AN ANALYSIS OF PRIMARY SCHOOL CHILDREN'S DRAWINGS **BASED ON WILSONS' SEVEN PRINCIPLES**

YU LEI TAO

FACULTY OF EDUCATION
UNIVERSITY OF MALAYA
KUALA LUMPUR

2021

AN ANALYSIS OF PRIMARY SCHOOL **CHILDREN'S DRAWINGS BASED ON WILSONS'** SEVEN PRINCIPLES

YU LEI TAO

DISSERTATION SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION (VISUAL ART EDUCATION)

FACULTY OF EDUCATION
UNIVERSITY OF MALAYA
KUALA LUMPUR

2021

UNIVERSITY OF MALAYA
ORIGINAL LITERARY WORK DECLARATION

Name of Candidate: YU LEI TAO

Matric No: POJ 170003

Name of Degree: MASTER OF EDUCATION

Title of Project Paper/Research Report/Dissertation/Thesis ("this Work"):

AN ANALYSIS OF PRIMARY SCHOOL CHILDREN'S DRAWINGS

BASED ON WILSONS' SEVEN PRINCIPLES

Field of Study: VISUAL ART

I do solemnly and sincerely declare that:

(1)   I am the sole author/writer of this Work;
(2)   This Work is original;
(3)   Any use of any work in which copyright exists was done by way of fair dealing and for permitted purposes and any excerpt or extract from, or reference to or reproduction of any copyright work has been disclosed expressly and sufficiently and the title of the Work and its authorship have been acknowledged in this Work;
(4)   I do not have any actual knowledge nor do I ought reasonably to know that the making of this work constitutes an infringement of any copyright work;
(5)   I hereby assign all and every rights in the copyright to this Work to the University of Malaya ("UM"), who henceforth shall be owner of the copyright in this Work and that any reproduction or use in any form or by any means whatsoever is prohibited without the written consent of UM having been first had and obtained;
(6)   I am fully aware that if in the course of making this Work I have infringed any copyright whether intentionally or otherwise, I may be subject to legal action or any other action as may be determined by UM.

Candidate's Signature   Date:

Subscribed and solemnly declared before,

Witness's Signature   Date:

Name:

Designation:

ABSTRACT

Issues about low perception and limited information on children's drawings in Malaysia has led to the need of analysis of children's drawings. This study studied and analyzed drawings of a group of Malaysian primary school children of six age groups based on Wilson and Wilson (2009) seven graphic principles. A quantitative research design was adopted. A total of 335 children's drawings were analyzed to identify the most common used Wilsons' graphic principle and determine the use of the principles according to their age groups by using descriptive statistic method. In order to determine the relationships between children's used of Wilsons' graphic principles and their stage of pictorial development, inferential testing by using Chi-Square was conducted. The findings of this study show that; conservation/multiple application principle was the most common Wilsons' graphic principle that children used in their drawing, and there were similarities and differences in the use of principles for each children's age groups. In addition, the Chi-Square test indicated significant association between children's used of every principles and their stage of pictorial development with all p values ≤ .05. Thus, it can be concluded that children's artistic development can be established using the Wilson and Wilson seven graphic principles. A continued need exists for further research to be conducted to make comparisons between gender and between cultures.

ANALISIS LUKISAN KANAK-KANAK SEKOLAH RENDAH BERDASARKAN TUJUH PRINSIP WILSON DAN WILSON

ABSTRAK

Isu tentang persepsi yang cetek dan maklumat yang terhad tentang lukisan kanak-kanak di Malaysia telah membawa kepada keperluan analisis lukisan kanak-kanak. Kajian ini mengkaji dan menganalisis lukisan sekumpulan kanak-kanak sekolah rendah di Malaysia yang terdiri daripada enam kumpulan umur berdasarkan tujuh prinsip grafik Wilson dan Wilson (2009). Reka bentuk kajian kuantitatif telah digunakan dalam kajian ini. Sebanyak 335 lukisan kanak-kanak telah dianalisis dengan menggunakan kaedah statistik untuk mengenal pasti prinsip yang paling biasa digunakan oleh kanak-kanak dan menentukan penggunaan prinsip mengikut kumpulan umur mereka. Untuk menentukan hubungan antara kegunaan prinsip grafik Wilsons dalam kalangan kanak-kanak dengan perkembangan artistik mereka, ujian inferens dengan menggunakan Chi-Square telah dijalankan. Dapatan kajian ini menunjukkan bahawa, prinsip conservation/multiple application paling biasa digunakan oleh kanak-kanak dalam lukisan mereka dan terdapat persamaan dan perbezaan dalam penggunaan prinsip bagi kumpulan umur masing-masing. Di samping itu, ujian Chi-Square menunjukkan signifikan ketara antara penggunaan setiap prinsip grafik dan perkembangan piktorial dengan semua nilai $p \leq 05$. Oleh itu, dapat dirumuskan bahawa pembangunan artistik kanak-kanak dapat dibentuk dengan menggunakan tujuh prinsip grafik Wilson dan Wilson. Terdapat keperluan yang berterusan untuk menjalankan penyelidikan lanjut untuk membuat perbandingan antara jantina dan antara budaya.

ACKNOWLEDGEMENT

CONTENTS

Chapter 1: Introduction

Chapter 2: Literature Reviews

LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS AND ABBREVIATIONS

P1   : Simplicity

P2   : Perpendicular

P3   : Territorial Imperative

P4   : Fill the format

P5   : Conservation or multiple application

P6   : Plastic

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1   Introduction

This chapter begins first with explaining the background of children's drawing. Next, it offers a discussion on problems related to children's artistic development before focusing on the Wilson and Wilson theory of seven graphic principles. Towards the end, the chapter also includes statements on the objectives and questions of the study, the significant of study, the study's limitations, as well as the definitions of the key terms in quantitative research study.

1.2   Background of Study

Art as a way of learning and communicating about the world is generally considered in attempts to build of an early childhood art programme. It is an approach essentially adopted from a developmental theory of art education. From the moment a child is able to hold a pencil and put some marks on paper, the child is then presumed to have started a drawing as a great way to communicate. As Wilson and Wilson (2009) have claimed, children convey their thoughts and concpets in drawings.

From records (e.g. Golomb, 2004; Kellogg, 1970), we know that drawings are among the easiest products of children to collect. Many parents, educators and researchers collect children's drawings in their way. From these collection, they make interpretations of children's drawings to get some information from what children create. As children scribbling on the paper, they produce different kinds of recognizable images that denote particular human and animal referents. Eventually, we are able to gather that a theory on artistic development does help teachers and

parents to understand that scribbling and exploring are natural part of children's art.

A drawing is a series of marks on a flat surface, and so much more than manipulating lines and figures. If children are given a drawing material which does not leave a mark, they will soon lose interest in the drawing activity. Cox (1992) pointed out that, repeated scribbling may indicate that the child is in the process of mastering particular forms. Children need to use lines and shapes that they have mastered to produce some resemblance of the real objects. When children want to draw three dimensional objects, they will have to face the difficulty as they need to transfer three dimensional space onto a two dimensional flat surface. Thus, they may be able to find the solution through art education and socialization in the classroom.

According to Ministry of Education Malaysia (2016), art education curriculum in KSSR consists of two disciplines: music education and visual art education. It should be noted that the field in this study was only related to visual art. The visual art education aims to produce harmonious, critical, and creative people through the use of visual art language. It focuses on four main aspects: active observation; critical and creative interaction with tools and materials; an easy appreciation of visual art, and value good values in all aspects of life. The visual art curriculum for primary school consists of four areas, including drawing, pattern making, design and construction and traditional crafts.

In particular, this study tended to focus on the area of children's drawings. Going by Wilson and Wilson's (1982) exposition, children draw in order to explore their worlds symbolically. By the age of three or four, most children are already able to master the necessary rudiments for presenting their own ideas about reality in observable symbolic forms. By the time the child reaches the "symbol-making stage" at the age of seven to nine, he or she could by then devise rules or graphic principles

to solve spatial problems (Wilson & Wilson, 1977). As Putih (2002) also mentioned, the child would use all the possible means acceptable to translate three dimensional objects into symbolic forms.

Drawing has special and unique reality-creating characteristics. Wilson and Wilson (2009) maintained these characteristics by drawing on a more flexible way for developing ideas about the four realities: the common, the archeological, the normative and the prophetic because it has a visual equivalence to the world. The common reality refers to the familiar and everyday perceptions and experiences of objects and events that human share. Children creates characters, objects and settings in their drawings very much like those in make-believe play. The archeological reality is the reality of self which involving a self-defining process of children's drawing. Children delineate a concept of self to experimenting with self-images and self-possibilities.

The normative reality is the reality of good and bad, of right and wrong, subsuming the implicit and explicit rules by which an individual or a society behaves. Through drawing, children can portray themselves the standard of right and wrong, symbolically determine how they might be and how they ought to be to make the exploration. Children involved the prophetic reality in their drawings to anticipate the future and seek to control future wants in a variety of ways. Children built their own realities incorporating bits and pieces of the already existing world of their own culture, or models of the four realities. The reality making drawings of children combine innately determined features encountered in the culture with influences from drawings, illustrations and other graphic media of the culture.

The style of a child's drawing can be influenced by the interaction of natural and cultural forces. Wilson and Wilson (2009) argued that practice at drawing exposure to other people's drawings are necessary. By the same token, Braswell (2001)

suggested that social interaction plays an important role in young children's drawing activities. In their study, they found that young children learn to create graphic representations through utilizing information from their mothers' drawings and from conversations with their mothers about drawings, although the extent of children's learning is related also in part to their level of drawing performance.

A child's drawing is a commonplace of everyday life. Farokhi and Hashemi (2011) pointed out that researchers can use children's drawings to assess their view, as well as demonstrate their knowledge and experience. It is expected that throughout the primary school years, along with other artwork, drawing is deemed to be instrumental in developing children's imagination and creativity. This is how the context of their own work is to be related to others' artwork at different stages in this development is an avenue which will need to be explored through the imaginative work of children.

This research aims to analyze children's drawings. For this purpose, researcher employed Wilson and Wilsons' theory of seven graphic principles to examine primary school children's drawings of the objects inside a house. The children's drawings were examined in order to understand drawing's characteristics and determine whether or not Malaysian children's artistic development can be established using the Wilsons' seven graphic principles.

1.3   Problem Statement

Numerous expert scholars have expressed their perspectives regarding the analysis of children's drawings, for instance, in relation to the development (e.g. Didkowska, 2016; Almeida, 2003; Deornellas, 1997; Chan & Louie, 1992), gender (e.g. Bakar, 2001; Tuman, 1999), socio-cultural (e.g. Lau, 2013; Hopperstad, 2008; Braswell & Callanan,

2003; Cugmas, 2004), expressions (e.g. Sumanto, 2017; Hsu & Ya-Huei, 2014) and drawing characteristics (e.g. Tamara, 2014; Türkcana, 2013; Deaver, 2009; Yang & Noel, 2006).

Definitely, drawings provide valuable insights into children's thinkings and records of their growth and development. Regarding the development of drawing in children, although children usually follow these stages, they also defy the rules and produce combinations of stages. Barnes (1987) noted that children move clearly from one stage of drawing to another, but their progress is not very steady. Undoubtedly, it cannot be assumed that children's drawings are always typical of a particular age-range. In this regard, there are implications to further investigate contemporary typical developmental characteristics in children's drawings. Moreover, there are some issues raised in the previous studies that have not been resolved by the results.

One primary problem is lack of current normative data about children's drawings. In the educational context, drawings have been used as assessment tools but reports of using children's drawings as an evaluation tool are relatively rare. Other studies (Hsu & Ya-Huei, 2014; Tamara, 2014; Cugmas, 2004) have failed to support what developmental changes have occurred in children's drawings as the they only used small number of children and children's drawings for analysis. As a result, Cugmas (2004) suggested that the analysis of children's drawings should include a larger number of children and the analyses of more drawings. On the other hand, Chan & Louie (1992) proposed that future studies can further extend drawing task to include objects, such as house or car to assess the developmental trend of drawing based on different themes. This could help researcher to understand the uses of different themes that influenced the content and structure of children's perceptions in their drawings.

Furthermore, in previous studies, sample was limited to one age-group, so far

is lacking of generalizability to other ages of children. Only a few studies of children drawings (e.g. Putih, 2002; Chan & Louie, 1992) have conducted using different age groups of children. Türkcana (2013) discussed that studies of children's drawings should look from a more generalizable perspective. This can be applied to comprehensively understand the relationship between children's drawing characteristics and age. It was noted that children apply the seven graphic principles differently at different levels of their development (Wilson & Wilson, 2009). Nevertheless, there is no any direct evidence proved by Wilson & Wilson about the seven principles in respect to children's age levels. These principles were not differentiated by age levels. Also, there is no previous research using Wilsons' seven graphic principles as an approach to analyze children's drawing characteristics if compared to other popular theories such as Lowenfeld and Kellogg

Different aged children create a number of "errors" in their drawings as they become more intentional realist and their drawings become characteristic of failed realism (Luquet, 2001). Though the older children (11 to 12 years old) who under the stage of dawning realism (Lowenfeld & Britain, 1987) are most probably able to create realistic drawings. However some of them still depict pictures with few details and improper orientations. There are apparent imperfections in children' drawings as it depends on their progress in particular stage of artistic development. Taking this issue in hand, it appears that there is necessarily for researcher to understand the meanings and concepts of children's drawings with their artistic development using appropriate ways to analyze their drawings.

Above all, the foremost problem is the fact that many children lose their interest in drawing at the stage of "dawning realism" stage because they become frustrated with their attempts at representing real life in their drawings. There are many "errors"

appearing in children's drawings (e.g. transparencies, differences in size, etc.). Those "errors" show technical graphic problems of poor position, orientation, and proportion. They were actually problem solving solutions that the children had adopted to overcome the limitations of representing three-dimensional reality on a two-dimensional surface (Anning & Ring, 2004; Freeman, 1980; Arnheim, 1974). Luquet (2001) noted that many children stop drawing between 10 and 12 years old. The older children stop drawing because they do not feel that their efforts are satisfactory as their drawings are not realistic (Winner 1986).

Furthermore, Gardner (1980) explained that children will more likely to continue to draw if they are able to solve the problems of proportion and perspective to their satisfaction. Importantly, the support, time and opportunity for children to pursue complexity in their drawing have to be part of the teaching and learning process. Teachers need find more suitable ways to teach proper drawing's skills. However, art teachers who are not graduated in Visual Art Education are lacking in appropriate experience and training. This is supported by Abdullah (2013) that, teachers who are not major graduated in Visual Art Education has been posted to schools to teach the subject. As a result, those teachers are lack of knowledge and skills in the field of Visual Art Education if compared to trained art education teachers (Liau, 2018; Piaw, et al, 2003). Given the foregoing concerns, this problem can be rectified by analyzing drawings of children to understand more completely the key tenets of their drawing development.

1.4   Research Objectives

The research seeks to study drawings of a group of Malaysian primary school children of six age groups. The objectives of the study were to:

i.   To identify the most common Wilsons' graphic principles that children used in their drawing of the objects inside a house.

ii.   To determine the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age.

iii. To determine the relationships between children's used of Wilsons' graphic principles and their stage of pictorial development.

1.5   Research Questions

To facilitate the study, the following research questions were formulated as a guide:

i.   What are the most common Wilsons' graphic principles that children used in their drawing of the objects inside a house?

ii.   What are the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age?

iii. Are there any relationships between children's used of Wilsons' graphic principles and their stage of pictorial development?

1.6   Significance of Study

This study on the analysis of primary school children's drawings based on Wilsons' seven principles have numerous significances as follows.

i.   Visual Art Teacher

Data given provide the art teachers with information on children's artistic development. The findings contribute to the body of useful knowledge about the

development of children's drawings. Teachers can benefit by gaining insight into what children are drawing, basically their drawing's characteristics.

As teachers who concerned with curriculum development in art education, it is important to understand the characteristics of children's art based on the theories of children's artistic development. For instance, teachers would understand the characteristics of perpendicular and x-ray drawing in children's drawings based on Wilsons' theory. The results of this study enable the art teachers to understand well about Wilsons' seven graphic principles that applied by children at different age range. With this understanding, teachers can make sure that every art medium and activity they offer provide opportunities for children to work in the most appropriate way. This will encourage them to value child art as a developmental process, not a product.

The most effective way to facilitate drawing development is to interact and to present children with drawings at slightly higher level that their own, as well as verbal descriptions of the next level. In order to interact with children sensitively and spontaneously in the course of the graphic development process, it is important that teachers be able to anticipate the subsequent steps in the children's drawing development. Therefore, data gathered from this study help the art teachers become familiar with the general course of the children's drawing development.

Teacher's assistance is necessary to evoke children spontaneity and creativity in drawing. Children need the support and encouragement from teachers in order to keep them confident to continue drawing. Thus, teachers need to understanding the nature of art teaching and the minds of children. The difficulty a teacher has in persuading children to draw can partly be solved by understanding what they are capable of doing. It is also important and necessary for art teachers to give the correct

instruction in technical drawing techniques so that children are confident in their drawings efforts.

Through this study, teachers could discover a deeper layer to what children are drawing by knowing how to interpret their drawings. With these efforts, teachers can understand better what the children are thinking. For example, when a child draws a horse by using two contiguous circles and three lines for legs, it shows that the child understand the basic spatial relationship of horses. Importantly, this study will foster new ways of enhancing knowledge, skills and attitude, thus preparing globally-competitive visual art teachers in the future.

ii.   Parents

The output of this study is a source material that parents can use as a guidance to know about characteristics of children's drawing development. Development does not proceed at a regular pace. Children's artistic development theories in this study have been provided to help parents better understand the art behavior of children at different age range. It provides parents opportunities to offer the most appropriate art experiences and encouragements to their children at the right time.

Parents should enhance their perspective and awareness toward their children's drawing development (Hsu & Huei, 2014). Through this study, parents will become aware of their roles and influences on their child's drawing progress. It would be absurd to view the child of seven or eight years old as a mature artist. Because so many different elements and experiences come together in children's drawings, simple explanations and interpretations of their creative work are not always possible. In order to avoid imposing adult standards on children's drawing, parents need to understand the content and meaning presented in children's drawing. Thus, the Wilson's theory of graphic principles could provide a greater insight into the complex

nature of children's drawings.

The results of this study will provide some insights and information on how importance of drawing for children's growth. The growth of young children from exploring scribblers to symbol-creating artists is an amazing process. Initially, children draw by memory those items they have already encountered and knows, but without any care for accuracy (Vygotsky, 1978). If parents want their children to progress in drawing, they should accept their most primitive attempts to draw and able to determine where children stand developmentally.

iii.   Ministry of Education Malaysia

The data of this study provide information on the current characteristics of drawing that primary students have. The findings of this study also provide preliminary information on the impact of drawing and children' artistic development to enhance their performance in Visual Art Education.

Data produced from this research can be used as a guide in improving the quality of content in Visual Art Education curriculum. It will redound to the benefit of Ministry of Education Malaysia considering that drawing plays an important role in children artistic development. The implications of drawing to children generally are to help them in their growth and development (Maulana & Rohkmah, 2017). Thus, Ministry of Education could introduce more effective and meaningful teaching and learning strategies by creating moduls for teachers and students to further support the Visual Art Education environment.

In addition, this study is expected to contribute to Visual Arts Education as well as additional information and knowledge to potential or future educators, in the field of art or teaching in Visual Arts Education. This information can inform how the curriculum is structured and provide a marker of early artistic development. It is hoped

that this study will also bridge the gaps resulting from the existing agenda for Visual Arts Education subject in line with other subjects. All of these findings have prompted the Ministry of Education to further its efforts towards generating creative and innovative human being.

1.7   Limitations of Study

Every research has limitations. Research limitations can exist due to constraints on research design or methodology, and these factors may impact the findings of the study.

There are limitations in this study. As researcher is now teaching in primary school and studying about children's artistic development, researcher decided to get the sample of this study from the population in the present school. The study was confined to primary school students only, including students from standard one to standard six, ages of seven to twelve, which involving only one school.

The population under study was limited to Cheras district which is located at Selangor state. Not all students of the population have a chance of participating in the study. The sample size of this study was 335 students. These students have met once to collect their drawing products. The results of this study were limited to the sample and population involved and should not be generalized to other populations. The study was limited in its design, method, measuring devices and statistical techniques.

1.8   Operational Definitions

There are five main terms in this study, which are analysis, children's drawing, primary school children, children artistic development and Wilsons' seven graphic principles of children's drawing.

i.   Analysis

Analysis is a detailed examination of anything complex in order to understand its nature or to determine its important features. Based on the definition from Cambridge Academic Content Dictionary (2017), analysis means the process of studying or examining something in an organized way to learn more about it, or a particular study of something.

In the present research, the analysis is to examine and identify the drawing's characteristics of children based on Wilsons' seven graphic principles, with drawings collected from seven years old to twelve years old children currently attending a primary school.

Numerous expert scholars have expressed their perspectives regarding the development and analysis of children's drawings. Through the process of observing and analyzing the drawings of young children, insights can be gained as to the social or emotional, physical, and intellectual development of each child (Farokhi & Hashemi, 2011). In addition, Hsu & Ya-Huei (2014) and Toku (2001) also carried out the research on analyzing children's drawings. Hsu & Ya-Huei (2014) maintained that the imagination and creativity expressed in a child's drawings can be determined by analyzing the theme, structure, characteristics, and color.

ii.   Children's Drawing

Drawing is the manipulation of lines to create a visual effect. When the child transfers his or her hand's activities to lines, only then he or she draws (Longobardi, Quaglia & Iotti, 2015).

A drawing is usually a representation of something. Drawing is the idea that simple forms may stand for a variety of different objects (Willats,

2005; Arnheim, 1974; Kellogg, 1970) As these investigators have noted, the construction of many varied pictures from a few simple shapes is possible. One shape can represent many different things. For example, in a child's drawing, circles may be used to represent a head, eyes and even the teeth of a saw. Arnheim (1974) in particular, considers that circle is universal in children's drawing and important in their drawing development.

Drawing is a form of visual language (Hawkins, 2002; Gentle, 1981). Young children can typically construct their pictures from a limited "vocabulary" into simple shapes and lines. In contrast, drawings of older children often contain continuous contours in which a complex shape is produced with an embracing outline. Drawings is always an interesting topic to discuss. This is especially so when it involves children's productions. Thomas & Silk (1990) indicated that a great deal of investigation of children's drawing has considered only the finished pictures that children draw.

Children's drawings are analyzed to explore their view of major problems in the world today and in the future. The term drawing can be used to describe a product and a process at the same time. By a product, it refers to the end result of mark making whereas process refers to the on-going drawing activity. This definition is in line with what researcher wants to investigate because children draw purposefully to communicate a message to and about the world around them. Child art is an important facet for understanding how children think. When children draw a shape, whether simple of complex, it involves a number of decisions. Many researchers (Wilson & Wilson, 2009; Lowenfeld, 1964) have noted the fact that children use drawing to develop, create, communicate and record their thoughts.

iii.   Primary School Children

A primary school (or elementary school in American English and often in Canadian English) is a school in which children receive primary education from the age of about seven to twelve, coming after preschool and before secondary school. In Malaysia, primary education is the first stage of compulsory education. Primary schooling is mandatory for all children (Ministry of Education, 2016). Thus, children between the ages of 7 and 12 have to register and enroll at primary schools.

iv.   Children Artistic Development

Every human being goes through the artistic development in life. Same as the children too, they go through visible stages of artistic growth, reflecting the increasing muscular control and cognitive growth. This development does not proceed alone, but accompanies simultaneous growth in language and reasoning. Koster (2001) pointed out that, artistic growth reflects the cognitive growth that is necessary for children in their beginning of their writing.

The term "artistic development" implies that this phenomenon is concerned with human development in the domain of art. Over the years several models of artistic development have been created. Each provides important perspectives on the teaching of art to young children. Kellog (1970) was one of the first to recognize that the scribbles of young children were an important part of the children's development. She also isolated twenty kinds of markings made by young children which called basic scribbles. She argued that children need plenty of time for free drawing and scribbling in order to develop the symbols that will later become the basis of drawing.

Lowenfeld and Brittain (1987) built on Kellogg's work with young children and expanded the developmental sequence through adolescence. The stages they developed are basically descriptive generalizations of the kinds of drawings children make at different ages. Scribbling, shape making and the graphic symbols' development were found to be important parts of the normal children's development. In making drawing, the strategies used by children are of interest in their own right because of what they reveal about the development of representational schemata and of planning and organizing skills (Thomas & Silk, 1990). Therefore, the understanding of the effects of those strategies is also an essential requirement for any adequate interpretation of a drawing.

v.   Wilsons' Seven Graphic Principles of Drawing

The nature of children's drawing is determined by an innate set of graphic-ordering principles. Wilson & Wilson (2009) proposed that children possess seven innate "graphic-ordering principles", which included simplicity principle, perpendicular principle, territorial imperative principle, fill the format principle, conservation and multiple application principle, draw everything principle, and plastic principle.

These seven principles are commonly applied by most of the children, but they are not used by all children all of the time. This is because children apply these principles differently at different levels of their development. Children are hardwired to keep their drawings as simple as possible, to organize lines and shapes at right angles, to avoid overlapping, to conserve and reuse configurations they have mastered while they still achieving their graphic goals. Wilson & Wilson (2009) claimed that if children do not learn to

overcome, or subvert, or learn to take advantage of these inherited biases, their graphic development will be impeded and eventually stop.

Each adult who interacts with children as they draw must decide how much or how little to influence the child's drawing development. Harris (1963) pointed out that as children grow older, their drawings become more detailed, better proportioned and more realistic. However, there are some striking and distinctive features which characterize the drawings often made by children at each stage in their drawing development. To assist and teach children to draw, it requires a knowledge of children's graphic development steps.

1.9   Conclusion

In this chapter, researcher described the background, problem statement, objectives, significance and limitations of the study. Definitions of terms were also explained clearly. The next chapter discuss about the children's drawing, theories of children's artistic development, Wilsons' seven graphic principles and related past researches of the area of this study. The literature review aimed to discover what researcher in the area chosen have been, and also to clarify the problem or issue to be researched. Then, the theoretical framework was developed to guide this study, determining what things to be measured, and what statistical relationships to look for.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

The review focused on literature covering topics related to analysis of children's drawings. The first section of the literature is on children's drawing and its underlying theories. The second section focused on the importance of drawing in children.

Next, researcher also discussed on the children's artistic development theories for better understanding in children's drawing. Lastly, researcher had outlined Wilsons' theory of seven graphic principles which have been used to analyze children's drawing in this study. Previous researches on children's drawings were also looked into and identified the gaps, which led to the present study.

2.2   Children's Drawing

Children's art like drawings has been studied for over one hundred years mostly by psychologists and educators. Drawing is one of the most important activity for children. Drawing is the single most accessible form of art available and just need a pencil and a sheet of paper. Drawing also provides the basis for other creative activities like painting, sculpture and printmaking.

In drawing, one has to reproduce the world in pictorial images that can be quite complex. In that process, children not only need to bring out a picture of three-dimensional objects onto a two-dimensional surface, but also bring out the right representative symbols in the image. The process of constructing a drawing is much more complex than a simple translation of a mental image onto paper. Freeman &

Janikoun (1972) discussed that some of the more remarkable features of young children's drawing may be by-products of drawing strategies rather that reflections of children's conceptions of the topic portrayed. The strategies used by children in drawings are of interest in their own right because of what they reveal about the development of representational schemata and of planning and organizing skills. Based on the empirical study on children's art, it is found that the creative growth of a child can normally be seen in three recognizable stages, which are scribbling or manipulative, symbolic or schematic and representational or realistic.

The general course of the development of the child's ability to draw is best described through the development of the human figure which is the most frequently depicted by children. The evolution of the figure from its genesis in the child's first scribbles, through its unfolding, to its conclusion as a complex depiction of the human form. Anning & Ring (2004) stressed out, from the perspective of "natural" development, it is clear that children use drawings as a tool for understanding and representing important particular of their own personal, lived experiences of people, places and things. Winner (1986) and Gardner (1980) proposed that drawings of children are transformed in their very nature between the ages of 7 and 12 years. They are transformed from non-aesthetic to aesthetic symbols.

Children engage more often in drawing than in any other pictorial activities such as painting. They can easily draw by using pencils, crayons and paper. The work of Luquet (2001) and Lowenfeld (1964) has greatly influenced art educators' understanding of how children grow in the artistic development. Lowenfeld (1964) has emphasized the significance of changes in special relationships as well as in form of development from one stage to the next. Whereas Kellogg (1970) has put more emphasis on the prefigurative pattern-making stage of early childhood art. Especially

children between ages 2 and 4 years enjoy making marks. Through scribbling activity, children set to create basic elements of symbolism in art.

Indeed, children art is just simply "children art" and should be allowed to grow along with the children who produce it. Children's drawings reflect the growth of activity from simple to compound, intentional and planned actions. Either Kellogg (1970) or Gardner (1980) has been written about the stages that children go through from scribble through symbolism and schema to visual realism. Although development is essentially linear in nature, children may skip ahead at any time or return to an earlier type of depiction for reasons that are entirely their own. Moving back and forth among the various stages is normal and should not be regarded as regression.

2.2.1   Types of Drawing Representations

In drawing, there are some information about the structure and appearance of the topic or scene represented. It is needed to be clear about the kind of information which presented in children's drawing.

Children's representational drawings are usually initiated by the child's desire to draw subject matter of the people and things. To produce a representational drawing, children need to grasp the features of an object as component parts and decide how to draw it on paper using lines in specific positions and in a certain order. Children's drawing can be considered as a process that can be traced back to the children's mental representation of the subject matter they have depicted. The analysis of the construction process in children's drawing may contribute to developmental and cognitive psychology about strategies of representation and the presentation of information. Obviously, children in their drawings present different kinds of information. In children's drawing, their knowledge and concepts from the

information need to be made with care.

Drawing that present information about the topic or scene portrayed give two kinds of information. Thomas & Silk (1990) distinguished between these two types of information about the way that object or scene looks from a particular viewpoint. Pictures that present structural information can be further subdivided into those that provide information about the structure of the object, or termed as object-centered representations.

Most of the older children's drawings, often display object-centered information about the structure of the object depicted. Array-centered representations refer to pictures that present information about the special relations of objects in a scene. Figure 2.1 shows two kinds of representations (Thomas & Silk, 1990).
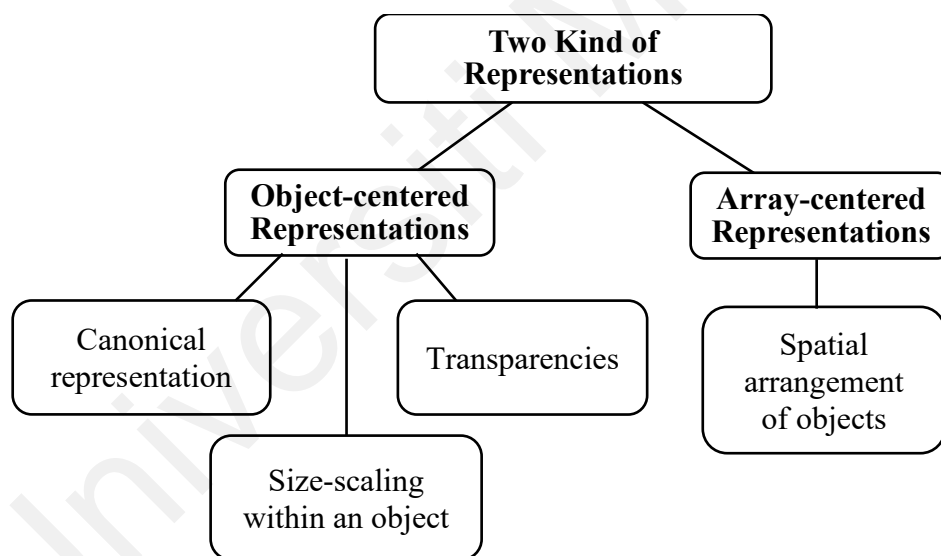
Figure 2.1. Two Kinds of Representations (Thomas & Silk, 1990)

As Thomas and Silk (1990) outlined, in the object-centered representation, the problem was viewed from the issues of representation of canonical forms, size-scaling within an object including proportion and employing transparency techniques. The canonical representation refers to general purpose representations that make the object

easily recognizable. Freeman (1980) stated that the canonical view of an object is the best way for conveying structural information. Children usually choose to draw familiar objects in their canonical orientation. For example, in children's drawing, the canonical representation of a house and a human figure are usually in a frontal position, while cars and animals in side-view.

The correct relative size of an object is an important aspect of the object's structure. Children will produce the wrong scaling in their drawings if they have planning problems. This was studied by Thomas and Tsalimi (1988), they found that the common tendency of children to exaggerate the size of the head in relation to the trunk was the problem of planning failure. Planning problem may result in certain parts of the figure, for instance the head, being disproportionately large. More realistically proportioned images are not drawn by most children until at least the age of 8 years.

Türkcan (2013) has studied the semiotic approach in the analysis of children's drawings. In his study, his found out that the children used the objects in their drawings mostly with icon including its direct meaning and secondly with its symbolic meaning. In any drawing by any child it is possible to observe the consequences of two major factors. The universal graphemes and universal intrinsically biased graphic features such as perpendicular arrangements and avoidance of overlap may be seen in relationship to fix a culturally specific graphic and artistic models. These models subtly inform children regarding how they should arrange, combine and modulate the graphemes to form the "words" of their graphic language.

Arnheim (1974) defined that, mark making is a fun activity and, although children may initially gain sensory pleasure from the process of gamboling on paper. Adults should reflect on the suggestion that children use drawing to create a meaningful whole which combines diverse elements of their experience.

Developmental perspectives are among the most widely examined, establishing the possibility of universal developmental stages in children's artistic expression. Lowenfeld & Brittain (1987) noted that, in the process of selecting, interpreting and reforming these elements, children have given us more than a picture, as a part of themselves about how they think, look and feel.

Performance factor often play a crucial role in determining the information apparently presented to draw inferences about children's knowledge and the kinds of information that they have presented in their drawings. Barnes (1987) pointed out that, when children draw form experience of looking, they often draw expressive points which adults miss. Every drawing has a purpose and meaning deserves both notice and a question or comment by adults. When adults question and even guess about the content of children's drawings, they can persuade children that adults are truly interested in their drawings and consequently in the children themselves.

2.2.2 Characteristics of Children's Drawing

Children's drawings often look stereotyped. The drawing characteristic of children's drawing development reflects what children at each stage typically regard as an adequate representation of the topic. Each child's art is unique and follows a universal pattern of development.

Children learn very quickly and make basic symbols for people and objects with no assistance. These symbols for a person, a sun or a house have at least some visual correspondence to objects in the world and are easily understood. These visual symbols or pictures provide children with their primary symbolic means for understanding reality. Children's drawing abilities develop more or less 'spontaneously' and universally. Drawing development can be characterized as

occurring in multiple tiny steps and adjustments. It is described more aptly as 'organic growth and fortuitous discovery' (Wilson & Wilson 1987). Through their drawings, they are able to record their ideas, feelings and experiences. This means that, when children draw, children are developing, presenting and expanding their own ideas or conceptions about reality on drawings.

All children go through the same stages but the age at which this happens different. Young children learn how to make marks on paper during their first drawing. They want to see what they can do through practice and repetition. When children gain greater control of pencil, their drawings are easily to have circular patterns. As children are able to consistently draw circles and lines, they will make circles with lines radiating from them. After that, these circles and lines start to become objects like people, as children are able to represent what they are thinking about. With continued practice, their drawings are finer with details and start to appear more features such as people having hair and fingers

Children's drawings are often extremely neat in their layout. Objects are drawn with discrete boundaries and often with minimal contact with other objects. Drawings are often clearly spaced out. This demands clear positioning skills. These are problems in handling of spatial problems and scaling. Children's drawing also often display the impression of a mixture of viewpoint when a number of objects are drawn together as part of a scene. Instead of drawing a number of separate objects on the page, children may try to put them together so that they can make up a scene. Young children draw different parts of the same object or different objects in a scene in order to show an overall view.

One of the very curious and striking features about young children's drawings is the rather jumbled fashion the objects are drawn. Children usually draw something

that is clearly recognizable as a human, a cat, or a house. To ensure that the drawing is recognizable, they will define the important features of the object. Generally, they draw houses and human figures in a frontal position, and cars and horses in side view. They represent those objects in the canonical view or position. If children produced a set of canonical forms in a single drawing, this could look dramatically unlike a real scene, but it would be constructed by one single system of pictorial representation. Sometime, the objects show mixed views, in which a body might be drawn in frontal view while its head might be drawn in side view.

Drawings made by children aged 7 years may be still contain elements which the child knows to exist, even though they cannot normaly be seen. Piaget and Inhelder (1963) stated that, children draw what they know about the world, rather than trying to capture a photographic mirror of reality. That is why their drawings depicting both the outside and inside of an object at the same time. This result is a so-called "transparency" or "X-ray" drawing which is characteristic of what Luquet (2001) has termed in the stage of intellectual realism.

In addition to supporting literacy, Freeman (1980) has distinguished between these two types of X-ray drawings. First, the drawing which depicted something that is usually never visible in the real world. For example, a baby may be shown in the mother's womb. The child was intended to show the normally hidden contents of the stomach. The second type of transparency is children fail to show occlusion of something that is normally hidden behind a nearer object. For example, a man in horseback with the hidden far leg of the rider can be seen through the horse's body.

In addition, children's drawings cannot be easily understood out of context. Children try to create appropriate compositions for the thematic content they are expressing. They can also omit or exaggerate certain elements to achieve an expressive

aim. Children have a keen interest in creating representational art based in direct observation and memory. While approaching realism, children's drawings remain imaginative throughout the preschool years with imagination leading color, composition, and content.

Children find perspective so hard to construct when it comes to drawing. In drawing a real scene, rules must be observed for projecting it onto the picture plane. Perspective is a system of drawing, which revolves around a line of sight by not drawing it directly on the picture plane. In general, as children grow older, their drawings become increasingly realistic. Drawings by children at five to eight years old are increasingly visually realistic in terms of scaling and detail.

2.2.3 Subject Matter of Children's Drawings

Once the child had learned the technical skills for drawing lines, the child could start to represent subject matter form the object itself. Chapman (1978) defined that subject matter is the actual or implied content presented in or through artwork, which may have several levels of meaning. Cox (1992) indicated that the human figure is one of the earliest and most popular things that children draw. It first appears in a rather bizarre form looking like a tadpole.

In the early elementary grades, children seem to prefer drawing people, simple landscapes, animals and objects like cars and airplanes. Koppitz (1968) and Lark-Horovitz, Lewis & Luca (1967) have concluded that animals, houses, cars, boats, planes and flowers are popular topics of children's drawing. In pictorial work, symbols representing people, houses and tress are often placed along one or more baselines. This arrangement retains the visual clarity of each part. By the end of third grade, children begin to use overlapping shapes to show near and far space in the drawing.

Whereas Cox (1986) has noted that, many young children draw a single square to represent a house. Based on Kitahara and Matsuishi (2007) study, the first and favorite subject that children draw is human beings, and the second subject is the house in which they live. They begin with the facade of the house, which in its most primitive form is drawn simply as a quadrilateral or rectangle, with or without windows, without a roof and often also without a door. When children reach a higher stage, they draw windows, door and roof, this being mostly shown as a triangle or a trapezium, but sometimes also as a rectangle or a semi-circle. Some of the children might also represent religious subjects in their drawings.

The most common element of children's drawings is house and tree (Walker, Myers-Bowman & Myers-Walls, 2003). Lark-Horovitz, et. al. (1967) had investigated that the houses and children's intimate world were important subjects to children. The house represents a stable place where the child's basic needs are met, and where the child generally spends the majority of time (Walker, Myers-Bowman & Myers-Walls, 2003). This stage of drawing is known as the schematic because of the nature elements and the way the objects are lined up along the bottom of the page (Lowenfeld & Brittain, 1987).

2.3   The Importance of Drawing in Children

Drawing is a necessary activity for children and need to be encouraged and nurtured. McQuistan (2017) explained that drawing as an art form and visual culture.

Children's drawing should be looked at, talked about, appreciated, and understood by adult. There is more to children's drawing than has been widely recognized and certainly a good deal more than meets the eye. Figure 2.2 shows the importance of drawing in children.
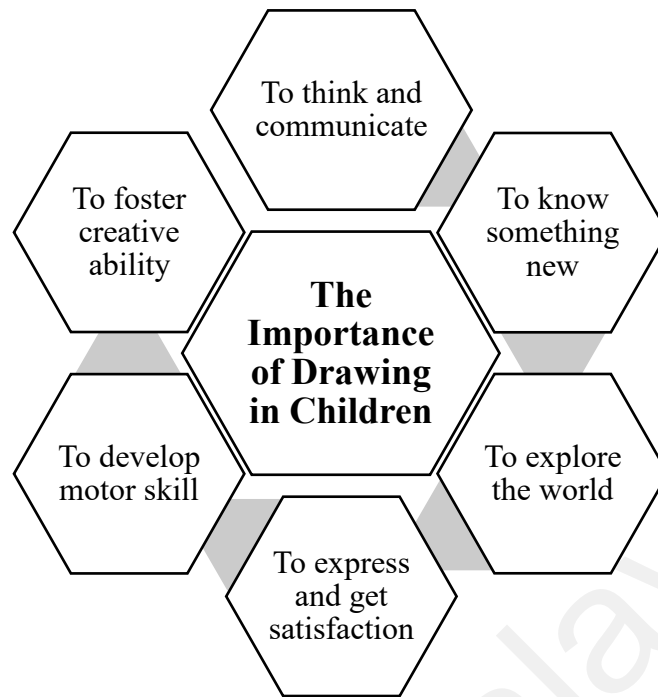
Figure 2.2. The Importance of Drawing in Children

Art making is a process that brings together many different experiences for children to create something new and unique. Drawing is a tool with which to think and communicate. Eisner (1972) suggests that through the arts, it is not only possible to communicate feelings and emotions, but also knowledge which cannot always be reduced into words for communication to others. Through art, ways of knowing and feeling can be expressed, provoking understanding in those who share in the art. Children are not able always express themselves using words and actions, so drawing is another important form of communication. When children draw, they are constantly thinking or feeling something, so what they choose to draw and the story they try to portray help them build in their knowledge and visual skills. The process of drawing requires children to choose, translate, and arrange the elements of art such as lines and shapes to convey a thought, feeling, synthesizing many components involving content, style, and compositions to create interesting form.

Children love drawing because they draw to know something new. Children

are most concerned that the objects in their drawings can be identified even though they draw readily and without inhibition. In their drawing, they create characters, objects and settings. In this way, children are the creators of their own worlds, in which things may be seen, and examined, to find out what they are like, what they can do and how they work. When children draw something familiar to them, for example, a dog, they have the opportunity to think about what they know and how they feel towards this animal. They also use their memory to recall what they know about dogs, in turn extending their concentration and thought-processing skills. Drawing too, provide a way for children to develop models for their own future selves, actions and worlds.

Children draw in order to symbolically explore their worlds. Anning & Ring (2004) pointed out that people draw because they want to use drawing as one of the models available to them for exploring idea. Drawings provide an early means or the first perception by which ideas and feelings can be made concrete and perceivable. Young children learn to draw very quickly to form basic graphic symbols in their drawings. These symbols for a person, a sun or a car have at least some visual correspondence to objects in the everyday world and are easily understood. Drawing provides a more flexible way to develop ideas about the reality because it is easily acquired and understood, and because it has a visual equivalence to the everyday world.

Drawing makes children more expressive. Being able to express what they feel also boosts a child's emotional intelligence. Children make drawings for the satisfaction they get from the activity. Selfe (1983) noted that the purpose of drawing is to produce a satisfying symbol of visual aspects and emotional experience. Children engaging in it and becoming absorbed in it much as they do in their solitary play with toys and materials. In drawing, children find they are satisfying to produce pictures

because pictures symbolize and express their interests. Lowenfeld (1964) claimed that the major reason for drawing is self-expression in art which provides satisfaction. Arnheim (1974) also mentioned that, children aim to draw symbols and implied that artistic expression in pictorial symbols is universally satisfying.

At school, drawing's activities always will be encouraged. It is generally reckoned to be a very important activity. In drawing, it helps to develop children's motor control over pencil or crayon and this presumably facilitates the forming of letters and figures. Lowenfeld (1964) discussed that children's physical growth is reflected in his creative artwork by his capacity for visual and motor co-ordination. By the way in which the children draw lines, they are able to control their body and utilize skills in drawing. Thus, children are able to develop physically by improving the ability to control large and small muscles and by refining hand-eye coordination.

Children have different reasons for drawing. Adults can learn many things from how children behave and react artistically. By observing children's drawing, one knows about the growth of children in the areas of physical, social, emotional, spatial, symbolic language and cognitive understanding. Drawing plays an overwhelmingly important role in the definition and analysis of children's art. There is no fixed relation between the age of a child and the stage of his drawings. Just as children of the same chronological age vary in their so-called mental age, so their drawings reflect individual variations in their rate of artistic growth. For some the pleasure of drawing may be the creation of a symbolic world in which children can exercise the control which they lack in the reality.

Last but not least, drawing is important in fostering the general creative ability of children. Creativity focuses on the process of forming original ideas through exploration and discovery. Creative growth starts as soon as the children beings to

document himself, which they may do by inventing concepts such things as "man", "house" and so on. In children, creativity develops from their experiences with the process, rather than concern for the finished product. Through drawing activity, children creativity could be unlocked and the imaginative life of the children could come to the fore.

The simple act of drawing does indeed play an important role in a child's physical, emotional, and cognitive development. The drawing activity becoming more widespread among the child population. Drawing is an artful activity, requiring the mastery of particular techniques. Therefore, a balanced education for every child should include the teaching of drawing. Consequently, adults should be able to teach children the basic techniques of drawing, without sacrificing their creativity and do not force them produce only fixed solutions and stereotyped pictures.

2.4   Children's Artistic Development Theories

Children's art tends to look the same throughout the world. There must be something "natural" in the stages of development because the characteristics of children's art are similar. By viewing artistic growth as a developmental process, it will guide adults to respond better to the artistic growth of their children.

Children develop their own personal style of drawing. In drawing activity, children also develop strongly personal preferences for what they want to draw and how to draw it. Developmental theories in art have certain common characteristics and are based on some shared assumptions. Each of these stages refers to a combination of visual characteristics found in the children's artwork. "Developmental-Stage" theory assumes that the stages occur in a sequential order. Little attempt has been made to relate these stages of growth in art directly to chronological age because so many

factors contribute to the child's development in art.

Many theories have been proposed to explain the distinctive character of children's drawings. Most often these explanations parallel or are part of the larger stage theory, which states that children art development consists of an unfolding of innate rules within stages. These theories may help to suggest some explanations for the curious features that are commonly depicted in children's drawings. Moreover, some of these theories are relatively rare examples in the literature on children's drawings in that they attempt to provide a detailed analysis and holistic framework for understanding the developmental pattern of children's representational drawing. The theories also complement each other, like Willats and Luquet's theories, as each goes some way in providing what the other is lacking. Luquet's classification of stages of development has subsequent work of Piaget (Thomas & Silk, 1990).

Figure 2.3 below is about the related theories of children's artistic development with the theory of Wilsons' seven graphic principles. These theories are from Arnheim, Willats, Piaget, Lowenfeld, Golomb, Luquet and Freeman and Janikoun.
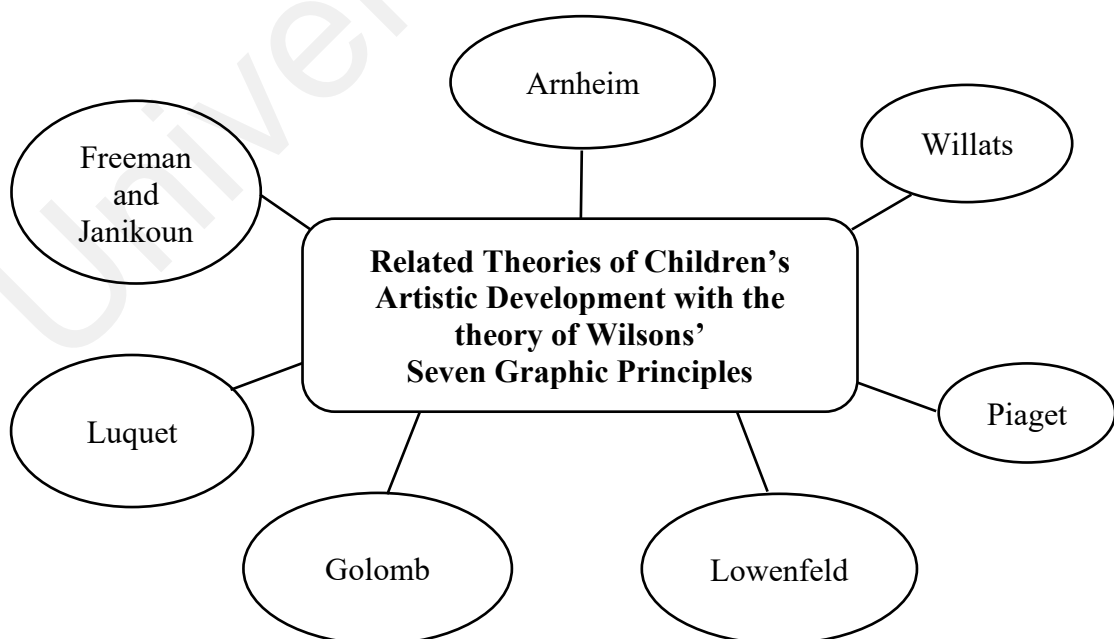
Figure 2.3. Related Theories of Children's Artistic Development with the Theory of Wilsons' Seven Graphic Principles

2.4.1 Arnheim

During the early elementary years, children continue to develop their work by a part-by-part thought process and they show greater detail within parts after the years. Arnheim's representational theory has provided a productive framework within which to reassess children's drawings.

Art making always involves simplification. In early child art this simplification is at an extreme. Arnheim (1974) had discussed about the law of differentiation, indicated that organic development always proceeds from the simple to the more complex. Arnheim believed that perceptual organization develops from simple forms into more complex ones. Children only gradually come to differentiate the particular shapes of objects and surfaces, both in perception and in their drawings.

In Wilsons' graphic principle of simplicity, it is normally applied by younger children in their drawings as they are not yet able to draw complex forms. Young children use simple forms to represent objects, regardless of whether or not the precise shape of the form matches that of the object portrayed. The frontal view of object in children's drawing does not imply that the child intends to portray a specific aspect of the appearance. They do not intend to draw the objects from a specific viewing point, rather their major aim is to capture its general characteristics.

As the children become confident to hold in mind the features they consider important to the topic, and in relating the parts synthetically, an increasing number of details are depicted. Children who age of about 12 years old will gradually add more details to their drawings of human figure. For example, clothing may be added to the human figure drawings.

2.4.2   Willats

With a reference to Willats (2005) and his theory of drawing systems, he has derived five drawing systems that can be summarized as topology, orthogonal projection, horizontal and vertical oblique projections, oblique projection and perspective. As the children's drawings fell into these categories to an age-related sequence, children might pass through these systems as "stages" in development (Freeman 1980).

Willats explored how children and adolescents draw a rectangular table on which three items, a radio, a box, and a saucepan are displayed. Analyses of the drawings reveal a number of distinctive solutions to the problem of representing a three-dimensional table on a two dimensional surface. Among the younger children, ages five to seven years, the predominant tendency is to arrange the items separately, without indicating a specific relationship to the table. Willats noted that drawings of this type depict the items as a random collection that does not relate objects to each other, as same as the Wilsons' principles of territorial imperative and fill the format.

Accordingly, Willats' account of the development of drawing systems embraces a cognitive view of drawing. Willats argued that children's drawings developed through these drawing systems. With these drawing systems, it helps to extend the knowledge of the different ways children use lines to represent spatial relationships. He considers the various spatial solutions as serious efforts to solve a difficult problem. He also noted that the systems are not adequate on their own in informing the viewer about what each line represents.

Willats' approach of not being driven by the division of the mental processes from "draw what they know" to "draw what they see," but focusing instead on the drawings themselves, has allowed him to provide a more formal scheme for classifying drawings. And so, the handle of a mug, for Freeman and Janikoun (1972), is drawn to

make the object recognizable, but for the child, a cup is not an object you observe, it is something you drink from, and to do so, you have to draw the handle.

2.4.3 Lowenfeld

Through creative art, children may be able to represent experiences that they cannot verbalize. They may draw pictures out of proportion, exaggerating things that are important to them. For example, the trees and people can be the same size. As noted by Lowenfeld (1964), children include in their drawings those aspects of an object that are of importance to them. Thus, they emphasize through size exaggerations that which has the greatest significance.

Lowenfeld & Brittain (1987) has proposed six stages of artistic development which are scribbling (2 to 4 years), preschematic (4 to 7 years), schematic (7 to 9 years), dawning realism (9 to 12 years), pseudorealistic stage (12 to 14 years) and adolescent art (14 to 17 years). He argued that are six clearly defined stages of artistic development and these stages can be witnessed in the artworks of children. Based on his theory, the stages that related to the age of the children in this study are schematic and dawning realism.

Children who aged 7 to 9 years at schematic stage have clearly assigned shapes to objects that they are attempting to communicate. They often have developed a schema for creating drawings. There is a defined order in the development of the drawing. Their drawings show a clear separation between the sky and the ground. Objects are often placed on the baseline instead of floating in space. Objects of importance are often drawn larger than objects of lesser importance. Therefore, this stage of children normally would apply the plastic principle as they prefer to draw the object which is more important for them.

Children who at dawning realism stage in artistic development, are beginning to become more critical of their own artwork. It has become evident that a structured order to drawing objects is no longer sufficient. While a schema is still used to create drawings, it is more complex than the schema used in earlier stages. Overlapping can be seen and a sense of spatial relationships is more evident.

2.4.4 Golomb

In three-dimensional world, the object can be seen, almost simultaneously, form the front, the rear, and the sides, which of course is not possible in the two-dimensional plane of the paper. The children's solution to this problem reflect their visual conception of the task.

In the case of the house, children normally draw it in frontal view. The frontal aspect represents the object in a manner that captures its most characteristic attributes, maintains its symmetry and provides maximal information with minimal efforts. The problem of frontality highlights the difficulties that the two-dimensional medium poses to the inexperienced children and some of the solutions such as transparencies or X-ray pictures. Thus, it is why children apply draw everything principle in their drawings as stated by Wilson &Wilson (2009). Also, children often seem unable to put the parts of a drawing together to make a whole. Ground and sky never meet at the horizon and all of the action takes place in the air gap between.

Once the major forms have been differentiated, children are also ready to turn their attention to the relative sizes within a series of figures and to their proportions. In Golomb & Bonen' study (1981), it designed to assess children's awareness of size differences and their ability to portray their perceptions. Three and four years old were asked to draw pairs of objects that clearly varied in their absolute sizes; a mommy and

a baby, a kitten and a giraffe, a tree and a flower, a snake and a worm, and house and a car. He found that the majority of the children made distinct size discriminations in their drawings of the pairs of objects, although in their own spontaneous drawings they paid little attention to size differences. This problem is related to the Wilsons' principles of territorial imperative and plastic.

2.4.5 Freeman and Janikoun

In the studies of Freeman and Janikoun (1972), who asked some five to nine years olds children to draw a cup from imagination, they found that all the cups in their drawings had handles. After the children were shown a real cup with its handle turned away from them and they were asked to draw it, those children who below the age of eight years old tended to include the handle in their drawings. Whereas, the older ones were more inclined to leave the handle out.

The fact that the younger children included the handle in their drawings of the cup even though they could not see it is evidence in support of Luquet's idea. It shows that children are inclined to draw from their internal model to define facts about the object. For another example, most of the children when asked to draw a vase, they often draw flowers in the vase even though it is not requested. The same basic schema may be repeated for each figure as Luquet (2001) called this type constancy. In Wilsons' graphic principle, it is known as conservation or multiple application as children use the same symbol to represent an object in their drawings.

Freeman considered drawing styles as indices of specific cognitive abilities that enable the children to handle pictorial depth relations. As the ability to use hidden line elimination increases, the tendency to segregate objects declines, and children display a better overall grasp of pictorial depth cues.

2.4.6 Luquet

Luquet's theory has had a widespread and significant influence on many of the subsequent researchers in the children's drawing development. For Luquet, once children believe they can represent life then this belief will characterize their subsequent drawing development. He has argued that children's drawings develop through four main types of realism.

Children progress through fortuitous realism, failed realism, intellectual realism and visual realism. Luquet believed that children's drawings are based on their idea or concept of the object. The main features of the object are contained in a mental or called internal model. When children are asked to draw something, it is the internal model that children draw from.

In fortuitous realism, children begin to notice a vague resemblance between some marks they have made when they scribble and they know that pictures can represent life. Children will continue to scribble in subsequent drawings without having an a priori representational intention. As children become more consistent intentional realist their drawings become characteristic of failed realism. In their drawing may show technical graphic problems of poor position, orientation, and proportion. A lack of attention leads to only some of the details the children are thinking of to be included.

Intellectual realism is characterized by an advance in detail and spatial arrangement in children's drawing. Children represent each item in its characteristic shape and increase number of details. Luquet (2001) argued that children who draw in the graphic system of intellectual realism do not want to draw parts in atypical shapes. They will use various techniques to ensure that as many features as possible are shown and in their entire shape. These techniques include separation of the details,

transparency, drawing some features from an air-view plan, and folding out certain parts of the topic. These techniques are relevant to Wilsons' graphic principles such as territorial imperative, draw everything and perpendicular.

Luquet's account, he stated that children draw what they know, not what they see. Even when children have the objects in front of their eyes they generally do not draw what they see but what they know. This is summed up in the slogan "the child draws what he knows rather than what he sees". It is known as "transparency representations" whereby a hidden object seems to be drawn in its entirety through an object which should occlude it. For example, in a "man on a horse" drawing, children usually used transparency so that no part of the horse or man is occluded by the other, and crucially both of the man's legs are depicted. Luquet's theories have been summed up by saying that "young children draw what they know and older children draw what they see".

2.4.7 Piaget

Piaget (1969) incorporated Luquet's theory of drawing development into his own more general theory of cognitive development. The most ambitious and comprehensive analysis of cognitive development has been formulated by Piaget. Piaget's interest in drawing focused on children's representation and conception of space.

Piaget analyzed the universality of children's artistic development based on cognitive development. Piaget suggested each stage of drawing development is related to four different levels of perceptual and cognitive awareness. The stages cover a range of ages from birth to 2 years old to young adulthood. There are four stages in all, included sensorimotor stage (birth to 2 years), preoperational stage (2 to 7 years), concrete operational stage (7 to11 years) and formal operational stage (11 to 15 years).

Piaget proposed that children's drawings intended to produce a recognizable and realistic representation if an object. Piaget said that the young children lack of proper spatial appreciation of the external frame of a drawing. The main achievement of children in preoperational stage is being able to attach meaning to objects with language. Their thinking is about things symbolically. Symbolic thought is a type of thinking where a word or object is used to represent something other than itself.

When children fall into concrete operational stage, it is marked by more logical and methodical manipulation of symbols. The main goal at this stage is for children to start working things out inside their head. Children will try to solve problems without physically encountering things in the real world. They include more details in the drawings and the internal ordering of parts is much improved.

Piaget linked the development of logical operations to the growth of spatial mathematical reasoning and to the ability to coordinate perspective, proportion and distance in drawing. From the nine years on the child begins to draw objects in correct perspective. Thus, children before the age of nine are normally would apply the Wilsons' principle of perpendicular as they are poor in perspective.

2.5   Wilsons' Seven Graphic Principles

This research aimed to study about children's artistic development. Wilson & Wilson (1987) proposed that drawing development can be characterized as fitting into several large and distinct stages. Like a process of organic growth, new images in drawing emerge slowly from previous ones, and may at other times change abruptly through a change discovery in the accidental lines and shapes.

The artwork of children has been much studied and analyzed (e.g. Willats, 2005; Kellogg, 1970). There have regularities and similarities among the drawings of

children. The regularity which children everywhere produce similar forms has led some observers to conclude that all children possess a universal language of visual symbols. Understanding how children's natural preferences for certain kinds of shapes, relationships, arrangements and order, coupled with their developing mental capacities, may lead children to apply innate principles in increasingly advanced ways as they draw.

Wilson and Wilson (2009) rejected the theory of graphic development as a universal pathway and maintained it arose from complex interactions between innate (biological) and cultural factors that generated multiple and divergent developmental pathways. With the concept of graphic symbolic world-making, Wilson and Wilson showed that children are inclined to employ graphic narrative as a means of self-inquiry when drawing on their own or by invitation. They explained the natural principles that they appear to follow and that determine the nature of the things they draw. They also argued that practice at drawing and exposure to other people's drawings are necessary as normal drawing development.

For instance, Wilson and Wilson (2009) proposed that children possess seven innate "graphic-ordering principles", or seven inclinations to organize artistic elements in particular fashions. These inclinations, they stressed, are subverted or maintained depending on a child's exposure to cultural influences and social interactions with adults and other children, a process which varies by child (Wilson & Wilson, 2009). With Wilsons' theory, the interpretative objective in this research is to analyze the children's drawing by using Wilsons' seven graphic principles. These seven graphic principles provide a theory to explain why children's drawings look the way they do and determine where children stand developmentally. The seven graphic principles of children's artistic developments are shown in Figure 2.4 below. Then, the following

are a list of explanation for each Wilsons' seven principles, which were used in the analysis of the children's drawings in this study.
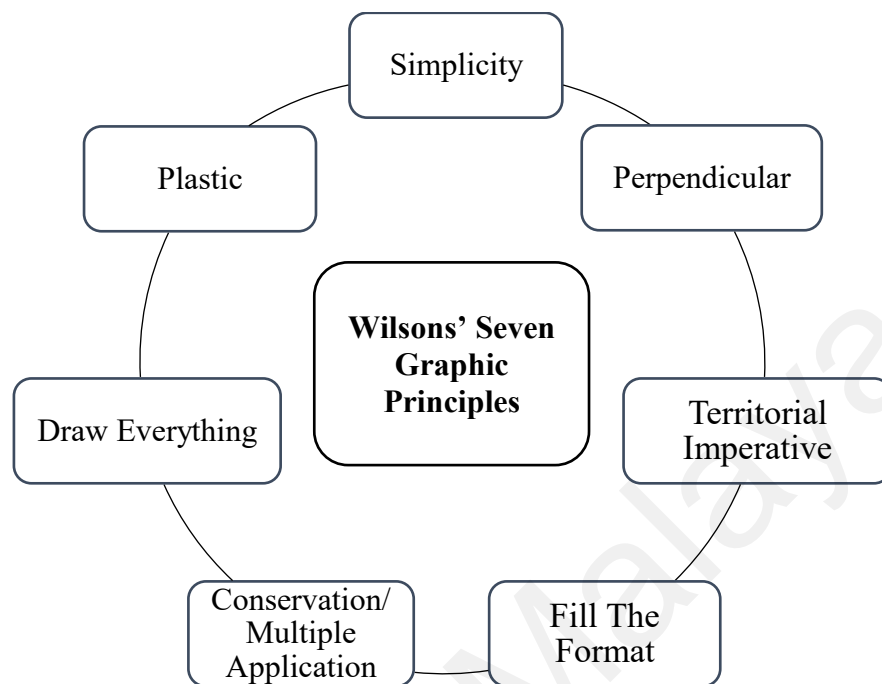
Figure 2.4. Wilsons' Seven Graphic Principles (2009)

2.5.1 Simplicity Principle

Simplicity principle is the most basic graphic principle. The simplicity principle states that children will often use the simplest method available to them in drawing a particular thing. Hamble pointed out that children's drawings develop over time from the simple to complex, with distortions due to children's difficulties in inventing two-dimensional equivalents for what is perceived.

It is generally accounts for most of the others. It takes less time and energy to depict objects with few details and variations. With this principle, the children seem to depict an object in as simple and undifferentiated a way as conforms to the children's expectations for the depiction of the objects. Wilson & Wilson (2009) pointed out that, children's drawing follow the same mental processes as their conception of "things" proceeds from simple to complex and from general to specific.

2.5.2 Perpendicular Principle

The perpendicular principle has different objects in the drawing presented from multiple angles at once in a way that is not possible in real life. With this principle, children make the images with the greatest possible degree of contrast between the parts. This is evident in early depictions of crosses and ladders, and in the later orientation of objects at a nighty-degree angle to the baseline.

In children's drawing, the nearest line often serves as the baseline to which the object is anchored. Children or often the adults sometimes apply this principle and overpower the need for visual order of their perceptions of the natural world. The perpendicular principle explains such diverse graphic phenomena as chimneys and smoke that appear to defy the laws of nature as they stand at right angles of the roof.

The chimney seems to be toppling off the roof. This is because children do not draw a water level parallel with the ground nor a chimney on a house parallel with the vertical side of the page. It is quite easy to demonstrate that the children's ability is being masked by a performance bias towards making acute angles perpendicular. The finished object looks peculiar and showing non-horizontal. When children draw people who climb hills or staircase, they draw the figures in fly-like defiance of gravity. These figures climbing at the hill still adhere to the perpendicular principle and will continue to stand at a right angle to the hill, whatever twists and turns it may take.

For the child, however they are logically at right angles to their baseline. They draw the objects such as book and vase on the table in an upside down position. In a similar way, the top of a table is often set upright and shown as a rectangle, while the table legs are drawn turned over. Turning over is often seen in children's drawing. They always draw a house with turned-over doors and windows. Awareness of space is often confused in children's minds and they may solve the problems by working all

round their paper so we have no firm idea of where the top and bottom of the room is.

2.5.3 Territorial Imperative Principle

Territorial imperative principle has each item drawn on its own way. The children allot to each its own inviolable space in order to present each element in a drawing with the greatest clarity. This principle not only governs the lack of overlap of one figure by another but applies to body parts as well.

Children bring parts of a single mental picture together in an incorrect relationship to one another. The objects were drawn and shown in the use of separation of the detail. Children place objects which belong together as parts of thing on the paper without any relationship to one another, or even join them together in a way which does not correspond to reality. Besides, Luquet (2001) used the term synthetic incapacity to characterize the lack of relations between the individual elements of the drawn topic. For example, when young children draw the "tadpole" form of the human figure, they may draw with a crucial element appears to be missing or the arms are omitted. Those parts that are drawn are aligned inappropriately like the arms and legs appear to be drawn from the head. With the improvements in the children's attention, they are able to consider other elements in the drawing rather than just the feature currently being drawn. This allows the children to remember to include more details and to draw them within more appropriate spatial relationships.

2.5.4 Fill The Format Principle

Fill the format principle is when children extend the boundaries of their work to fill the space on the page. They learn to draw a shape and repeat it over and over again. The size and shape of the format determines the number and size of the appendages.

Lowenfeld (1964) stressed out that when children develop their own repeated symbols, this is quite natural to them and is part of their evolving perception. Whatever children need, they will make it to fit the space on the page. Sometimes children draw animals with too few or too many legs, or humans with extra fingers and toes. The fill the format principle accounts for these seeming inconsistencies. The young children inability to coordinate their movements produces animals' bodies that are too long or too short.

Even older children still repeat their drawings. The size of the page itself and the way elements are placed determine the size and the shape of the format so that there is more or less room for inserting another object. This leads also to the need to stretch limbs in order to reach an object or to lengthen or shorten features so that they fit neatly and aesthetically into a given space. If it is a small space, the object will be condensed to fit. Fill and fit the format as well.

Clearly, Didkowska (2016) mentioned that repetition is the main characteristics in the development of the child's drawing. At the beginning, repetition plays the greater part as the child only has a few motives and practiced forms of drawing. Then new motives begin to appear continually and are repeated. They gradually become more complete by repetition, and acquire new detail.

2.5.5 Conservation/Multiple Application Principle

Conservation or multiple application principle is when children use or rely on the same symbol each time they represent a certain thing. Children apply the same configuration over and over again in a variety of ways.

For example, suns are reemployed as hands or the head of the human serves as a head of dogs or cats. It serves as an equally satisfactory head for an animal, until

such time as the need arises for more characteristic animal head. For the children, a limited vocabulary of already acquired configurations may serve as many uses as possible and desirable. D'Amico (1942) indicated that, from the first to the third grade, the child represents objects and people, not with accuracy or detail, but with self-devised symbols. Symbols for people are drawn almost looking like tadpoles.

2.5.6   Draw Everything Principle

Draw everything principle is when the inside and outside of an object are both represented at once. Children draw what can be seen from several or all points of view and may include things that cannot actually be seen.

For example, a cross section of a bus or car. In a more recent description, its characteristic is "X-ray" drawing, where there is no attempt to hide the objects in the house. The X-ray picture tells what is known to be there so it follows that we can also see inside the house. It also explains the peculiarity described by Luquet (2001) as transparency. He called this phenomenon "intellectual realism" which referred to the fact that children seemed to be drawing everything that was known about an object.

Willats (2005) also stated that, distortions and x-rayed figures are due to the child first drawing the most visually obvious aspect. Artistic development occurs as the child acquires logical drawing sequences. This principle assumes a variety of forms in children's drawings. For example, children draw a house which show that both the inside and outside of the house. Tables are drawn which seen simultaneously from the side and the top which result a flattened-out view. Such graphic principle does not indicate the children's confusion about the inside and outside of an object, but reflect their limited skills to cope with the vexing task of translating the tree-dimensional object to the flat, two-dimensional surface of the paper.

2.5.7 Plastic Principle

Plastic principle applied when the most important feature of a work is exaggerated in size or attention to detail. Children exaggerate object, person and action in their drawings that are most important to them.

Children between 4 and 6 years of age are capable of combining basic shapes, such as circles, squares, and triangles, to depict images that are similar to physical objects. However, children in this age group are influenced by egocentrism, causing them to produce exaggerated drawings. Eisner (1972) noted that children between ages of four and ten tend to exaggerate in size those objects that are most important to them. The preoccupation with ideas or images significant to the child leads to what Piaget calls "centration" and to what Arnheim refers to aptly as "local solutions". The solution is local because the child neglects the relationship between his primary form and its relationship to other, secondary or supportive, forms in the picture plane.

2.6 Review of Past Studies

Given the findings of the previous researches on analysis of children's artistic development, children show important characteristics in their drawings although artistic development in the early stages indicates a universal pattern.

Characteristics and universal patterns, such as graphic representational patterns, spatial patterns, and so on, emerge with children cognitive development and physical growth at an early age (e.g. Golomb, 2004; Lowenfeld & Brittain, 1987; Goodnow, 1977; Arnheim, 1974; Kellogg, 1970;). Thus, children's drawings are influenced by the factors of age and cognitive development.

i.   Children's Drawing Characteristics

In analyzing young children's drawings, Yang & Noel (2006) have analyzed

and identified the most commonly used scribbles and placement patterns in children's drawings based on Kellogg (1970) 20 categories of scribbles and 17 categories of placement. The most common scribbles used at ages four and five were single vertical lines, single horizontal lines, single curved lines, and single diagonal lines. Besides, the most common placement patterns used are the centered placement followed by the second most common placement pattern called overall. On the other hand, the two least used scribbles were spiral and circular lines. Additionally, they also determined the developmental change in the use of scribbles in their study. Their findings confirmed the results of Longobardi et. al (2015), who found that scribbling evolve through different stages, much like drawing does and can be classified.

As such, this study has some similarities with the study of Yang & Noel (2006). In this study, researcher has adopted Wilsons' theory to analyse the common children's drawing characteristics based on seven graphic principles. Researcher has identified the most commonly used Wilsons' graphic principle and determine the use of principles in children's drawings of the objects inside a house according to their ages. In the process of drawing's analysis, the scribbles and placement patterns in children's drawings are also important factors to analyze as they related to the principles.

Didkowska (2016) carried out an extensive research over an interval of 10 years to study 2134 children's drawings from 3 to 12 years old in the context of changes occurring in the drawing's activity brought about by the visual language of new media. His findings showed intrinsic changes both in the artistic form and in the content of the drawings. The type of drawings that most frequently seen is drawing referring to banal repetitions of images. This result is similar to the findings of Acer & Benli (2019) in analysis of children's drawing behaviors. They found that variety and repetitive lines were used in the drawings of a majority of children aged 3 to 5 years.

These included controlled, repetitive, zig-zag, straight and curved lines. Taking this result in hand, researcher would wonder if a similar pattern of ability is also present in the area of primary school children's drawing and whether it is related to Wilsons' seven graphic principles or not.

Children transfer formal qualities easily to their drawings. As a result, Didkowska (2016) found that children used greater decorativeness and disproportional sizes in their drawings whereas Acer & Benli (2019) discovered that children drew human figures with heads bigger than the body and extending legs and arms. Moreover, both of their studies also shown that children were more likely to emphasize the two-dimensionality in their drawings. They drew examples of geometric shapes including squares, rectangles, ovals, and so forth. Findings also revealed the drawings of children aged 3 to 4 years corresponded to the scribble stage set forth in Lowenfeld's (1964) stages of artistic development. Also, it is more to recognize that because children are drawing according to what they think then it is not uncommon to see the use of exaggeration and diversion in their drawings. It is certainly of interest to know what the exact nature of this drawing's characteristic can be, and how children overcome it developmentally in this research.

Basically, young children draw what they know while the older children draw what they see (Willats, 2005). In drawing activity, children develop strongly personal preferences for what they want to draw and how they want to draw it. In contrast with young children, Yamagata (2001) found that older children produce representational drawings through the systematic organization of component parts according to a plan or drawing procedure. Again, this finding is consistent with the results obtained by Putih (2002), older children produced more structurally complex triple-plane pictures and involved drawing of near and far objects using different sizes. Using a

developmental model, these results are particularly consistent with the findings of some earlier researches (e.g. Thomas & Tsalimi, 1988; Freeman & Janikoun, 1972; Eng, 1931). With these evidence, researcher attempts to describe in further detail the children's drawing characteristics, by comparing the differences between three age groups.

Children's drawing follows a universal pattern in their early years regardless of their environment. Sumanto (2017) has studied on diversity of symbolic meanings of drawing by elementary school children. It can be found similarity in the various symbols displayed on each drawing, and there are different ones. The symbolic meaning relates to some objects such as people, animals and plants with many characteristics of styles. Not only children, but the same goes to adolescents. In another study, Lau (2013) argued that adolescents have derived a conception of beauty from cartoon images they have seen in their drawings. Also, based on the findings from Toku's study (2001), in spatial treatment, Japanese children create new ways to show spatial complexity, for example exaggerated view, bird's-eye view, and multi-perspective view as influenced by the cartoon. Particularly, these different kinds of views in the drawings has the similarities and related with the Wilsons's graphic principles especially perpendicular and plastic.

By using Wilsons' seven graphic principles (2009) as a guide in present study, researcher could also identify children's drawing characteristics in the relation with the age factor and developmental process. This could help teachers and parents to recognize a wider range of drawing activity as 'developmentally appropriate' for meaning-making for children as stated by Ring (2006). Therefore, in this study, researcher aimed to find out the drawings characteristics which depicted by children who aged from 7 years to12 in their drawings and then related them with Wilsons'

seven graphic principles. Specifically, researcher studied the preferences of children from different age range in the use of Wilsons' principles to determine the most common and the least common principles in their drawings.

This study proposed to analyze a large amount of children's drawings as a tool to understand children's drawing characteristics of different age groups. It is always a good idea to use different methods of data acquisition. A number of works have shown that an alternative way for analysis children's drawings is by using rating or scoring method. As Cugmas (2004) has mentioned, the formation of global rating scales is needed for the evaluation of the drawings. This is supported by Deaver (2009) that scoring system is useful as a tool for developing a large scale normative database of children's drawings. Towards this goal, the present study focused on a drawing task and collected the data through quantitative method.

ii.   Children's Artistic Development

Children's purpose in art changes with age. In art education, the issue of children's drawings with age as a factor has been addressed from various perspectives and several theories were used to determine the children's drawing level. Studies include Putih (2002) study of the three spatial strategies of children in drawings, Almeida (2003) investigation of typical developmental characteristics in children's drawings and Yang & Noel's (2006) examination of the developmental characteristics (scribbles and placement patterns) of children in drawings. Taken together, these results contribute to the body of useful knowledge about the development of children's artistic.

Interestingly, other research with children aged 3 to 12 years determined that the significance of drawing activity for the development of children, bearing in mind differences occurring between kindergarten and school groups (Didkowska, 2016). As

a consequence of this, children will produce new and different characteristics in their drawing patterns depending upon their particular stage of development. Even perceptive difficulties and errors in graphic representation are always been described as "normal stages of development". Solovieva & Rojas (2017) indicated that children modify and develop their abilities of representation of the objects from one stage to another. Children started with elemental representation of gestures and actions, then they draw lines and shapes before their ability for drawing of complex objects appeared.

The tendencies of children's drawings in spatial order and other pictorial presentations are not always qualitatively or quantitatively universal in linear progression from simplicity to complexity (Freedman, 1997). In a study conducted by Putih (2002) by using the theory of Eisner 14 visual categories (1972), he stated that the visual strategies employed by children in their representation of pictorial space change in a systematic fashion with the increase of age. Similar to the study conducted by Toku (2001) with the use of same theory, she had proved that the differences between U.S. and Japanese children in the process of spatial treatment were significant. In addition, regardless of age, the ability of children to construct drawings systematically by combining or organizing the component parts increases with age as Yamagata (2006) tend to believe.

As stated above, Yamagata (2001) found that children are increasingly better at organizing component parts with age, regardless of the task conditions. Even if children sometimes make an error in drawing, they still construct drawings by organizing the component parts systematically on the basis of object cognition. With an increase in age, there is an imperative change in the way children present their ideas in art affecting their approaches and techniques (Ling & Sharifah & Hasnah, 2012;

Putih, 2002). These findings are underpinned by important theories, such as Arnheim (1974) law of differentiation; Lowenfeld & Brittain (1987) stage of dawning realism; Luquet (2001) intellectual realism and Willats (2005) drawing system, which emphasized the relationship between children's art characteristics and their development under typical conditions.

Some of the studies also highlighted the problem of sampling method employed by the researchers. Hsu & Ya-Huei (2014) who only comprised one research subject, that is a child at the age of four years, to determine the relationship between children's drawings and the images these drawings portray. Whereas, Almeida (2003) used one age-group of sample, to study changes in the drawings of eight-year-old children when compared to Lowenfeld's findings. On the other hand, Yang & Noel (2006) also used small sample of 17 four and five years old children. In these studies, they suggested that researchers of future studies increase the number of research subjects or age-groups to comprehensively understand the relationship between children's drawing performance and image symbols.

A closer look to the literature on these studies of children's drawings, however, reveals a number of gaps and shortcomings. First, the previous studies more likely prefer the use of theories of Eisner, Kellogg, Lowenfeld and Willats in analyzing of children's drawings, but no study to date has applied Wilsons' seven graphic principles. Although Wilsons' theory has been widely used in the education field in relation with cultural, comic and animation, there is still lack of research in children's drawing characteristics as well as the relationship between artistic development. In particular no study, to our knowledge, researcher has considered the theory of Wilsons' seven graphic principles and attempted to use it in the current study.

In addition, previous studies (e.g. Hsu & Ya-Huei, 2014; Tamara, 2014; Lau,

2013) have almost exclusively focused on qualitative methods such as observation to analyze children's drawings. Such observation is insufficient to verify the indications of children's characteristics in different age groups. Also, the visual art education research in quantitative method remains limited. A much larger number of children's drawings collected should be investigated as limited sample is rarely to find the differences between the various age groups of children. Other studies have observed similar implication, showing that problems in sampling methods and the small number of subjects prevent generalization of results (e.g. Deaver, 2009; Deornellas, 1997).

2.7   Theoretical Framework of the Study

Through the review of literature on various topics related to research questions, researcher constructed a framework of theory on which built for this study. The theoretical framework is the structure that can support a theory of a research study. The theoretical framework in this study was based on Wilson and Wilsons theory of seven graphic principles in children's drawing.

A theory provides a framework for understanding a certain aspect of human behavior, thought and development. First, the seven graphic principles of drawing which has developed by Wilson and Wilson (2009) has been described and discussed. By having a broad base of understanding about the what's and why's of children's drawing behavior, researchers or educators can better understand the children's artistic development. Besides, researchers or educators will value the children's graphic development and encourage the acceleration of development and the transcendence of the natural principles.

Most of the children's drawings show the similar children's style of presentation. For example, children often make x-ray drawings during the stage of

intellectual realism (Luquet, 2001). As Wilson & Wilson (2009) indicated that the drawings of children are very much alike, and yet not at all like the of adults' drawings. Thus, it can be concluded that children's drawings were ruled by unconscious and innate "laws of form". It means that children follow inborn universal rules as they learn to use the language of drawing. It also has noted the regularities and similarities among the drawings of children. The regularity with which children everywhere produce similar forms has led some observers to conclude that all children possess a universal language of visual symbols.

Meanwhile, Wilson & Wilson (2009) proposed that children all around the world share a predisposition to arrange lines and shapes in certain ways because of an innate preference for certain types of visual order. For this reason, the drawings of children everywhere appear to look the same. Wilsons' seven graphic principles explains the natural principles that the children appear to follow and that determine their drawing's characteristics. Those principles are simplicity, perpendicular, territorial imperative, fill the format, conservation and multiple application, draw everything and plastic. It gives us greater insight into the nature of children's drawing to understand the reasons of their drawing and determine their developmental stages.

Wilson & Wilson (1987) propose that graphic representation should be understood as a symbolic language. They emphasize that symbolic languages (verbal, mathematical, or graphic) are culturally determined and they are a product of culture-specific experiences. Children search for information about the environment and then construct or invent models of the world or models of reality in making reality and knowledge (Wilson & Wilson, 2009). According to Wilson & Wilson, the complexity of the graphic language system is shaped by cultural context. Their analytical strategies examine children's drawings for both aesthetic and thematic content.

As well as that, this theory helps to provide a guide for researcher to design research questions, guide the selection of relevant data and interpret the data. It provides insight to the developmental of children's art and the knowledge through which to look at the characteristics of children's drawing. In addition, it also focusing researcher's attention on the aspects of children's lives and providing a framework within which to conduct the process of children's drawing analysis. By studying this theory, it shows that children's natural preferences for certain kinds of shapes, relationships, arrangements and order, coupled with their developing mental capacities, guide them to apply innate principles in increasingly advanced ways as they draw.

Moreover, art educational philosophies, theories, and practices that focus on children's drawings were also discussed to make a better understanding on the drawings of children at different ages or stages. Though various pieces of literature espouse artistic development and art production, this research study looks specifically on the children's drawing, and focus on the content of the drawing which depicting the reality of the object. The development of graphic art may teach important skills of visual thinking as well as beneficial expressive skills.

In this study, children aged 7 to 12 were asked to make a picture based on the task given. After the collection of all the drawings, researcher analyzed the drawings based on Wilsons' seven graphic principles. Through the study, researcher could describe the way that children draw and the content differs among the children. Researcher also identified the most common and the least common principles that children used in their drawing. Along with, researcher determined the relationships between children's used of Wilsons' graphic principles and their stage of pictorial development. The theoretical framework of this research is show in Figure 2.5. As

researcher outlined the theoretical framework that underpinned this study, researcher was able to make explicit and purposeful connections to the methods.

```
┌─────────────────────────────────────────┐
│        Children's Artistic Development    │
└─────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────┐
│        Analysis Children's Drawings       │
│  (Drawing of the objects inside a house)  │
└─────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────┐
│ Identify Drawing's Characteristics of 7 to 12 Years Old │
│  Children Based on Wilsons' Seven Graphic Principles     │
└─────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────┐
│ Wilson and Wilsons' Seven Graphic Principles (2009) │
└─────────────────────────────────────────┘
```

```
┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐         ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
                                   Law of differentiation (Arnheim, 1974)
       Simplicity        Related   Drawing systems (Willats, 2005)
      Perpendicular       with     Stages of artistic development
   Territorial Imperative   ⟺        (Lowenfeld & Brittain, 1987)
      Fill The Format              Theory of drawing development
 Conservation/Multiple Application        (Luquet, 2001)
      Draw Everything               Theory of cognitive development
         Plastic                          (Piaget, 1969)
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘         └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
```

Determine

```
┌──────────┐  ┌──────────────┐  ┌────────────────┐
  The most     The use of Wilsons'  The relationships between
  common       graphic principles in  children's used of
  principles   children's drawings    principles and their stage
  used         according to their age  of pictorial development
└──────────┘  └──────────────┘  └────────────────┘  ➡
```

Figure 2.5. The Theoretical Framework of the Study

2.8   Conclusion

Through this literature review, researcher has surveyed the literature in the area of children's drawing and synthesized the information in literature into a summary. The literature is reviewed for information related to the research problems and to the suitable methods for conducting this research. Thus, researcher has determined what others have done and discovered that might be useful for researcher in present study. It should establish the need for the research and indicate that the researcher is knowledgeable about the children's art.

CHAPTER 3

METHODOLOGY

3.1   Introduction

This chapter describes the methodology of the study on analysis of primary school children's drawings based on Wilsons' seven graphic principles, including the research design, population and sample of study, procedure, instrument, validity and reliability, process of data collection and analysis of data.

There are many different ways to choose a sample, and the method used will depend upon the area of research, research methodology and preference of the researcher. Verma and Mallick (1999) mentioned that, the research methodology consists of the collection, organization, verification, validation and analysis of information in accordance with a set of specific standards. Throughout the discussion conducted so far, researcher have purposefully made explicit links between theory and practice, in order to outline the ways in which researcher enacted rich theoretical insights, engaging with questions of methods, value and purpose. At this juncture it is thus useful to outline the methodological approach in more detail.

3.2   Research Design

This research is a quantitative research. Quantitative research is where researchers apply numerical measurements that involve making clear measurements and gather numerical data and process the results numerically (Dawson, 2002).

Quantitative research is one of the most widely used research type in educational research because it encompasses a wide variety of research studies. The

quantitative data can be used to look for the relationships and also make predictions. As this study is related to the artistic development of children, therefore researcher applied the quantitative methods to collect the data as the content of development is quantitative. Development is seen in terms of an increase in the number of units that are differentiated, that is specific and informative.

The study of children artwork is known as a product-oriented approach. This research analyzed drawing's characteristics that occur naturally in children's drawings. For this purpose, researcher has to identify the principles that children used in their drawings at different age groups based on Wilsons' seven graphic principles, termed respectively as simplicity, perpendicular, territorial imperative, fill the format, conservation/multiple application, draw everything and plastic.

Variables were studied as they exist in the situation in a natural situation. The dependent variable, primary children's drawing is the outcome in this study that needed to be explained. The independent variable, Wilsons' seven graphic principles are the factors that influence the outcomes. A dependent variable is an attribute or characteristic that is dependent on or influenced by the independent variable (Creswell, 2012). This approach allows researcher to examine the relationship between these two variables of primary children's drawings and Wilsons' seven graphic principles as show in Figure 3.1.

Wilsons' Seven Graphic Principles	⟹	Primary Children's Drawings
Independent variable (IV)		Dependent Variable (DV)
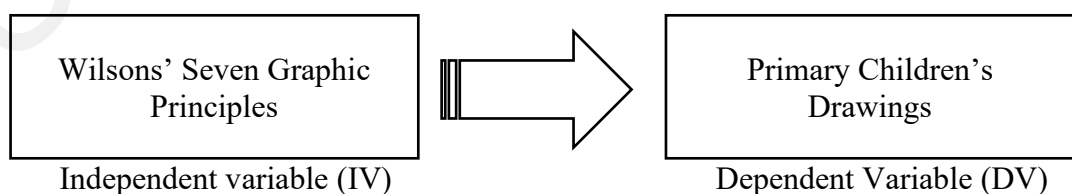
Figure 3.1. Dependent and Independent Variable

As has been discussed, the study presented here applied developmental approaches which studied about the artistic development. It is a classification of

children's drawings into developmental sequences. All children move through stages of development. Children move through these developmental stages at different rates, depending on how their bodies and brains are maturing and what is going on around them. Children's drawing is a copy of an image in the children's mind and therefore, their drawings express their feelings and thoughts.

The visual art education comprises of four modules: module of 'arts language', module of arts skills, module of creativity and innovation, and module of arts appreciation. The visual art curriculum for primary schools consists of four areas, drawing, pattern making, design and construction as well as traditional crafts. In this present study, researcher focused on drawing and selected only one topic, which is picture-making. Picture-making is an effective way for children to organize experiences and construct ideas about themselves and the world.

In the picture-making activity, children were given a drawing task to produce the picture by using dry art materials such as pencil and paper. The drawing theme was set by researcher and then children were asked to draw a well-practiced and familiar tittle, that was a theme of a house. It required the children to draw six main simple objects inside a house such as chair, table, book, lamp, television and vase. From the drawings, researcher identified and classified children drawing's features based on the Wilsons' seven graphic principles.

The data is usually gathered using structured research instrument. The results are based on larger sample sizes that are representative of the population. Through this study, researcher investigated the children's drawings that considered only the finished pictures that children draw. It would help the researcher to understand types of presentation of children when the reality of objects in their drawings were depicted.

3.3 Population and Sample

Before the process of collecting quantitative data, researcher has identified the people and place that needed to be studied. This research took place in an elementary school which situated in Selangor. Chinese language is the main medium used for communication in the classroom. Standing in a community of largely moderate income Chinese families, this school is attended by children of two-income families.

This study made up from the population of students. Researcher collected the data from only one level, which involved only students in a school. Creswell (2012) defined that a population is a group of individuals who have the same characteristic. Within this common defining characteristic, a sample for study was selected by researcher. A sample is a subgroup of the target population that the researcher plans to study for generalizing about the target population. Table 3.1 shows the population and sample process in this study.

Table 3.1
Population and Sample Process

Population of primary student in School X			2600
Determining sample size based on Krejcie & Morgan (1970)			335
Simple random sample using random numbers method (Assigned each student's name a number for each category, and then use a table of random numbers to select sample)			
Year 1	55	Year 4	56
Year 2	57	Year 5	55
Year 3	59	Year 6	53

The type of sampling used in this study was random sampling. As Dawson (2002) noted, there are two main types of sampling category, probability samples and purposive samples. Probability samples also known as random samples. Random sampling refers to a variety of selection techniques in which sample members are

selected by chance, but with a known probability of selection. The sample selection method is closely related to the type of research being made (Darusalam, 2016). As this research applied quantitative method, researcher used random sampling method to choose the sample. Creswell (2012) stated that simple random sampling is a basic sampling technique where every member of subset of the population has an equal chance of being chosen to be in the sample.

When selecting participants for a study, it is important to determine the size of the sample. Sample size measures the number of individual samples measured in a research. The size of sample will depend upon the type and purpose of the research. The School X has student population of about 2600. Based on the population, researcher has to choose the sample size. The main reason to accurately calculate the required sample size is to save time and money. In addition, it can achieve both a clinically and statistically significant result and ensuring research resources are used efficiently and ethically.

The most important thing taken into consideration is that the sample drawn from the population must be representative so that it allowed the researcher to make inferences from the sample to the population understudied. Thus, researcher decided to use Krejcie & Morgan's (1970) approach in determining the sample size. Krejcie & Morgan (1970) came up with a table for determining sample size for a finite population for easy reference. The estimation of sample size in research using Krejcie & Morgan is a commonly employed method. Based on Krejcie & Morgan's (1970) table for determining sample size, for a given population of 2600, a sample size of 335 would be needed to represent a cross-section of the population. Therefore, 335 sample needed as representative of primary children population in this study.

In order to create a balanced subset that carries the greatest potential for

representing the population and minimize any biases, researcher created a simple random sample using random numbers method. Using this method, researcher assigned each student's name a number for each category, and then use a table of random numbers to select sample for every category. The use of random numbers is an alternative method that also involves numbering the population. Figure 3.2 shows the simple random sampling.
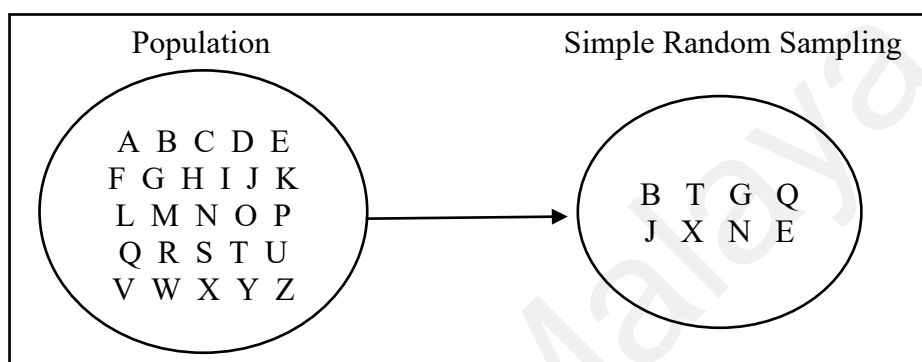
Figure 3.2. Simple Random Sampling

As mentioned previously, 335 students were chosen from standard one to six who are studying in School X are selected as samples for this study. None were academically advanced or delayed. Of these, 55 were from Year One, 57 from Year Two, 59 from Year Three, 56 from Year Four, and 55 and 53 were from Year Five and Year Six, respectively. The average age of each year was as follow in Table 3.2.

Table 3.2
Average Age of Each Year

Year	Age
1	7
2	8
3	9
4	10
5	11
6	12

Researcher decided to integrate group year 1 and year 2 into one group, group year 3 and year 4 into one group and group year 5 and year 6 into one group. Putih (2002) has carried out the study of three spatial strategies namely, the use of planes,

arrangement of objects, and size change employed by primary school children in their drawing of scenery. In his study, Putih (2002) found that there was no significant difference between the performance of children in year 1 and year 2, year 3 and year 4, year 5 and year 6, either on the spatial skill or choice of devices in t-test and chi-square test. Thus, in this study, researcher deemed it reasonable to collapse the children's age groups from six groups into three main categories, designated as Group A, Group B and Group C, respectively. Table 3.3 is the categories of the sample.

Table 3.3
Categories of the Sample

Year	Age	Group
1 and 2	7 to 8	A
3 and 4	9 to 10	B
5 and 6	11 to 12	C

3.4   Research Procedure

Planning and the process of organizing activities in a research is known as research procedure. This study intended to collect children's drawings in order to accomplish the purpose of the study. Prior to collection, researcher has requested the permission from the headmaster to conduct this study in School X.

A large sample size is needed to be collected in school. Therefore, by asking art teachers to independently run the drawing session is the most efficient way to collect a large amount of drawings. Before gathering the drawings, researcher has obtained permissions from several art teachers in school. They were either major or minor graduated from field of Visual Art Education. The teachers were informed of the purpose of the study by way of written and verbal explanation. Researcher also provided a set of instruction for them to carry out the drawing's activity in the class (*refer to appendix A*). The instruction set provides teachers an outline or manual of technical procedure in this drawing activity.

The school children did their drawings in classroom during art period set aside for this study. All drawings were made under the supervision of a teacher in each class. In order to ensure that the pupils were making the drawings in the correct manner, all of the pupils have been instructed before they start to draw. In the first 10 to 15 minutes, teachers were required to give the strict instructions to pupils on how to perform the drawing session, including what to draw, what to use, when to start the session, and how long to allow the session to go on. After distributing materials, children were asked to write their name and grade level on the upper right hand corner of the back side of the paper.

The drawing process took between 45 to 60 minutes, depend on the grade level. Each child was given basic tools such as a piece of paper and a pencil to draw a theme as the researchers' instruction:

> "Imagine you are in a house.
>
> Inside the house, there are table, chair, television, vase, book and lamp."

This is an imaginative drawing, not an observation drawing which looked at the scene or objects directly. The context, content and instructions of the drawing task were found often to have an important effect on the children's drawing (Thomas & Silk, 1990). Thus, the teacher in charge needs to explain clearly about the instruction to make sure that the pupils understand what they need to draw. During the drawing activity, children were given the opportunity to ask questions regarding the instruction.

At the same time, teachers were not encouraged to give much guidance or demonstration for the pupils on drawing skills or techniques. Children were encouraged to draw depend on their creativity as long as they were following the instruction given. Besides, children were asked to draw independently so as to not be

influenced by what they see their friends drawing. They were requested for not to use pen or colour pencils. This is because the element of colour was not needed in the analysis of children's drawing.

Besides of the six main objects, children were allowed to draw other things of their choice as long as those objects that were required have been drawn. For example, people, vehicles and plants. Drawing papers were collected as the individual children indicated they have completed their drawings. After that, researcher received the drawings from each of the teacher. Finally, researcher started to analyze the drawings. Figure 3.3 is a flow about research procedure in this study.
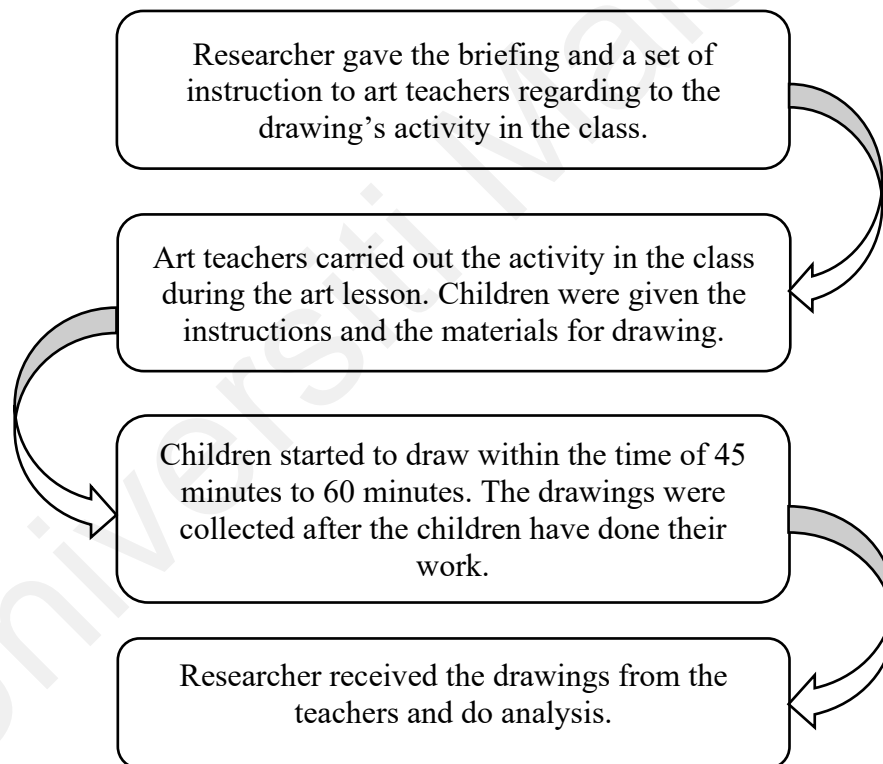
Figure 3.3. Flowchart of Research Procedure

3.5   Research Instrument

The quality of the instrument used in research is very important. Instrument depends on the nature of research to achieve objectives. An instrument must be identified and developed to enable researcher to collect data through the right procedure.

In other words, research instrument is a designed tool that aid the collection of data for the purpose of analysis. There have two instruments used in this research. First, researcher designed a set of standardized drawing's instruction in order to distribute to the art teachers in school to collect the children's drawings. In the set of drawing's instruction, it contained a simple instruction as a drawing task for students (*refer to appendix A*). Teacher used this instruction to ask the children to make the same drawings in the class.

After the children's drawings were collected, researcher need an instrument for analysis to get the numerical data from the drawings. Creswell (2012) mentioned that an instrument is a tool for measuring, observing, or documenting quantitative data. In this study, researcher examined and identified the children's drawing characteristics based on Wilsons' seven principles by using an instrument for analysis (*refer to appendix B*). Figure 3.4 shows the two instruments used in this research.
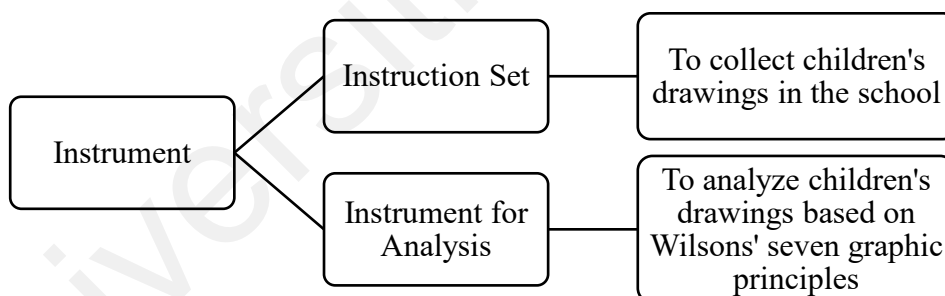
Figure 3.4. Research Instrument

Researcher constructed the instrument for analysis in order to make the analysis process more consistent and fair. Instrument for analysis is a descriptive guide developed based on Wilsons' seven graphic principles to assess any children's drawing. It contains three parts: 1) criteria; 2) scale; and 3) criterion. On the left side, the scale identifies the present or absent of the principle. At the top, the criteria describe the Wilsons' seven graphic principles of children's drawing. Under each section of the criteria, the criterion provides concrete descriptor for each principle.

Before creating the instrument for analysis, researcher has consulted professional literature and the book "*Teaching Children to Draw*" in second edition that was written by Wilson and Wilson (2009). In the book, researcher has read and understood clearly about the seven graphic principles and then adapted the criteria, scale, and indicators to this study's need. Researcher has identified the criteria and standards in the instrument. The descriptive criteria for the seven graphic principles are meaningful and clear to ensure the interrater reliability.

The drawings were then classified in reference to the Wilsons' seven graphic principles. After researcher identified what object was drawn, the categorization has been made based on whether the object drawn in the picture are applying the principles or not. The instrument was used to assess only those children's drawing characteristics that are directly matched with the Wilsons' seven graphic principles. The example of process on how the drawing is analyzed by using the instrument of analysis was given. (*refer to appendix C*). For purpose of scoring, researcher designated a present of principle as 1 and non-shown of principle as 2. It required only a single score based on the principle which presented in the drawings. After that, researcher recorded the scores in Excel.

3.6   Validity of Instrument

Validity of instrument refers to how well an instrument as measures what it is intended to measure. Fraenkel and Wallen (2009) defined that validity refers to the appropriateness, meaningfulness, correctness, and usefulness of the inferences a researcher makes. Researcher needs a good instrument to record the data and some sort of assurance that the information obtained will be able to draw correct conclusions.

Researcher established content-related validity through expert check in this

study. Content-related evidence of validity refers to judgments on the content and logical structure of an instrument as it is to be used in a study. Content-related evidence can usually be obtained since it requires only a few knowledgeable and available judges. If the instrument does not have content validity, then the instrument is not actually measuring what it seeks to.

To obtain content-related evidence of validity, researcher have two head of panel who are trained in Visual Art Education to check at the content, language and format of the instrument for analysis and judge whether or not it is appropriate and valid. They helped to evaluate whether each Wilsons' principle matches the main domain of the drawing's characteristic. Likewise, the instrument must have a logical link with the research objectives. The instrument and validation sheet were given to the head of panels in different schools. Each panel has filled and signed on the validation sheet completely (*refer to appendix D*). Through the expert check, content validity was sought. The instrument was slightly modified for the wording of criterions to make the instrument more understandable and to ensure clarity.

3.7   Reliability of Instrument

Reliability concerns the replicability and consistency of the methods, conditions and results. Reliability of instrument concerns the faith that one can have in the data obtained from the use of an instrument (Mohajan, 2017). In order to test the consistency of scores, the data must be consistent in the way that it measures each of the criteria.

Reliability means that scores from an instrument are stable and consistent. Instrument reliability is a way of ensuring that any instrument used for measuring experimental variables gives the same results every time. This mean that the scores

should be nearly the same when researchers administer the instrument multiple times at different times.

To check the reliability of the instrument in this study, researcher checked through pilot test and used the method of scoring observer agreement to compare scores obtained by three scorers. This consistency needs to be present for each individual scorer as well as across scorer. If the instrument is reliable, there will be no variation between the three scorers. When three different scorers use the instrument on analyzing the same drawings, they will give similar scores. This is called interrater reliability.

A reliable instrument is one that gives consistent results. The more reliable the scores from the same instrument, the more valid the scores may be. This is important to score children's drawing consistently and more precisely to measure the children's performance. Researcher have three art teachers as scorer to rate each of the principles by using the same instrument based on the children' drawings. This could negate any bias that any one individual might bring to scoring. Researcher has recorded the scores that rated by the scorers. Table 3.4 below shows the procedures of interrater reliability to examine the instrument's reliability.

Table 3.4
The Procedures of Interrater Reliability

Form of Reliability	Number of Times Instrument Administered	Number of Different Versions of Instrument	Number of Individuals Who Provide Information
Interrater reliability	Instrument administered once	One version	Three persons analyzed children's drawings

3.8   Pilot Study

A pilot study is the first step of the entire research protocol and is often a smaller-sized study assisting in planning and modification of the main study. Baker (1994) noted that a pilot study is often used to pre-test or try out a research instrument. Although the pilot study does not guarantee success in the main study, it greatly increases the likelihood.

In this study, the two instruments have been pilot tested before the major data collection for the study is undertaken. The pilot study was conducted in a quantitative method. The pilot study assisted researcher to know how to work out the procedures of the main data collection and looking at anything needs to be modified or changed. It also helps to create new and important ideas to the instrument of data collection. The feedback of conducting the pilot study can be seen after the data analysis.

The pilot run was done with a limited number of students. Connelly (2008) proposed that, extant literature suggests that a pilot study sample should be 10% of the sample projected for the larger parent study. Baker (1994) also found that a sample size of 10-20% of the sample size for the actual study is a reasonable number of participants to consider enrolling in a pilot. Hence, 37 of drawings were distributed to three experienced visual art teachers to analyze the children's drawing characteristic based on the instrument of Wilsons' seven graphic principles.

Three raters (labeled as X, Y and Z) were engaged to provide the principles for each of the drawings based on the instrument. Three of them did not know each other to ensure the validity of the findings. The teachers were chosen because of their willingness to participate in the pilot study and major in the degree of Visual Art Education. To help establish interrater reliability, a rater training session was conducted during the pilot study.

All the drawings were collected from 7 students of Year 1, 6 students of Year 2, Year 3, Year 4, Year 5 and Year 6 respectively. In order to make the comparison of the raters' scores in an easier way, researcher has designated six groups of students as Group A, Group and Group C, respectively. Thus, year 1 and 2 as Group A, year 3 and 4 as Group B and year 5 and 6 as Group C. 37 students who participated in the pilot study were able to understand and draw the six main objects listed inside a house. Therefore, the set of instruction was appropriate and understandable for the students. The time assigned for the drawing activity was suitable for the students to complete their drawings.

All ratings were then matched with the children's age groups in order to provide a developmental description of children's drawing characteristics. Table 3.5 shows the scores rated by the three raters (labeled as X, Y and Z) on each of the principles for group A (year 1 and 2), B (year 3 and 4) and C (year 5 and 6).

Table 3.5
Data of Pilot Study

Wilsons' Seven Graphic Principles	GROUP								
	A			B			C		
	RATER			RATER			RATER		
	X	Y	Z	X	Y	Z	X	Y	Z
P1	9	10	9	6	7	5	4	5	4
P2	10	9	11	9	9	10	8	8	7
P3	9	10	8	8	8	9	5	4	5
P4	5	5	5	8	9	10	5	7	7
P5	12	10	11	9	6	10	7	7	6
P6	5	8	7	5	6	7	5	8	6
P7	5	5	7	3	3	4	1	2	2

Key: P1 = Simplicity; P2 = Perpendicular; P3 = Territorial Imperative; P4 = Fill the Format; P5 = Conservation/Multiple Application; P6 = Draw Everything; P7 = Plastic.

Once the ratings from the three raters had been obtained, an interrater reliability analysis based on the comparison of the scores was been carried out. Regarding

valence ratings, the finding clearly indicated that there are not so much differences among the scores given by the three rates. The pilot study confirmed that there was good interrater reliability across all the score of the principles and thus the research procedures proceeded as designed. The pilot study was excluded from the data collected for the dissertation.

The pilot study is important for improvement of the quality and efficiency of the main study. Pilot run feedback can be very useful for finalizing the instrument. By doing so the pilot study, researcher could draw the conclusions based on the information which obtained by using the instrument. The instrument remains unaltered upon the pilot test. With the reliability of the study, researcher interpreted the results with confidence or generalize them to others populations and conditions. ensuring that any instrument used for measuring the variables gives the same results every time.

3.9   Data Collection

After the instrument for analysis is judged to be satisfactory, the data collection began. Data collection in a research is a detailed process in which a planned search for all relevant data is made by the researcher. The research data was collected via the process of analysis on children' drawings. Before analyze the drawings, researcher obtains children's drawings in a primary school.

Quantitative research quantifies the data and generalizes the results from the sample to the population. In this research, data was collected through quantitative method. Researcher analyzed children's drawings by using the instrument as a tool to decide the score for each of the Wilsons' principles. The type of numerical data in this study was categorical data. Categorical data represent types of data which may be divided into groups. Fraenkel & Wallen (2009) explained that categorical data simply indicate the total number of objects, individuals, or events that a researcher finds in a

particular category.

Quantitative data deal primarily with numbers. Fraenkel & Wallen (2009) defined that data is the information where the researchers can obtain on the subjects of their study. In this study, the data refer to the score of analysis of children's drawings based on Wilsons' seven graphic principles. This kind of data is a primary data as it is collected by researcher directly from first-hand sources for the purpose of study. Thus, primary data is the original data collected by the researcher first hand.

In the preceding chapter, researcher has outlined Wilsons' theory, which offers a theoretical view to interpret children's drawings based on seven graphic principles. The drawings have been categorized according to Wilson's seven principles by using quantitative content analysis methodology. The present study focuses on analyzing the contents of the drawings only. Figure 3.5 below show the process of data collection in this study.
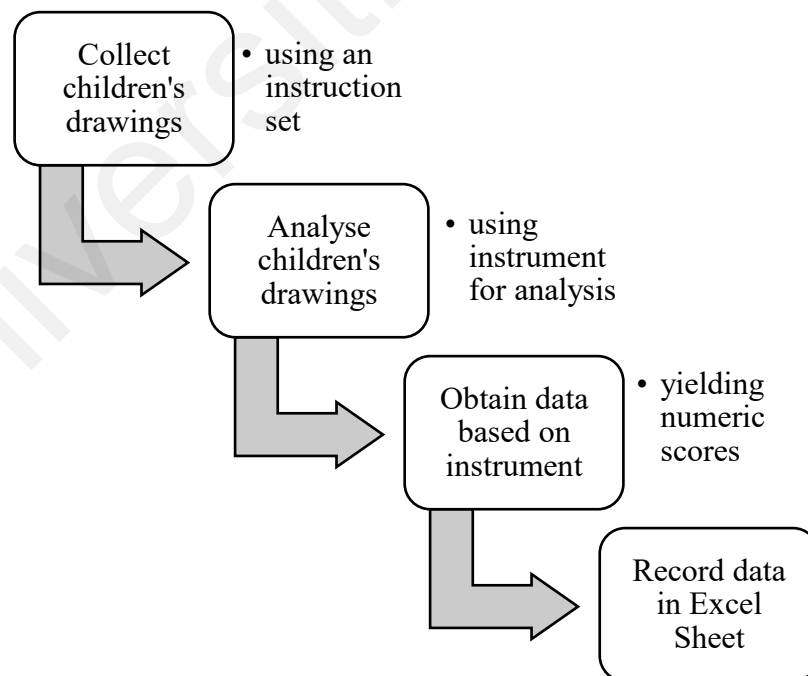
Figure 3.5. Process of Data Collection

3.10   Data Analysis

Data analyses will depend on the nature of the data. Bakar (2008) stated that data will influence the type of statistics used.

First, researcher organized the data for analysis. Preparing and organizing data for analysis in quantitative research consists of scoring the data and creating a codebook, determining the types of scores to use, selecting a computer program, inputting the data into the program for analysis, and clearing the data. Once scored, data was tabulated and coded. To analyses categorical data on a computer, the data are often coded numerically. The first step in coding data was to assign an ID number to every student from whom data has been collected. For example, there were 55 Year 1 students, then the researcher numbered them from number 1 to 55.

Children's drawings were analyzed based on Wilsons' (2009) seven graphic principles for drawing's characteristics within the page on which it was drawn. Unrecognisable or shapeless lines were not considered. Researcher coded each of the principle, like simplicity as P1, perpendicular as P2, territorial imperative as P3, fill the format as P4, conservation or multiple application as P5, draw everything as P6 and plastic as P7. In proceeding, researcher assigned a value to each response category for each principle on the instrument used to collect data. To analyze the drawings, researcher assigned scores for the principles such as 1 = a present of principle and 2 = non-shown of principle.

The type of inference technique that researcher used was non-parametric techniques. It was because the data do not meet the assumptions of the parametric test, especially the assumption about normally distributed data. Non-parametric techniques make few assumptions about the nature of the population from which the samples are taken. It refers to a statistical method in which the data is not required to fit a normal

distribution. Non-parametric test is also called distribution-free test because they do not assume that the data follow a specific distribution.

After researcher has prepared and organized the data, researcher is ready to analyze it. Researcher used statistics typically used in educational research, descriptive and inferential statistics. Data has been summarized, manipulated, and analyzed by using the Statistical Package for Social Sciences (SPSS). SPSS is a powerful, commonly used statistical computer package. Researcher has used IBM SPSS Statistics for Windows, Version 24.0 which released in 2017 from IBM Corp, Armonk, NY. SPSS is organized so that each column is a variable and each row consists of a subject's data. Researcher entered data by using the "Data View" window and analyzed data to address each one of the research questions in this study. Figure 3.6 shows the types of statistics used for each research question.

| Research Question 1 | What are the most common principles that children used in their drawing of the objects inside a house? |

- Descriptive statistic (percentage)

| Research Question 2 | What are the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age? |

- Descriptive statistic (percentage)

| Research Question 3 | Are there any relationships between children's used of principles and their stage of pictorial development? |

- Inferential statistic (Crosstabulation Analysis: Chi-square)

Figure 3.6. Statistics Used for Each Research Question

Researcher used frequency statistic (percentage %) to report the findings of Questions 1 and 2. Percentages can be calculated to assess the percent of the sample that corresponds with the given frequency. Researcher analyzed the data by converting the totals for each category of graphic principles into a percentage. For the first

research question, researcher used frequency statistic to calculate the percentage of seven graphic principles which applied by students in their drawings. By doing so, researcher could compare and identify the most common principles that children used in their drawing of the six main objects inside a house. Also, on the second research question, researcher used percentage to determine the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age.

For the third research question, researcher would need to compare two or more groups on the independent variable in terms of the dependent variable. Researcher wanted to make inferences about the population based on the data that have obtained from the sample. To do this, researcher used inferential statistics. Inferential statistics allow researchers to make inferences about a population based on findings from a sample (Creswell, 2012). In order to answer the third research question, the statistical method (Pearson Chi-square) was used to establish the connections between children's use of principles and their style of presentation according to their stage of pictorial development.

Researcher used Chi-Square to determine whether there is a relationship between these two variables in this study. The Chi-Square statistic is based on the difference between what is actually observed in the data and what would be expected if there was truly no relationship between the variables. Researcher determined the level of significance in a Chi-Square test by the level of significance (typically .05) and the degrees of freedom. Degrees of freedom (df) used in a statistical test is usually one less than the number of scores. The difference between two variables is judged to be statistically significant when p-value of the observed scores is less than the predetermined alpha level set by the researcher ($\leq$ .05).

3.11   Conclusion

This chapter has put forth various research methods and some methodological issues that are considered relevant to the main areas upon which this inquiry draws. Quantitative research can be carefully designed to enhance not only completion of the research but also interpretation of the results. It depends of the research problem and the conditions of the research that determine the appropriate methodology. A substantial part of the chapter was devoted to an overview of the procedures and outcomes of the pilot study. After the data analysis, the next step is to report the results that are found using tables, figures, and a discussion of the key results.

CHAPTER 4

FINDINGS

4.1   Introduction

This chapter included the findings and results of the data analyses related to the three research questions that posed in chapter one. In this section, researcher answered the most common Wilsons' graphic principles that children used, the use of principles according to children's age, follow by the relationships between children's used of principles and their stage of pictorial development.

In order to pursue the stated research objectives, data collection was executed using appropriate statistical analysis measures. The data analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 24 to calculate the relationships between categorical variables. Researcher used descriptive statistic to indicate general tendencies in the data and inferential statistical analysis to make inferences about a population based on data that have obtained from the sample.

4.2   Demographic Profile

The population of this study consists of 2600 children. In order to obtain the data as a representative of primary school children population, researcher requested the art teachers to carry out the drawing activity with 400 children to collect their drawings. Data was obtained from 335 children aged seven to twelve in a primary school for the present study. A total of 335 drawings which were complete in all respects and were received to be analyzed. The sample of 335 children consisted of 158 males, i.e., 47.2% were males and females were 177 in number, i.e., 52.8% of the sample.

After received the drawings, researcher analyzed the drawings by using the instrument for analysis (*refer to appendix B*). Simplicity is the use of simplest method available to children in drawing a particular thing. Perpendicular principle has different objects in the drawing presented from multiple angles at once in a way that is not possible in real life. Whereas, territorial imperative principle has each item drawn on its own way.

Following, fill the format principle is when children extend the boundaries of their work to fill the space on the page. Conservation or multiple application principle is when children use or rely on the same symbol each time they represent a certain thing. Draw everything principle is when the inside and outside of an object are both represented at once. Plastic principle applied when the most important feature of a work is exaggerated in size or attention to detail. All these principles were identified by looking at the drawing of six main objects in a house, included table, chair, television, vase, book and lamp. Other than that, other recognizable objects in the drawings also has been analyzed to provide more information.

4.3   Presenting the Findings of Data

Researcher reported the findings of data based on the three research questions.

4.3.1   Research Question 1

What are the most common Wilsons' graphic principles that children used in their drawing of the objects inside a house?

Table 4.1
Percentage for Wilson's graphic principles that children used in their drawings

Wilsons' Graphic Principles	Number of Children	Percentage (%)
P1	79	23.6
P2	92	27.5

Table 4.1 continued

P3	91	27.2
P4	192	57.3
P5	221	66.0
P6	151	45.1
P7	83	24.8

N = 335
Key: P1 = Simplicity; P2 = Perpendicular; P3 = Territorial Imperative; P4 = Fill the Format; P5 = Conservation/Multiple Application; P6 = Draw Everything; P7 = Plastic

Percentage is calculated by taking the frequency in the category divided by the total number of sample and multiplying by 100%. As illustrated in Table 4.1, descriptive statistics presented the percentage of seven Wilsons' graphic principles that used by children from Year 1 to Year 6 in their drawings. Reading from the table showed, it is obvious that from a total of 335 children, most of the children applied P5, which is principle of conservation/multiple application with the greatest percentage of 66% (221 out of 335). Thus, the most common principle that children used in their drawings of the objects inside a house is conservation/multiple application principle. The result indicated that it is very likely to show as children most typical drawing characteristic.

The second mostly used principle is P4, which is principle of fill the format, with the percentage of 57.3% followed by P6, drawing everything principle with percentage of 45.1%. There is almost similar percentage for P2 and P3, 27.5% were children who applied perpendicular principle and 27.2% were children who applied territorial imperative principle. Next, 24.8% of the drawings of children were confined to plastic principle. As a point of note, P1 was not a category likely to be displayed in the children's drawings. It is the least common principle that children used in their drawings, as only 23.6 % (79 out of 335) of children applied simplicity principle.

4.3.2 Research Question 2

What are the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age?

In order to provide a picture of the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age, the seven principles were cross-tabulated with age groups, as shown in Table 4.2.

Table 4.2 shows the descriptive statistics presented the distribution of the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age.

Table 4.2
Percentage for the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age

Wilsons' Graphic Principles	Group A		Group B		Group C		Total
	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*	
P1	35	22	11	8	1	2	79
	63.6%	**38.6%**	**18.6%**	**14.3%**	**1.8%**	**3.8%**	**23.6%**
P2	22	20	16	17	10	7	92
	40.0%	**35.1%**	**27.1%**	**30.4%**	**18.2%**	**13.2%**	**27.5%**
P3	28	20	16	14	8	5	91
	50.9%	**35.1%**	**27.1%**	**25.0%**	**14.5%**	**9.4%**	**27.2%**
P4	42	40	36	32	26	16	192
	76.4%	**70.2%**	**61.0%**	**57.1%**	**47.3%**	**30.2%**	**57.3%**
P5	45	46	45	38	26	21	221
	81.8%	**80.7%**	**76.3%**	**67.9%**	**47.3%**	**39.6%**	**66.0%**
P6	31	32	31	26	19	12	151
	56.4%	**56.1%**	**52.5%**	**46.4%**	**34.5%**	**22.6%**	**45.1%**
P7	20	19	16	12	10	6	83
	36.4%	**33.3%**	**27.1%**	**21.4%**	**18.2%**	**11.3%**	**24.8%**

N = 335
Key: P1 = Simplicity; P2 = Perpendicular; P3 = Territorial Imperative; P4 = Fill the Format; P5 = Conservation/Multiple Application; P6 = Draw Everything; P7 = Plastic. Note. Numbers in bold are column percentages.

The result in Table 4.2 indicates that there is no much difference between the use of Wilsons' seven graphic principles in children's drawings of Year 1 and Year 2, Year 3 and Year 4, Year 5 and Year 6. As indicated in Table 4,2, the number of

children decreased with age groups for Groups A, B and C, respectively. Therefore, it is reasonable to breakdown the years into three main groups (A, B and C).

Table 4.3

Percentage for the use of Wilsons' graphic principles in Group A children's drawings of the objects inside a house

Wilsons' Graphic Principles	P1	P2	P3	P4	P5	P6	P7
Group A	57 50.9%	42 37.5%	48 42.9%	82 73.2%	91 81.3%	63 56.3%	39 34.8%

N = 112
Key: P1 = Simplicity; P2 = Perpendicular; P3 = Territorial Imperative; P4 = Fill the Format; P5 = Conservation/Multiple Application; P6 = Draw Everything; P7 = Plastic.

As illustrated in Table 4.3, descriptive statistics presented the distribution of the use of Wilsons' graphic principles for Group A children's drawings of the objects inside a house. The distribution is observed on the basis of percentage of children's applying the seven Wilsons' graphic principle in their drawings.

Based on the table above, from a total of 112 children in Group A, 50.9% applied simplicity principle, 37.5% applied perpendicular principle and 42.9% applied territorial imperative principle. Checking from the tables (Table 4.4 and Table 4.5), compared to older children (Group B and Group C), it was obvious that younger children (Group A) frequently used the principle of simplicity, perpendicular and territorial imperative in their drawings as shown in Table 4.3.

Most children used conservation/multiple application principle with the greatest percentage of 81.3%, followed by the use of principle fill the format that has the second greatest percentage of 73.2%. Whereas, 56.3% applied draw everything principle and 34.8% were children with plastic principle. Given the ordinal value of the categories in Table 4.2, it is safe to say that the older the children, the lower was their chance of displaying drawings of draw everything principle and plastic principle.

Table 4.4
Percentage for the use of Wilsons' graphic principles in Group B children's drawings of the objects inside a house

Wilsons' Graphic Principles	P1	P2	P3	P4	P5	P6	P7
	19	33	30	68	83	57	28
Group B	**16.5%**	**28.7%**	**26.1%**	**59.1%**	**72.2%**	**49.6%**	**24.3%**

N = 115
Key: P1 = Simplicity; P2 = Perpendicular; P3 = Territorial Imperative; P4 = Fill the Format; P5 = Conservation/Multiple Application; P6 = Draw Everything; P7 = Plastic.

As illustrated in Table 4.4, descriptive statistics presented the distribution of the use of Wilsons' graphic principles for Group B children's drawings of the objects inside a house. The distribution is observed on the basis of percentage of children's applying the seven Wilsons' graphic principles in their drawings.

Based on the table above, from a total of 115 children in Group B, most of the children prefer to use conservation/multiple application principle. This is evidenced by the fact that 72.2% (83 out of 115) of the drawings of Group B were confined to this principle. The second greatest percentage is 59.1%, with 68 out of 115 children used fill the format principle, followed by the principle of draw everything with the percentage of 49.6%. On the other hand, 28.7% of the children used perpendicular principle, 26.1% of children used territorial imperative principle and 24.3% of children used plastic principle. Compared to Group A in Table 4.3, simplicity principle is the least used principle among the Group B children as it has the lowest percentage of 16.5% (19 out of 115).

Table 4.5

Percentage for the use of Wilsons' graphic principles in Group C children's drawings of the objects inside a house

Wilsons' Graphic Principles	P1	P2	P3	P4	P5	P6	P7
	3	17	13	42	47	31	16
Group C	2.8%	15.7%	12%	38.9%	43.5%	28.7%	14.8%

N = 108

Key: P1 = Simplicity; P2 = Perpendicular; P3 = Territorial Imperative; P4 = Fill the Format; P5 = Conservation/Multiple Application; P6 = Draw Everything; P7 = Plastic.

As illustrated in Table 4.5, descriptive statistics presented the distribution of the use of Wilsons' graphic principles for Group C children's drawings of the objects inside a house. The distribution is observed on the basis of percentage of children's applying the seven Wilsons' graphic principle in their drawings.

Based on the table above, from a total of 108 children, the older children showing conservation/multiple application principle as the most typical with the highest percentage of 43.5% (47 out of 108) display for Group C. Next, 38.9% were children who applied fill the format principle, 28.9% of children applied draw everything principle and 15.7% of children applied perpendicular principle. On the contrary, there are only 14.8% of children who used plastic principle and 12% used territorial imperative principle. After all, the oldest group, Group C, not commonly used simplicity principle in their drawings if compared to Group A and B since it appeared the lowest of the group's total drawings with 2.8% (3 out of 108) display.

4.3.3 Research Question 3

Are there any relationships between children's used of Wilsons' graphic principles and their stage of pictorial development?

In order to determine the relationship between Wilsons' graphic principles and

children's stage of pictorial development, the chi square tests were carried out. To

obtain chi-square tests, researcher used crosstabs procedure.

Table 4.6
The Chi-Square analysis of significant in relationship between children's used of simplicity principle and their stage of pictorial development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	85.575a	5	.001
Likelihood Ratio	88.111	5	.001
Linear-by-Linear Association	74.277	1	.001
N of Valid Cases	335		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.50.

Table 4.6 shows the Chi-Square analysis of significant in relationship between

children's used of simplicity principle and their stage of pictorial development. In this

case, the observed Pearson Chi-Square value equals to 85.575, and there are 5 degrees

of freedom. The associated p-value labeled "Asymp. Sig. (2-sided)," is reported as

.001, which is less than .05, showing that $\chi2(5, N = 335)$, p = .001, p < .05. Thus, the

Chi-Square test result of Table 4.6 indicated a significant association between

children's used of simplicity principle and their stage of pictorial development. At the

bottom of the table, footnote a. provided indicates that '0 cells (.0%) have expected

count less than 5'. This means that it has not violated the assumption, as all the

expected cell sizes are greater than 5 (in this case is greater than 12.50).

Table 4.7
The Chi-Square analysis of significant in relationship between children's used of perpendicular principle and their stage of pictorial development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.027a	5	.001
Likelihood Ratio	14.684	5	.001
Linear-by-Linear Association	12.778	1	.001
N of Valid Cases	335		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.56.

Table 4.7 shows the Chi-Square analysis of significant in relationship between children's used of perpendicular principle and their stage of pictorial development. In this case, the observed Pearson Chi-Square value equals to 14.027, and there are 5 degrees of freedom. The associated p-value labeled "Asymp. Sig. (2-sided)," is reported as .001, which is less than .05, showing that $\chi2(5, N = 335)$, $p = .001$, $p < .05$. Thus, the Chi-Square test result of Table 4.7 indicated a significant association between children's used of perpendicular principle and their stage of pictorial development. At the bottom of the table, footnote a. provided indicates that '0 cells (.0%) have expected count less than 5'. This means that it has not violated the assumption, as all the expected cell sizes are greater than 5 (in this case is greater than 14.56).

Table 4.8
The Chi-Square analysis of significant in relationship between children's used of territorial imperative principle and their stage of pictorial development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.462a	5	.002
Likelihood Ratio	31.086	5	.002
Linear-by-Linear Association	28.817	1	.002
N of Valid Cases	335		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.40.

Table 4.8 shows the Chi-Square analysis of significant in relationship between children's used of territorial imperative principle and their stage of pictorial development. In this case, the observed Pearson Chi-Square value equals to 30.462, and there are 5 degrees of freedom. The associated p-value labeled "Asymp. Sig. (2-sided)," is reported as .002, which is less than .05, showing that $\chi2(5, N = 335)$, $p = .002$, $p < .05$. Thus, the Chi-Square test result of Table 4.8 indicated a significant association between children's used of territorial imperative principle and their stage of pictorial development. At the bottom of the table, footnote a. provided indicates that

'0 cells (.0%) have expected count less than 5'. This means that it has not violated the assumption, as all the expected cell sizes are greater than 5 (in this case is greater than 14.40).

Table 4.9
The Chi-Square analysis of significant in relationship between children's used of fill the format principle and their stage of pictorial development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.550a	5	.001
Likelihood Ratio	31.202	5	.001
Linear-by-Linear Association	29.068	1	.001
N of Valid Cases	335		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.62.

Table 4.9 shows the Chi-Square analysis of significant in relationship between children's used of fill the format principle and their stage of pictorial development. In this case, the observed Pearson Chi-Square value equals to 30.550a, and there are 5 degrees of freedom. The associated p-value labeled "Asymp. Sig. (2-sided)," is reported as .001, which is less than .05, showing that $\chi2(5, N = 335)$, p = .001, p < .05. Thus, the Chi-Square test result of Table 4.9 indicated a significant association between children's used of fill the format principle and their stage of pictorial development. At the bottom of the table, footnote a. provided indicates that '0 cells (.0%) have expected count less than 5'. This means that it has not violated the assumption, as all the expected cell sizes are greater than 5 (in this case is greater than 22.62).

Table 4.10
The Chi-Square analysis of significant in relationship between children's used of conservation/multiple application principle and their stage of pictorial development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.495a	5	.001
Likelihood Ratio	39.310	5	.001
Linear-by-Linear Association	35.370	1	.001

Table 4.10 continued

N of Valid Cases	335	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.04.

Table 4.10 shows the Chi-Square analysis of significant in relationship between children's used of conservation/multiple application principle and their stage of pictorial development. In this case, the observed Pearson Chi-Square value equals to 39.495a, and there are 5 degrees of freedom. The associated p-value labeled "Asymp. Sig. (2-sided)," is reported as .001, which is less than .05, showing that $\chi^2(5, N = 335)$, $p = .001$, $p < .05$. Thus, the Chi-Square test result of Table 4.10 indicated a significant association between children's used of conservation/multiple application principle and their stage of pictorial development. At the bottom of the table, footnote a. provided indicates that '0 cells (.0%) have expected count less than 5'. This means that it has not violated the assumption, as all the expected cell sizes are greater than 5 (in this case is greater than 18.04).

Table 4.11
The Chi-Square analysis of significant in relationship between children's used of draw everything principle and their stage of pictorial development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.257a	5	.001
Likelihood Ratio	21.053	5	.001
Linear-by-Linear Association	17.927	1	.001
N of Valid Cases	335		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 23.89.

Table 4.11 shows the Chi-Square analysis of significant in relationship between children's used of draw everything principle and their stage of pictorial development. In this case, the observed Pearson Chi-Square value equals to 20.257a, and there are 5 degrees of freedom. The associated p-value labeled "Asymp. Sig. (2-

sided)," is reported as .001, which is less than .05, showing that χ2(5, N = 335), p = .001, p < .05. Thus, the Chi-Square test result of Table 4.11 indicated a significant association between children's used of draw everything principle and their stage of pictorial development. At the bottom of the table, footnote a. provided indicates that '0 cells (.0%) have expected count less than 5'. This means that it has not violated the assumption, as all the expected cell sizes are greater than 5 (in this case is greater than 23.89).

Table 4.12
The Chi-Square analysis of significant in relationship between children's used of plastic principle and their stage of pictorial development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.144a	5	.002
Likelihood Ratio	13.694	5	.002
Linear-by-Linear Association	12.978	1	.000
N of Valid Cases	335		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 13.13.

Table 4.12 shows the Chi-Square analysis of significant in relationship between children's used of plastic principle and their stage of pictorial development. In this case, the observed Pearson Chi-Square value equals to 13.144a, and there are 5 degrees of freedom. The associated p-value labeled "Asymp. Sig. (2-sided)," is reported as .002, which is less than .05, showing that χ2(5, N = 335), p = .002, p < .05. Thus, the Chi-Square test result of Table 4.12 indicated a significant association between children's used of plastic principle and their stage of pictorial development. At the bottom of the table, footnote a. provided indicates that '0 cells (.0%) have expected count less than 5'. This means that it has not violated the assumption, as all the expected cell sizes are greater than 5 (in this case is greater than 13.13).

4.4   Conclusion

This study, conducted based on a theoretical framework that used Wilsons's seven graphic principles as a guideline to analyze primary school children's drawings. Hopefully, this study has revealed analysis based on research questions that revolved in this underlying study to better understand children's drawing developmental process.

The findings indicate that the nature of children's drawing is determined by an innate set of graphic-ordering principles. The most common Wilsons' graphic principle that children used in their drawing of the objects inside a house is conservation or multiple application. Confirming the result of the earlier test in Table 4.2, the principle category of youngest children (Group A) is evidently highest. Younger children applied the higher number of seven graphic principles compared to intermediate group (Group B) and older group (Group C). All the Wilsons' graphic principles seems to be related to children stage of pictorial development ($p < 0.05$).

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1   Introduction

The overriding purpose of this study was to analyze primary school children drawings based on Wilsons' seven graphic principles. This chapter is the final chapter of this study with the aim to summarize the major findings as presented in previous chapter. Then, a detailed discussion was done with relation to past studies and related theories. Moreover, future implications and contributions were also outlined. The last part of this chapter presented some recommendations for future study.

5.2   Summary of Findings

The objectives of this research were to: (i) identify the most common Wilsons' graphic principles that children used in their drawing of the objects inside a house; (ii) determine the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age; and (iii) determine the relationships between children's used of Wilsons' graphic principles and their stage of pictorial development.

This study reported descriptive data for the use of Wilsons' graphic principles in children's drawings of the objects inside a house. Firstly, this information provided data on the percentage of the most common Wilsons' graphic principles that children used in their drawing. Based on the finding, conservation/multiple application principle is the most common Wilsons' graphic principle that children used in their drawing.

Secondly, in examining the use of Wilsons' graphic principles in children's

drawings according to their age, the sample of children was divided into 3 age groups. Group A is children who age 7 to 8; Group B is children who age 9 to 10 and Group C is children who age 11 to 12. The fact that the use of simplicity principle, perpendicular principle and plastic principle in Group A children's drawings were most prominent when seen in relation to children's age did somewhat meet researcher expectation. As expected, Group A children, which is the youngest group are inclined to draw objects independently of a consistent unique viewpoint.

Thirdly, this study analyzed the relationships between children's used of Wilsons' seven graphic principles and their stage of pictorial development. An analysis of inferential statistics (Pearson Chi-square) was performed on each Wilsons' seven graphic principles, which included simplicity principle, perpendicular principle, territorial imperative principle, fill the format principle, conservation and multiple application principle, draw everything principle, and plastic principle. All analyses were tested at the .05 predetermined alpha level for significance. The results suggested that all the Wilsons' graphic principles were associated with children's stage of pictorial development.

5.3 Discussion

The discussion was divided according to the research questions in answering them and to further discuss the Wilsons' seven graphic principles in children's drawings.

5.3.1 The most common Wilsons' graphic principles that children used in their drawing of the objects inside a house.

Descriptive statistics presented the percentage of seven Wilsons' graphic principles that used by children from Year 1 to Year 6 in their drawings. From a total of 335 children, most of the children applied P5, which is principle of conservation/multiple

application with the greatest percentage. Thus, it could be clear that the most common Wilsons' graphic principle that children used in their drawing of the objects inside a house is conservation/multiple application principle.

This is to say, conservation/multiple application principle is very likely to show as children most typical drawing characteristic. With this principle, children used or rely on the same symbol each time they draw an object. They applied the same arrangement of elements over and over again in a variety of ways. As explained by Wilson & Wilson (2009), children use the same symbol as many uses as possible and desirable because of their limited vocabulary. For example, house was shown as a trapezium, television was shown as a rectangle and lamp was shown as a circle.

As children grow, they are constantly striving to understand their world. In drawing, children begin to create images that do symbolize aspects of their world at about the age of three to four (Eisner, 1972; D'Amico, 1942). At this time, representational shapes and figures emerge in children's drawings. During this age period, they make simplified, flat and two dimensional shapes that signify with art materials. It is during this period, from ages three or four to nine or ten, that the lollipop tree, the gabled house and the four-paned window become evident in children's drawings.

Children's drawings often reflect how children understand and what they emphasize in their surroundings. Lowenfeld (1964) present the notion that children increasing awareness of themselves and their surroundings is usually indicative of intellectual growth. In their art-making process, this developing alertness is reflected in the details which they included. As researcher found in the children's drawings of this study, children formed or combined different kind of symbols with circles, squares, and lines in different ways. Most of the children's drawings from this study

show a series of houses which were all drawn the same and in familiar canonical orientations, mostly in full frontal view. As Cox (1986) has noted that, many young children draw a single square to represent a house. In their drawing of house, children love to draw the symbol of four-paned windows.

Besides, the conservation/multiple application principle also found in their drawing of the objects inside a house such as table, chair, television, vase, book and lamp. For example, the leg of the table and chair had been interchanged with legs with feet. Children drew the picture of table and chair with three of four legs. Moreover, the top of the table also be drawn often with objects on it, for instance, they depicted the books on the table by the shape of square. The shape is the essential feature of the object, which enable the child to represent an object on the graphic level. The generalization of the shape helps children to draw appropriate lines on the paper in order to represent the necessary object (Solovieva, 2017).

In particular, conservation/multiple application principle is related to the characteristic of children's drawing in schematic stage (Lowenfeld & Brittain, 1987). The main characteristic of this stage is the repetition of symbols for familiar objects. In general, children reach this stage between 6 and 11 years of age. The limited range of graphic schema, such as vertical and horizontal lines, the grid, the zigzag, the arc, the enclosure and the 'core and radial' (sun shapes), which children use in their drawings are well documented. For the traditional stage theories, these strategies produce deficient drawings, lacking visual verisimilitude in relation to the objects they represent.

On the other way, data of this study also indicated that simplicity principle is the least common principle that applied by children in their drawings. As Wilson & Wilson (2009) stated, drawing develops by the alteration of simple and

undifferentiated ways of drawings to conform to newly devised or borrowed, more complex or differentiated methods. This is in accordance with Arnheim (1974) who similarly highlighted that younger children use simple forms to represent objects, regardless of whether or not the precise shape of the form matches that of the object portrayed.

As a whole, children applied all the Wilsons' seven graphic principles in the drawings of this study. Among the seven principles, conservation/multiple application principle is the most common principle that children used in their drawings. Conversely, simplicity is the least common principle that children applied in the drawings as it is more general used in younger children drawing. It must also be pointed out here that drawing's characteristics such as repetition, symbolism and transparency are commonly revealed by children in their drawings. This can be concluded by the use of fill the format principle, conservation and multiple application principle and draw everything principle were in higher range compared to other principles.

5.3.2 The use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their age.

The findings of this study have noted the regularities and similarities among the drawings of children. It can be concluded that all children possess a universal language of visual symbols (Wilson, & Wilson, 2009). To answering this research question, researcher explained the type of graphic principles that children appear to follow and that determine the nature of things they draw.

Most of the Group A and Group B children used conservation/multiple application principle with the greatest percentage of 81.3% (91 out of 112) of the Group A children's drawings and 72.2% (83 out of 115) of the drawings of Group B.

Based on Table 4.5, the same goes to Group C children, as 43.5% (47 out of 108) of their drawings showed the used of conservation/multiple application principle. Thus, it could be easily surmised that conservation/multiple application principle not only was very likely to be documented by younger children, but also for older children. This statement is also roughly consistent with the result obtained by Lau (2013) that 13 years old students also used similar symbols as younger students to depict the objects in manga drawings.

Group A children's drawings showed the most number of application of conservation/multiple application principle. Their drawings showed concepts but not real images that represent the certain objects. As children grow older, they start to be more aware of their environment (Lowenfeld & Brittain, 1987). Children develop and use graphic symbols for representing the things they encounter in their environment. Thus, they will develop a set of symbols to represent concepts that may not be in proportion to real objects in their drawings. This result is in agreement with studies that suggest that a majority of children aged 3 to 5 years used variety and repetitive lines or shapes to create pictures for conveying their ideas (e.g Acer & Benli, 2019; Didkowska, 2016).

Another important point to note is that in the older groups, Group B and Group C children, are lesser in the use of conservation/multiple application principle if compared to Group A children. These two groups of children who age from 9 to 12 year are in the developmental stage of dawning realism (Lowenfeld & Brittain, 1987; Kellogg, 1970). In this stage, children draw the objects in a smaller size but with more details. They start to realize that symbols do not represent real images. The findings support the research of Deaver (2009) which indicated that older children included more details and used significantly more color and space than the younger children.

As supported by Lowenfeld (1964), the closer the child approaches adolescence, the more he or she loses the strong subjective relationship to the world of symbols.

Whilst the use of principle fill the format that has the second greatest percentage of 73.2% for Group A and 59.1% for Group B, respectively. In comparison to Group C children, has a lower percentage of present characteristics with this principle. This result is consistent with the findings of previous studies (Golomb, 2004; Toku, 2001). In many drawings of the younger children have the tendency to fill the space with decorative detail. Young children also tend to arrange the objects less in accordance with reality. This is because the concept of spatial arrangement found in their drawings were created with imagination. These findings are consistent with previous ones (Hsu & Ya-Huei, 2014; Ling & Sharifah & Hasnah, 2012) revealed that drawings' images reflect children's imagination and creativity. For the older children, they are no longer placed the objects side by side on a baseline as seen in younger children's drawings. They are more attempt to arrange the objects they draw in relation to one another on the page with a ground plane.

Checking from the tables (Table 4.4 and Table 4.5), compared to older children (Group B and Group C), it was obvious that younger children (Group A) frequently used the principle of simplicity, perpendicular and territorial imperative in their drawings as shown in Table 4.3. This means that younger children more inclined to create simple and improper orientations of images in drawing. The more structurally complex pictures were more likely to be produced by older children (Putih, 2002). Following this developmental pattern, it could also be easily surmised that these three principle were very likely to be drawn by children of the younger age group if compared to older age group. This finding confirmed the results of Yamagata (2001), who found that children are increasingly better at organizing component parts in

drawings with age. Moreover, group C children or older children added more elements in their drawings such as a sun, trees, and flowers, showing that the older children had a broader world view (Farokhi & Hashemi 2011).

This result indicates that younger children were more likely use simplicity because simple figures can easily be found in younger children's drawings, and the figures were less complex structurally. The older group (Group C), not surprisingly, was less likely to be identifiable by its use of simplicity principle. This means that older children were able to produce more complex pictures because they gradually add more details to their drawings. As Arnheim (1974) has emphasized in the law of differentiation, it indicated that organic development always proceeds from the simple to the more complex. According to previous research, Toomela (1999) pointed out that 4 to 7 years old children typically draw single units whereas 8 to 13 years old children frequently draw differentiated figures. Thus, it may be concluded that as the children getting older, their ability for drawing of complex objects appear gradually.

Another finding is that, territorial imperative principle was most likely to be applied by much younger children who involved drawing of the objects on a page usually seem to float and were usually not related to one another. As a result, each of the objects drawn occupying its own space. For instance, vase and book are illustrated with the concept of laying down on the table. As mentioned above, because children are increasingly better at organizing component parts with age (Yamagata, 2001), older children are more likely to draw objects with proper orientation and arrangement. The findings are in line with Willats (2005) who similarly emphasized in the drawings of younger children who age five to seven years, the predominant tendency is to arrange the items separately, without indicating a specific relationship to the main object.

As well as that, another important children's drawing characteristic is diverse graphic phenomena. The application of this principle and the need for visual order overpower many of the child's perception and natural world. Results in this study also revealed that, younger children used more perpendicular principle than older children in drawing. The different on the use of this principle between Group A and Group B is 8.8 percent. Another technique of this principle sometimes used is called "folding over" this is demonstrated when objects are drawn perpendicular to the base line. By using this technique, the objects in the drawing appear to be drawn upside down. Like what have depicted by the children, researcher has noted the error in orientation of the chimney on the roof of the house. The chimney of the house is oriented to the roof at a 90-degree angle. Other than that, the table is often shown with four legs drawn form an "aerial" view.

These "turning over error" generally create by younger children as they are confusing with the awareness of space in the paper. This finding also found evidence to support Piaget (1969), that the child begins to draw objects in correct perspective from the nine years. In schematic stage, the children begin to adopt realistic choices in their drawings and attempt to draw objects of various sizes and locations on the page. The older children are able to show how the position of a viewer influences the image drawn. They begin to draw objects that overlap one another and that diminish in size. They also begin to use diagonals to show perspective, or the recession of planes in space. The important thing is that the results of the analyses of the drawings correspond with the results of the studies performed with other samples of children (see Türkcana, 2013; Golomb, 2004).

Another characteristic seen in a lot of children's drawings is called x-ray drawing, which termed as draw everything principle. It is a drawing in which the

"inside" of an object is made visible. An example of draw everything principle would be a child drew an image of a house and also drew the room inside the house with tables, beds, and perhaps people. Besides, children in this study also drew the vase with the flower inside it and appear to be see-through. The result is a so-called "transparency" or "X-ray" drawing which is characteristic of what Luquet (2001) has termed in the stage of intellectual realism. According to the account given by Luquet (2001), children are drawing what they know rather than what they see. This statement is more related to younger children.

Of the three groups, only the youngest group (Group A) seemed to favor the use of plastic principle. Children applied plastic principle when they drew huge or oversize images that indicate aggression and overactive. The apparent inaccuracy shows that objects of importance are often drawn larger than objects of lesser importance. Exaggeration between figures is often used to express strong feelings about a subject. Part of the body or place in the composition is exaggerated by excluding other parts. For example, in the drawings, children extended the arms of the human figure if touching or picking up and object, humans taller than a house, flowers bigger than humans, family members large and small.

As the use of plastic principle decreased with age, it means that Group C or older children use the realistic proportion more frequently than younger children. This also corresponds with the findings of other authors (Golomb, 2004; Putih, 2002; Thomas & Tsalimi, 1988) namely that the older children, who have achieved a higher level in drawing, express the proportions and relations among the elements in the drawing better than younger children. On the other hand, children who do not adapt well in drawing like Group A children tend to draw exaggerated figures. Following this developmental pattern, in drawing a human or animal figure, the older group and

intermediate group are directed in their proportioning of the body parts by the principle that the head must be smaller than the body. All these drawing "errors" will be helping the children to develop skills including trial and error, patterns, shapes and interpretation.

Results also indicated that the majority of objects drawn were what children readily observe in their environment. This result is consistent with previous studies that children draw what they see or observe around them, particularly elements of nature and animals. The most common object in children's drawings as found in previous research is house and trees (Walker, Myers-Bowman & Myers-Walls, 2003). The same was found in this study in that the majority of drawings contain house, tree, flower and bird. Of the three groups, Group C children drew more objects. Younger children were most likely to produce drawings of similar and limited objects. As far as older children were concerned, they were most likely to produce different objects that inspired by their lived experiences. It is because the content of a drawing depends on the richness and extent of a child's experiences (Deguara & Nutbrown, 2017). The breadth of the child's world vision has a great influence on the contents of the drawing.

As a point of note, Wilsons' seven graphic principles were used by the children at different age range. These findings were roughly consistent with the result obtained by Thomas & Silk (1990) indicates that children's drawing characteristics could be identified by age. Group A was the group which used the most principles and the number of principles used were highest among the groups. In contrast, Group C used the least number of principles whereas Group B used lesser than Group A. It could be inferred that the older the children, the less were the principles the children employed in their pictures. Broadly speaking, as children grow older, their drawings become more detailed, better proportioned and more realistic.

5.3.3 Relationships between children's used of Wilsons' graphic principles and their stage of pictorial development.

In order to answer research question three, the chi-square tests of independence were performed to examine the relation between seven Wilsons' graphic principles and children's stage of pictorial development.

Measured by chi square, the findings indicated that there were significant association between children's used of Wilsons' seven graphic principles and their stage of pictorial development. In particular, researcher considered the seven Wilsons' graphic principles (simplicity, perpendicular, territorial imperative, fill the format, conservation and multiple application, draw everything, and plastic) correlated highly with children stage of pictorial development. In fact, the relationship indicates that the children's use of Wilsons' seven graphic principles went in accord with age factor, developmental trends.

One of the earliest and most quoted descriptions on children's drawing development was advanced by Luquet (see Golomb, 2004; Cox, 1992). The central tenet of this description is a shift of children's preoccupation with the drawing strategy that affects their pictorial style to move from intellectual to visual realism. Thus, Wilson's proposed sequence of drawing development postulated developmental stages in organizational and graphic skills as well as in the child's realistic intentions. Based on Thomas & Silk (1990), children's drawings can be classified into five stages, starting with the scribbling stage to visual realism, which has been termed by Luquet. Thomas & Silk (1990) also stated that there is no a fixed relationship between children age and the stages that they have achieved in their drawings.

The present finding revealed that a developmental trend apparently existed in drawing among the children. Children apply Wilsons' seven graphic principles

differently at different levels of their development (Wilson & Wilson, 2009). In this study, the five to eight years old children's drawings are in the stage of intellectual realism. Children at this stage are aware of how a human looks and they see the same things an adult see. The difference is that children draw what they know, not what they see. Children still tend to be more interested in the process of making art rather than the final product at this stage. This is because, their drawings still contain elements which the children know to exist, even though cannot normally be seen. As is typical in this stage, children often make X-ray drawings during the stage of intellectual realism. In Wilsons' principles, X-ray drawings is the principle of draw everything. Hence, the principle is evident in children's drawing proofed the X-ray drawings exist.

Apart from the factor of age, drawings are affected by knowledge and the ability to draw. Farokhi & Hashemi (2011) stated that children's age and cognitive development are important factors to consider. And, Arnheim (1974) investigated graphic development as a cognitive process of perception and representation. In children's learning processes, they must grapple with the complex problems of turning three-dimensional into two-dimensional versions of things. Thus, children use different ways to solve the problem of space between objects in their drawings. The challenge of larger objects is resolved through fold out drawings, X-ray drawings, multiple-viewpoint drawings, and bird's-eye views. Drawings by children at this stage are increasingly visually realistic in terms of scaling and details compared to the previous stage, failed realism. As their drawings become more realistic, their uses of Wilsons' graphic principles decreased. It is assumed that with an increase in age, children's drawing would become more realistic. This result is similar to the findings of other relevant literature (e.g Didkowska, 2016; Yamagata 2001).

The child's involvement in symbolism usually goes downhill after a child has

passed the age of eight or nine. A child is then deemed to have reached the stage at which he has to confront with new challenges as to how he can make things look real in the drawing. As a result of the increasing awareness toward his surroundings, children become more concerned to form true visual images related to external objects. This fact seems to indicate that, the mode of representation of the child veers with the change of age. As the children evolve through this stage more details begin to appear in their drawings. The number of Wilsons' seven principles used by the children decreased as the children's age increased. Age is a determining factor in skill development (Acer & Benli, 2019). These preliminary findings are congruent with those of the earlier studies (e.g. Freedman, 1997; Thomas & Silk, 1990).

Children's drawing become more proportional and more detailed when their age increased. The relation between drawing in realistic proportion and social competence is conditioned by the chronological or mental age of the child (Cugmas, 2004). Around the age of nine or ten, children strive toward optical realism in their drawings. Children now begin to draw from a particular viewpoint and proportions and relationships are worked out accordingly (Thomas & Silk, 1990). This stage has been termed "visual realism" by Luquet. Older children at this stage often applied less Wilsons' graphic principle than younger children. As the age of children increase, they start to lost the expressiveness and originality which seems to occur in children's drawings. Therefore, there is an imperative change in the way children present their ideas in their drawings through this study.

Many older children continue to draw symbolically in spite of the increased concern for realism. While young children become engrossed in the meanings and actions of subjects as they draw, older children tend to be more concerned with whether their pictures resemble what it is they are drawing their artwork. Interest in

detail, perspective, and art techniques makes the children in this stage exciting to work with. Children become increasingly critical of their graphic abilities. They start to show a reluctance to engage in drawing activities as they grow older. This interest in visual description typically emerges around the age of eight or nine as children begin to adopt their culture's conventions for representing a three-dimensional scene on a two-dimensional surface (Winner,1986). This is in accordance with Toku (2001) who similarly highlighted that children' drawings are influenced by their cultures.

Depending upon the age of children, their learning style and personality, they will have different needs. Kellogg (1970) has argued that there is a universal pattern of development in children's drawing. Children of different ages utilize different approaches to represent their world and how they symbolize knowledge can change developmentally. The progression of drawings that children make over a period of time can show significant growth and development, as well as determine academic capabilities and skills of their developmental level (Brittain & Lowenfeld, 1987). Although the stages of pictorial development are marked with approximate age levels, the developmental level may vary for each child. Each of these stages refers to a combination of Wilsons' graphic principles found in the children's drawing.

5.4   Implications of Study

This section explicates and discusses the implications of the findings can be directed to the field of Visual Art Education, on theory, knowledge and teachers respectively.

5.4.1   Implication on Theory

The findings from the analysis respond to the research questions and help to achieve its goals, which are to identify the most common Wilsons' graphic principle that children used in their drawing of the objects inside a house; the use of Wilsons' graphic

principles in children's drawings according to their age and determine the relationships between children's used of Wilsons' graphic principles and their stage of pictorial development. These information helps to explain the reasons children's drawings look the way they do and determine where a child stands developmentally.

The current study applied Wilsons' theory for the analysis of children's drawings. With this theory, researcher is able to make a more satisfactory analysis of children's art, and understand the development of planning and organizing skills in children's drawings. Wilson & Wilson (2009) believe that the innate principles interact with the structure of the world and the influence factors to allow children to draw greater accuracy and completeness. The natural predisposition to apply these seven graphic-ordering principles is strong and governs most of the child's early drawing activity. When a principle is not applied, and these principles are certainly not always applied the reason may be one principle has for some reason taken precedence over another. The second reason is the child has learned through practice and observation to overcome the natural tendencies.

These points are important because studies that concentrate on children's drawing ultimately enable children to better understand the context of drawing as well as develop pictorial skills. The continued development and enriching of children's vocabulary also allows them to better provide details in their drawing. At the same time, more researches should also be conducted in this area to understand children artistic development. Analysis of children's drawings has provided insight into the structure of children' perceptions, its orientation and content. This theory can be used in teaching and learning process in visual art education for teachers to better understand the characteristics of children's drawing based on the Wilsons' seven graphic principles. Similarly, this theory might also be widely used in other area other

than in visual art education, for example in psychology.

In this sense, this theory might be important and useful for other researchers and educators to try in other schools or in other state. Children's drawings will differ depending on what environment they are in (Ahmad, 2018). In this study, the sample was taken from a primary school with most of the population of Chinese in an urban area. This study may serve as a guide and reference for the educators undertaking similar studies in rural schools or other states. Studies can also study about the comparison between urban and rural schools. This will add to the body of global research on children's drawings and allow comparisons of children's drawings across cultures. The comparison could help to determine if there are any detectable changes between the drawings collected.

5.4.2 Implication on Knowledge

A second important implication of this study derives from finding on the uniqueness of the knowledge, in particular in the field of visual art education. The findings point to develop skills and knowledge of children's drawings, for example the content of children's drawings. The findings of this study are expected to provide insights and information that can form the basis for further study by focusing on children's drawings.

The findings from this study provide visual art teachers more knowledge about children's artistic development. The more knowledge teachers have about children's development the more they can take it into consideration when putting together an educational curriculum. For instance, they understand that children's drawings are not always typical of a particular age-range. By having knowledge of this practice, teachers can use different drawing themes to assess the developmental trend of children's drawing. It is because the uses of different themes influenced the content

and structure of children's perceptions in their drawings. Given the chance, teachers would be able to use appropriate ways to analyze children's drawings to understand the meanings and concepts of children's drawings with their artistic development.

Moreover, the results of this study also provide some insights and information on how importance of drawing for children's growth. The findings are important for society to raise their awareness for the importance of children artistic development in Malaysia. Society need to enhance their perspective and awareness toward children's drawing development in order to encourage children to express themselves in creating art. Society need to be aware that children nowadays learn a lot more from graphic sources than in the past, for example the visual information and pictures in smart phone or tablet. It is imperative to society that children are raised to not only appreciate art in all its forms but also be confident and competent to do the artworks by themselves. When society have access to these skills and bodies of knowledge, they can prepare for the needs of their children.

5.4.3 Implication on Visual Art Teacher

The results of the present study give a clear indication that children applied the Wilsons' graphic principles in their drawings. Seven graphic principles used by children in various situations help explain the nature of these sometimes curious and humorous drawings. The results of this research may aid in the future design of activities utilized in the development of primary school children's drawing skills.

The implications of drawing to children generally are to help them in their growth and development. Through drawing, children are able to improve their communication method. Other than that, drawing can also be used to give an indication of children's intellectual level. Therefore, teachers should make the development of drawing abilities a priority in classroom. This is to provide children with opportunities

to draw often and give them the assistance and the encouragement they require.

Children's drawings are used in explaining certain dimensions of teaching methodology, directed towards understanding the pedagogical questions about the validity of process of teaching children how to draw (Anning & Ring, 2004). Of greater concern to art teachers should be the loss of expressiveness and originality which seems to occur in children's drawings as they grow older.

With the knowledge of children art, teachers would be able to understand children's drawings and the meanings expressed in the children's image symbols. It helps teachers to enhance their perspective toward their children's drawing development. In order to improve the teaching process, teacher could develop proper module in visual art teaching and learning as compared to the traditional method of using a textbook. The use of a module presents a more flexible learning environment for both teachers and students. It is also very helpful in providing guidance and support for new and inexperienced teachers.

Teachers could comprehensively understand and provide them with a suitable growth environment in school. They understand what children seem to do naturally and what they are capable of doing are entirely different matters. It is likely that teachers will find that students within their classrooms are at varied points in their graphic development since some have had abundant prior experiences with art, whereas others, may have had limited creativity or skills. Thus, teachers should avoid the temptation to place children at a particular stage simply because of their age or grade level.

5.5   Recommendations

The findings and conclusions resulting from this study lead to some recommendations in different aspects, such as research variables, research procedure and data analyses. In the end, a continued need exists for further research to be conducted in the area of children's drawing.

Although the present study addressed the process underlying the emergence of representational drawing, some issues remain to be investigated. In this study, children were given a drawing theme and they constructed a drawing based on the theme of house. Future study is needed to check whether the use of the Wilsons' seven graphic principles for this depends on the task conditions or other drawing themes as well. Therefore, future study can further extend drawing task or theme to include other familiar objects, such as car, tree, descriptive scenery and colorful objects so that their spontaneous criteria for drawing can be assessed.

In addition, other ways of collecting and analyzing the data may also be useful in future studies. The current study presented quantitative methods to collect research data in the analysis of children's drawings. Similar studies could be designed or mixed with qualitative research methods to look from a more generalizable perspective on the children's drawing characteristics. The children could be interviewed to get their feedback about their drawing product and observing the way they draw to extent the current findings. The results of these additional analyses from interview and observation could then respectively inform the development of future studies as described above.

One of the limitation in this study is that gender is not a variable to be studied. According to Tuman (1999), artistic and structural components in drawing change in response to gendered content preferences. Further research can also focus on

identifying the use of Wilsons' graphic principles in children's drawings of the objects inside a house according to their gender. By doing so, the difference between male and female in the use of graphic principles in children's drawings will be identified. Moreover, further research could also determine whether there are significant differences between children's used of Wilsons' graphic principles and gender.

The current study, as mentioned earlier, covered a wide range of ages from 7 to 12 years. Further research would do well to target a more narrowed age range, or just focusing on one age group. By doing so, researcher can comprehensively understand and present the characteristics of children's drawing more specifically. Besides, the present study provides insight into Wilsons' seven graphic principles which children applied in their drawings. Further research could reduce the categories of Wilsons' graphic principles that need to be studied. For example, future research could only choose the common principles that children tend to use in their drawings to get acquire more rich and detail data.

5.6   Conclusion

The present study provides evidence of how Malaysian children of various age groups draw an imaginative drawing. Taken as a whole, this study has identified the characteristics present in children's drawings that may particularly represent a significant contribution to understanding children's picture-making. Wilsons' seven graphic principles were used by the children at different age range. Among the seven graphic principles, conservation/multiple application principle is the most popular used principle in children's drawings. Children apply these graphic principles differently at different levels of their development. Children's drawings have an order of development and their drawings naturally change according to age. There is a

relationship between children's used of Wilsons' graphic principles and their stage of pictorial development. Each stage may be identified by certain characteristics that show up repeatedly in their artwork.

REFERENCES

Abdullah, S.B.B. (2013). *Keperluan Penguasaan Kemahiran Pendidikan Seni Visual Sekolah Menengah Untuk Guru-Guru Seni Di Sarawak*. Universiti Malaysia Sarawak: Fakulti Seni Gunaan dan Kreatif.

Acer, D. & Benli, G.K. (2019). *Description of Turkish Children's Drawing, Early Writing and Narrative Skills Using A Picture Book.* Ankara University: Journal of Faculty of Educational Sciences, Volume: 52, Issue: 2, 495-523.

Ahmad, JF. (2018). *Children's drawings in different cultures: an analysis of five-year-old Jordanian children's drawings.* International journal of early year education, The Hashemite University.

Almeida, S. (2003). *A Re-Analysis of Typical Developmental Characteristics in Children's Drawings, according to Victor Lowenfeld: A Pilot Study of Eight-Year-Old Children Attending Philadelphia Public Schools*. Drexel University: Hahnemann Creative Arts in Therapy Program.

Anning, A. & Ring, K. (2004). *Making sense of children's drawings*. Maidenhead: OUP/McGraw-Hill.

Arnheim, R. (1974). *Art and Visual Perception*. Berkeley: University of California Press.

Bakar, S.A. (2001). *Children's Drawings as Research Tool: Establishing Children's Environmental Concepts and Preferences*. The University of Sheffield, U.K.

Bakar, B.A. (2008). *Kaedah Analisis Data Penyelidikan Ilmiah*. Kuala Lumpur: Utusan Publication & Distributors Sdn. Bhd.

Baker, T.L. (1994). *Doing Social Research* (2nd Edn.). New York: McGraw-Hill Inc.

Barnes, E. (1987). *Studies in Education, Vol. 1*. California: Stanford University Press.

Braswell, G. S. (2001). *Collaborative Drawing During Early Mother-Child Interactions*. Visual Arts Research, 27, 27-39.

Braswell, G. S. & Callanan, M. A. (2003). *Learning to Draw Recognizable Graphic Representations During Mother-Child Interactions.* Wayne State University Press: Merrill-Palmer Quarterly, Vol. 49, No. 4, pp. 471-494.

Cambridge Academic Content Dictionary. (2017). Cambridge University Press.

Chapman, L.H. (1978). *Approaches to Art Education*. Harcourt Brace Jovanovich Publishers.

Chan, L. & Louie, L. (1992). *Developmental Trend of Chinese Preschool Children in Drawing and Writing.* Journal of Research in Childhood Education Vol.6, No. 2, 93-99.

Connelly, L. M. (2008). *Pilot Studies*. Medsurg Nursing, 17(6), 411-2.

Cox, M.V. (1986). *Cubes are Difficult Things to Draw*. British journal of developmental psychology, 4, pp. 341-5.

Cox, M.V. (1992). *Children's Drawings*. New York: Penguin Books.

Creswell, J.W. (2012). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. MA: Pearson Education.

Cugmas, Z. (2004). *Representations of the Child's Social Behavior and Attachment to The Kindergarten Teacher in Their Drawing*. University of Maribor: Early Child Development and Care, Vol. 174(1), pp. 13–30.

D'Amico, V. (1942/53). *Creative Teaching in Art*. Scranton: International Textbook.

Darusalam, G. & Hussin, S. (2016). *Methodologi Penyelidikan Dalam Pendidikan*. Kuala Lumpur: Penerbit Universiti Malaya.

Dawson. (2002). *Practical Research Methods*. United Kingdom: How to Books Ltd, 3 Newtec Place.

Deaver, S.P. (2009). *A Normative Study of Children's Drawings: Preliminary Research Findings*. Journal of the American Art Therapy Association, 26 (1) pp. 4-11.

Deguara. J & Nutbrown. C. (2017). *Signs, Symbols and Schemas: Understanding Meaning in A Child's Drawings*. International Journal of Early Years Education.

Deornellas, K. (1997). *A Comparison of the Kinetic Family Drawings of African American, Hispanic, and Caucasian Third-Graders*. Denton, Texas: College of Arts and Sciences.

Didkowska, B. (2016). *Children's Drawing in the Context of the Visual Language of New Media*. Poland: Nicolaus Copernicus University.

Eisner, E.W. (1972). *Educating Artistic Vision*. New York: Macmillan.

Farokhi & Hashemi. (2011). *The Analysis of Children's Drawings: Social, Emotional, Physical, and Psychological aspects.* Procedia: Social and Behavioral Sciences 30 (2011) 2219 – 2224.

Fraenkel, J.R & Wallen, N.E. (2009). *How to Design and Evaluate Research in Education 7th*. New York: McGraw-Hill.

Freedman, K. (1997). *Artistic Development and Curriculum: Sociocultural Learning Considerations. In A.M. Kindler (Ed.), Child Development in Art*. (pp. 95-106). Reston, VA: The National Art Education Association.

Freeman, N. H. & Janikoun, R. (1972). *Intellectual Realism in Children's Drawings of a Familiar Object with Distinct Features*. Child Development, 1116-1121.

Freeman, N. H. (1980). *Strategies of Representation in Young Children: Analysis of Spatial Skills and Drawing Processes*. London: Academic Press.

Gardner, H. (1980). *Artful Scribbles: The Significance of Children's Drawing*. New York: Basic Books.

Gentle, K. (1981). Rebecca Whitnall (3-14). In S. Paine (Ed.), *Six Children Draw* (pp. 64-75). London: Academic Press.

Goodnow, J. (1977). *Children Drawing*. Cambridge, MA: Harvard University Press.

Golomb, C. & Bonen, S. (1981). *Playing games of make-believe: The effectiveness of symbolic play training with children who failed to benefit from early conservation training.* Genetic Psychology Monographs, 104(1), 137-159.

Golomb, C. (2004). *The Child's Creation of a Pictorial World*. London: Lawrence Erlbaum Associates.

Harris, D.B. (1963). *Children's Drawings as Measures of Intellectual Maturity*. New York: Harcourt, Brace and World.

Hawkins, B. (2002). *Children's Drawing, Self-Expression, Identity and The Imagination*. International Journal of Art and Design Education, 21(3), 209-219.

Hopperstad, M.H. (2008). *Relationships Between Children's Drawing and Accompanying Peer Interaction In Teacher-Initiated Drawing Sessions.* Queen Maud's College: International Journal of Early Years Education Vol. 16, No. 2, 133–150.

Hsu & Ya-Huei. (2014). *Analyzing Children's Drawings*. USA: 21st Century Academic Forum Conference at UC Berkeley Berkeley (Vol. 2, No. 1 ISSN 2330-1236).

Kellogg, R. (1970). *Analysing Children's Art*. Palo Alto, Cal.: National Press Books.

Kitahara, R. & Matsuishi, T. (2007). *Research on Children's Drawings*. Retrieved on Dec 15, 2012 from www.medico-pedagogy.org/childrenpicturesummaryJ_E WP.pdf.

Koppitz, E.M. (1968). *Psychological Evaluation of Children's Human Figure Drawings*. London: Grune and Stratton.

Koster, J.B. (2001). *Growing Artists: Teaching Art to Young Children*. New York: Delmar, Thomson Learning.

Krejcie, V.R. & Morgan, W.D. (1970). *Determining Sample Size for Research Activities, Educational and Psychological Measurement*. Duluth: University of Minnesota.

Lark-Horovitz, B., Lewis, H. & Luca, M. (1967). *Understanding Children's Art for Better Teaching*. Columbus, Ohio: Merrill.

Lau, C.Y. (2013). *Manga Drawing as Stereotyped Aesthetics*. University of Illinois Press: Visual Arts Research, Vol. 39, No. 2, pp. 42-53.

Liau, S.F. (2018). *Implementation of Arts Education in Malaysian Primary Schools: The Teachers' Perspective.* 3rd International Music and Performing Arts Conference Proceedings.

Ling, P.K, Sharifah & Hasnah. (2012). *Using Visual Art Activities for Creativity Development in Early Childhood Education.* Sibu: NECIC.

Longobardi, Quaglia & Iotti. (2015). *Reconsidering the scribbling stage of drawing: a new perspective on toddlers' representational processes*. University of Turin, Department of Psychology, Front. Psychol. 6:1227.

Lowenfeld, V. (1964). *Creative and Mental Growth. (4th edition compiled by W. L. Brittain).* London: Collier-MacMillan.

Lowenfeld, V. & Brittain, W.L. (1987). *Creative and Mental Growth (6th edition compiled by W.L. Brittain)*. London: Collier-Macmillan.

Luquet, G. H. (2001). *Children's drawings.* (A. Costall, Trans.). London and New York: Free Association Books (Original work published 1927).

Maulana N. Z. & Rohkmah. S. (2017). *Sketching Profiles: for Meaning Making of Graphical Representation in Children's Drawing*. Universiti Teknologi Petronas, Conference on e-Learning, e-Management and e-Services.

McQuistan. (2017). *Beyond Representation: Exploring Drawing as Part of Children's Meaning-Making*. The International Journal of Art & Design Education.

Ministry of Education. (2016). *Dokumen standard kurikulum dan pentaksiran, pendidikan kesenian tahun 2* [Standard document of curriculum and assessment, arts education year 2]. Putrajaya: Curriculum Development Centre, Ministry of Education, Malaysia.

Mohajan, H. (2017). *Two Criteria for Good Measurements in Research: Validity and Reliability*. Annals of Spiru Haret University, 17(3): 58-82.

Piaget, J., & Inhelder, B. (1963). *The Child's Conception of Space*. London: Routledge.

Piaget, J. (1969). *The mechanisms of perception*. New York: Basic Books. Piaw & Sharifah & Naim & Zah. (2003). *Kreativiti Guru Pendidikan Seni*. Universiti Putra Malaysia, Fakulti Pengajian Pendidikan.

Putih, A.T. (2002). *Is Children's Representation of Pictorial Depth in Drawings a Naturally-Acquired Trait?* University of Illinois Press: Visual Arts Research, Vol. 28, No. 1 (2002), pp. 24-37.

Ring, K. (2006). *Supporting Young Children Drawing: Developing A Role.* International Journal of Education through Art, Volume 2 Number 3.

Selfe, L. (1983). *Normal and Anomalous Representational Drawing Ability Child.* London: Academic Press.

Solovieva, Y. & Rojas, L.Q. (2017). *Stages for Introduction of Drawing Actions in Pre-School Age.* Journal of Education and Culture Studies, ISSN 2573-041X, Vol. 1, No. 1.

Sumanto. (2017). *Analysis on Symbolic Meaning of Drawing Arts by Elementary School Children.* Journal of Social Sciences (COES&RJ-JSS), Vol.6, No.3, pp: 464-480.

Tamara, K, I. (2014). *Thematic Analysis of the Children's Drawings on Museum Visit: Adaptation of the Kuhn's Method.* University of Zadar: Journal of Education Vol. 4, No. 3.

Thomas, G.V. & Tsalimi, A. (1988). *Effects of Order of Drawing Head and Trunk on Their Relative Sizes in Children's Human Figures Drawings.* British Journal of Development Psychology, 6, pp. 191-203.

Thomas, G.V. & Silk, A.M.J. (1990). *An Introduction to The Psychology of Children's Drawings.* New York: Harvester Wheatsheaf.

Toku, M. (2001). *Cross-cultural Analysis of Artistic Development: Drawing by Japanese and U.S. Children.* University of Illinois Press, Visual Arts Research, Vol. 27, No. 1(53) (2001), pp. 46-59.

Toomela, A. (1999). *Drawing Development: Stages in the Representation of a Cube and a Cylinder.* Research in Child Development, Inc. Volume 70, Number 5, Pages 1141- 1150.

Tuman, D.M. (1999). *Sing a Song of Sixpence: An Examination of Sex Difference in the Subject Preference of Children's Drawings.* University of Illinois Press: Visual Arts Research, Vol. 25, No. 1 (1999), pp. 51-62.

Türkcana, B. (2013). *Semiotic Approach to the Analysis of Children's Drawings.* Anadolu University Educational Sciences: Theory & Practice - 13(1) 600-607.

Verma, G.K. & Mallick, K. (1999). *Researching Education: Perspectives and Techniques.* London: Falmer Press.

Vygotsky, L.S. (1978). *Mind and Society: The Development of Higher Psychological Processes.* Cambridge, MA: Harvard University Press.

Walker, Myers-Bowman, & Myers-Walls. (2003). *Understanding War, Visualizing Peace: Children Draw What They Know.* Journal of the American Art Therapy Association, v20 n4, p191-200.

Willats, J. (2005). *Making Sense of Children's Drawings*. Mahwah, NJ: Lawrence Erlbaum.

Wilson, B., & Wilson, M. (1977). *An Iconoclastic View of The Imagery Sources in The Drawings of Young People*. Art Education, 30, pp. 5-11.

Wilson, B., & Wilson, M. (1982). *The Persistence of The Perpendicular Principle: Why, When and Where Innate Factors Determine The Nature of Drawings*. Review of Research in Visual Art Education, 15, 1-18.

Wilson, B., & Wilson, M. (1987). *Pictorial Composition and Narrative Structure: Themes and The Creation of Meaning in The Drawings of Egyptian and Japanese Children*. Visual Arts Research, 13(2), 10–21.

Wilson, B., & Wilson, M. (2009). *Teaching Children to Draw: A Guide for Teachers and Parents (2nd ed.)*. Worcester, MA: Davis Publications.

Winner, E. (1986). *Where Pelicans Kiss Seals.* Psychology Today, 20 (8), 25-35.0.

Yamagata, K. (2001). *Emergence of Representational Activity During the Early Drawing Stage: Process Analysis.* Kanazawa University, Japanese Psychological Research, Volume 43, No. 3, 130–140.

Yang, H.C & Noel, A.M. (2006). *The developmental characteristics of four- and five-year-old preschoolers' drawing: An analysis.* Journal of Early Childhood Literacy 6: 145.