

Exploring Filipino Kindergarten Children's Concepts of the Environment: A Study of Drawings

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Abstract

The success of Environmental Education (EE) is based on how the curriculum helps students develop the “right” relationship with the environment. EE scholars reveal that environmental problems arise not because EE approaches have failed but because people connect with the environment differently. Hence, educators should understand students' views of the environment before formulating environmental science lessons. Children should be taught to view themselves as part of the environment at the early childhood stage because, during these years, they develop their basic values, attitudes, and habits. However, young children do not always have the words to describe what they see, think, or feel. Thus, drawings and interviews were used to elicit children's environmental concepts. Thirty-five drawings and transcribed interviews of kindergarten pupils from a public school class in Calauan, an agro-industrial municipality south of Manila experiencing some environmental problems, were analyzed. Results show that the children see the “environment” as an area composed of more natural elements than built or human elements. Common in the drawings is the presence of weather elements. Only less than half have humans in their drawings, indicating that they see humans as separate from the environment. Through the drawings and interviews, it was found that the role of past experiences is vital in children's conceptions of the environment. Moreover, some drawings have evidence of misconceptions of their environment, specifically the presence of day time and night time elements in one drawing and the existence of “foreign” fruit in the locality.

Keywords: Concepts of the Environment, Kindergarten, Drawings

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Introduction

Young children have always been fascinated by their environment. They usually explore their surroundings—touching and even tasting things, wondering if this move or not, and asking how nature around them generally works. Hence, it is during these years, usually from zero to eight years old, that they slowly discern the environment around them and its effect on their daily lives. A young Filipino may be used to experiencing and hearing about calamities caused by natural hazards such as typhoons, storm surges, volcanic eruptions, or occasional earthquakes because of the country being located at the Typhoon Belt and the Pacific Ring of Fire.

However, it should be noted that young children are also “the most vulnerable to, and most at risk from sustainability challenges, now and into the future” (Dymenta, Davies, Nailona, Seyum, McCrea, & Hill, 2014). United Nations Children’s Fund (UNICEF) categorized the impacts of climate change on children into three: Health, Education, and, Well-Being and Protection (UNICEF Philippines). Children’s immune systems have not yet developed, thus, during calamities, children easily incur injuries and diseases. Moreover, education is abandoned during these calamities. Deprivation in education caused by the experience of calamities leaves “long-term mental and physical health and inability to contribute to a sustainable society” (UNICEF Innocenti Research Centre, 2008). Lastly, calamities caused by climate change have social and psychological implications for children. As in typhoon *Haiyan*, many families were relocated and torn apart. Hence, children faced a heightened risk of psychological stress, physical harm, trafficking, and exploitation (Eimer, 2013).

Children, which is the biggest age group in the Philippine population, have great potential in contributing to a sustainable, climate change-adapted society if they have acquired knowledge about the (1) dynamics of the environment, (2) ways they could respond and adapt to natural hazards; and (3) different approaches of taking care of the environment. Herewith, gaining experience and knowledge of the environment through the implementation of Environmental Education (EE) at the early childhood stage could give the Filipino child a provocation to protect and act as a steward of the local natural resources. This will, thus, allow future generations to also reap natural ecosystem benefits that individuals of the past and present are profiting from.

Environmental Education (EE) is one of the most important, more efficient, and more promising strategies proposed to achieve sustainable development (Nasibulina, 2015; Kasimov, Malkhazova & Romanova, 2002). EE is defined by the ASEAN Environmental Education Plan 2014-2018 as, “the process of helping people, through formal and non-formal education to acquire understanding, skills, and values that will enable them to participate as active and informed citizens in the development of an ecologically sustainable and socially just society”. One goal of EE is to aid its students to clearly understand the interdependency and interrelatedness of the social and natural systems.

Therefore, it is in due course for scholars of environmental science, early childhood development, and education to profoundly study the Filipino children’s relationship with nature, state of environmental knowledge, and even their capabilities in responding to environmental problems. The main purpose of the study is to

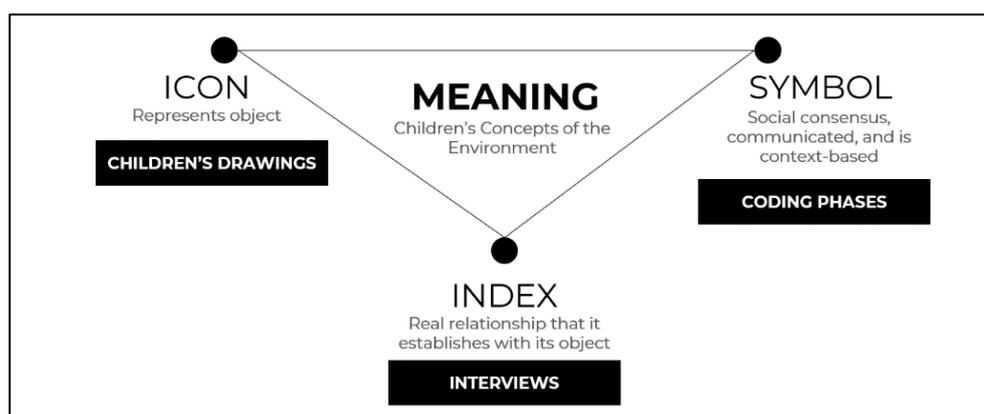
semiotically describe children's concepts of the environment through drawings and in-depth interview transcriptions. More specifically, the study aims to (1) identify and categorize symbols used by children to represent the environment; and (2) determine features and emerging themes of the children's drawings that reflect their understanding of the environment.

Determining the students' emerging environmental understandings would aid early childhood educators in providing a more appropriate environment or science-related experience and learning environment for children specifically in Calauan, Laguna.

Conceptual Framework

The conduct and analysis of children's concepts of the environment are based on Peirce's Semiotic Approach. Semiotics studies non-linguistic forms of communication and sees signs and images as representations of human perception (Turkcan, 2013). Because young children may not always have the capacity to communicate their thoughts in written form or even verbally, their drawings will be considered as the language used to express their opinions and views of the environment. According to Yavuzer (1997), children's drawings are indications of mental development because, through this art form, they can organize and reveal their understanding of the complex world they live in.

Peirce's Semiotic approach examines the (1) icon, the representation of the object; (2) index, a real relationship that is established with its object; and (3) symbol, social consensus and context-based aspects in interpreting the meaning of specific concepts (Deledalle, 2000). For this study, the children's drawings will represent the icon that represents the object. The personal interviews with children will serve as the method to establish the index. While the coding phases will aid in establishing the symbol, in which the icons and index are communicated, reflected upon, and contextualized



(Figure 1).

Figure 1: Conceptual Framework of the study

Methodology

This study was conducted in Calauan, a municipality in the province of Laguna, Philippines which has experienced several environmental problems that include contamination of well waters due to pesticides (Medina, Calumpang & Medina,

1991), contamination of ground and surface water by leachate because of a former/closed landfill (Belen, 2012), relocation of environmental refugees (Moya, 2013), and ineffective solid waste management. The respondents of the study were selected through non-probability, purposive sampling. The public school with the largest population in the town proper and biggest preschool class in terms of population was chosen. All of the students in the preschool class, composed of forty (40) five to six-year-old students, were asked to participate. Permissions were granted by local academic authorities and their parents. The researcher spent three weeks in the classroom. Two weeks were spent to get to know the children and spend time with them. The third week was allocated for the drawing activity and one-on-one in-depth interviews.

To determine the respondent's conceptions of *what the environment is*, a drawing activity adapted from Sorin and Gordon (2012), was conducted. Research on very young children has been deemed difficult because of the challenges faced in collecting valid, reliable, and extensive data. Hence, to understand how children think and feel about certain issues, scholars employ various methodologies and sources. These include recordings of children's conversations, some anecdotal notes, photographs of their actions, and samples of their drawings (Jones & Courtney, 2003).

Each child was given a sheet of letter-sized white paper, 8 ½ inches by 11 inches. Standardized drawing materials, a specifically sixteen-color box of crayons were also provided. The sixteen colors were the following: black, blue, brown, green, orange, red-violet, yellow, blue-green, blue-violet, carnation pink, red-orange, red-violet, white, yellow-green and yellow-orange.

For the first part of the drawing activity, students were asked to illustrate the "environment". The students were specifically asked, "What is the environment for you?" Or in the vernacular or Tagalog language, "*Ano ang kapaligiran para sa iyo?*" The students were given 30 minutes to complete their drawings. At the end of the allotted time, the drawings were submitted. As suggested by Sorin and Gordon (2012) when doing drawing activities with young children, the researcher interacted with the children while taking notes during the drawing process. After the drawing sessions, the students' photographs were taken together with their drawings to avoid mixing up of drawings. They were then individually interviewed about their drawings. They were specifically asked two questions: (1) "What are the elements of your drawing?" and (2) "What is your drawing about?"

For the analysis of data, two coding phases of the student's environmental conceptions and awareness were employed. Using the student's drawings of the environment and the interview transcriptions, the first coding phase was done. All the drawings were reviewed and all the elements in the drawing were listed. Categories were then formulated based on the emerging themes of the elements. The categories are: natural, built, human, natural-built and others (Table 1).

Table 1. Formulated categories and examples after first coding

NATURAL	BUILT	HUMAN	NATURAL-BUILT	OTHERS
Biotic elements (plants and animals)	Buildings Vehicles Flag etc.	Male Female Ambiguous	Flower in pots Fishes in aquariums	Words Shapes
Abiotic elements (sun, moon, clouds, stars, sea, mountain, etc.)				

For the second coding, the counting strategy was utilized in which all the elements were grouped into their category for each drawing. Frequencies and percentages were computed individually and as a group. After indicating the presence of the elements in each category, the drawings' descriptions (e.g. color, interaction with other elements) were indicated. The student's awareness of environmental issues was also taken into account by taking note of indicators of environmental issues such as fallen trees, smoke, dirty water, and the like.

Results and Discussion

During the drawing activity, five children were absent. Hence, only 35 valid drawings were produced. For the first coding, all the elements drawn by the students were identified using the drawings and the interview transcriptions. Themes and categories were then conceptualized using the existing elements (Table 1). Each drawing was analyzed. All the elements were identified and classified. Descriptions by the child (from the standardized interviews) and the researcher were also given.

Concepts of the Natural and Built Environment

According to the Department of Education's (DepEd) December 2013 "Standards and Competencies for Five and Six-Year-Old Filipino Children", the students of kindergarten should be able to "demonstrate a basic understanding of concepts about living and non-living things including weather and uses these in categorizing things in his/her environment".

There were a total of 371 elements drawn by the pupils from public school. For the 35 drawings of public school kindergarten pupils, there were 236 (64%) natural, 76 (20%) built or artificial, 29 (8%) natural-built, 27 (8%) human, and three unidentified (1%) elements. Twenty-seven (77%) of the 35 drawings of public school pupils have 50% or more natural elements in their drawings. For each drawing, it is expected that there would be seven natural, two built, one human and one natural-built element.

Table 2. Category of elements drawn by public kindergarten pupil's drawings of the environment

CATEGORIES	FREQUENCY*	PERCENTAGE (%)	MEAN PER DRAWING
Natural	236	63.61	6.7
Built	76	20.49	2.2
Natural-Built	29	7.82	0.8
Human	27	7.28	0.8
Unidentified Objects	3	0.81	0.1
Total	371	100	NA

λ Multiple elements are drawn by each student

Hence, for public school kindergarten children, the environment is mostly made up of natural than built or human elements. This just reflects how the environment is defined by society—especially the education sector. An environment is a place in which biotic and abiotic elements are contained but are ideally separate from the societal and technological realms.

The natural elements drawn by the public school kindergarten pupils can be grouped into biotic and abiotic elements. There are a total of 130 biotic and 106 abiotic elements. For the biotic elements, more plants (105) were drawn than animals (25). The most common plant elements drawn are trees and flowers. On the other hand, the most common animals drawn are insects and birds. Since the early 1900s, researchers found out that natural components mostly drawn by children are animals and flowers (Koppitz, 1968). For abiotic elements, the most commonly drawn are celestial elements such as clouds, sun, rainbows, and moon. Other abiotic elements drawn are rivers, mountains, and seas. Again, the results are not surprising. The environment in which the children live is surrounded by mountains and rivers. Even with rapid urbanization, many towns still live up to its province's name *Laguna*, which might have been derived from the local terms *lago* (*lush, grow*) and *na* (*now*). The name might have also been derived from *lagoon* because it is home to one of the largest lakes in the Philippines, *Laguna de Bay*, which the children would have already seen and would have mistakenly thought of it as a 'sea'. Moreover, the town of Calauan, which is known for its sweet pineapples, is surrounded by hills and valleys.

For some of the respondents, their concept of the environment is mainly the natural environment—the physical and biological elements. For the examples (Figure 2), both have drawn similar biotic elements—trees, butterflies, flowers, and grass. They also have the same abiotic elements—sun and clouds.



Figure 2: Drawings 6 and 14 - Environment as mainly composed of natural elements

The authors of drawings 6 and 14 are both six years old and are from different *barangays* (villages). However, the similarities in the components and organization of their drawings are evident. According to Roland (2006), though the experience may be a factor to a child's conceptualization of what the environment and its elements should look like, at age five or six, children's symbols are highly individualized. Meaning, how they draw a tree or a person is a result of how they understand it rather than their observation of the world. Hence, this drawing of the environment might not be an exact place but their idea of what the environment should look like.

Furthermore, the built elements drawn by the students are mostly houses, swings, roads, schools, airplanes, cars, etc. This result is similar to Koppitz's (1968) study in which most of the built elements drawn by children are houses, cars, and planes. On the other hand, some elements which cannot be classified are placed under natural-built elements. Examples of this are a flower in pots and fish in aquariums. Other elements include words, planets, and shapes drawn by the pupils. Looking at the drawings, many of the elements can be identified by other people even without the narratives of the respondents. This is expected because according to Roland (2006), "by the age of five or six, most children have developed the repertoire of graphic equivalents for the things in their environment".

Weather Elements

One of the important things the DepEd wants Filipino kindergarten pupils to know about the environment is determining the weather. At the start of the class, the public school teacher who is in charge of the respondent class always leads a weather song that helps the students identify the date and weather of the day (sunny, cloudy, stormy, etc.).

Most of the respondents (69%) have shown weather elements in their drawings. However, together with the sun, they have depicted another weather element which is the rainbow (20%). The results are in agreement with a kindergarten curriculum which states that at ages four or five, children would be able to identify the "weather and climate in their immediate surroundings from their point of view" (Fromboluti &

Seefeldt, 1999). Learning about the weather is a way for kindergarteners to realize one of the ways the environment could affect human lives.

Human Component

An idea of the interdependence of the social and natural realm is one of the first and more important lessons to appreciate in environmental science. To be sensitive to the environment and be able to properly take care of it, human beings should have an idea that people and nature (biological and physical) are in a mutually-sustaining relationship. Humans are part of the environment. Humans need nature to survive and nature is to be properly managed and taken care of by humans. Hence, for the “ideal” drawings of the environment, based on the field of environmental science, the presence of a human component is important. For public school pupils, 15 (43%) out of 35 drawings have humans (Figure 3).

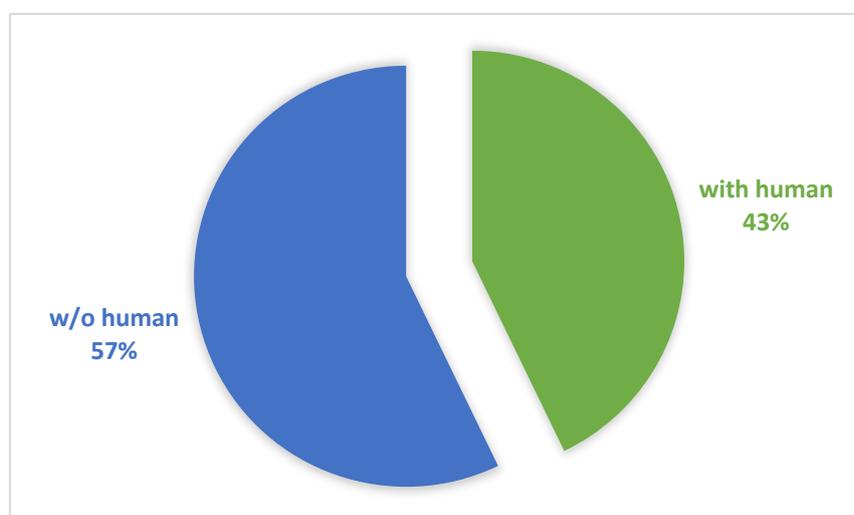


Figure 3: Drawings with human components

Developmentally, a five or six-year-old’s omission of some elements in his/her drawing should not be a cause of immediate concern for a parent or teacher. According to Roland (2006), this just means that the child may just consider that particular element as less essential for that certain topic being asked of him/her. Since more than 50% of all the pupils from the public school omitted a human component in their drawings, it could be perceived that the children see the presence of humans as not that important when one talks about the environment. For many of them, humans may be considered as separate from the environment.

This result could be of great importance for EE. This confirms that the first lesson that must be taught to children about the environment could be about the mutual relationship between humans and the environment. However, some children (43%) also recognized that humans are part of the environment and included human components in their drawings. Most of them either drew themselves or their families.

Human Component (Self-portrait and the environment)

There were seven (20%) pupils from the public school class who depicted themselves in their drawings. Researchers have concluded that children ages five and six are egocentric. Meaning, the children see themselves as the center of all things and thus, have less concern about others. However, compared to a two-year-old, five and six-year-olds are slowly becoming less egocentric and may even try understanding the point of view of others like their friends, parents, and teachers (Raising Children Network, 2016).

Being egocentric at this stage may be advantageous when learning about their relationship with the environment. According to Roland (2006), “art plays a crucial role in the self-defining process.” Through drawing, the child may be able to identify the people, things and processes in their environment that are particularly beneficial and important to them. With this, the child starts to have an idea of his/her relationship to the environment.

In one of the self-portrait drawings (Figure 4), the student specifically said that she is the girl in the drawing and this is their house’s front yard (Drawing 20). She described her love for the environment through the drawing. She narrated that in the drawing she was doing one of her hobbies which is gardening. Hence, at this age, children can realize the benefit and enjoyment they gain from the environment.



Figure 3. Drawing 20 and 34: self-portrait and their environment

On the other hand, Drawing 34 was made by a boy. He specifically said that he is the person in the drawing. Having spent already a week with the pupils, the researcher somehow guessed that he was the boy in the drawing because of the spiky hair, but it was just validated during the individual interviews. This just shows that children, five and six years old, might know their unique features or those features that differentiate them from other people so that they could be identified.

Another unique element drawn by the child (Drawing 34) was the papaya (*Carica papaya*) tree on the left side of the drawing. He illustrated how different a papaya tree looks like to the two other trees drawn. The boy could have noticed this because he lives in *barangay Paliparan*, a village famous for fruit farms. Hence, this validates Piaget’s (1994) assumption that children from their knowledge of the environment

through their experiences and that they have the innate desire to know about the world.

Human component (Family members and home)

Six pupils (17%) drew their family or a family member in their drawings. Twenty-seven (77%) of the 35 drawings of the public school kindergarten pupils depicted their home environment. Filipino kindergarten children only stay at school for about five to four hours, hence, most of the day is spent at home. Five and six-year-old children usually tend to draw things that are significant to them (Stolley, 2012). Not only do they draw themselves, but they also represent other people in their drawings (Figure 5).

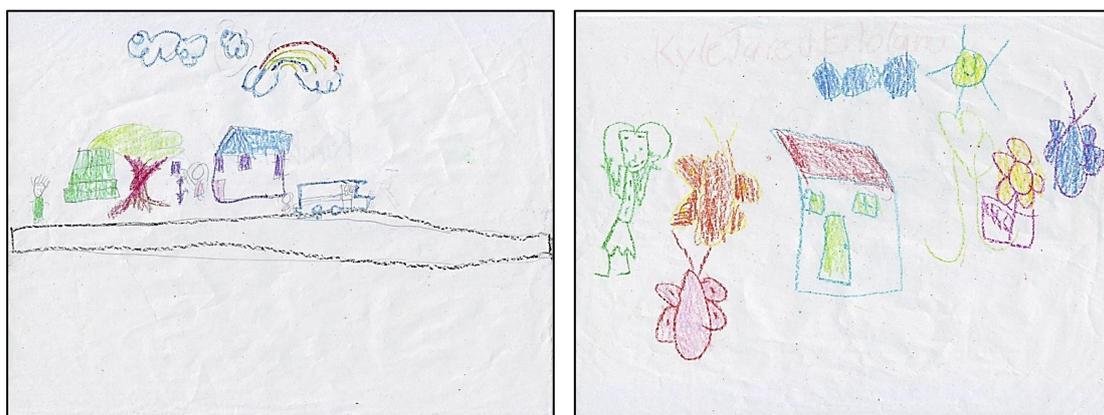


Figure 5: Drawing 19 and 18 - examples of drawings featuring family and the environment of public kindergarten pupils

In the first example drawn by a public school kindergarten child (Drawing 19), her concept of the environment is the people and the activities done around her. The child narrated that the woman at the center of the drawing is her mother who is watering plants. The man on the right side near the swing (green) is her father. The woman riding a jeep is her sister. Hence, in her concept of the environment, there exist people with a natural and build environment.

In another drawing by a boy (Drawing 18), he drew a girl. Since he is a boy, he was specifically asked about the drawing. He said that the girl in the drawing is his sister. Seemingly, his sister, who is also in the same elementary school, is a great influencer for him. In the environmental attitude interviews, he was asked why he does not want to segregate and he answered that his sister does not also segregate and he wants to do the same.

Research has proven that family members are good influencers in developing positive environmental behavior. It was suggested that parents are to help their children visit and connect with nature (Yilmaz, Kubiato, & Topal, 2012). This shows that environmental conceptions and attitudes are indeed influenced by family members, whether it is their parents or their siblings. This shows that the school should work hand-in-hand with the family to develop the right environmental conceptions and positive environmental attitudes of the children.

Role of Experience in the Conceptualization of ‘The Environment’

Though it is known that four to six-year-olds, at their stage, may have some confusion of reality and fantasy, the role of experience in the conception of the environment is still significant. In fact, according to Sali, Akyol, and Baran (2012), “environmental opportunities of kindergartens and preschools gain specific importance for preschool children.” Thus, most of the environments drawn, as mentioned, are usually related to their home, village/community, and school. About 20% of the respondents drew themselves, 17% drew their family members, 77% drew their home environment and 0.06% drew their school. All these are drawn from experience.

Only two pupils from public schools drew a school as their environment. These are Drawings 3 and 10. This might be because, for kindergarten pupils, they spent only a minimum of three hours in school. Only one (Figure 6) of these two drawings designated the school as the focal point of the drawing.



Figure 6: Drawing 10 - School as the environment

For Drawing 10, a playground is drawn beside the school. On their campus, there is a similar playground structure. The depiction of the school with a playground is comparable with the research of Sali *et al* (2012) because these facilitate outdoor play for the children. These are memorable places for children, hence, it can be seen in many school drawings.

The other example that shows the role of experience in the environmental conception of a child is that of Drawing 13. This is an example portrayed in a daily situation experienced by the child (Figure 7). This drawing is created by a child from *Barangay Lamot I*. If one has been to this village, the rolling hills with lush evergreen trees are evident. This is also seen in Drawing 13. The way the child drew the mountains are very unique compared to the other drawings. The “little” trees are specifically drawn indicating the child’s awareness of the presence of those trees in the hills as seen from

her house. Hence, a five to six-year-old child can observe the different elements in the environment, their arrangement, forms, and relative sizes.

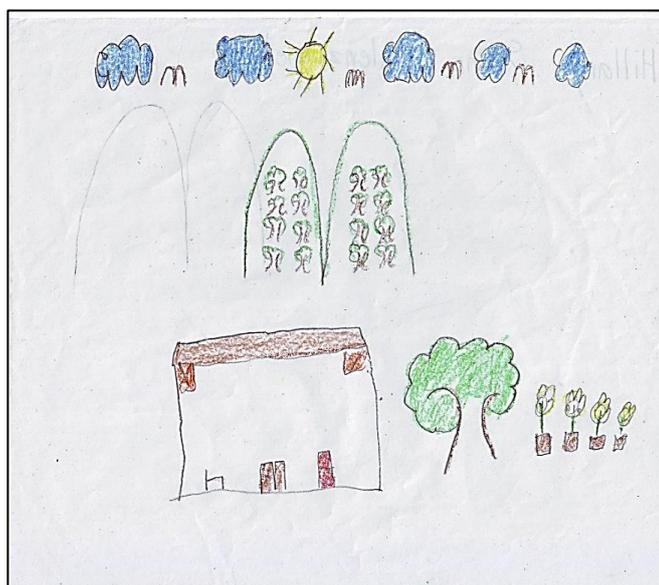


Figure 7: Drawing 13 - Drawing from a daily experience

Some Misconceptions about the Environment

According to Barraza (2006), drawings of five to seven-year-olds are usually called “intellectual realism”. This means that the elements of their drawings are that which “the child knows to exist, even though they cannot normally be seen” (Barraza, 2006).

One of the more consistent “misconceptions” in the children’s depictions of the environment is their practice of putting into one picture celestial elements for day time and night time. Five pupils (Drawings 5, 21, 29, 30 and 32) from public school drew a moon and/or stars together with the sun. Though this study is not about concepts of day time and night time, this result may be similar to Saçkes’ (2014) study of Turkish kindergarten students. The conclusion was children in this stage have “naïve mental models of the day and night cycle.” In Saçkes's (2014) study, for instance, only 14 of 46 children described the appearance of stars and moon in the sky as indicators of night time and only 18 of the 46 children mentioned the existence of the sun as day time.

Furthermore, another “misconception” depicted by three pupils is the existence of “foreign” fruit in their environment. The pupils who illustrated these foreign fruits in their environment are two boys and three girls. This means that regardless of gender, every Filipino child could be more knowledgeable about foreign fruit which is usually and most commonly found in the local market and is used as examples when learning the alphabet. For instance, the children will draw apple or orange trees, which do not thrive in the Philippines, in their environment.

In Drawing 32, the author depicted his *barangay* as his environment (Figure 8). He was then asked about what fruit was found in the trees in his environment, his answer was, “apple trees”. He was asked again to clarify and he nodded and confirmed.



Figure 8: Drawing 32 - “Apple trees” in the environment

Conclusions

The understanding of public school kindergarten pupils of the term “environment” is an area composed of more natural elements than built or human elements. Specifically, for each drawing of a public school kindergarten pupil, it is expected that there would be seven natural, two built, one human and one natural-built element. Especially common in the public school kindergarten pupils’ drawings are the presence of weather elements. Moreover, only less than half of the drawings contain human components, indicating that they see humans as separate from the environment.

Through the drawings and individual interviews, it was also found that the role of past experiences is vital in their conceptions of the environment. Hence, it is recommended that experiences in and with nature—nature walks, taking care of pets, segregating wastes, touching leaves and soil, etc.—be created for the children to enhance their connection and affinity to the environment.

Lastly, some of the drawings have pieces of evidence of misconceptions in the environment such as the presence of day time and night time (celestial) elements in one drawing and the existence of “foreign” fruit in their environment. Hence, the use of endemic animals and plants as examples in different subjects such as Values, English, Filipino, Math, and Science should be used rather than “foreign” examples. This would help children learn more about the natural resources present in the local environment that would lead to appreciation and care for the environment they are currently living in.

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