Constructive Modular Playhouse for Child Development

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Abstract

Parents often search for a good toy that can enhance their children's development. Many of them end up with buying video game, which might contain only entertainment and violence issues. Many constructive toys have an important role to trigger child's creativity, but they lack other aspects such as gross motor and learning environment. The aim of this research is to create a constructive large-scale toy such as playhouse that can enhance the child's development in three aspects – gross motor skill, role-playing and creativity/problem solving. The toy was designed and made from Ethylene vinyl acetate with 5 parts containing 89 pieces. It was evaluated through an experiment with children to see its effectiveness. From the observation with 3 group; 1 boy, 3 girls, and 4 boys from 5-6 year olds, the playhouse enforces the gross motor skill including hands, legs, and body. Subjects also created many forms of objects according to their imagination such as robot, road and others. They can construct the complex configuration of the toy by using their own problem solving skill. In terms of role-playing, they used the toy to create different kinds of playing scenario. This constructive toy promotes the safety issue and enhances the learning.

Key words
Constructive toy, Child development, Playhouse

1. Introduction

Toy has been an important part in child development. Many designers and psychologists around the world have investigated the study and explored various designs and materials to invent the best toy hopefully to help in developing the child's potentials in many directions. Most parents do purchase toys without concern about how well they help their children's development. Thus, they end up with purchasing video games which might contain only an entertainment and violence.

Piaget[1] posited that children learn through actively constructing knowledge through hands-on experience. The adult's role in helping the child learn is to provide appropriate materials for the child to interact or construct. Constructive play is characterized by making a three-dimensional object. Creativity is required to design the work, problem solving skill to take the design from abstract into solid form and manipulative skills to physically put objects all together [2].

Currently, many constructive toys in the market can be classified into four areas:

1. Small components and flexible – Lego®[3] block is a good example to illustrate this. Children can construct different kinds of configuration and form. It can be constructed as a large scale also, but it is heavy weight.
2. Small components and rigid – Each component is a unique form so it is fixed form. For example, the Plan city toy from Plan toys®.
3. Large components and rigid – This type of toys has rigid configuration and a large components. Many of them are light weight, for example, the Bazoongi™ kids mushroom playhouse tent[5].
4. Large components and flexible – It has large components, and it is flexible to do many configurations. The example can be seen from plastic outdoor playground such as Kangxibo[6].

Many constructive toys are not intended for children to use them by their own due to the safety problem and heavy weight product. The toys that are too rigid also limit the children's creativity and learning. The large components and flexible toys are too difficult and heavy for children to build. As a result, researcher selects the Ethylene vinyl acetate which is light weight, elastic and able to do a large scale.

The Constructionism relates to children's creativity. It can be separated into 3 parts: creative exercises, creative activities and creative thinking. Creative exercises are

invaluable in expanding their thinking abilities. They gives them opportunity to explore the possibilities of imagination. Through an artistic work, a child can create something unknown or explore something that he/she does not fully understand, or even use, his/her own emotions to produce the works.
Creative activities therefore offer a forum for thinking and can easily be used as a tool for developing a child's thinking. Toys perfectly enhance the development of children's creativity system until it is completely processed in their ages; they could be either music, visual arts or a performed piece of work. Whichever way it is represented, the final product needs to go through a process of thinking before it can be materialized. Creative thinking is the most useful tool in life and many people consider it a more development form of intellect as it offers the ability to solve problems and create what yet not exist, sometimes even from a product that is unknown. Creativity is a mental and social process involving the generation of new ideas or concepts, or new associations of the creative mind between existing ideas and concepts. It is fueled by the process of either conscious or unconscious insight.

According to the development of children aged 5-6 years old, they could develop many skills simultaneously. For physical development, they are able to use their gross motor skills such as climbing, swinging and dancing. For the social development, the role playing is important for social interaction and cognitive aspects.

The aim of this research is to create a constructive large scale product that can enhance the child's development in three aspects – gross motor skill, creativity/problem solving and role playing.

Research questions

1. How do children develop their gross motor skills by using the modular playhouse?
2. How does the modular playhouse support children's creativity and problem solving?
3. Why does modular playhouse encourage the role playing?

2. Method

There many type of playhouse. Most of them are made from plastic, wood, cardboard and/or fabric, and come in a form of planned concept. As seen in the mind mapping in figure 3.1, its details make the researcher understand that the playhouse can become a toy for developing children's skills.

As far as the researcher has studied a variety of different concerned resources, it was found that creating and developing a playhouse effectively needs to consider concerned categories, namely, target users (their ages and number), development of abilities and skills, used materials, and uses (durability, place and form) as shown in the mind mapping of Figure 1.

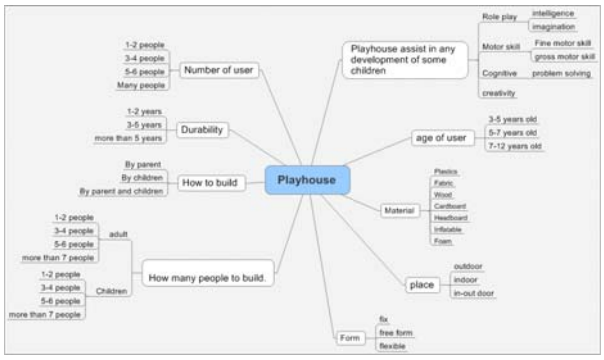

Figure 1. Category of playhouse

In order to answer the research questions, the experiment was conducted by asking children to play with the prototyping tool and observing the outcomes of the playing activity including their behavior.

In addition, concerning the production of playhouse, the researcher has significantly considered the playhouse's scale and flexibility, and studied related information. This is to help the researcher to device the playhouse in scale for how large and how flexible it is. The positioning map of Figure 2 has shown where the position of existing toys in Thailand is, and how toys' scale and flexibility are related. It is useful for analyzing the information about playhouse and its development.

Figure 2 Positioning Map

For the production of this playhouse, the researcher used Ethylene Vinyl Acetate or EVA sheet as the playhouse's material. The good features of EVA as the playhouse material are as follows:-

1. EVA is lightweight. Such selected lightweight materials help promote child safety since the uses of this materials will not dangerous to child players; moreover, the work design can be created in large scale without concern for the effect of weight.

2. EVA is simply formed and more durable to different temperature and environment than other kinds of materials.
3. EVA is more flexible than other types of plastic; therefore, children can develop their motor skills very well when they are playing.
4. Chemicals, which are used for EVA production, are non-toxic and safe for children
5. Materials of EVA formula can be adjusted by consumer demand.

2.1 Tool

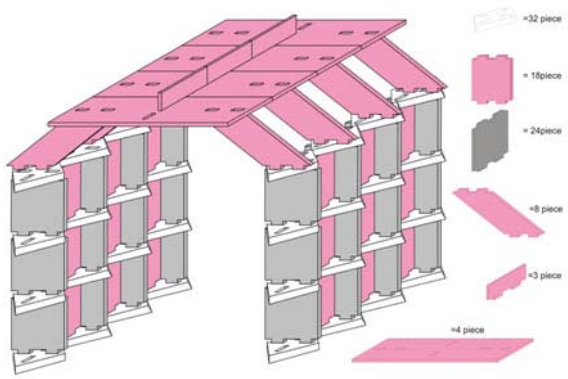

Figure 3. An plan for building playhouse

The tool in this experiment is five different parts of playhouse(see Fig. 1). This prototype is cut manually by blade. Each part can be fixed together like a jigsaw puzzle. The thickness of all components is 1.5 cm. and 2 cm.

2.2 Participants and procedure

The first one is to examine how children use their gross motor skills with a group of three boys aged 4 to 6 years. The second one is to test the creativity with a boy aged 4 years old. The third one is to test the role playing with a group of three girls.

3. Result

The research provided 3 parts for the whole experiment. Firstly, the experiment was implemented with all of three groups, secondly only with the group of three girls, and finally with the group of five boys. The children would be assigned to work out the following activities:-

1. Joining pieces of the playhouse puzzle by using the given patterns

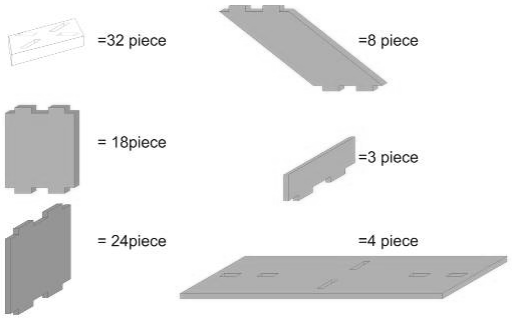

Figure 4 Playhouse Part

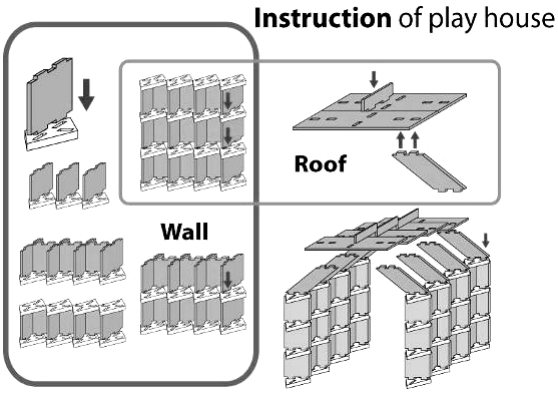

Figure 5 Playhouse Instruction

Before starting this activity, the researcher would introduce what each part of the playhouse puzzle looked like and how it worked or connected. Then, the instruction of playhouse as above would be shown to all of them. Children were able to see the instruction during creating the playhouse.

2. Building their own playhouses by connecting the puzzle pieces to create another style of playhouse
3. Using the puzzle pieces to connect other things.

Figure 6. a) Gross motor skill b) Creativity c) Problem solving and d) Role playing

3.1. Gross motor skill

From the observation, children used their large muscles when they played. They used hand, wrist, and body. For example, they used their body weight to insert components together (Fig. 2a). Although many children used a lot of physical effort on the product, the product was safe to play. The EVA material was not too heavy and difficult to tear off.

3.2. Creativity

When a child had a free-play with himself, he created different kinds of objects based on his imagination. The creativity could be counted from the number of ideas/objects that the child designed. The examples of the objects are highway (Fig 6b), robot, cannon stand, and buildings. He used 8-12 pieces for each design. After finishing each design, he played what he built. For example, he used a car to run over the highway.

3.3. Problem solving

A group of three boys was assigned to build a playhouse according to the instructions (see Fig.5). They planned to assemble from the bottom to top. For the wall part, they figured out how the components fit together by rotating the puzzle parts. The roof part was difficult for them, since the height of the roof was above the eye level (Fig. 6c).

3.4 Role play

A group of three girls designed their own props for their role playing. The examples of the plays were sleeping in the house, merchandising in the plant shop, doing the bank account service, and playing the Thai wedding ceremony (Fig. 6d). Their props were quite simple with a design that looked like fence and table. The key insight was that children could build their props according to their imagination and put themselves into the large scale product. Moreover, the props also enhanced the social interaction.

4. Discussion

Children have their own perspectives about the look of the toy. It does not need to be close to the reality. The benefit of the EVA material is the fast prototyping to fulfill child's imagination.

The researcher initiated, created and developed the playhouse successfully through tests and trials with the great support and cooperation of an expert and the focus group. As the tests, it found that the target children aged 3-6 years had ability to assembly the puzzled parts of the playhouse, even though parents or adults needed to guide them about some tasks in order to accomplish the objectives of knowledge. They could assembly all different parts together and establish a playhouse. Moreover, children could play with the puzzle in various ways as the followings:-

1. Children connected the playhouse by themselves, and use their imagination to play role-playing in the playhouse such as counter service of the bank, snake shop and plant selling shop, etc.
2. By using their imagination, children also created many rooms and assume areas of shower, toilet and living rooms. They also had television, shower and lamp in different rooms.
3. Children used the puzzle to create or build a variety of stuff or construction, namely, robot, bridge, road and cannon stand.

This playhouse puzzle should play in-group because it is large-sized and can be created or built into various stuff or construction as their imaginations. Learning by doing and learning process helps create team working, participation, responsibility and leadership among children. For example, children arrange and accept their functional roles, practice their different abilities, help each other's to complete tasks, and lead or follow other child as their assigned roles. The advantage of EVA (Ethylene Vinyl Acetate) toy over other type of toys are ease transport, safety product, lower cost and children's building their own

5. Suggestions for the further research

1. The modular playhouse should have its package with instructions, which shows parents, guardians and teachers how to create various activities of playhouse. Children can keep their toys in the package after played.
2. The number of different sampling groups should be more than in this research.
3. During playing the playhouse, parents, guardians or teachers are required to observe and give suggestions when having social conflicts. For example, if there are 2 older children and 1 youngest child playing together. The youngest is ignored or rejected to stay in the playhouse because the older ones said the house is too small for all of them. Parents, guardians or teachers could guide them how to play together fairly for longer playing and social learning.

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