

Children's drawings speak more than words

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Abstract

This study explored how children's drawings reveal prior knowledge Filipino children have for science words commonly found in grade I science textbooks before entering grade I. They were asked to draw and explain their concepts. Chi square tests and ANOVA tests were made to find patterns of conceptions considering the variables in the study. The children showed beginnings of awareness, especially in words related to their direct experiences. Most children could not give a precise definition of terms, but they can give explanations, examples and make drawings about science concepts. Differences were found in abilities to give explanations and give examples among boys and girls; among children who have attended preschool or not; and among those whose parents have gone through different levels of education. All children were able to express themselves in drawings. Children's drawings were found to express more understanding about certain concepts they cannot explain in words.

Keywords: *science concepts, children's drawings, prior knowledge, preschool*

Introduction

Educational psychologists recognize Ausubel's theory of the influence of prior knowledge on how learning occurs (Ausubel, 1978; West and Fensham, 1974). It is recognized that a person's prior knowledge may help or hurt concept formation. Children's prior knowledge comes from past experiences, their culture and environment. Any misconceptions can hinder new learning and so should be corrected before

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learning can occur. Educators, including teachers and textbook writers, would be interested in finding out the prior knowledge of their learners. This study sought to find out the prior knowledge Filipino children entering grade I have for science words or concepts commonly introduced in local grade I science textbooks (Butial, 1990; Cortes, 1987; Garcia, 1989; Jesuitas, 1990).

Psychologists use children's symbolic representations to study how they represent knowledge, as in the use of children's drawings to inform us of what they know. Piaget (1951) sometimes refers to this as "conceptual representation". Editors Edwards, Gandini and Forman (1998) reiterate that in the Reggio Emilia approach, young children are encouraged to use what they call graphic language (graphical representational abilities) in expressing their feelings and understanding. The teachers had to document what the children said about their drawings, about what they observed or experienced, to let the teachers know the children's understanding. In Loris Malaguzzi's "Hundred Languages of Children" teachers did not just concentrate on the development of the child's verbal and literacy skills but also valued the child's use of their many nonverbal languages. In the study of Cox (2005) it was shown that children can recognize the power of drawing to represent. She suggests that while drawing, children are actively defining reality rather than passively reflecting a given reality. In this study, both verbal responses and drawings were studied together in finding prior knowledge.

As children grow older, the drawing and mark system they use in their drawings change. Drawings of older children look "better" in a sense because they look more like adult pictures or because they look more like the real world (Willats, 2005; Thomas & Silk, 1990). Children aged 5 to 7 years, however, sometimes still contain elements which the child knows to exist, even when not normally seen as in "transparency" or "x-ray" drawing (Thomas & Silk, 1990). An example is when a child draws something that is normally hidden behind a nearer object like a normally hidden far leg of a table can be seen through the table or beside the near legs of the table. The children in this study, aged 6 to 7 years old were chosen because this is the age group that enters grade one in the country. Since they belong to a common age group, their fine motor skills, drawing skills in particular, are assumed to be more or

less of the same level and should not be a variable. It is the meaning children attach to the drawings that is the focus of the study.

To explore this knowledge in detail, Thurstone's Primary Mental Abilities (PMA) (French, 1939) showing a person's intellectual capacity, was used. Thurstone's information forms or product categories were classified as follows: *unit* (defining "what is"), *class* (giving examples of things that belong to a class), *relation* (stating the relationship of 2 objects), *system* (stating the relationship of 3 or more objects), *transformations* (describing changes), and *implications* (giving indications, meanings, significance, etc.). In a study on The Goodenough Draw-A-Man Test using 100 fourth-grade children, in correlation to Thurstone's primary mental abilities (Ansbacher, 1952), children's drawings showed high correlation with factors of reasoning, space, and perception, and had little in common with verbal meaning and number. So in addition, the mental ability of expressing ideas by drawings was added based on studies about graphical representational abilities mentioned earlier.

The patterns in the meanings children give to these words were analyzed to find out possible differences among (a) children from rural and urban communities, (b) with or without preschool education (c) male and female, and (d) of different socio-economic status (SES) as represented by children's parents who went through different levels of education. The original focus of the research is prior knowledge of science words or concepts, however, as an offshoot of the study, this article focuses on the author's discovery about the revealing power of exploring children's drawings in trying to discover children's prior knowledge.

Method

Ninety six 6 to 7 year old children from rural and urban sites in the 3 major island regions in the Philippines were interviewed regarding 48 science words commonly found in grade I textbooks (see Table 2). For each word 24 children were interviewed: from each of three regions or major island groups (Luzon, Visayas, Mindanao), each from rural and urban schools, 1 boy who attended preschool, 1 boy who did not attend preschool, 1 girl with preschool, 1 girl without preschool (Figure

1). The sample constitution from each region is shown in Table 1. Each child in the sample was asked to describe only 4 words each, to avoid exhaustion. The children were asked to verbally define, describe, give examples, and to draw their understanding of these words.

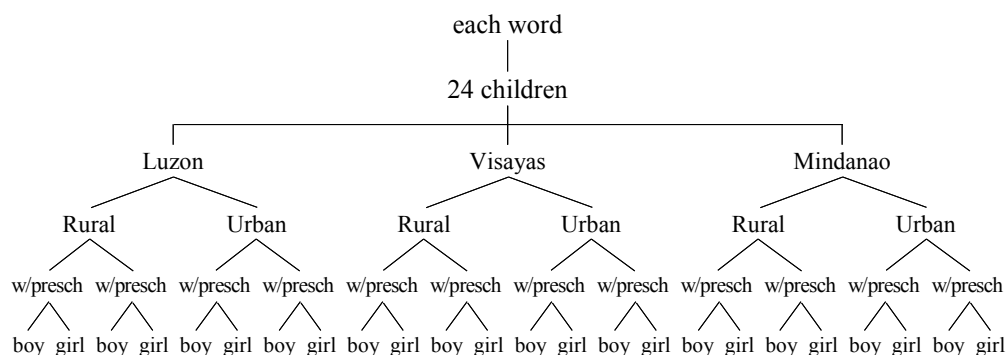


Figure 1. How the sample distribution per word was done

Table1. *Sample Constitution from Each Island Group or Region*

Type of Community	Number of kids	Gender	Preschool attendance
Urban	4	Boys	With
	4	Boys	Without
	4	Girls	With
	4	Girls	Without
Rural	4	Boys	With
	4	Boys	Without
	4	Girls	With
	4	Girls	Without

Table 2. *List of Words / Concepts Introduced in Grade 1 Science Textbooks*

set 1 : weight, hearing, smell, touch, taste, sight
set 2 : size, height, shape, color, fruits, seeds
set 3 : change, living things, born, grow, plants, animals
set 4 : nonliving things, health, safety, heat, night, day
set 5 : weather, sunny, rainy, cloudy, windy, rainbow
set 7 : solid, liquid, gas, land, air, water
set 8 : motion, care, soil, food, time, feelings

In relation to the questionnaire, a rating scale following Thurstone's mental abilities was developed (see Table 3). Added to this is the "ability to express concepts by drawings". Words were rated as to: "no idea", "vague idea", or "good idea" (the actual scale used is provided in the end). Chi square tests for each question was done to determine significance of the answers for each question, and ANOVA tests for the whole sample were made to find patterns of conceptions considering the variables in the study.

Table 3. *Scale of Responses to Questions in Terms of Mental Abilities*

Mental Abilities	1	2	3
Giving Definitions	No idea	Vague statement (translates to native language/points to/ gives examples only)	Good definition
Giving Examples	No idea	Wrong examples	Good examples
Giving Relations (related ideas, objects/ actions)	No idea	Ideas/activities/objects not related	Ideas/activities or objects related
Describing Changes (processes or procedures)	No idea	Gives only 1 step or a state of a process or procedure	Enumerates different steps of procedure or diff. stages in a process
Giving Implications (associations)	No idea	Beliefs (reference to the supernatural)	Close to scientific meaning (states causes/evidence/purposes/activities associated with events)
Expressing Concepts by Drawings	No idea	Vague idea	Good idea

Findings

In general, the children showed beginnings of awareness, especially in words related to their direct experiences. Although most children could not give a precise definition of terms, they can give explanations, examples and draw about concepts. Since the focus of this article is on using drawings in exploring prior knowledge, the detailed definitions and descriptions the prior knowledge of the different concepts is not included. Only the patterns in mental abilities and word meanings. Only illu-

strations that show unique features to show the usefulness of drawings in revealing knowledge that is not verbally described by children was presented

Mental Abilities and the Variables in this study

The following abilities were results of ANOVA tests on the whole sample, regardless of the words being studied. The following abilities are not related to any of the variables in this study are as follows:

- (1) *Ability to give definitions.* The ability or rather, the inability of the children to define words in logical statements is not related to any of the variables in this study. This is in accordance with Jean Piaget's thoughts about a child's conception of the world. The children have so many ideas but cannot translate their thoughts adequately into words (see Table 4).
- (2) *Ability to give related words/activities,* or recognize relations/relationships (see Table 6).
- (3) *Ability to describe changes/transformations* (processes of birth and growth) (see Table 8).
- (4) *Ability to express ideas through drawings.* (see Table 9).

It was found that any child, boy or girl, from urban or rural community, of parents with or without college education, is apparently able to recognize relations, describe transformations and express their thoughts in drawings. This implies that no matter what is the background of a child, one can explore his prior knowledge by letting him/her draw about certain concepts.

The following mental abilities are affected by some variables in this study:

- (1) *Ability to give examples belonging to a class,* regardless of the words in question, is affected by gender and attendance in preschool (see Table 5), where females perform significantly better than males (see Table 5.1) and where children who have attended preschool perform better than those who did not (see Table 5.2).

The effect of gender confirms findings of other studies that girls develop their

communication skills earlier than boys, showing girls to talk earlier, articulate better and acquire more extensive vocabulary than boys of the same age (Kaledaite & Savickiene, 2007).

Table 4. *Ability of Children to Give Definitions*

By levels of	F	Significance
Community	2.5057	.0970
Gender	.5831	.4469
Preschool attendance	3.1027	.0812
Father's education	1.0922	.2985
Mothers education	2.1565	.1451

Table 5. *Ability of Children to Give Examples*

By levels of	F	Significance
Community	0.4485	.5046
Gender	4.3330	.0399*
Preschool attendance	4.4520	.0373*
Father's education	2.1929	.1416
Mothers education	3.0702	.0828

*p < .05

Table 5.1 *Gender & Giving Examples*

Gender	Mean	Std. Dev.
Entire sample	1.4719	.6127
Female	1.5968	.4823
Male	1.3495	.7013

Table 5.2 *Preschool Attendance & Giving Examples*

Preschool Attendance	Mean	Std. Dev.
Entire sample	1.4719	.6127
Without preschool attendance	1.2618	.6619
With preschool attendance	1.5466	.5806

Table 6. *Ability of Children to Give Relations*

By levels of	F	Significance
Community	.0877	.7677
Gender	.6518	.4214
Preschool attendance	2.6667	.1043
Father's education	.2130	.6454
Mothers education	1.2287	.2703

Table 7. *Ability of Children to Give Implications*

By levels of	F	Significance
Community	.2676	.6065
Gender	3.5433	.0637
Preschool attendance	11.5948	.0011**
Father's education	15.2588	.0002**
Mothers education	4.7144	.0331*

* $p < .05$, ** $p < .01$

Table 7.1 *Preschool Attendance & Giving Implications*

Preschool Attendance	Mean	Std. Dev.
Entire sample	1.2338	.5811
Without preschool attendance	.8658	.6367
With preschool attendance	1.3564	.5105

Table 7.2 *Father's Education & Giving Implications*

Gender	Mean	Std. Dev.
Entire sample	1.2338	.5811
Pre-college education only	.9887	.6450
Post-secondary education	1.4662	.3980

Table 7.3 *Mother's Education & Giving Implications*

Gender	Mean	Std. Dev.
Entire sample	1.2338	.5811
Pre-college education only	1.0320	.5624
Post-secondary education	1.3327	.5686

Table 8. *Ability of Children to Describe Transformations / Processes*

By levels of	F	Significance
Community	.8184	.3702
Gender	.2276	.6355
Preschool attendance	1.7181	.1962
Father's education	.8106	.3724
Mothers education	1.3620	.2489

Table 9. *Ability of Children to Express Science Concepts in Drawings*

By levels of	F	Significance
Community	.6116	.4372
Gender	1.1156	.2949
Preschool attendance	1.0846	.3017
Father's education	3.7529	.0573
Mothers education	1.5692	.2150

The effect of preschool attendance supports the contention of advantage in-creasing children's vocabulary over scores of children who did not attend preschool (Barnett & Lamy, 2005) and consequently, a richer prior knowl-edge in learning.

- (2) *Ability to give logical answers, explanations or implications* (why things happen, where things come from, what things are made of, etc.). This is affected by preschool attendance and the education of both mother and father (see Table 7).

Those who have attended preschool do better than those who did not (see Table 7.1). As with the ability to give examples belonging to a class, being able to explain and analyze, being among the higher order thinking skills according to Bloom's Taxonomy (Woolfolk, 1998) apparently is developed with preschool attendance.

Those whose fathers had college education and higher do better than those whose fathers had only pre-college education (see Table 7.2). The same is true for children whose mothers had college education and higher (see Table

7.3). This data not only implies that parents who have pursued higher education could possibly enhance higher order thinking skills development in their interaction with their children, but also imply that they are able to secure higher paying jobs and have a higher socioeconomic status (SES), consequently being able to provide for better education and nutrition, among others.

Patterns in the Meanings of Words

There were words or concepts children found “easy” and some “hard” or difficult. By “easy” we mean having the same or almost the same concepts as adults find in the natural world. By “hard” we mean not being able to describe at all, or having a different concept from the natural world. As a whole, the groups of words that the children find “easy” to describe and to give examples and relations of are words referring to the five senses; living and non-living things; things done during the day and night; different weather conditions; health, care, safety, feelings; and words for describing matter (for size, height, length, texture and temperature, specifically “small”, “big”, etc.).

However, the last set of words should be presented using two objects, for example a watermelon is “big” while a “cherry” is “small”, otherwise, as was observed in the drawings and in the examples given by children, if only one object is taken into consideration, the child will use himself as a point of reference. Anything bigger than the child is “big”, while anything smaller than the child is “small” (Illustration 1).

The groups of words the children find most difficult to talk about are those about the solar system (like planets, earth, etc); phases of matter (like liquid and solid), and heat and light. Information regarding these concepts about the earth, planets and the solar system, cannot be obtained by actual experience or exploration with the senses. Children must rely on information from books, television, and other media, and from the adults around them. Since the words “liquid” and “solid” are not commonly used in everyday language of children, it is understandable that they could not define or give examples of these. Thus, for these words in particular, for “liquid”, children

were asked to draw water in a pre-drawn glass and saucer. The same was done for “solid”, asking the children to draw a ball in the two settings.



Illustration 1. “liquid”

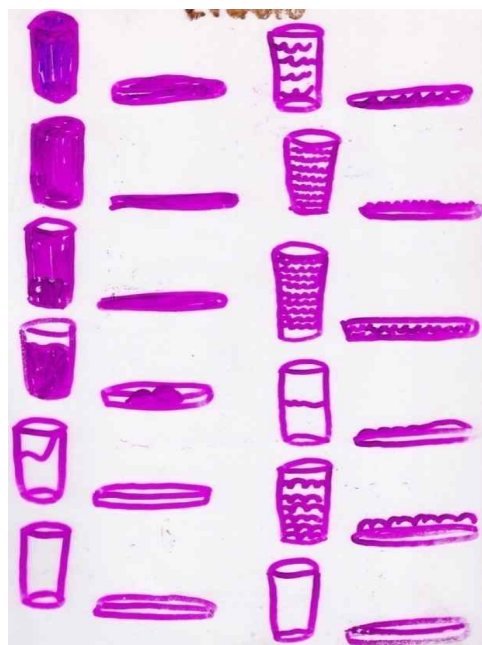


Illustration 2. “solid”

This is where their drawings powerfully reveal knowledge that children cannot even explain with their vocabulary. They drew water following the shape of the container it is placed in, as following the shape of a glass or the shape of a saucer. Some even drew waves perhaps to depict the fluid or liquid nature of water. The children drew balls as instructed as an example of a “solid”. The children depicted balls in a glass and balls on a saucer still retaining its shape in whatever container they are drew in. This shows they know that a ball will hold its own shape. However, many of them drew the balls suspended in space while in the glass. This might lead one to conclude that the children who drew balls this way, might have concentrated only in the shape of the ball and perhaps forgot about the effect of gravity on it (That balls should be at the bottom of the glass and not flying or suspended in air).

Patterns in the Mental Abilities

From the children's responses, the following mental abilities were derived, which strikingly parallel Thurstone's information forms or product categories:

<u>Mental Abilities defined by the author</u>	<u>Thurstone's Product Categories</u>
I . Defining (what is...)	(1) Unit
II . Giving examples	(2) Class
III. Stating Relations	(3) Relation (2 objects)
	(4) System (3 or more objects)
IV. Describing Changes	(5) Transformations
V . Giving Implications (why, where, what do you think)	Transformations
VI. Expressing Ideas by Drawings	

The mental abilities that children find easy to do are giving examples of things belonging to a certain class; giving related objects or actions; describing changes or processes; and expressing themselves by drawings. Common objects easily seen like plants and animals and everyday objects are easily represented in children's drawings. Other more complex words show deeper thoughts which the children could not explain or describe using words.

Their drawings of the sun show circles with rays all around. Some of them drew a circle with eight (8) rays – very similar to the symbol of the sun represented in the Philippine flag (Illustration 3). This symbol represented the eight provinces that were involved in the revolt of the Philippine people against a foreign colonizing country in some time of its history. Most likely, the familiarity with this symbol has created a stereotype drawing of the sun as “a circle with 8 rays”. Even the choice of colors the children use reveal their life experience. Although many children use color yellow for their drawing of the sun, one child insisted that orange is the correct color to use.

What was most interesting is the drawing of one child of the sun with rays only on the top part of the circle (Illustration 4). Analysis of drawings of some children while waiting for their turn for the interview reveal that when they draw an outdoor scene which includes the sun, they usually draw the sun in between two clouds or two mountains. Perhaps the child who drew the unique drawing of the sun (rays only on

top) believes the sun does not have rays behind the clouds or behind the mountains.

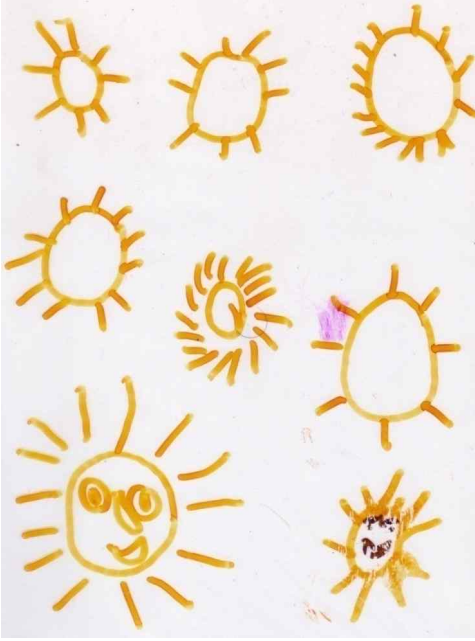


Illustration 3. "sun"

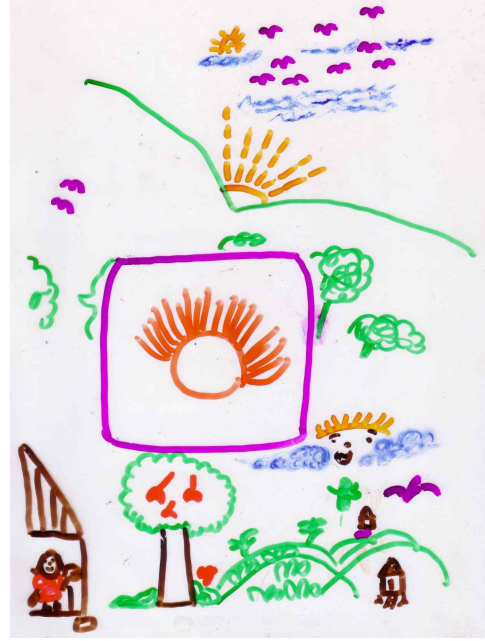


Illustration 4. "sun" (between two mountains)

There was one drawing of the moon as colored violet and one colored black among the common yellow drawings of a moon in this study. Perhaps this shows that some children associate the moon with the dark night and draw the moon with a dark color. On the other hand, many people have the habit of drawing a day scene and use a blue crayon to make outlines of clouds, when as yet clouds are actually white against a blue sky (Illustration 5).

Illustrations of the word earth and planet usually were circles, with these concepts: "It's a circle"; "a planet"; "made of stones"; "...soil"; "houses"; "God made the earth"; Shape: "circle"; "round", "like a ball" (*"I know because Teacher said so"*); "It's a place with people"; "It's where we live in"; Examples of planets: "Planet is like the Pluto, Neptune, Uranus, Saturn, Jupiter"; One child said examples of planets are "Philippines, Hong Kong"; another one said It's made of "soil", "devils, fire", "stone & rocks", "God made the earth".



Illustration 5. “moon” (“black sun”)



Illustration 6. “planet”

The children find it difficult to answer questions that call for definitions. Some children try to answer “what is” questions by giving examples, or relations or by pointing to the object.

Children also find it difficult to give implications. They usually answer questions as to “why something happens” by stating a purpose, or evidence that something has happened, rarely knowing the cause of events. Some children answer questions on “where something comes from” or “what something is made of” “by saying” “from God”.

Conclusion

The six to seven year-old children in this study cannot define words in clear, concise statement. They usually give meanings of words by giving examples or by answering related questions. The children have a whole world of thought, hardly capable of verbalization and made up of images. When a child is asked about the

meaning of a word, he tries to translate his thoughts into words. However, he does so inadequately. It is therefore more important for the adult to follow the direction of the thought rather than the words the child says. The children's ability to explain consists of both cognitive and linguistic components. His ability to give and understand explanations is of considerable educational importance.

Using children's drawings can be used to find out what the children have in mind or what they are trying to say. This is because the child's ability to draw is not affected by any of the variables in this study (gender, preschool attendance, type of community and parents' educational attainment). Although children may have reached different levels of motor development, their abilities to use symbols to represent what they know about the world is more or less the same. DiLeo (1983) suggests that in young children, superiority of speech over drawing in communication is only apparent. He says, better than speech, drawings may express a subtlety of intellect beyond the power of verbal expression. It is apparently because the children in this study are in an "x-ray drawing" stage (Thomas & Silk, 1990), that they reveal things in their drawings, about what they know about certain concepts even when they don't describe it verbally or even when they do not have the words to explain what they know.

Implications and Recommendations

Implications for curriculum planning, textbook writing and teaching of science: Teaching is a manipulation of a child's environment in such a way that his activities would contribute to his development. This is not just by any direct influence of an adult, like teaching a parrot how to talk, but by encouraging a child's curiosity, by allowing the child to explore with his senses, to do experiments and to analyze, to draw up his own conclusions. It must be remembered, however, that the child's learning capacity is so influenced by biological factors such as stages in physical and mental development, gender in some aspects, and his inherent intelligence. It is also influenced by the child's social and cultural background, his learning style and his previous learning experiences.

1. Teachers should realize that the child's ability to explain has cognitive as well as linguistic components. His inability to explain himself could be due to an inadequate vocabulary and it should not be presumed that the child is incapable of understanding explanations. Teachers are encouraged to give explanations and not give information. Giving examples within the child's limited world of experience not only extends understanding of his immediate physical world but also expands his horizons.
 2. With regards the effect of preschool attendance and parents' educational background on some mental abilities of children, the teacher should find a way to bridge the gap among her students with varying backgrounds. This could be done by way of more visuals, hands-on activities, illustrations and examples.
 3. Based on the findings of this study regarding science concepts, curriculum planners and textbook writers are advised to consider not just the structure of the subject matter, but also the learner's ideas. Curriculum development should be based primarily on the learner, not just the logic of the subject which is only the result of a conceptual analysis of the subject itself. Children do not necessarily see the logical structure of subjects taught to them the way an adult does. This may mean revising the starting points of certain topics to be presented.
 4. It is hoped that in the next few year collaborative efforts among researchers, teachers, curriculum planners and textbook writers will be done to enable the education system to make use of and build on what have been discovered by studies like this about Filipino children's ideas in order to improve the science curriculum. This means a collaboration between subject matter experts and expert on child development.
 5. On the findings on the usefulness of drawings in exploring children's prior knowledge, teachers are advised to record children's thoughts but at the same time look beyond the verbal responses and look into details in the drawings that reveal deeper understanding of concepts and possible misconceptions.
- It must be bore in mind, however, that the ultimate goal is the benefit of the children. Whatever research projects are launched to this end should aim to

enable the child to experience the joy of learning, and where the ideas of children are given importance and encouraged to develop.

References

- Ausubel, D.P, et al. (1978). *Educational Psychology, a Cognitive View*. New York: Holt Rinehart and Winston
- Butial, L. (1990). *Science and Health I*. Philippines: Phoenix Publishing House, Inc.
- Cortes, L. (1987). *Modern Science: Life, Health, Earth, Physical*. Grade I. Philippines: Modern Curriculum Press, Inc,
- DiLeo, J. (1983). *Interpreting children's Drawings*. New York: Brunner/Mazel, Inc.
- Edwards, C., Forman, G., & Gandini, L., eds. (1998). *The Reggio Emilia Approach – Advanced Reflections*. Greenwich, Conn. (u.a.): Ablex Publishing.
- Thomas, G. & Silk, A. *An Introduction to the Psychology of Children's Drawings*. London: Harvester Wheatsheaf.
- Woolfolk, A.E. (1998). *Educational Psychology*. 7th ed. Needham Heights, MA: Allyn & Bacon.

Website references:

- Ansbacher, H. L. (1952). *The Goodenough Draw-A-Man Test and primary mental abilities*. Journal of Consulting Psychology. Vol 16(3), 176-180. Retrieved June 15, 2009 from <http://psycnet.apa.org/index.cfm?fa=search.displayRecord&uid=1953-05141-001>
- Barnett, W.S. & Lamy, C.E., (2005). *Estimated Impacts of Number of Years of Preschool Attendance on Vocabulary, Literacy and Math Skills at Kindergarten Entry*. Retrieved June 16, 2009 from <http://nieer.org/resources/research/EstimatedImpacts.pdf>
- Brooks, J. and Brooks, M. (1993). *Learning with the Constructivist Learning Theory in In Search of Understanding: The Case of Constructivist Classrooms*, ASCD. NDT Resource Center. Retrieved June 15, 2009 from http://www.ndted.org/TeachingResources/ClassroomTips/Constructivist%20_Learning.htm

- Cox, Sue (2005). *Intention and Meaning in Young Children's Drawing*. International Journal of Art & Design Education, v24 n2 p115-125 May. Blackwell Publishing. Retrieved June 16, 2009 from <http://www.ingentaconnect.com/content/bpl/jade/2005/00000024/00000002/art00002>
- French, T.M. (1939). Primary Mental Abilities: By LL Thurstone. Chicago: University of Chicago Press, 1938, 116 pp. Psychoanalytic Quarterly, 8:534-535. Retrieved June 15, 2009, from <http://www.pep-web.org/document.php?id=PAQ.008.0534A>
- Harris, D. B. (1963). *Children's Drawings as Measure of Intellectual Maturity: a revision & extension of the Goodenough Draw-a Man Test*. New York: Harcourt, Brace & World, Inc. Retrieved June 15, 2009 from http://www.archive.org/stream/childrensdrawing010007mbp/childrensdrawing010007mbp_djvu.txt
- Kaledaite, V. & Savickiene, I. (2007). *The role of a child's gender in language acquisition*. Estonian Papers in Applied Linguistics (Eesti Rakenduslingvistika Ühingu aastaraamat), issue: 3 / 2007, pages: 285-297, Retrieved June 16, 2009 from <http://www.ceeol.com>.
- Malaguzzi, L. (n.d.). *The Hundred Languages of Children*. (Translated by Lella Gandini). Retrieved June 15, 2009 from <http://virtual.yosemite.cc.ca.us/Childdevelopment/jeanette/sp09/100Lang.pdf>
- The Reggio Emilia Approach to Early Years Education*. YMCA Early Stars Newman and Port Hedland Early Learning Centre. Retrieved June 15, 2009 from <http://www.perth.ymca.org.au/getdoc/1d73d2cb-c314-462b-be24-1a3461cbb66a/The-Reggio-Emilia-Approach-to-Early-Years-Education.aspx>
- West, L.H.T.; Fensham, P.J. (1974). *Prior Knowledge and the Learning of Science. A Review of Ausubel's Theory of This Process* Retrieved June 15, 2009, from http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=EJ103106&ERICExtSearch_SearchType_0=no&accno=EJ103106
- Wilats, J. (2005) *Making Sense of Children's Drawings*. Ebook. Retrieved June 5, 2009 from <http://books.google.com.ph/books?id=6y3TMN8dbtsC&pg=PA145&lpg=PA145&dq=MAKING+SENSE+OF+CHILDREN%27S+DRAWINGS+>

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lEbvNZYEOJ8UgsL86eDShLvs&hl=tl&ei=wUs9SrKeJ5eO6AOjv7GpDg&sa=
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