

Exploring Conceptual Play Furniture For Children

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Abstract : This study conducted to investigate play furniture for children. There is various type of furniture for children but not all are suitable for children. Play is necessary for every children childhood. A play furniture design for children must be impact resistance, durable, safety and smooth materials. Play as progress concerns the belief that the purpose of play is to learn something useful. Play is a means to improve or enable psychological or social needs. The objectives are to identify the type of play furniture, analyse which type of play furniture is suitable for children and to design a conceptual play furniture for children at home. The anthropometric data will help on full-scale dimensions for designing an ergonomics play furniture for children. The implementation data will help in designing a comfortable, safety, ergonomic and good sitting posture for children. Furthermore, exploration on the height of Asian children and also materials used. The research approach used in this study are quantitative and qualitative. There were randomly 59 samples of parents to do a survey about the design and features of play furniture and 17 children age between 4 to 6 years old to choose their preferred colour as a guideline on the designed children play furniture. The result of the average children 4 to 6 years old height is 93cm-114cm for girls and 95cm-116cm for boys. In total 37.3% of parents select a minimalist concept and 76.4% prefer organic shape. The highest percentage for the size of children play furniture was medium size which affordable for 2 children used.

Keywords: Play furniture, Children, Ergonomic, Conceptual.

1 INTRODUCTION

According to (Rieber, June 1996) current theories of play are generally organized around four themes: play as progress, play as power, and play as fantasy. Children can develop cognitive skills, self-confidence, and their social skills through playing. Play has the paradoxical cause on enhancing attention and become better on thinking and problem-solving. Kindergarten teacher plays an important role as an instructor where self-learning is an important ability. It is an important step for children age between 4 to 6 years old to develop self-learning (Franziska Perels, 2009). Children must know how to organize their knowledge and also able to accord on the learning problem. Self-regulation also an important aspect for effective learning because of the relevance of competence for learning and academic achievement which are demonstrated by children (M-M, 2007). Parents should understand the meaning of children's play will increase the sensitivity and know the basic of emotional grow of children and also understand the needs of children having time for experiences by themselves. Children can express their expression in many ways through play such as running, jumping, drawing, and painting. This will help them in managing their expression now and in the future. Play is one of the ways for children to learn their abilities and master the experiences that are important for building resilience and developing (Lieberman, n.d.). Children can boost their brain development and growth through playing and in a sense makes them more intelligent (Goldstein, 2012). A well-design furniture can promote children's growth with their feet touching the floor, children can seat themselves and there is a back to lean on. A place where having child-size furniture at children learning environment can give them more access to learn on materials and also given more chance to explore their environment. According to Shetty (1987), a key element for better company competitiveness is to produce a high product quality and added value for customers. Furniture in good designed can reach children's attention and help to explore the endless desires. Children with good posture are good for the overall health and mood, not only good for the health of our spine. The more the neck bend downward, the more the stress on the cervical spine. A poor posture might compress the diaphragm which will affect children voice quality and breathing. The number of children who have poor posture has rapidly increase said Jacqueline

(2018). The number of children went to see her for spinal problems and muscle problems had typically increased. Children are overwhelmed with electronic device but aren't being taught good posture when utilizing them and they will spend excess time on it. According to Chrisp (2015), children always move around because the traditional chair lacks the flexibility of sitting. Children naturally elongate the spine when they first learn to sit where the position requires least muscle strength and boost the most support from the skeletal system. A soft furnishing on furniture also important because having something soft to fall on will give them feel confident in getting up and trying again without helps from adults (Kaplan Early Learning Company, 2014). Ergonomic is importance on designing furniture for children. According to Linton (1994), ways to motivate children to sit properly is to have comfort furniture. There are 30 to 65% of children and adolescents reported having neck and headache pain. Besides creating an object for children, extended life cycle also about the product's long-lasting performance. The bond between furniture and user is seen when a precondition for products' sustainability and designing a pleasurable product (Salvador, 2015). A slope at the backward of furniture can help the body keep in a certain position with the backrest. (Adawiyah, n.d.) said that it is different from children ergonomic and adult ergonomic so the furniture design for children should be focusing on prevent injuries or hazard to them. According to (Ruth, 2000) had made a design standard for children which include anthropometric and ergonomic design. Ergonomics has benefit people in declining musculoskeletal disorders (MSDs) (Kroemer, 2001). However, children are hard to change when seeing that incorrect posture and habits become rigidly fixed over the period.

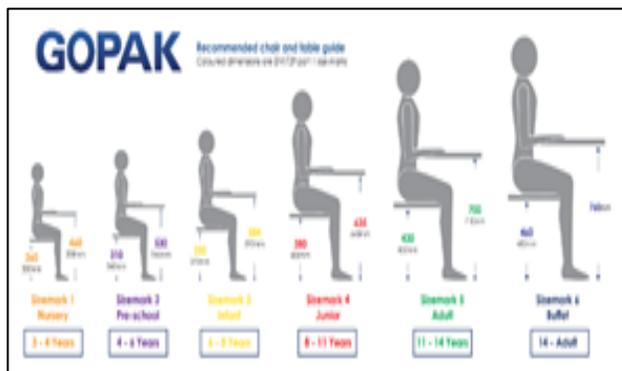


Figure 1: Children furniture size recommendations dimension.

(Source: <https://www.gopak.co.uk/useful-buyers-guides/height-guide> Date: 24 November 2018.)

The rules for children furniture are furniture in good designed can be reached by children's attention and help to explore the endless desires. Besides that, a material made furniture for children should be environmentally friendly. Garvin (1984,1987) said a well-known theoretical model for product quality consists of eight attributes which are durability, performance, aesthetics, reliability, features, conformance, perceived quality, and serviceability. All furniture for children users should have soft edges to prevent possible injury where children are still in poor body balance. Good furniture is children would get together all the children's developmental needs and also ensure it will not lose its functions along with children growing. The behaviour of children can be affected by colour within the physical learning environment. Colour is a powerful design of element that produces profound psychological and physiological reactions. Besides that, colour can also affect children emotion and performance. There are some children keen to color in the learning environment due to improve sensory responses and strong visual processing abilities. Color can impact the brain because it can greatly affect our physiology since it influences anxiety, pulse, blood flow, and arousal. Other than that, color also influence people while they are studying or working or playing which can show a positive and negative feeling and emotions to themselves. Green and blue will bring relaxation, comfort, and happiness while yellow furniture can bring the classroom to become more energetic. Besides that, researcher has to understand about the emotions of children toward furniture. The internal spaces of curve shapes can give the feeling of "happy and joyful" (Papanek, 1995). Children can generate the emotion like happy, stress or pleasure from the environment and expect the products can give pleasure through their emotional and relation with others. Stimulation of emotions along design will give more interactions and the satisfaction of influence. Besides that, the texture, size and complexity can also attract children through their visual appearance (Dazkir, 2011). According to (Salingaros, 2015) said that it will come out more psychological comfortable if the buildings with natural and biological forms. Children always learning through their relationships with people and the things around them also through play. It is important for them to

manage the feeling through play and also train their intellectual development.

2. METHOD AND MATERIALS

This studied is based on interviewed with an expert on furniture and survey from parents and children. A total number of 59 randomly selected parents who have children age between 4 to 6 years old was targeted in this study. They were all in Malaysia and living with their children with proper interaction with their children. Parents well known about their children behaviour in the house while playing.

Its aim is to search for the information about:

- The concept and shape of play furniture.
- The material used, color, features.
- The number of children at the same times and comfort.

What is the suitable design of play furniture for children? How to improve safety of children while they playing? What type of material for making play furniture?

2.1 Study Population

Based on the study of this research, there are getting more children having poor sitting posture and neck pain due to children often focus on electronic devices. Children nowadays are more interested on electronic device than playing around. Besides that, parents who are busy on working do not have much free time to take care or play with their children and may cause their children having wrong sitting posture and does not correct quickly. Children can develop their creativity and body balance through play.

Table 1: Anthropometric data of height and weight for studied subjects from 4 to 6 years old.

Gender	Age (years)	Height (cm) (Mean \pm SD)	Weight (kg) (Mean \pm SD)
Boys	4.0	101.45 \pm 6.59	15.13 \pm 3.34
	4.5	104.02 \pm 5.85	15.37 \pm 3.43
	5.0	107.90 \pm 6.72	17.85 \pm 4.86
	5.5	109.86 \pm 7.94	18.35 \pm 4.57
	6.0	113.98 \pm 7.37	20.33 \pm 4.82
Girls	4.0	101.18 \pm 5.67	14.94 \pm 2.85
	4.5	104.11 \pm 5.63	15.39 \pm 3.16
	5.0	107.26 \pm 6.94	16.65 \pm 3.49
	5.5	111.73 \pm 8.09	18.62 \pm 3.70
	6.0	113.40 \pm 7.35	18.67 \pm 3.67

2.3 Interview on children

Researcher randomly select 17 samples age between 4 to 6 years old in this studied. Children was given a colour pallet and choose their preference colour. The colour selected by children as a guideline for the colour of play furniture.

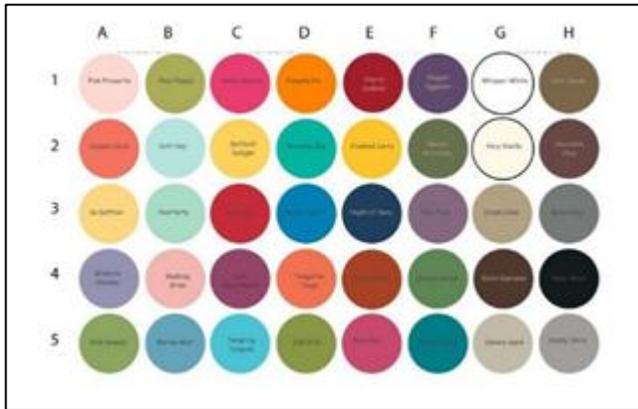


Figure 2: Sample of colour pallet.

3.0 RESULTS



Figure 3: Idea development



Figure 4: Final design sketch

Researcher interviewed an expert in furniture name AP. Dr. Musdi bin Hj, Shanat about his opinion on children furniture. He said that children play furniture should be attractive and the material must be light in weight so that it will not harm the children. Besides that, he said that the criteria for making furniture for children are the size of the furniture. If designing furniture for two to five years old children, the size of furniture cannot be too big and too high so that children can reach the furniture. He also said that we should understand what is the needs of the furniture. He mentioned about using an environmentally friendly material,

no toxic in colour and no sharp edges are the safety feature that should be considered on making children furniture. The difference between children furniture and normal furniture are the size, function, and colour. Children furniture should apply a soft colour. Furthermore, the size of furniture still suitable for children but sometimes it does not follow the ergonomic of children's size and also it is a must for making children furniture. He gave his suggestion to improve existing children furniture by first looking at the anthropometric size of the children followed by furnishing and the colour of the furniture either suitable or not for the children. A questionnaire is distributed to 59 target respondents to get data and information for this research. There are 50 respondents (84.7%) among total of 59 respondents would buy play furniture for their children. There are only 9 respondents (15.3%) choose not to buy play furniture for their children. Parents willing to spend money on their children nowadays and understand the importance of play on children. Besides that, there are 41 respondents (69.5%) said they have play furniture for children and only 18 respondents (30.5%) among 59 respondents do not have any play furniture at house because their house does not have enough space for them to put any play furniture for children so they bring their children to playground instead of having furniture at house. There are 35 respondents prefer wood making furniture, 15 respondents choose plastic and 8 respondents choose fabric as their preference. Wood is more environmentally friendly and has longer life spent. Besides that, wood is stronger than plastic like plywood can bend easily and there is many bending furniture are made by plywood. Next, 22 number of respondents (37.3%) prefer futuristic concept, 19 respondents (32.2%) choose modular concept, 10 respondents (16.9%) and only 8 respondents (13.6%) choose minimalist. Majority of respondents prefer organic shape than geometric which 44 respondents chosen organic because organic shape does not have sharp edges. An ergonomic furniture is important for children so there are 53 respondents (89.8%) chosen ergonomic whereas only 6 respondents (10.2%) do not prefer ergonomic design furniture. It may cause children sitting in wrong or poor sitting posture There were total of 11 samples children chosen warm colour as their preference among 17 samples children. There were only 6 samples children chosen cool colour and 2 samples children chosen neutral colour.

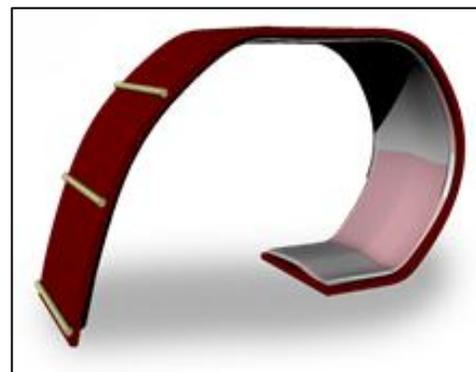


Figure 5: 3D render of final design

Plywood as a main material used on producing a children play furniture. There are two different thickness of plywood

used in this furniture which are 3mm and 25mm. The 25mm plywood used on producing the structure of furniture whereas 3mm is used on the surface of furniture. Researcher choose plywood because it is long lasting and can shape it easily. Inner surface of the play furniture is covered with a lining of fabric to increase the comfort when children sitting on it. Besides that, the fabric is detachable so it is easy to clean.



Figure 6: Images above shown the conceptual 3D drawing in different view.

4.0 DISCUSSION

Play furniture for children should be attractive and the material used is light in weight. The size of the furniture is the main criteria for designing furniture and also the target user. An environmentally friendly material, no toxic in color and no sharp edges are the safety feature should be considered on making children furniture. Non-toxic material and environmentally friendly material for making children furniture are importance which will assist better in children's health and wellbeing. So, if the material contains toxic, it may go into children body through their mouth while using the furniture. The safety feature is important on designing any furniture for children because they will not aware of dangerous while playing. The researcher will apply warm colour for children play furniture due to the children preference and survey from parents. Besides that, most of the parents nowadays willing to buy play furniture for their children at the house because they realize play also important for children and playing while learning is much more effective. Based on the result of the questionnaires, parents prefer organic shape, futuristic concepts with no technologies. If the design of play furniture not comfortable for children when they used, it is a fail design. Table 1 shows the means of height and weight of children to design ergonomic furniture for children. The height must be comfortable to them and follow the anthropometric data stated. The height of boys is slightly higher than girls.

5.0 CONCLUSION

This research is aimed to prevent children poor sitting posture and allow them to explore more by themselves through playing. Children will not get bored easily while learning through playing and also helps in developing interest in learning. It may improve children's knowledge absorbability. Besides that, producing conceptual play furniture also prevent children in a poor sitting posture. Children should never sit long for prolonged periods in the wrong size furniture with their feet dangling. A chair should comfortably fit the child and allow the child to sit in a natural, relaxed way while keeping their feet on the floor. Besides that, ergonomic furniture will help in achieving a healthy sitting posture to the children. Fun furniture will make children use more on it as they can learning or reading on it. Plywood is good in making furniture because it can give the shape wanted and soft the edge when the thin veneer layers are put into a mould which allows to come out with better design and more interesting. The soft edges are suitable for children furniture (Tarmeko, n.d.). The bond between furniture and user is seen when a precondition for products' sustainability and designing a pleasurable products (Salvador, 2015).

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