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Effectiveness of Kindergarten Design in Malaysia

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Abstract

This paper aims to examine the effectiveness of kindergarten design in promoting early childhood development before embarking further in the education system in Malaysia. It also aims to investigate the problems that kindergartens today are facing while using this as a basic guideline to foster better kindergarten design in the future. Past studies had shown kindergarten design on three main aspects involving architectural elements, geographical considerations and technical aspects. However, to date, there are no research done to determine the best design approach deemed fit for the user; the kindergarten children, in Malaysia. This paper is vital as education plays an important role not only concerning individual involved in the kindergarten premise, but also responding to Malaysia's national agenda on education as early from 1957 till present. Kindergarten is known to play this role in providing the most basic and fundamental education system before children step into a more formal education program such as the primary and secondary schools. This research will be conducted using case study approach as outlined by Yin (2003) and data collection will draw attention to two typologies of kindergartens; single dwelling kindergarten and shop lot kindergarten. Direct observation will be adopted for analysis on these two case studies with regards to four environment stimuli; movements, comfort, competence and control. This paper is of benefit not only to policy makers, designers, and educators, but it will also be of importance in promoting better education system in response to Malaysia's national agenda in its quest to produce better nation and brighter future.

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Keywords: Effective kindergarten design; quality education; single dwelling kindergarten; shop lot kindergarten

1. Introduction

At present, there are about 70% of mothers with children below 12 years of age working full-time in Malaysia (Claessens, 2012; Stevens, 2000). This is seen to be the norm in our today's settings and is thought to grow in the future. The changing demographic scene means children's growth will also change with a lesser formal education

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from the maternal response as preschools and kindergarten will play a more pivotal role in the modern setting. Thus, it is imperative to understand the children's environment that we have conditioned our future children to adapt to. Children spend up to 12,500 hours in a child development centre prior to entering the first grade. The design of these facilities, therefore, cannot be understated. The design and maintenance of a child's physical educational setting should support high-quality activities as well as allow for an optimal use that fosters quality learning. It is through new research in educational settings, new technology, and the consideration of the child in general that can aid designers in creating the most innovative, useful, and effective environment for the world's children to develop, adapt, and learn (Leinonen and Venninen, 2012; Abas et al., 2012). Henceforth, this research is important in evaluating the effectiveness of this current trend of shophouse styled Kindergartens in comparison to single-dwelling kindergarten in trying to understand the limitations so as to assist designers in achieving the best spatial considerations to strengthen their design output parallel to the pedagogical need of our children today. It is also vital as Malaysia needs to achieve better human capital especially in improving the access and quality of education systems in response to the national agenda of the country (Chiam, 1991).

Published writings on the subject have been produced by children experts and past academic scientists since the 18th century till present. Their writing, however, touched on the historic development of a particular kindergarten, ways to optimize childcare, discussion on a healthy environment for children, psychological studies on children, and technical approach in children's development. There are also studies that touched on kindergarten design, however, non-related to the effectiveness of kindergarten design with relationship to the architectural consideration which took children as the main user into account. To understand this, next section will discuss on children's behaviour and the development of preschool.

2. Background study

2.1. Children and kindergarten – background issue

A human being below the age of 18 is categorized as a child (Oatley and Jenkins, 2007). Children of this age group in Malaysia particularly is divided into three sub-categories- a) birth to two years of age are infants, b) three to six are preschool children, c) seven to twelve years of age are primary school children and d) thirteen to eighteen years of age are secondary school children. For the benefit of this study, this research will be focussing on the first category of children; preschool children aged three to six. The need of kindergarten throughout Malaysia is seen to be a vital issue as our economy grows more rampant, women need to be involved in the labor force (Claessens, 2012). In Malaysia, the women contribute 36 percent of the nation's workforce (Stivens, 2000). This left them with no choice but to send their children to kindergartens. As a result, more and more kindergartens were built or created to cater this need.

2.2. The historical development of kindergarten

Firstly, it is vital to know the background knowledge of the study. A kindergarten as defined by Dudek (2001) is 'garden for children' in the German language. It was originally derived from the notion of the school as a metaphorical garden, alludes to the idea of children as unfolding plants. The first infant school that created the term was built in 1837 and was founded by Friedrich Wilhelm August Fröbel (1782-1852). It was located at Bad Blankenburg in the mountains of Thuringia, in the small principality of Schwarzburg-Rudolstadt, Germany. Froebel is thought to be the most influential person behind the development of schools for young children where he inserted educational philosophy into the system. Later, supporters who were influenced by Froebel immigrated to other countries bringing along with them this new movement of kindergarten.

In Malaysia, kindergartens were first introduced during pre-Merdeka days by Christian's missionaries for the rich people in the country. It later became an economic agent and the country's development agenda for the underprivileged to develop in conjunction with the country's socio-economic expansion after the Merdeka period in the 70s. It was primarily modelled after the 'Head Start' program practiced in America. This later developed to become KEMAS which is an institutionalized government preschool known as Tadika an acronym for Taman Didikan Kanak-Kanak which aptly translates as Kindergarten and was a part of a compulsory development under

children's rights acts (Act 308 and Act 550). The government has since then grounded educational standards for preschool children in preparation for their primary academic schooling (Department of Social Welfare to practicing child care providers in 1988). However, there are no strict regulations for a kindergarten operation in Malaysia and one do not need a high educational certificate to operate one. Often, kindergartens would adopt an approach that has been successfully researched and practiced in the West, like the Montessori system but rarely these institutions have carefully regarded the effect of the environmental surrounding as a development agent for the children in Malaysia. This rapid demand left kindergarten with a new realm of economic opportunity without taking proper and effective design into consideration especially in the subject of movement, comfort, competence and control.

2.3. Types of kindergartens – quality of early childhood education

In Malaysia, there are two types of kindergarten that can be observed. They are – a) single building design that has the building to itself and has ample compound that fits the purpose of a kindergarten and b) shophouse design that has its building attached to other buildings with little or no compound. The single design complex kindergarten can be further categorized into a dwelling type where kindergartens are transformed from a basic house and the second sub-type is a single complex type that was purposely built on a stand-alone concept to fit this purpose (refer diagram 2.1).

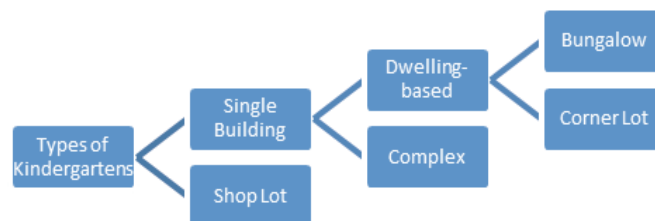


Fig. 1. Types of kindergartens.

This current study will investigate on both types of kindergarten architecture emphasizing the comparison of dwelling-based design and shop lot design.

2.4. Early learning theories

Learning theories focussing on early age development have touched on how young children could establish psychological developments based on the constructivist cognitive theory laid by Jean Piaget (1896-1980). In his study, Piaget (2013) stressed that children construct their own knowledge developments by experience. School programs for children using Piaget's theory attempt to become more hands-on as children are allowed to explore and be exposed to their environment freely. In architectural design studies, Piaget's theory fits perfectly as architectural elements could provide the medium to promote knowledge development by hands-on experiences.

An environment that are; sensitive of sensual variety of texture, sound, light and colour that challenged and inspired children, rich enough to provide cosy quiet places for withdrawal and security, as well as more open communal and social places, for group activities; and an exciting outdoor space, for freedom of movement and physical daring – all these were regarded as fulfilling the needs of children in kindergarten setting (Leinonen and Venninen, 2012; Abas et al., 2012). Thus, for this study it is important address four basic aspects of architectural elements that constitute to a better environment for kindergarten children. They are – a) spaces, b) scale and proportion, c) colour and d) lighting.

2.5. Optimized environment for kindergarten children

A kindergarten's curriculum and system is important to ensure that a child receives affectionate interaction with at least one adult or a few of familiar people from whom they can receive intensive, personalized, and predictable care on constant basis. This is to make certain a child receives healthy progress in all four domains; physicality, social-emotional, language and cognitive development (Feldman and Garrison, 1993; Abas et al., 2012). Nevertheless, a well-designed setting of caregiving institution too can promote a healthy development for the children. As suggested by Leinonen and Venninen, (2012), they are four major environmental stimuli that are needed within the kindergarten. They are – a) movement, b) comfort, c) competence and d) control (Leinonen and Venninen, 2012). Such environment involves the systematic manipulation of space and will be discussed in turns the table below.

Table 1. Four major environments optimized for kindergarten children.

Stimuli	Key aspects
Movement	A key design requirement is to allow children the greatest possible variety of large muscle movement both indoors and out. The entire space should offer invitation to move within safe and tolerable limits. Motions permit children to locate themselves freely in space, create their own boundaries, access diverse territories, and explore their abilities. Moreover, psychological studies on children, believes that movement is considered to be the bedrock of all intellectual development.
Comfort	When children feel comfortable in their physical surroundings, they will venture to explore materials or events around them. Consider places which make you feel comfortable. Most likely, these settings involve moderate and varied levels of stimulation for all the senses Comfortable settings can be felt in the variation of architectural elements such as scale, floor height, ceiling height, and lighting, variety in the texture of finish materials, and the presence of soft elements such as carpets, couches, and pillows.
Competent	A supportive environment helps children fulfil their own needs, execute tasks easily, manage their own tools and materials, and control their own movements from place to place. Different spaces should satisfy different the group of children. A quiet place for example with dimmed lights is a comfortable setting for sleeping while a bright and cheery place will excite a child to read or do other activities and when another child wakes up from his/her nap, the child will confidently do their own activity
Control	It is important that children have the ability to exercise control over their immediate personal environment by being able to have some privacy, to make predictions, and to appropriately orient their bodies in space. Certain design tactics can also assist in maintaining a balance between access to the child and the child's need for privacy. It is also important to have spaces designed to support predictability that often involve a vista or an elevated position so that occupants can scan all areas of the room and anticipate future events.

With the efficiency in design, these four major environments could elevate the quality of kindergarten designs to promote better education for these children. To explain this in depth, two case studies of kindergarten will be used as the exemplar. Both case studies will be examined and analysed using qualitative method as follows.

3. Method of analysis

The method used in the data collection in this study was done by observing two case studies in a qualitative manner by using the constructivist paradigm as outlined by Piaget (2013). Suggestions and design related issues could be drawn out and recommended to assist later designers as well as for educational purposes. Research analysis will be made by comparing these two case studies with regards to four architectural elements; spaces, scale and proportion, colour and lighting- looking at four main environments stimuli; movement, comfort, competence and control.

4. Findings – private-owned kindergarten

Private ownership kindergarten is chosen because they have established a preschool program that is being recognised by Malaysian and international education bodies. This type of kindergarten also is widely known among

modern living parents who desire for better education for their children from the early stage and also suits to their need because of its location in many suburban and residential areas.

4.1. Dwelling-based kindergarten design

The first case study chosen is a dwelling-based kindergarten type, Kuala Lumpur that is located in a residential area. It is a stand-alone single dwelling type kindergarten with its own vicinity of the compound. The centre was an old Malay house that was converted and redesigned to suit the kindergarten needs. It has evolved and expanded to meet the needs of the expanding children applicants.

- Space

The space layout is systematically designed in line with the franchise system. Each class is divided into different type of lessons taught in the classrooms with different artwork painted on the walls as well as furniture designs to differentiate the class use. The classes share the centre hall and toilets. The spaces are organized and one could understand the planning concept of the centre where it encourages movement from one class to another. The stairs leading to the main school and the other stairs separated to the extensional space that house the dining area, toilets, art room, and computer.

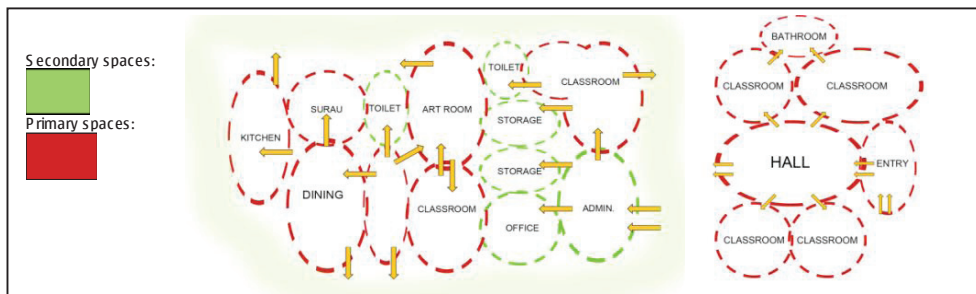


Fig. 2.(a) Flow on Ground Floor Level; (b) Flow on First Floor Level.

The connecting staircase from the first floor and the ground are brightened with natural lighting from the sky roof above. (Refer picture) This would interest the children as well as give them a boost after coming out from pedagogical classes to move towards the dining area as well as to the other classes programmed for creativity.



Fig.3. (a) Staircase Hallway; (b) Sky roof for natural lighting.

The classrooms are in accordance to the franchise’s programs, separated into lessons plans. All the furniture’s are differentiated to enhance the children’s attention span and organized informally. Each group has their own class schedule and the children alternate the uses of each class and share the main area. There is also outdoor classroom that encourages children to have unconstrained learning. Most of the indoor activities done together are held at the main hall. Children are often ungrouped where they will socialize with all the other age groups. This idea will

enhance both their social skills as well as focus them for the next lessons. The indoor area activity is fairly small as indoor activity is usually done when it's raining outside.



Fig.4. (a) furniture arrangements in classroom; (b) Outdoor classroom; (c) Hall used for center core activities.

The franchise program concentrates on preparing children to statutory learning in later years, the center provided ample outdoor play area for their children. There's a homeliness feel to the center that offers comfort to the children.



Fig. 5. (a) View overlooking the outdoor; (b) Playground; (c) Emerging with natural surrounding; (d) Ample outdoor space.

There is a drop off niche near the entrance of the centre to ease drop off of the students as a child waited upon by the teacher will be received at the corner of the entrance. Children can wait in the play area or below the house that's afforded temporary shelter outdoors if the sun is too hot or the weather is raining. The outdoor is also used as a teaching ground for explorative play for the children who often stay back for the day care centres till 6 to await their parents.

- Scale and Proportion

Scales and proportions are important elements in children centres as they afford the children to navigate their environment confidently (Leinonen and Venninen, 2012). All the scales in toilets in the centre adhere to children's heights, which is important to ease their use independently and without assistance from teachers. The furniture's are in accordance to the franchise guidelines and expertise. It comes provided with the franchising costs, thus all the furniture suits the children's use.

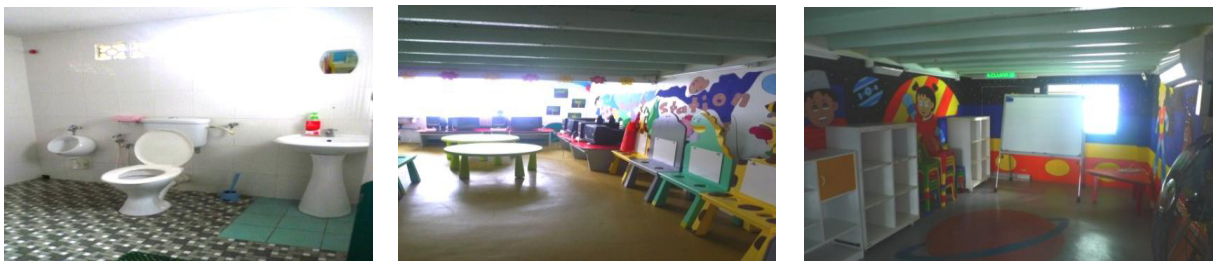


Fig. 6. (a) Bathroom anthropology and scales; (b) Tables layout in class; (c) Book racks and storages.

- Colour

All franchised kindergarten is painted the same colour for their educational classrooms referring to their regulation and requirement. All the walls are decorated with mural cartoons displaying soft stimuli. Classes are painted in bright colours to spark the children’s interests towards learning.



Fig. 7. View of Math’s classroom.

- Lighting

The center is naturally lit with sufficient natural sunlight in the classrooms. The hall or the core center of the kindergarten has no natural sunlight, hence the designer had treated one of the classroom with floor height sliding door, puncturing light into the core. There are some problems with a classroom near the admin where it’s poorly lit. Bright hued walls and naturally bright classrooms are essential elements to children to keep them interested and stimulated in their environment. As for sun radiation problems, the center uses natural elements within the boundary from trees for direct sun protection. This will provide natural comfort for the children while playing. The cantilevered section also offers shelter from the sun below the house. Careful design ideas will greatly enrich children’s experience while learning there.



Fig. 8. (a) Tree shade; (b) Vertical and horizontal elements casting shadows.



Fig. 9. Single dwelling kindergarten.

4.2. Shop lot design kindergarten

The second case study chosen is shop lot type kindergarten of the same franchise located in a business district. The company has redesigned the whole premise to make it into a working kindergarten.

- Space

The studied centre is greatly restricted in terms of its spaces layout as compared to the earlier study due to the shop lot premise. The centre focuses heavily on the learning system by books, teaching techniques, and classroom guidelines. From the diagram below we could study the restricted movements evident in the spaces. From the lobby, children all file into the reception area and then gathered in the Hall or the core of the spaces and the morning assembly will commence. Activity such as light exercises, singing and dancing are done in this hall with all the group of different ages in the Kindergarten. The students will then be dispersed to the classrooms depending on their schooling schedule and groups. Because of the limiting space; the hall acts as the dining area too for when the students have breaks.

Secondary spaces:



Primary spaces:

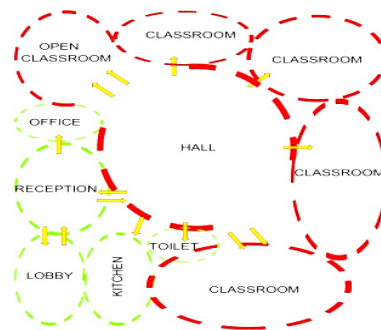


Fig. 10. Floor plan of the kindergarten.

The Kindergarten is situated among the busiest business areas with incoming cars and traffic. There is no relationship between the indoors and outdoors as it would be dangerous to do so. The children are protected within the kindergarten. The classes are conducted for 45 minutes per session. The maximum pupil per classroom is 15 children. The classrooms are in accordance to the programs and franchises, therefore, the rooms are set similar to the first case study. However, due to space constraint, all the classes are compacted together making it little crowded for all the children.

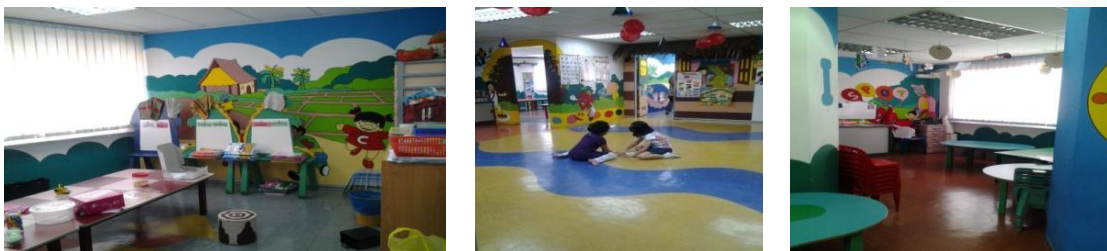


Fig. 11. (a) Furniture arrangements in classroom; (b) center core hall; (c) Art classroom.

The children gather in the main hall at the centre of the Kindergarten. It is used for morning assembly, light exercises, dancing and eating area. The hall is later used for dining and other activities. Space is restrictive and movements are limited when all the children are gathered. There is no outdoor play as the center is mainly based indoors for the preparation of statutory learning in formal schooling in education and also because it is a shop lot

premise. As for the drop-off/ pick up system, children will be assisted by their teachers while waiting in from of the staircase entrance as there is no proper drop-off point design for the kindergarten.

- Scale and Proportion

The center uses appropriate scales for children proportions where they can navigate the kindergarten with ease. The furniture is same as in all of the franchise as per requirements of the program. Different rooms have different furniture to suit the function of each classroom.

- Color

The stairs of the entrance is painted red to enhance the sense of arrival and to assist in waking up a child cognitive mind. The interior is painted in cartoonish murals uniform with other franchises.



Fig. 12. (a) Staircase painted in bright and brain-stimulating colours; (b) Colourful interior.



Fig. 13. Shop lot based kindergarten.

5. Analysis and discussion

Based on the analysis in table 5.1, it is clear that single dwelling-based kindergarten design is more effective in providing a better education for kindergarten children. The main agenda of a kindergarten is to promote quality learning in all four major environment stimuli.

Table 2. Comparison between dwelling-based design and shop lot based design kindergartens.

Case Study	Stimuli-Elements	Movement	Comfort	Competence	Control
Dwelling-based design	Space	Positive Gross Motor Skill	Very spacious classroom and classified spaces for specific functions	Spacious outdoor and indoor play-learn area	Good control of indoor and outdoor Safety and security in neighbourhood vicinity
	Scale and Proportion	Proportionate with ample space for movement	Comfortable room size with ample play area	Promote children competency in the activities that they do	More control when indoor and outdoor spaces are adequate

					Increase capability
	Color	Encouraging movement	Following the franchise's guideline	Supportive and receptive	Following the franchise's guideline
	Lighting	Positive – Exposure to natural lighting encourage movement	No glare – naturally shaded with vegetation as well as vertical and horizontal shading on facade	Optimum lighting promotes optimum exploration and heighten experiences	Usage of skylights, as well as different ceiling height, gives better control to children exploring indoor spaces
Shop lot based design	Space	Negative Gross Motor Skill	Limited indoor space leads to frustration among children	Limitation of space inhibits exploration and experiences	No control as kindergarten exposed to urban activities Less safety and security as it is located in a commercial zone
	Scale and Proportion	Limited space for movement	Limitation of classroom size Shared spaces instead of specifically functioned spaces	Fewer activities could be done as shared spaces limits children's explorative intend	No control – needs guidance from teachers for safety Increased dependency
	Color	Encouraging movement	Following the franchise's guideline	Supportive and receptive	Following the franchise's guideline
	Lighting	Negative-Mechanical lighting	Excessive mechanical lighting will limit children's sensory motors	Competency decreases lighting quality decreases. Children will have impaired competency	Mechanically lit and standard ceiling height give less control and inhibit children from exploring safely

Children need lots of space to grow and play. Play enhances their motor skills development. The dwelling-based design kindergarten is found to enhance children's development as it provides spacious indoor and outdoor playing area which promotes better environmental stimuli as compared to the shop lot based design kindergarten. The result of a natural setting is better focus in the classroom, better marks on standardized tests and better overall fitness of the student body (Aziz and Said, 2012; Azlina, 2012; Aziz and Said, 2012). Comfort in a child centre could be from various stimulating variables that could be played by architectural or building elements that are offered in their surroundings.

6. Conclusion

A kindergarten should provide children the best quality of education. This could be achieved only if the designer, as well as policymakers, are aware of the factors that promote a better environment for these children. The objective of this study is to find the effectiveness instead of recognizing the problems that exist within a kindergarten spatial environment. It is essential for a kindergarten to offer all four environmental stimuli to further enhance the quality of early-age education through effective design and architectural approached as outlined in table 5.1 so as to provide the best fundamental education in accordance to Malaysia's national agenda. From the findings above, it is found that natural setting is an important element for a conducive learning environment that encourages children's growth and development in education. But due to constraints in the context of urban living in modern society like limited land space, price hike of property and land ownership issues, kindergarten nowadays have no choice but to use existing buildings like residential and commercial typologies as learning centres. However, from the study conducted, single dwelling type kindergarten is much appropriate to be considered as education centres for preschool children because of safety, security and privacy reasons. Such example is in terms of the freedom of space in which renovation and expansion can occur indoor and outdoor (Corraliza et al., 2012). This promotes experiential and exploration values as a learning process when children roam about in green and large open spaces (Azlina,

2012; Aziz and Said, 2012; Dewi, 2012). In addition, the aspects of security and safety can also happen in single dwelling kindergarten as it is usually located within neighbourhood vicinity where the large community lives. In this sense, passive surveillance can take place naturally and this ensures safety for children from predators (Dewi, 2012). In sum, the single dwelling kindergarten type is seen as the best possible solution in accommodating the needs of children and parents living in urban areas.

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