children. One of the research architects and development and environmental psychologist on environmental-behavior studies, Professor Gary Moore mentioned in his research that there is a direct effect on the quality of the designed spaces in preschool settings with children's growth, cognitive development, and social interactions (Mohammadreza, et. al., 2021). Moreover, Reggio Emilia states that a well-designed esthetical space is defined as the "third educator" (van Liempd, et. al., 2020). Hence, it is tremendously important to create a sense of place in the school environment where the children spend much of their time in school.

Sense of place is important during early childhood, as it is an essential element in enhancing children's cognitive, social, and emotional development. Through the sense of place, equipped with curiosity and the five senses, children can explore and develop certain understanding through their interaction with the surrounding environment (Mankiw, 2015) and are also able to create and engage in a wide range of play (Sandseter, et. al., 2023). Early childhood practitioner, Anita Rui Olds (1979) has well expressed that, "The motivation to interact with the environment exists in all children as an intrinsic property of life, but the quality of the interactions is dependent upon the possibilities for engagement that the environment provides." (Altenmüller-Lewis, 2014).

Lin (2021) mentions that children are more sensitive and attached to space compared to ordinary adults. So is the provision of space in school in this era-appropriate and suitable design for children? Children nowadays spend most of their time in schools, therefore preschools should create a quality design and suitable spatial planning to support all the children's activities and experiences in joy where they are engaged, enthusiastic, and motivated. The architect and designer who designs preschools will need to create a children's space that corresponds to the needs and wishes of the children, along with a stimulating environment to facilitate children's exploration and various activities. Anita Rui Olds (1987) mentioned, "When children feel comfortable in their physical surroundings, they will venture to explore materials or events around them" (Aleksić, 2015). A well-designed and appropriate environment in preschool will create a space for children to engage in a wide range of play and expand their development and ability to learn. Nevertheless, a good quality classroom spatial design inspires and encourages children to experience various LTP experiences. Alternatively, poor-quality classroom spatial design may affect children's behavior and development.

There are some important architectural design elements and techniques to create spatial quality in preschool. For this study, the five aspects of spatial architecture features are referred to the Montessori Architecture pattern mentioned by Association Montessori Internationale (AMI) (n.d.) and research study by Al, et. al (2012). These five spatial design features are - i) articulated space and form; ii) outdoor learning space; iii) social spaces; iv) personalized environment; and v) anthropometric design (Table 1).

Table 1: Five Aspects of Spatial Architecture Features in this Study

Spatial Design Features	**Descriptions**
Articulated space and form	Refers to the design or organisation of the space.
Outdoor learning space	Refers to the outdoor setting to facilitate dynamic educational activities and experience.
Social spaces	Refers to an area designed to encourage and facilitate social interaction and teamwork among a group of people.
Personalized environment	Refers to an area designed for diverse learning tailored to different needs or preference and individualized learning experience.
Anthropometry design	Refers to the furniture and facilities that are well-suited to the users in appropriate size.

LTP is not widely explored in the Malaysian preschool context due to the unsupportive learning environment with quality spatial design (Nazri & Shaari, 2023; Lim et al., 2015). Therefore, the following section in this paper will examine two case studies of successful Montessori preschools that indicate the LTP in its design environments towards producing quality learning paces.

3.0 METHODOLOGY

This study employed two case studies as the research strategy under qualitative methods and approaches. Interpretivism as a research paradigm is utilized that involves an in-depth study of the spatial design of two Montessori preschools in a global context. To have a better insight into the spatial design for both case studies, the spatial narrative is adapted principally to provide research direction on the selection of indicators in this study. Hermeneutics approach must be applied to this study theoretically to create a systematic framework to read and analyze the spatial design elements of the preschool to develop a better design framework for the children. Through this approach, researchers understand the social phenomenon clearly and can process data to answer why, how, and what happens, which involves reading documents, books, and others.

On the other hand, document analysis and direct observation are used as data collection methods for the selected case studies. The analysis was based on the explanation-building analytic technique built by Yin (2018) to explain the causes and outcomes of the phenomenon. Then the analysis findings from both case studies were compared to identify the similarities and differences. Finally, both analyses were combined then to outline a design framework of preschool that highlights the role of LTP pedagogy on quality spatial design for developing children's play behavior patterns in future Malaysian preschools.

The justification for the selection of case studies, which is the My Montessori Garden Preschool and Tabika KEMAS Keramat Nur Parlimen Titiwangsa, refer to two criteria. First, the two selected case studies have been categorized as single-story design complex preschools where they have ample compound spaces. Second, the preschools are located in residential areas in the urban settings. Moreover, the Tabika KEMAS is chosen as the case study in this paper as it has the highest number of preschools in Malaysia, which consists of 8,387 nationwide (KEMAS, 2023). It is considered a public preschool and the curriculum and program are also follow NPSC and accredited by the Ministry of Education (MOE) for the ECE program.

4.0 RESULTS

In this section, the background of the two case studies and the findings based on the data collection from text and documents will be described with the determinants of the spatial design features as mentioned earlier, which are the: - i) articulated space and form; ii) outdoor learning space; iii) social spaces; iv) personalized environment; and v) anthropometric design.

4.1 Case Study 1: My Montessori Garden Preschool

My Montessori Garden Preschool is the first case study in this study which is located in a residential area in Ha Long City, Quang Ninh. Quang Ninh is one of the fastest-growing cities in Vietnam. This preschool designed by HGAA Architects was established in 2020. The build-up area of this preschool is 340m^2. This preschool is built as a story building with an upper walkway with a steel structure as a simple construction solution for easy dismantling and relocating, the classrooms are in two blocks of steel-framed design surrounded by gardens to create a natural space and effective learning environment for children (Archdaily, 2024).

Fig. 1: My Montessori Garden Preschool and layout plan.
(Source: Archdaily, 2024)

Articulated space and form

There are two blocks of classrooms surrounded by a garden. This space layout shows the theory of linear spaces linked by a common space (garden) where the two blocks are separated by a distance and linked to each other by the garden. The space layout design of this preschool has a direct link between children and nature. In this linear arrangement, the classroom blocks are placed on one side of a verandah and a corridor where the garden is accessible to children and staff from the classroom to enjoy nature.

The classrooms in My Montessori Garden Preschool are in an open-plan facility with no interior wall where all the teachers and children will be working and interacting in the same, large area. However, the classroom can be divided into smaller areas with moveable furniture if needed and can be arranged and suited to larger group activities or individual work personal areas.

Fig. 2: Classroom arrangement in My Montessori Garden Preschool
(Source: Archdaily, 2024; Dezeen, 2021)

Outdoor learning space

Children have free access from the classroom to the outdoor garden. From the transitional space, such as the corridor and verandah, children can easily access the upper walkway garden with iron stairs. The connection between the ground floor level with the walkway garden created a continuous cycle of circulation with the stairs. This has formed an interesting discovery space for the children where they can freely move from the ground to the top and back down.

Fig. 3: The outdoor gardens in My Montessori Garden Preschool
(Source: Archdaily, 2024)

Social spaces

The classrooms are in open plan facility with no interior wall where the low-height furniture serves as soft partitions for certain spaces indication. Many communal spaces within the classrooms allow the children to interact with each other.

Fig. 4: The social spaces in My Montessori Garden Preschool (Source: Archdaily, 2024)

Personalized environment

The children have the freedom to have their preference to work on different issues on their own or with peers or in groups in the open plan facility either in the indoor classroom or outdoor garden. Besides, within the indoor classroom, they can also define their workspace either to work at tables, on the floor o or using any classroom equipment by rolling out mats to do their work comfortably where they can freely enjoy the garden experience outdoors.

Fig. 5: The personalized environment in My Montessori Garden Preschool
(Source: Archdaily, 2024)

Anthropometry design

There are no customary rows of school desks in My Montessori Garden Preschool. Referring to Fig. 6, the furniture and facilities, such as tables, chairs, and low-rise shelves in the classroom are in children's ergonomic and anthropometry design, all are appropriately scaled for the children. The play, teaching, and learning materials and equipment are easily reachable by children easily which organized properly in storage units, such as shelves and cubbies.

Fig. 6: Furniture and facilities arrangement in My Montessori Garden Preschool
(Source: Archdaily, 2024)

4.2 Case study 2: Tabika KEMAS Keramat Nur Parlimen Titiwangsa

Tabika KEMAS Keramat Nur Parlimen Titiwangsa is chosen as the second case study in this study which is located in a residential area in Kampung Datuk Keramat in Kuala Lumpur. It is considered a public preschool and the curriculum and program are also follow NPSC and accredited by the Ministry of Education (MOE) for the ECE programme. The build-up area of this preschool is 290m^2. This preschool is designed as a single complex type preschool and single story.

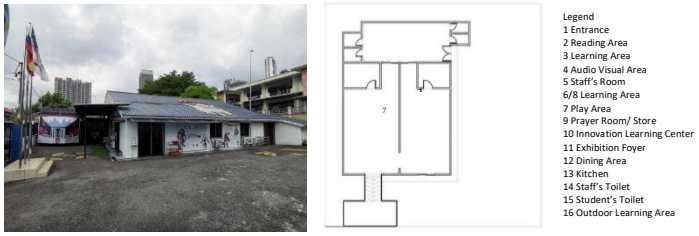

Fig. 7: Tabika KEMAS Keramat Nur Parlimen Titiwangsa and layout plan

Articulated space and form

The configuration of the Tabika KEMAS Keramat Nur Parlimen Titiwangsa spatial organization portrays an "adjacent spaces" spatial relationship. Each space in this preschool is clearly defined and responds to its function requirement. There are partitions to separate different areas that limit visual and physical access. Therefore, certain spaces need to traverse certain nodes along a fixed path to gain access to the deepest parts of the spaces.

Fig. 8: Classroom arrangement in Tabika KEMAS Keramat Nur Parlimen Titiwangsa

Outdoor learning space

Most of the time, children are limited to having play and learning activities indoors. There is no special design for the outdoor space that suits the children's needs and preferences.

Fig. 9: The outdoor space in Tabika KEMAS Keramat Nur Parlimen Titiwangsa

Social space

The rigid and structured learning environment is composed of children of the same age. Both learning areas segregate the children's activities and programs according to 5 years old and 6 years old.

Fig. 10: The rigid learning environment in Tabika KEMAS Keramat Nur Parlimen Titiwangsa

Personalized environment

Spaces are mainly occupied by the table arrangement and have fixed functions for different teaching learning and activities. Hence, children have limited choices in the freedom to have their preference to work.

Fig. 11: There is a limited personalized environment in Tabika KEMAS Keramat Nur Parlimen Titiwangsa

Anthropometry design

All furniture and facilities are appropriately scaled for the children. Besides, the play, teaching, and learning materials and equipment are easily accessible by children easily which organized properly in storage units, such as shelves and cubbies. The furniture is also in soft curves and gentle angles with colorful chairs and tables to provide comfort, support, and learning and promote positive behavior to the children.

Fig. 12: Furniture and facilities arrangement in Tabika KEMAS Keramat Nur Parlimen Titiwangsa

5.0 DISCUSSIONS

In light of the findings above, much needs to be done to ensure that the preschools in Malaysia are in enthralling spatial quality to fully implement the LTP as the main pedagogy in ECE for developing better children's play behavior patterns in preschool for Malaysia's future education. As highlighted earlier, there is a lack of design guidelines and adequate solutions for creating a quality spatial design to support LTP which is advocated in NPCS. To prepare children for the complexity of their future living and working environments, the new

generation of learning spaces should move forward from traditional teacher-centered teaching and learning to more children-centered learning. Therefore, the Malaysian preschool learning environment needs to be transformed by tacitly embodying LTP pedagogy to shape students' learning and play experiences and behaviors.

The paper proposes spatial design recommendations for Preschool in the Malaysia Context (Table 4), that are aligned with the design of a Montessori education preschool environment that supports LTP.

Table 2: Propose Spatial Design Recommendation for Preschool in Malaysia Context

Spatial Design Features	**Spatial Design Recommendation to Support LTP**	**Current Situation of Learning Spaces in Malaysia Preschool**
Articulated space and form	The learning environment are to be in open-plan design by interconnecting all the smaller spatial components with minimal of flexible separators or partitions to create a degree of seclusion for certain learning and activities whilst providing freedom to the children to access to all the spaces to have their desire activities.	The learning spaces are separated with fix partition for segregating the children's activities and program according into 5 years old and 6 years old. Therefore, it creates limitation in visual and physical access to the children.
Outdoor learning space	Classrooms are to be expanded to or integrated with a dynamic external learning area covered with nature, such as garden, where the transitional space, such as terraces or corridors, allows the children flow freely between indoor and outdoor settings to have different play experience in the unique and greater space.	The outdoor space isn't well design and most of the teaching and learning happens in the indoor settings. Children are prohibited to flow freely to between indoor and outdoor.
Social spaces	Social spaces to be designed in an inviting manner and sufficient accommodation that allow children to use it actively for a demanding social activity or gathering for interaction among each other.	The rigid learning environment with fix function of the spaces doesn't support children to have further activities based on their favorite and needs.
Personalized environment	The open-plan spatial environment with light-weight and moveable separators or partitions allows children to constantly personalize and reinvention the activities workspace to support their individual and collaborative work.	
Anthropometry design	The furniture and facilities to be special tailored made based on the principle of 'everything child-sized' to increase the level of independence and self-confidence where children are able to have immediate contact and independent use and operate all the elements in the space without adult's assistance.	Even though the furniture and facilities are in appropriately scaled for the children, the children are not able to use and operate the tools independently without teacher's instructions.

6.0 CONCLUSION

LTP is no doubt a widely recognized ECE approach that emphasizes play as significant in the learning process and has a positive impact on children's intellectual growth. In light of the issues discussed, the quality of learning space design in preschools in Malaysia is yet to be strengthened and improved urgently, it shouldn't be neglected or afterthought design and planning where the learning spaces should be designed to align with and support LTP as curricula towards positive children's play, learning, and development. Therefore, this paper has pointed towards the Montessori education reflecting on LTP and the affordance of quality spatial design in preschool context by emphasizing the five spatial design features as mentioned: - i) articulated space and form; ii) outdoor learning space; iii) social spaces; iv) personalized environment; v) anthropometric design, to serve as a benchmark and act as a vital reference for Malaysia preschools to develop quality learning space design reflective of LTP pedagogy enlisted in NPSC, and thereby providing comprehensive and valuable information for educators, designers, policymakers and scholars in the related field. It is recommended that future studies relating to the quality of the physical learning environment in preschools shall also focus on the spatial design and simultaneously concern on the relevant policies and guidelines to reduce the gap between the aspired and implementation.

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REFERENCES

Abdullah, M.; Md Nor, M.; Damaety, F.; Chee, J. (2017) Teaching Approaches in the Classroom among Preschool Teachers. International Journal of Academic Research in Business and Social Sciences, 7(3).

Al, S.; Sari, R. M.; Kahya, N. C. (2012) A Different Perspective on Education: Montessori and Montessori School Architecture. Procedia - Social and Behavioral Sciences, 46 (2012) 1866 – 1871.

Aleksić, J. (2015) Healthy Architecture for Children. [Conference session]. Places & Technologies 2015: "Keeping up with technologies to make healthy places".

Altenmüller-Lewis, U. (2014). Does size matter?" Considering the importance of size and scale in educational environments. [Conference session]. ARCC Conference Repository. https://doi.org/10.17831/rep:arcc%y315

Archdaily (2024) My Montessori Garden Preschool / HGAA. Archdaily. https://www.archdaily.com/941551/mmg-nil-my-montessori-garden-preschool-hgaa

Aziz, N. F.; Said, I. (2015) Outdoor Environments as Children's Play Spaces: Playground Affordances. Play, Recreation, Health and Well Being, Geographies of Children and Young People 9. https://doi.org/10.1007/978-981-4585-96-5_7-1.

Badiei, M.; Tajularipin, S. (2014) The Difference between the Montessori Curriculum and Malaysia National Preschool Curriculum on Developmental Skills of Preschool Children in Kuala Lumpur. British Journal of Education, Society & Behavioural Science, 4(10), 1372-1385.

Bahmaee, A. B.; Saadatmand, Z.; Yarmohammadian, M. H. (2016) Principle Elements of Curriculum in the Preschool Pattern of Montessori. International Education Studies, 9(1).

Chong, I.; Proctor, R. W. (2019) On the Evolution of a Radical Concept: Affordances According to Gibson and Their Subsequent Use and Development. Perspectives on Psychological Science, 15(1), 117–132. https://doi.org/10.1177/1745691619868207

Dezeen (2021) Plant-covered Mesh Panels Surround Preschool in Vietnam by HGAA. Dezeen. https://www.dezeen.com/2021/10/10/hgaa-my-montessori-garden-architecture-vietnam/

Fehr, K. K.; Boog, K. E.; Leraas, B. C. (2020) Play Behaviors: Definition and Typology. The Encyclopedia of Child and Adolescent Development. https://doi.org/10.1002/9781119171492.wecad272

Gestwicki, C., & Bertrand, J. (2011). Essentials of early childhood education. Toronto: Nelson Education.

Hirsh-Pasek, K.; Golinkoff, R. M. (2008) Why Play = Learning. Encyclopedia on Early Childhood Development.
Kelly, K. (2022) Gratitude and Work Conferences in the Upper Elementary Montessori Classroom.
KEMAS (2023) Tabika. KEMAS. https://www.kemas.gov.my/tabika/#toggle-id-5
Kiran, I.; Macun, B.; Argin, Y.; Ulutaş, I. (2021) Montessori Method in Early Childhood Education: A Systematic Review. Çukurova Üniversitesi Eğitim Fakültesi Dergisi, 50(2), 1154-1183.
Kyttä, M. (2003) Children in Outdoor Contexts: Affordances and Independent Mobility in the Assessment of Environmental Child Friendliness. Helsinki University of Technology, Centre for Urban and Regional Studies.
Lillard, A. S. (2013) Playful Learning and Montessori Education. American Journal of Play, 5(2).
Lim, P. P. L.; Khan, T. H.; Hussein, A. H.; Hee, J. M. (2015) Application of Available Attributes and Physical Characteristics for Learning through Play in Malaysian Preschools. World Journal of Social Science Research, 2(2).
Lim, P. P. L.; Bahauddin, A. (2019) Contextual Appropriateness: Reflections on Learning Culture, Policy and Physical Environment of Preschools in Malaysia. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies.
Lin, T. (2021) Initial Experience of Preschool Learning Environment Planning: Perspective of Teachers. ICMET'21.
Loebach, J.; Cox, A. (2020) Tool for Observing Play Outdoors (TOPO): A New Typology for Capturing Children's Play Behaviors in Outdoor Environments. International Journal of Environmental Research and Public Health 2020, 17, 5611. http://doi.org/10.3390/ijerph17155611
Mankiw, P. B. S. (2015) A Sense of Place: Human Geography in the Early Childhood Classroom. Young Children July 2015, 70(3).
Masnan, A. H.; Mohd Sharif, M. H.; Dzainuddin, M.; Ibrahim, M. M.; Che Ahmad, C. N.; Taha, H.; Ramli, S.; Md Taib, R.; Siraj, S.; Che Mustafa, M. (2021) The Concept of Professional Identity: Kindergarten Teachers' Professionalism Requirement in Malaysian Preschool Curriculum. International Journal of Evaluation and Research in Education (IJERE), 10(1), 126-134. https://doi.org/10.11591/ijere.v10i1.20849
Mavrič, M. (2020) The Montessori Approach as a Model of Personalized Instruction. Journal of Montessori Research. 6(2).
Mohammadreza, S.; Amin, B.; Mohsen, P.; Maryam, F. A. (2021) Ergonomics Factors Influencing School Education during the COVID-19 Pandemic: A Literature Review. Work, 68(I), 69-75. https://doi.org/10.3233/WOR-203355
Mohd Shahli, F.; Akasah, Z. A. (2019) Green Design for the Comfort Environment of Kindergarten Building in Malaysia: A Review. IOP Conference Series: Materials Science and Engineering 601. https://doi.org/10.1088/1757-899X/601/1/012020
Montessori, M. (1946) The 1946 London Lecturers. Montessori-Pierson Publishing Company (MPPC).
Myck-Wayne, J. (2010) In Defense of Play: Beginning the Dialog About the Power of Play. Young Exceptional Children. https://doi.org/ 10.1177/1096250610376616
Nazri, B.; Shaari, M. F. (2023) Learning with Nature in Malaysia: Methods of Incorporating Nature in Kindergarten Outdoor Physical Environments. Online Journal for Tvet Practitioners, 8(3). https://doi.org/10.30880/ojtp.2023.08.03.001
Olds, A.R. (1979) Designing Developmentally Optimal Classrooms for Children with Special Needs. Meisels, S.J. (Ed.): Special education and development. University Park Press, Baltimore.
Olds, A. R. (1987) Child Care Design Guide. New York: McGraw-Hill.
PlanMalaysia (Jabatan Perancangan Bandar dan Desa) (2017) Garis Panduan Perancangan dan Penubuhan Tadika dan Taska 2017. Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia Kementerian Perumahan dan Kerajaan Tempatan.
Piaget, J. (1962). Play, dreams, and imitation in childhood. New York: Norton.
Pyle, A.; Bigelow, A. (2015) Play in Kindergarten: An Interview and Observational Study in Three Canadian Classrooms. Early Childhood Educ J, 43, 385–393. https://doi.org/10.1007/s10643-014-0666-1.
Rahmatullah, B.; Muhamad Rawai, N.; Mohomad Samuri, S.; MD Yassin, S. (2021) Overview of Early Childhood Care and Education in Malaysia. Hungarian Educational Research Journal, 11(4), 396-412. https://doi.org/10.1556/063.2021.00074
Rathunde, K. (2001). Montessori Education and Optimal Experience: A framework for new research. The NAMTA Journal, 26(1), 11–43.
Rist, D. (2014) Fuji Kindergarten by Tezuka Architects.
Rosa, J. A. D. (2019) Fuji Kindergarten in Japan was Designed with a Healthy Dose of Danger. BluPrint. https://bluprint-onemega.com/fuji-kindergarten-designed-healthy-dose-of-danger/
Rusli, N. A. (2024) Issues and Challenges Faced by Malaysian Montessori School Teachers in Teaching Special

Educational Needs Children.
Sando, O. J.; Sandseter, E. B. H. (2020) Affordances for physical activity and well-being in the ECEC outdoor environment. Journal of Environmental Psychology. https://doi.org/10.1016/j.jenvp.2020.101430
Sandseter, E. B. H.; Sando, O.J.; Lorås, H.; Kleppe, R.; Storli, L.; Brussoni, M.; Bundy, A.; Schwebel, D. C.; Ball, D. J.; Haga, M.; Little, H. (2023) Virtual Risk Management—Exploring Effects of Childhood Risk Experiences through Innovative Methods (ViRMa) for Primary School Children in Norway: Study Protocol for the ViRMa Project. JMIR Res Protoc, 12.
Shaari, M. F.; Ahmad, S. S.; Ismail, I. S.; Zaiki, Y. (2020) Preschool Physical Environment Design Quality: Addressing Malaysia's PISA Rankings. Asian Journal of Environment-Behaviour Studies (ajE-Bs), 5(26), 45-57.
Smaldino, P. E.; Palagi, E.; Burghardt, G. M.; Pellis, S. M. (2019) The Evolution of Two Types of Play. Behavioral Ecology, 30(5), 1388-1397. https://doi.org/10.1093/beheco/arz090
Smith, P. K. (2010) Children and Play. Wiley-Blackwell.
Smith, P. K.; Pellegrini, A. (2013) Learning through Play. Encyclopedia on Early Childhood Development.
UNICEF (2018) Learning Through Play: Strengthening Learning Through Play in Early Childhood Education Programmes. UNICEF. https://www.unicef.org/sites/default/files/2018-12/UNICEF-Lego-Foundation-Learning-through-Play.pdf
Van Liempd, I. H.; Oudgenoeg-Paz, O.; Leseman, P. P. M. (2020) Do Spatial Characteristics Influence Behaviour and Development in Early Childhood Education and Care? Journal of Environmental Psychology 67 (2020) 101385. https://doi.org/10.1016/j.jenvp.2019.101385
Vettiveloo, R. (2008) A Critical Enquiry into the Implementation of the Montessori Teaching Method as a First Step towards Inclusive Practice in Early Childhood Settings Specifically in Developing Countries. Contemporary Issues in Early Childhood, 9 (2)
Vygotsky, L. S. (1967). Play and Its Role in the Mental Development of the Child. Soviet Psychology, 5, 6-18.
Wallerstedt, C.; Pramling, N. (2011) Learning to Play in a Goal-Directed Practice. Early Years an International Journal of Research and Development, 32(1), 1-11.
Yalçin, M. (2018) Relationship of Montessori Approach with Interior Spaces in Preschools and Physical Set-up. Megaron, 13(3), 451-458.
Yahya, R.; Wood, E. (2017) Play as third space between home and school: Bridging cultural discourses. Journal of Early Childhood Research, 15 (3), 305-322. https://doi.org/10.1177/1476718X15616833.
Yin, R. K. (2018). Case Study Research: Design and Methods. Six Edition. London, Sage.
Yogman, M.; Garner, A.; Hutchinson, J.; Hirsh-Pasek, K.; Golinkoff, R. M. (2018) The Power of Play: A Pediatric Role in Enhancing Development in Young Children. Pediatrics, 142(3).
Zamani, Z. (2014) Affordance of Cognitive Play by Natural and Manufactured Elements and Settings in Preschool Outdoor Learning Environments. Raleigh, North Carolina: North Carolina State University.
Zhao, S. W.; Yang, H. M.; Kim, C. S. (2021) The Application of Green Ecological Concept in the Architectural Design of Kindergartens in Coastal Cities of Korea – Busan as an Example. E3S Web of Conferences. 208, 02009. https://doi.org/10.1051/e3sconf/202130802009.
Zosh, J. M.; Hopkins, E. J.; Jensen, H.; Liu, C.; Neale, D.; Hirsh-Pasek, K.; Solls, S. L.; Whitebread, D. (2017) Learning through Play: A Review of the Evidence. The Lego Group, The Lego Foundation.