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MOSAICS VS MURAL: INVESTIGATING PRESCHOOL CHILDREN TACTILE MOVEMENT, INTERACTIONS AND PREFERENCE

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ABSTRACT

Designing a suitable, natural-based and attractive outdoor decoration in a preschool environment is important to develop both children and adults' aesthetic values. Compared to mural drawing, mosaics is a collaborative design in creating a particular picture or decoration made by setting small colored pieces of different natural elements such as stones, clay and glass tiles, which might develop the sense of appreciation to art and offers unique experiential learning to young children. This study investigates children's interactions, tactile movements and preference between mosaics and mural drawing. A suitable mosaic and mural drawing for preschool children was designed. Two walls at a high traffic preschool outdoor and indoor area were selected for mural drawings of different designs. After the initial data collection, both murals were transformed into mosaics. This study involved forty children (n=40) who attended the preschool center on a regular basis. Children interactions and tactile movements on both mosaic and mural were observed and tape recorded. Children's behavior was analyzed qualitatively and their words were transcribed to identify their actions and preference between mosaic and mural. Results show that different mural designs and the use of mosaics afford different interaction. The transformation of the murals into mosaics was much preferable among the children.

Keywords: Mosaic, mural, tactile movement, interactions, preference

INTRODUCTION

The visual arts have long been used, in creating esthetics visionaries on walls, ceilings, floorings, objects and many other surfaces. According to the National Art Education Association (2004), visual arts are artistic creations such as drawing, painting, printmaking, sculpture, ceramics, mosaics and jewelry. Each art practice is a means of communication and an interpretation or vision of the creator's world, where it inexplicably entwined emotions, feelings, thought and knowledge (Alter, 2010; Cropley, 1992; Eisner, 2002). It allows individuals to connect with the world in various ways, as it mirrors social identities within the realities of the society and culture (Alter, 2010; Cropley, 1992; Efland, 2002; Eisner, 2002). Murals and mosaics have long been used by artists in buildings and landscapes. The art of murals and mosaics has been used dating 1700 BC in China, Korea and Japan and during the ancient Babylons. These visual arts have been widely used in the Roman Empire especially in sacred buildings to create spiritual and cultural ambiance to the people. The art of murals and mosaics still has its place among the society in this new era and it has been widely used in many architectural designs – from sacred buildings to homes and children play area. Environment (e.g. Rigg, 2013, Woideck, 2012) or in children art activities (e.g. Woideck, 2012). As murals and mosaics are different in its form and texture, individuals might have preferences in choosing between murals and mosaics. These differences might due to interest,

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visual effects of the artistic product or even because of the tactile sensory that is provided to the audience. Hence this study is to investigate children tactile interactions and preferences between murals and mosaics.

LITERATURE REVIEW

Murals and Mosaics

Generally defined by many, murals are basically pictures painted on the wall (Messina, 2012). It is usually a large scale painting that is directly painted onto walls, ceilings and any other flat surfaces. Looking at the history of murals, they are presumed to be the oldest form of art, which has been found in numerous ancient human settlements to the magnificent ceremonial murals of Egypt, Rome, Mesopotamia and Greece. As reported by Johnson (2012), murals paintings differ from culture to culture and period of time. For example, the Tibetan murals are created to reflect Buddhist practices, and during the Baroque period, rich art patrons and royalty families had Biblical and allegorical murals painted on the walls and ceilings of their mansions and palaces. Currently, murals are usually commissioned by private organizations, government and institutions, and thus it is commonly found in museums, schools, offices, and other public places. Today, murals are painted in a variety of ways and vary in style, both traditionally and non-traditionally using oil or water based media (Johnson, 2012).

The art of mosaics may not be as ancient as the mural; however, the art was arrived in Greece as early as 5th century BC, found its way to Turkey in the 8th century BC, Egypt, the Orient and Africa. Understanding the history of the mural crafts, the Greek, Roman and Byzantine empires are a rich source of early mosaics, where mosaics are installed on floors, walls and ceilings of homes, churches, mosques and public buildings (Stone, 2009). Differ from mural, mosaics are cubes (usually small in size), of colored glass and stones called “tessera”. It is usually installed into a mortar ground, bounded with cement (MacLeod, 2013). These tesserae was made from various resources such as limestone, marbles, glass and other natural materials to give a wider range of colors to the mosaic patterns (Kondolen, 1995). Mosaic art can be perceive as an imitation of paintings, with an establishment of a particular perspective, geometry, light and shade; with the colors manipulated to create pictures or guided patterns (Record of the Art Museum, 1981; MacLeod, 2013). It is a form of art, favored by many as it offers a different sense of texture and patterns and a unique light reflection which contributes to the aesthetic of the environment.

Theory of Affordances

The theory of affordances is an important aspect when studying about potential interactions and behaviors towards a particular object in the environment. The idea of affordances was originated by J.J. Gibson (1977, 1979), which refers to a particular action or actions between a person/animal and the environment that is related to each other.

> “The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill…I man by it something that refers to both the environment and the animal in a way that no existing term does. It implicates the complementarity of the animal and the environment.” (Gibson, 1979, 127)

In other words, affordances according to Gibson (1979) are about how humans perceive objects in ways which the objects can be used as each presented objects may afford potential actions or behaviors. The understanding of affordances has now been studied by many researchers to extend the possibilities of human actions and the perceived environment (e.g.

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Tucker & Ellis, 1996, 1998, 2000, 2001, 2005; Gaver, 1996; Murata, Fadiga, Fogassil, Gallase, Raos &Rizzolatti, 1997; Chemero, 2003; Creem-Regehr & Lee, 2005; Chainay, Naouri & Pavece, 2010). In the earlier understanding on affordances, Gibson (1979) suggested that the concept of affordances is a direct link between perception and action, where affordances are part of nature and it is yet to be discovered as human interact with the environment each day. This is relevant to Chemero (2003) suggestion which explained that affordances are meaningful to humans as it provides opportunities for potential specific behavior and it should belong to the human-environment system instead of just the environment itself.

Chemero further explained that affordances are indeed "a feature of a whole situation instead of a particular properties or features of the environment alone". As such, Chemero suggested a new definition of affordances where affordances are relations between the environment and human and "the environment affords behavior to the organism". In recent studies, the notion of affordances has been narrowed down into specific understandings. Jeanneroad (1994) and Arbib (1997) suggested that although a particular object potentiates the appropriate action, the notion of affordances should include the process involving motor representations, depending on the intention of the subject (Chainay, Naouri & Pavece (2010).

Ellis and Tucker (2000) suggested that basic affordances are divided into two categories: 1) affordance relations that demand actions involving object-centered interactions (eg. Grasping, tearing, etc) and, 2) situated features which demand actions on motor abilities in locomotion (eg. Jumping, walking, etc). Examining the object-centered interaction, each object that is presented in the environment might have multiple affordances on how it is being grasped. However, according to Creem-Regehr & Lee (2005), familiar objects which may have one specific use associated to their features such as a mug, may constrain action representation. Therefore, Tucker and Ellis (2004) proposed that to reactivate appropriate types of actions to a particular object, the extrinsic properties like its visual characteristics of such object, such as size and shape are crucial. As for the second category, Chamero (2001) suggested that the features are important when presenting the environment relata to afford a particular action instead of its properties. This is because affordances are about placing features to allow a certain activity to happen in a particular situation.

This can be seen in several studies, for example in a study by Cesari, Formenti & Olivato (2003), the features of the staircase affords stair-climbing actions, and in a study by Kytta (2002), which suggested several categories of environmental features that could support affordances such as flat, smooth surfaces may afford running. Hence as for the second category, it can be explained that affordance relations is highly dependable on its relata; which is the situated features within the environment and the individual abilities to perform a particular action related to the presented feature (Costantini & Sinigaglia, 2012; Chemero, 2001).

In another study by Tucker & Eliis (1998, 2001), instead of presenting the actual object, observing pictures of objects of the real objects could potentiate specific motor actions, of which known as visio-motor priming. For example, Craighero, Fadiga, Rizzolati & Umilta (1999) explained that several states that demonstrates the "agent of something graspable will immediately retrieve the appropriate set of hand-action possibilities, even in the absence of any intention to act". This is similar to Ellis & Tucker (2000), where they proposed that visual representations may afford a series of motor patterns associated to the represented objects.

DESIGN SELECTIONS

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Mural Design Selection

Two mural designs were selected for two different walls. The outdoor wall is a drawing of a tree, which was drawn using a traditional drawing technique (Figure 1). The indoor wall is a drawing of several preschool children at the staircase; which was designed using interpenetration of figures technique (Figure 2). The overlapping figures are created by using positive/negative reversal; where the shape of one figure overlaps and interpenetrate another to reinforce the contour. This is to create an illusion of transparency and the feeling of depthness.

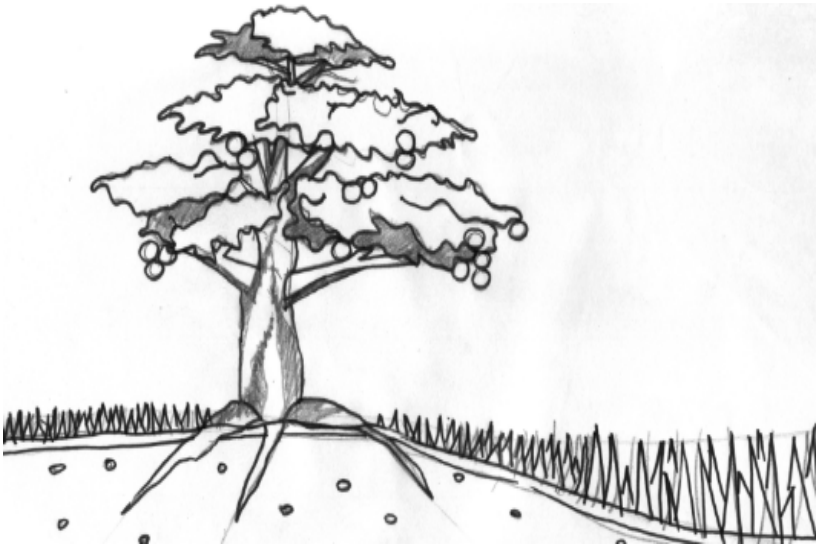

Figure 1. Normal tree drawing

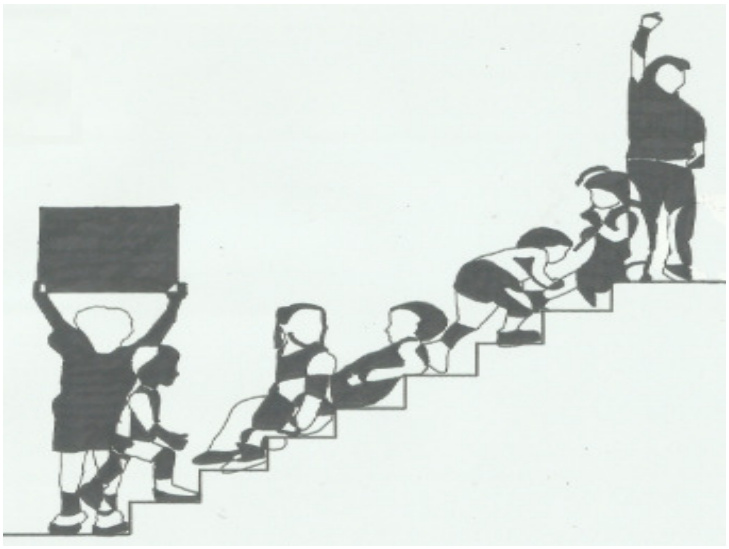

Figure 2. Interpenetrated Figures

However, in considering the affordances that these murals could offer to children, the drawings were scaled down to child size, with the estimation measurement of the 2, 4 and 6 years old children. Besides, the drawings of for both murals replicate the exact tree that is available within the preschool compound and children figures replicate the possible behavior when children use the staircase. Below is the measurement for the outdoor mural (Figure 3).

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The considerations in the design below is to allow children to be able to interact with the drawing, such as measuring their heights, and discussing about the concept of higher and lower.

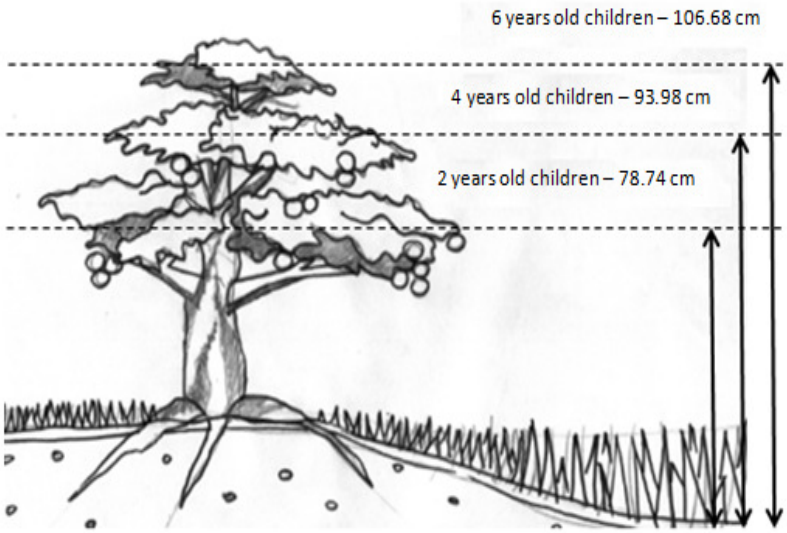

Figure 3. Tree drawing measurement for the outdoor mural

Below is the measurement of the children representation at the staircase, with 2 different measurements on the children's height (Figure 4). Again, the different measurement is to offer possibilities of actions and behavior when children interact with the mural, such as matching to their own size or imitating behaviors when going up or down the staircase.

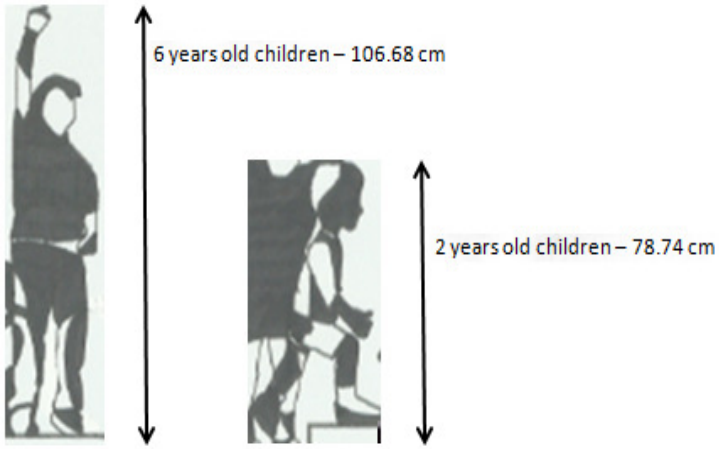

Figure 4: Measurement of children figures for the indoor mural

Mosaic Selections and Design Patterns

Pieces of mosaics will be arranged to form a design (which relates to the children cultural background) using various types of mosaics. Mosaics selected are glazed ceramic tiles, unglazed ceramic tiles, vitreous glass and pebble stone tiles. These different types of mosaics came in small pieces (approximately 10x10x10cm) which were randomly mixed then combined to create various pattern (Figure 5 and Figure 6), imitating and overlapping the mural design. The patterns are designed with the intention to afford various tactile movements, such as tracing the mosaic patterns as they move up and down the staircase. For the outdoor mural, different types of colors were selected (shades of green, brown, yellow

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and red) to represent the color of the tree. The mosaics were scattered all over the mural to give a different design from the indoor mural. In the other hand, only black and shades of grey were used for the overlapping human figure. However, several line patterns were designed for the indoor mural such as straight lines, vertical, horizontal, curve, diagonals and spirals (Figure 6).

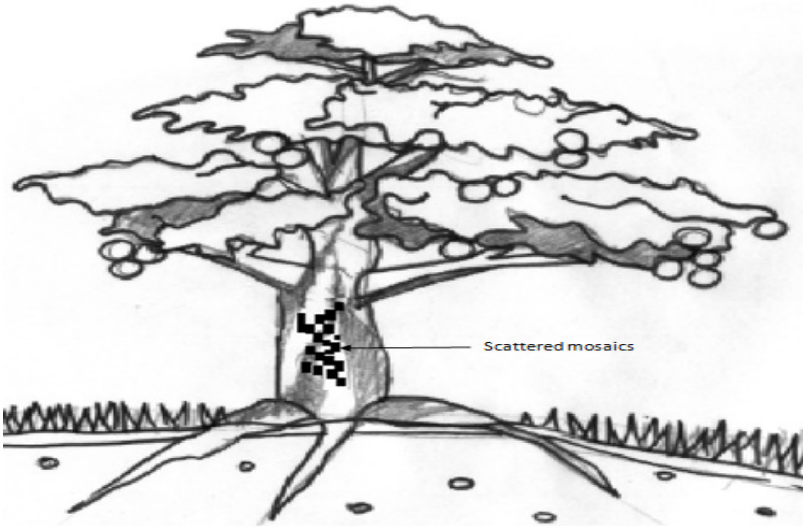

Figure 5. Example of the scattered design pattern for the outdoor mosaics

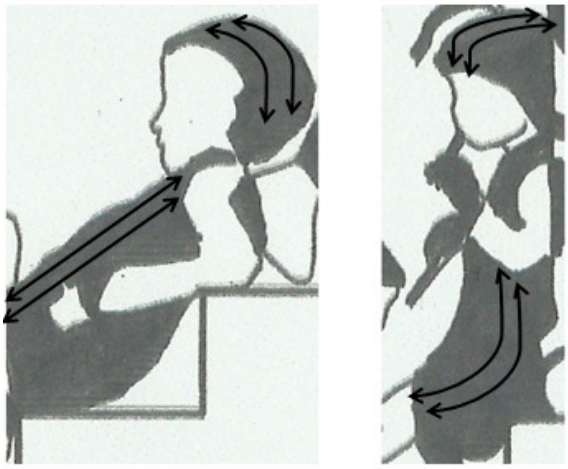

Figure 6. Arrows determining some of the pattern design for the indoor mosaics

METHODOLOGY

This study was conducted at a preschool center in Kuala Lumpur. The school usually has murals painted at several parts of the preschool, both indoor and outdoor. To improve the ambiance of the preschool classroom and the outdoor area, the walls were painted with yellowish brown and white paints. Doors and staircase bars are then painted white. This is to make the classroom and the staircase area brighter besides eliminating old murals.

Mural Construction

Two suitable murals was designed and painted on two different parts of the preschool wall (outdoor and indoor). The outdoor mural was selected near the shoe rack area and the indoor

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mural area was selected at the staircase area. The walls selection was based on the common area of the preschool that receive morning sunshine. The outdoor mural design represents the actual tree that was planted at the outdoor area and the indoor mural design represents children of different age and children possible behaviors at the staircase. The different mural designs are to afford various interactions by the children.

Mosaic Construction

After the first data collection, mosaics were constructed on both murals to offer children a different experience and to afford different behaviors towards the drawings. Different types of mosaic were selected of different types, colors and texture. This is to offer variety tactile experience to the children and to enhance the mosaic designs. Several mosaic patterns was designed and selected for each mural with the intention to afford various tactile movements.

Participants

Participants were preschool children between 2 years old to 6 years old who attended the preschool from 7.30am to 12.30 am. Some of the children were enrolled in a full day program, and will be at the center to approximately 6pm. No discussions were made with the children prior to the mural and mosaic installation to allow children to explore and recognize the mural and mosaic themselves.

Data Collection

Data was collected twice; first, after the mural drawings and second, after the mosaic construction. Children's behavior was observed and video recorded for a week (of each session) in the morning between 7.30 – 10.30am each day to see their interactions on both murals and mosaics. Children recorded behavior were analyzed qualitatively and children's words were transcribed to see their views and preferences towards the murals and mosaics.

RESULTS AND DISCUSSIONS

Based on the observation and video recordings, several types of children behavior were observed and recorded for both murals and mosaics for both indoor and outdoor. Relatively, results shows that the indoor and outdoor mural designs afford different types of behavior among the preschool children as well as the use of mosaic types and its pattern designs (Table 1). Not much of the children words were observed and recorded as children tend to interact with the murals and mosaics individually (Table 2).

Results in table 2 show that each mural design affords different interactions among the preschool children. As we analyze the first video recordings, which was recorded early in the morning, children were seen to be walking slowly than usual as they walk pass through the tree mural towards the shoe rack which was placed next to it. Several children were observed to continue staring at the mural as they took off their shoes. Such behavior is probably due to the new mural drawing, which uses more natural colors with natural scenery, compared to the old mural which was a picture of a huge Mickey Mouse and his friends. However, no data was available to confirm whether the attraction to the outdoor mural is due to the scenic drawing or the natural colors used. As the children's entire classroom is not located in the same building, some of the children do not pass through the indoor mural in the morning. These children will only be there except after lunch time, when they will gather in the classroom where the indoor mural is present, either waiting for their parents or waiting for their bath time (for full time program).

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Table 1. Types of interactions observed and examples of the interactions for both mural and mosaics

	Type of Interaction(s)	*Examples of Actions Observed / Recorded*
Outdoor Mural	i. Touching ii. Observing iii. Measuring	• Several children observe and touch parts of the tree mural as they walk pass through it. • Three (3) children measure the height of the tree and compare to their friend's height. Example, "You are this high" (pointing to one part of the tree mural).
Indoor Mural	i. Touching ii. Observing iii. Imitating	• As children climbed up and down the staircase, several children were seen to observe the human figures and touch parts of the mural. • Several children were seen to imitate the human figure such as : Pointing figures – 5 children were seen to raise their hand and point their pointer finger. Holding paper figure – 2 children were observed to imitate the holding paper figure (but holding their book instead). Sitting figure – A child was observed to sit on the staircase and tried to imitate the sitting figure. The child then moved downwards in the same position.
	iv. Tracing	• Several children were observed to trace the outline of the human figure as they move up and down the staircase.
Outdoor Mosaic	i. Touching	• Several children were observed to touch the tree mosaics using either their pointer finger or their 5 fingers and palm.
	ii. Observing	• A child was observed to touch the tree mosaic from the top to the bottom. • A child was seen to only observe the tree mosaic. • Several children were seen to observe and touch the tree mosaic either with their fingers, palm and feet.
	iii. Pressing	• Several children were seen to touch and press each single mosaic.
	iv. Tracing	• A child was observed to trace the scattered mosaic using his finger.
Indoor Mosaic	i. Touching	• Several children were seen to touch the different shades of mosaic as they move up and down the staircase.
	ii. Observing	• Several children were seen to observe the mosaics from a distance before touching it.
	iii. Pressing	• Several children were seen to touch and press the mosaics.
	iv. Tracing	• Several children were seen to trace the mosaic pattern as they sit or stand at the staircase. For the standing figure, these children were seen to trace the mosaic pattern while standing, and for the leaning and sitting figure, children were seen to trace the mosaic pattern while sitting at the staircase.
	v. Leaning	• A child was seen to touch the mosaics and then lean on the mosaics while rolling his back from side to side.

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Table 2. Types of verbal interactions and examples on children words

	Types of Verbal Interaction	*Examples of Children Words*
Outdoor Mural	i. Self -Expressions ii. Discussions	• "Eh, a tree picture" (*"Eh, gambar pokok."*) • Child A:"Look at this. It's beautiful!" Child B: "Yes, I like it too!" Child A: "Look! A fruit" Child C: "I love fruit!"
Indoor Mural	i. Self –Expressions ii. Discussions	• "Oh, Wow…..!" • "Hurm…..(nodding his head)" • Child A: "Look at me! It's the same, right?" (imitating a standing figure) Child B: "Yes! It's the same! I want to try too!" (*Child A: "Tengok ni! Sama kan?"* *(Child B:"Ye la….! Sama! Saya nak buat jugak lah..")*
Outdoor Mosaic	i. Self -Expressions	• "Wow! It's beautiful!" (*"Wah! Cantiknya!")*
Indoor Mosaic	i. Self -Expressions	• "It's shiny!"

However, for those children whose classroom in the building where the indoor mural is drawn, no interaction was seen during their first encounter with the mural, but only to observe it. Children whose classroom is upstairs tend to as well observe the mural without any interaction physically or verbally. Such behavior initially provide us with the assumption that mural or no mural, or a critically designed mural compared to any anonymous mural does not make any difference to the children. However, after a while, a child was observed to initiate her first interaction with the mural, where the child started to touch different parts of the mural and trace the outline of the mural before imitating the human figure structure. Several other children in the same classroom were then seen to interact with the mural.

As the outdoor and indoor mural was designed to afford different interactions, a small group of children were seen to touch, measure, and discuss at the tree mural. An example of the interaction:

Child A: "Look at me!" (standing next to the tree)

Child B: "You are this high!" (pointing to the second layer of the tree mural)

Child A: "Yes!"

Child C: "Hahahaha!"

Child B: "Baby will only this high!" (pointing to a lower layer of the tree mural)

Child C: "Like her!" (pointing to a baby who was carried by a caregiver)

Child B: "No. She cannot walk yet."(shaking his head)

In the other hand, the indoor mural (over lapping figure) does not initiate much discussion about measurement, but it affords discussions about comparisons and imitations as well as affording tracing interaction with mural. Such interaction was observed and recorded with either a child interacting with the mural individually or in small groups (2 to 3 children). Examples of the interaction:

Child A: "Up!" (pointing his finger upwards, imitating a figure)

Teacher: "Yes!"(smiling)

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In another scene:

Child A: "It's the same!" (standing next to the standing figure, raising both hands)

"Oh I need a book." (trying to imitate the actual figure holding something)

Child B: "Hahahahha" (the child then climb a few stairs up then sits on the staircase imitating a sitting figure)

Child A: "Look!" (pointing at child b)

Child C: "Can you lie down" (pointing to a leaning figure while holding the staircase bars)

Child B: (tried to lean on the staircase trying to imitate the leaning figure)

In another scene with a toddler (observation):

Child A: (the child was holding her teacher's hand climbing down the stairs. Then he release his teacher's hand and sitting on the staircase next to the figure)

Teacher: "Stand up!"

Child A: (not responding to the teacher)

Researcher: "It's ok. Let see what he is going to do."

Teacher: (smiling)

Child A: (looking at the mural then move downwards a few steps in a sitting position, one hand pressing the wall to balance himself)

With the observation and video recordings, several other imitative interactions with the human figure mural were documented. Such interaction was seen among toddlers and older children. However, children do not imitate the entire human figure but it was selected, probably based on their preference of the figure structure and position. Again, no evidence was documented to explain the figure selections among the children. Looking at the overall documentation on children interactions between the outdoor and indoor mural, it can be suggested that different mural designs do afford different interactions depending on the adult's intentions as suggested by Chainay, Naouri & Pavece (2010). As for this study it is the intention of the researcher to afford comparative and measurement interaction among the children as to promote and extended learning experiences about mathematical and science concept to the children.

The mural was then installed with mosaics using different types of mosaics and design patterns with the intention to afford more tactile interaction with the children. Children's observation and video recordings reveals that different pattern design afford different tactile movements but with least verbal interactions among the children. However, children initial interactions with the mosaics were observing it, for both outdoor and indoor. Initially no tactile interaction or verbal expressions were observed and recorded. Children were seen to start interacting with the mosaic after sometime. For example:

Scattered mosaic pattern:

Child 1

A child was seen (recorded) to first observe the tree mural without any interaction as he was taking off his shoe. After putting his shoe in the shoe rack, he pressed the mosaic (individual mosaic) using his finger then touching it with his 5 fingers and palm. Then he traces the scattered mosaic using his fingers from the tree top to the bottom (tree trunk).

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Child 2

A child was seen (recorded) touching the mosaics using his fingers. Then, the child alternately touched the mural (in between the mosaic gap) and the mosaics. No verbal interactions were recorded.

Designed mosaic pattern:

Child 1&2

Two children were playing with the mosaics at the staircase. Child 1 touched a mosaic and said, "It's shiny!" Both children then trace some of the mosaic patterns using their pointer finger.

Child 3

A child was touching a mosaic figure and trying to take out one of the mosaic. The child then touched the mosaics (of the same human figure) using his 5 fingers then using both of his palms. After examining the mosaic figure, the child leans (standing) on the standing human figure (most bottom figure).

From the observation and video recording, there was not much difference in the tactile and verbal interaction between the outdoor and indoor murals. However, the only difference in the children's tactile interactions was that the child tend compare the different texture at the outdoor mosaic (from the scattered design) and trace the lines at the indoor mosaic (from the patterned design). Such different interactions was expected which is related to the intentions of the researcher to provide different tactile experiences for the children. Again, for both outdoor and indoor mosaics, no children's specific interest and preferences was documented.

From the documented children's interactions, it shows that different mural and mosaic designs do play a role in affording different type of interaction. Even though children were allowed to explore the murals and mosaics by themselves; without any discussions about it by the teacher or the researcher, children are found to interact with the objects intuitively. In other words, the intentions of the adults when designing the murals and mosaics do afford specific interactions by the children as intended with is in line with earlier studies on affordances by Tucker & Eliis (1998, 2001). Therefore, it is important for adults (i.e. preschool operators, teachers and designers) to carefully design the preschool murals and mosaic installations, so that the drawing is not just meant to provide additional esthetic value to the environment, but also with an intention of providing possible interactions for the children, as it might be able to offer children an extended learning space.

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