Visual Education: A Curriculum Model for Learners' Socio-Cognitive Skill Development in Nursery Schools

KIBINKIRI Eric LEN (PhD),

Department of Science of Education, Higher Teacher Training College Yaounde (E.N.S), University of Yaounde I. Cameroon

Abstract

This study investigated "the extent to which visual learning tools can contribute to learners' thinking skills in nursery schools". The inadequacy of basic skills (numeracy and literacy skills) developed by some nursery school pupils in Cameroon motivated the researcher to carry out the study. Related literature was reviewed on visual learning tools and learners' thinking skills. The cultural theory, information processing theory and Jean Piaget's theory of cognitive development were used to give more meaning to the problem of study. The qualitative approach was applied to carry out the investigation. Semi structured observation and interview methods were used. Data was collected using an observation guide and interview guide. The population of the study was made up of nursery school teachers of "Ecole Maternelle d'Application de La Garde Presidentielle: Group A" (EMA G.P. 'A'). From this population, five teachers were selected for the study through non probability sampling technique. The data collected was analysed thematically following the objectives of the study. Overall findings of this study revealed that visual education influence learners' socio-cognitive skill development in nursery schools. Results have also shown that teachers are more comfortable with the use of real objects as compared to images and icons, signs and symbols. The study offers new evidence as well that visual education is real in our nursery schools and has the potential to help kids to learn better.

Key Words: Visual Education, Socio-cognitive development, real objects, images/icons, signs/symbols.

1. INTRODUCTION

Nowadays, the education and care of young children has received growing attention and interest from governments across the world including Cameroon. This has been the results of research showing the importance of pre-primary education for the child's development and learning in future years. According to Shore (1997), the first years of life are critical for the child's cognitive, physical, social and emotional development. It is during this period that future ability to learn in adulthood is built (Lambert, 1996; Lindsey, 1998). Shore (1997) stressed that if opportunities to promote children's development and learning are missed during the early years of life, later remediation is more expensive and less effective. According to The Centre for Educational Research and Innovation (1999), early childhood education programmes must be organized to ensure that every child acquires basic numeracy and literacy skills, the essential building blocks on which the ability to resolve complex problems in advanced societies depends. OECD(1999) points out that early childhood education includes all organized provisions for children below compulsory school age, whether education or care oriented, part-day or full-day, centre-based or home-based. The Western European continental countries view early childhood education for the age group 3-6 years as the right of every child (OECD, 1999).

In Cameroon, early childhood education (nursery education) includes children aged 4 to 6 years (The Scheme of work for English Speaking Nursery Schools in the Centre Region of Cameroon, 2012). It also states that a nursery school is an autonomous educational institution (The Scheme of work for English Speaking Nursery Schools in the Centre Region of Cameroon, 2012). Still in Cameroon, basic education which includes nursery and primary education is compulsory and free for all children. Nursery school teachers receive the same training and qualifications with primary school teachers. Most of the teachers at this level tend to have had less education and training. Programs at this level emphasize the importance of play, creativity and parental participation. In 2012, following the new organizational chart of the ministry of Basic Education, the Minister appointed Regional Inspectors and their collaborators to redress the problems of Nursery Schools in Cameroon. The changing social and economic conditions and the increase in working class women more than ever before has led to an increased in the demand for early childhood education all over the world.

The problem visualized by this study is how to improve learners' socio-cognitive skill development in nursery schools using visual education. The inadequacy of basic skills (numeracy and literacy skills) developed by nursery school pupils in Cameroon motivated the researcher to carry out the study. World Bank (2018) stressed that early learning deficits are magnified overtime especially in Sub-Saharan Africa. However, effective early childhood intervention can significantly improve poor children's ability to learn (World Bank, 2018)

2. LITERATURE REVIEW
2.1. Conceptual Framework

In our study, visual education refers to the acquisition or development of knowledge, skills and attitudes by

making use of visual learning tools. Visual education as the main concept in this study derive its meaning from the term visual literacy which is the ability to make meaning from every learning tool that we can see, read and write using visual language. Jonassen and Henning (1999) in Jonassen (2003) propagates that "well developed mental models consists of multiple representations including structural knowledge, procedural knowledge, reflective knowledge, images and metaphors of the system of strategic knowledge as well as social/relational knowledge, and artifactual knowledge". Jonassen (2003) concludes that problem representation is the key to problem solving. Visual learning tools in the study include real objects, images and icons, signs and symbols. Real Objects are concrete things that are used in the classroom to build knowledge and basic skills. They provide experiences on which to build and to provide learners opportunities to use all the senses in learning. Real objects allow learners to see, feel, hear and even smell the object being explored. The use of real objects in the classroom has as its basis that the learning experience is more memorable for the learners as it incites excitement, fun and kinesthetic learning. Kids have the opportunity to construct knowledge and meaning as they observe and read real objects during the teaching learning process. The role of the teacher is to make provisions for real objects such as sand trays, wooden mixing spoon, paint brush, fruits, pens, and nature corner. During the lesson, frequency of eye contact, timing of questions, facial expressions and ways of paraphrasing can always be interpreted by a teacher as approving or disapproving.

Also, images and icons in the study refer to visual representations of an object, scene or person produced on a surface. An image can be a picture produced on an electronic display such as a telephone or computer screen. An icon can be a small picture or symbol representing a program, a command, a directory, a device on a surface or screen, for example buttons on web browsers, and toolbars. The use of images and icons in the classroom is based on the belief that teaching consists of technical skills which can define effective teaching and learning. Images and icons can communicate or transmit the teacher's expectation to the learners. The study seeks to examine the teacher use of communication displays, support cards, schedules, shutter stock, radio buttons and toolbars.

More still, signs and symbols in this study refer to representations of objects, quality, events or entities. They have the capacity to inform, give direction using written text, pictures, marks, words, sounds, gestures or a combination. The use of signs and symbols in the classroom is a practice based on the premise that teaching consists of techniques or ideas which can define effective teaching and learning. The aspects to be considered include basic Mathematical symbols, numerical symbols, grading signs and flags. Signs and symbols simplify description of things, objects and ideas. On his part, Mumford(1966) in Engle(2000) argue that only when tool making or use is modified by linguistic symbols, aesthetic designs and specially transmitted knowledge does it become a significant contributor to human development.

2.2. Theoretical Framework
The Cultural Approach
The cultural approach to learning is relevant and can be applied in visual education and socio-cognitive skill development. The cultural approach situates learning and knowing in a more social context. It embraces the idea that context shapes how we think and know. According to Sheared (1994) what is essential to the cultural view is engaging "the students' lived experience within a socio-cultural, political, and historical context". Brown (2002) presumes that learners often construct and augment their own understanding of the content socially through conversations. Worthy of note is the fact that the cultural approach conceptualises learning and knowledge as participatory, distributed and socially situated. To Crook (2001), the cultural view frames intelligent action as something that is mediated. The interest in tool-mediation naturally leads to accounts of intelligent action that attend to the individual's deployment of tools and technologies, symbol systems, genres of communication (Crook, 2001). Bottino (2004) argued that the adoption of this perspective has implications for the support of learning.

Information – Processing theory
The information – processing theory is a cognitive theory which is relevant to visual education and learners' socio-cognitive skill development. It has become for many cognitive psychologist, a popular approach to the study of learning. According to Santrock (2004), the information processing theory is concerned with how individuals analyse the many sources of information in the environment and make sense of these experiences. Hunt and Ellis (2004) maintain that it is an attempt to explain how the human mind works. In practice, the computer is compared with the human brain. The physical brain is compared to the computer's hardware and cognition to its software. This comparison has contributed to our thinking about the child's mind as active information – processing system. Hunt and Ellis (2004) holds that central to this approach are the socio-cognitive processes of memory and thinking. Cognitive psychologists conceive learning as an internal process that involves the use of memory, motivation, thinking and meta-cognition. They contend that the amount of learning that takes place depends on the processing capacity of the learner, the amount of effort expended during the learning process, the depth of processing and the learner's knowledge structure. Memory can be defined as the

retention of information over time, which involves encoding, storage and retrieval. On the other hand, thinking can be defined as information processing. By processing, Hunt and Ellis (2004) are referring to activities such as perceiving, organizing, analysing, synthesizing, rehearsing, storing and retrieving.

On his part, Noe (2002) explains that information – processing theories, compared to other learning theories, give more emphasis to internal processes that occur when training content is learned and retained. Noe (2002) added that besides emphasizing the internal processes needed to capture, store, retrieve, and respond to messages, the information - processing model highlights how external events influence learning. These events include changes in the intensity or frequency of the stimulus that affect attention; informing the learner of the objectives to establish an expectation; enhancing perceptual features of the material (stimulus); drawing the attention of the learner to certain features; verbal instructions, pictures, diagrams, and maps suggesting ways to code the training content so that it can be stored in memory; meaningful learning context (examples, problems) creating cues that facilitate coding; demonstration or verbal instructions and helping to organize the learner's response as well as facilitating the selection of the correct response. Semenov (2005:108) emphasized that the time has come for schools to incorporate a wider array of mental processes and activities into the learning process. He argues that unlike the traditional classroom dominated by the spoken and printed word, the new classroom should practise a multisensory enhanced learning.

The Theory of Cognitive Development

Jean Piaget's theory of cognitive development explains how children learn. This theory is relevant and can be applied to visual education and learners' socio-cognitive skill development in nursery schools. According to Piaget's stages of cognitive development, children from the age of 2 – 7 years are in the preoperational stage (Ginsberg and Opper, 1988). Children in nursery schools in Cameroon are at this stage of cognitive development. At this stage, Piaget explains that the development of language and cognition are closely linked (Ginsberg and Opper, 1988). The child's growing vocabulary and language skills allow for development of complex play skills and a greater use of social language, reflected in development of complex story telling. As children grow in this stage, they begin to understand difference in others opinions and begin to develop the sense of time. The child can think about things and events that are not immediately seen. A lot of research has been carried out on the potentials of instructional materials in the teaching and learning process. But much is still needed to be known about visual education and learners thinking skills in nursery schools.

The study aims to answer the question *"To what extent does visual education influence learners' socio-cognitive skill development in nursery schools?* The researchers experience over the years as a lecturer assisting in the training of secondary school teachers; teacher trainers, nursery and primary school teachers in the Higher Teacher Training College Yaounde helped him to operationalize the main variables of the study (Visual education and learners' socio-cognitive skill development). As already seen, visual education in the study is defined by three main constructs. These include 'Real Objects', 'Images and Icons' and 'Signs and Symbols'. Thus, the study examines how these determinants of visual education contribute to learners' socio-cognitive skill development in nursery schools.

RESEARCH METHODOLOGY

The study was carried out in "Ecole Maternelle d'Application de La Garde Presidentielle". This school is a Government Practicing Nursery School Presidential Guard Melen Group A. It is located in Melen, Yaounde VI sub Division, Mfoundi Division in the Centre Region of Cameroon. Yaounde is the capital of the Republic of Cameroon. There are many nursery schools in Yaounde. These schools range from public, denominational and lay private schools. Public schools are those owned by the government. Denomination schools are those owned and managed by churches. Lay private schools are those owned by individuals. Government Practicing Nursery School Melen is a public school. It is purely a French speaking school with the French Language as the main language of instruction. It follows the Francophone Sub-system of education in Cameroon. However, it also has an English Speaking Teacher who teaches the English Language to children. This school was created in September 1987 as a Government Nursery School. In 2003, it was divided into two groups – Group 'A' and Group 'B'. In 2013, the school was transformed to a Government Practicing Nursery School. With its current status, the school serves as a practicing school for student-teachers. The school has two (2) buildings consisting of four classrooms, the office of the head teacher and a Library. The school has a playground with a slide, 3 tyres and a ladder all in their fixed positions. The population of the school is made up of 220 kids. The school is managed by a head teacher and her assistant. It has 10 teachers. Of the 10 teachers, 6 are in nursery I, 3 in nursery II and I English Language teacher. The choice of EMA GP 'A' Melen was due to the fact that the school is a practicing school with the necessary resources for teaching and learning. The English Language Teacher of the school (Madame Agnes   Nkenlefac Fondong) served as the main focal point of our project. She assisted in the data collection process. The population of the study was made up of nursery school teachers. The sample consisted of five (5) teachers. The teachers were selected because they are key actors in the teaching and learning process in the school. World Bank (2018) emphasized that the imperative in recent years about improving the quality of the teaching workforce is also about improving the learner outcomes. Purposive sampling technique

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was applied to select the participants. The table below presents the socio-demographic characteristics of the cases studied:

Table 1: Socio-demographic Characteristics of the Participants

Teachers	Class	Gender	Age	Qualification	Experience
Teacher 1	Nursery II A	Female	35 years	CAPIEMP	5 years
Teacher 2	Nursery I B	Female	38 years	CAPIEMP	10 years
Teacher 3	Nursery II B	Female	40 years	CAPIEMP	6 years
Teacher 4	Nursery I A	Female	36 years	CAPIEMP	8 years
Teacher 5	Nursery II B	Female	45 years	CAPIEMP	15 years

Table 1 show that there were five cases studied. That is Teacher 1, Teacher 2, Teacher 3, Teacher 4 and Teacher 5. All the participants were females. Their ages ranged from 35-45 years. As per professional qualification, they were all holders of the teacher's grade one certificate (CAPIEMP). Their teaching experiences ranged from 5 – 15 years. The methods used for data collection were observation and interview. The instruments used were a semi-structured interview guide and a semi-structured observation guide. These instruments were carefully constructed following the objectives of the study and applied respectively to collect data. Observation helped the researcher to collect firsthand information about the participants. The observation guide was adapted from Ned A. Flanders (1985) cited in Reed and Bergemann (1995). Observation served as a check against subjective reports from the respondents during interview. Interviews permitted the researchers to have face to face interactions with the participants. The data collection process began with the researchers obtaining permission from the head teacher to conduct the study in her institution. Confidentiality of participants and information collected was assured. My distance education student called Agnes Nkenglefac Fondong who is currently the English Language teacher of the school assisted in the data collection process. The observation of teachers and children in classrooms took place in the month of December, 2016. Each observation took a maximum time of 25 minutes. Interviews with the respondents started on the 15th and ended on the 19th of December, 2016. Each interview took a maximum of 50 minutes. The different interviews were carried out in the classroom in the afternoons when classes have ended and the children were already in their homes. Information was recorded using a multimedia phone and a note book. The interviews were transcribed. Transcription was done by listening to the audios and writing down carefully every word that was used by the teacher. The transcribed interviews were presented on a table and organized according to the different themes studied. Data was crosschecked several times to avoid useful information being left out.

3.   PRESENTATION OF FINDINGS
3.1. Findings of Observation

Table 2 presents the overall findings of observation on visual education and learners' socio-cognitive skill development in nursery school

Themes	Activity Observed	Frequency per Teacher (T)					Total Frequency	Percentage (%)	
		T1	T2	T3	T4	T5			
Real Objects	Sand trays	5.00	4.00	5.00	5.00	4.00	23.00	9.02	
	Wooden Mixing Spoon	4.00	4.00	4.00	4.00	3.00	19.00	7.45	
	Paint brush	4.00	4.00	4.00	4.00	3.00	19.00	7.45	
	Fruits	2.00	2.00	4.00	3.00	3.00	14.00	5.49	
	Pens	5.00	5.00	5.00	5.00	5.00	25.00	9.80	
	Nature Corner	3.00	3.00	3.00	4.00	4.00	17.00	6.67	45.88%
Images and Icons	Communication display	2.00	2.00	2.00	3.00	3.00	12.00	4.71	
	Support cards	2.00	2.00	2.00	2.00	2.00	10.00	3.92	
	Schedules	2.00	4.00	3.00	3.00	4.00	16.00	6.27	
	Shutter stock	1.00	2.00	2.00	2.00	2.00	10.00	3.92	
	Radio buttons	1.00	2.00	2.00	2.00	2.00	9.00	3.53	
	Tool bars	2.00	1.00	2.00	1.00	2.00	8.00	3.14	25.49%
Signs and Symbols	Basic maths symbols	3.00	3.00	3.00	4.00	4.00	17.00	6.67	
	Numerical symbols	5.00	5.00	5.00	4.00	3.00	22.00	8.63	
	Grading signs	4.00	4.00	4.00	5.00	5.00	22.00	8.63	
	Flag	2.00	3.00	2.00	3.00	2.00	12.00	4.71	28.63%
TOTAL		47.00	50.00	52.00	54.00	52.00	255.00	100.00	
Percentage		18.43%	19.61%	20.39%	21.18%	20.39%	100.00		

The general analysis of observed elements which constituted visual education and learners' socio-cognitive skill development in nursery school showed varying results as seen on Table 2 and Figure 1. Findings showed that 'Real objects' had the highest score (45.88%). This was followed by Signs and Symbols with a score of (28.63%). Images and Icons had the least score of (25.49%).
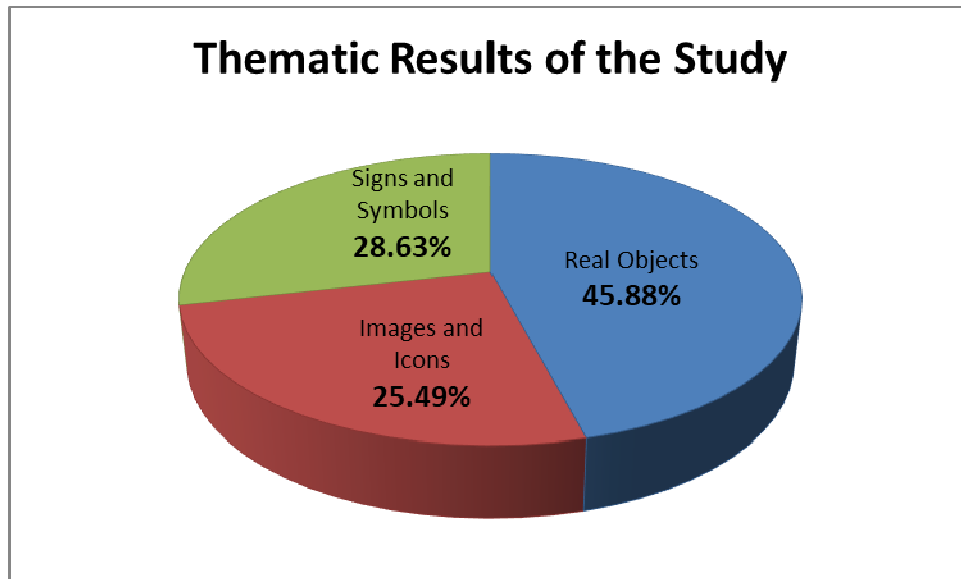
Figure 1: Findings according to major themes studied

Figure 2 shows that Teacher Four scored the highest percentage (21.18%) as concern observed elements. Teacher One had the least score with a percentage of (18.33%).
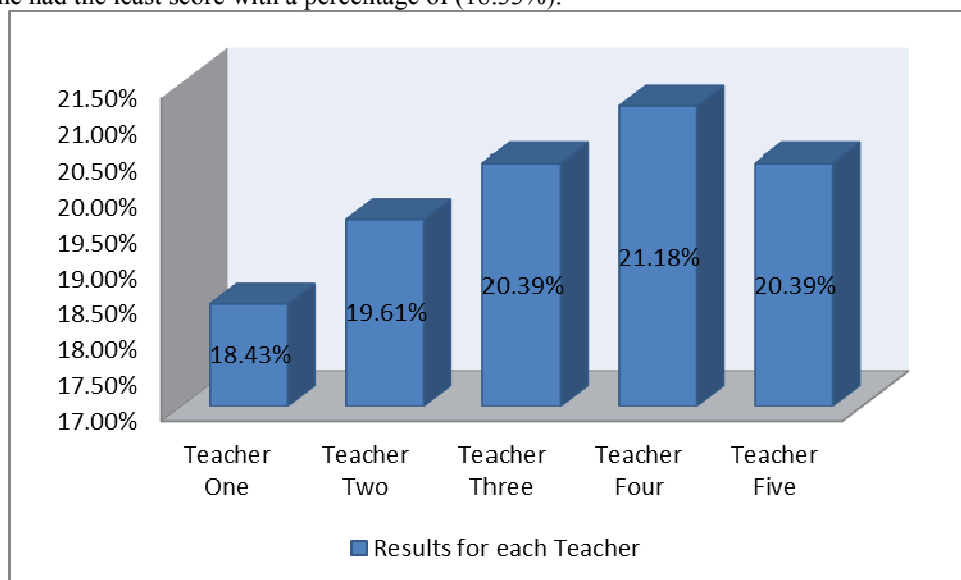

Figure 2: Findings of the study per Teacher

3.2. Presentation of Interview Results

Concerning real objects, Teacher A, Teacher B and Teacher C affirmed that real objects are indispensable resources for teaching in nursery school. Teacher A for example admitted that "*real objects help learners to make use of all their senses during the learning process. Kids have the possibility to see, hear, touch and even smell the objects. They influence learners' thinking skills as kids have the possibility to think, reflect and process information*" To Teacher B, "*real objects make a lesson more interesting and a memorable experience not only for the learners but for the teacher as well. When learners see real objects, for example a computer, they tend to be mentally active and so invest mental effort in the task. They play a vibrant role in focusing the attention of individual learners towards the teacher or the lesson.*" Teacher C stated that "*real objects can enhance understanding and further make the learning experience more memorable as kids have the opportunity to touch and manipulate them. When learners are presented with real objects, they explore and experiment as they touch and manipulate which go a long way to influence their thinking abilities.*"

As for Images and icons, Teacher A viewed that "images and icons are a powerful type of content representation that enhances the user's experience. But do not influence to a large extent learners' thinking skills." Teacher B stated that "images and icons can be visually pleasing and enhance the aesthetic appeal of a design. They influence learners' thinking skills in the sense that when learners are presented with images, the

brain automatically and effortlessly transmits a graphic image to the memory." Teacher C acknowledged that "images and icons not only inspire learners, but equally motivate them to take action but I cannot figure out the influence images and icons have on learners thinking skills."

On the aspect of signs and symbols, Teacher A argued that *"they help learners to bridge the gap between what learners experience as reality in the physical world and what they imagine this experience is or could be. They influence learners' thinking skills by unifying abstract mental thoughts together with the reality of living experience."* Teacher B pointed out that *"signs and symbols are important because they link the abstract world of ideas and the imagination with sensual experience. They influence learners thinking skills by stressing symbolic thinking which pre occupies the learners' psyche."* To Teacher C, *"signs and symbols provide a sense of belonging, social cohesion, aesthetics, authority, and identity. They influence pupils' thinking skills by connecting the creator of a sound, word, gesture, or image to the interpreter who is the learner."*

4. DATA ANALYSIS AND DISCUSSION
Real Objects
The investigation on real objects in the study was delimited to the use of tools such as sand trays, wooden mixing spoon, paint brush, fruits, pens and nature corner. The findings obtained from both observation and interview revealed that real objects have the highest influence on learners' cognitive skills development in nursery school. Real objects with respect to cognitive skills development following the results of the observation had the highest tally scoring (45.88%). As seen on Table 2, activities with pens had the highest percentage (9.80%). Still in the same light, the use of sand trays followed with (9.02%). This is revealing that teachers use pens regularly with kids in their classrooms in nursery schools. This was later buttressed by the results of the interview. The responses obtained on the question of real objects showed that nursery school teachers understand the importance of visual tools in instruction. All the teachers interviewed affirmed that real objects contribute to learners' cognitive development in varied ways.

Images and Icons
The inquiry on images and icons was centred on communication displays, support cards, schedules, shutter stock, radio buttons and tool bars. The researcher sought to find out how the use of these tools by teachers in instruction influences learners' cognitive development in nursery school. The results on images and icons revealed that images and icons to an extent contribute to learners' cognitive development in nursery schools. The findings from observation showed a tally of (65) scoring (25.49%). Table 2 shows that the use of schedules, a determinant of images and icons in the study scored the highest percentage (6.27%). This was followed by the use of communication displays with (4.71%). These percentages are suggesting that communicative displays are integral part of teaching and learning in nursery schools. This was later buttressed by results of the interview where out of the three (3) teachers who were interviewed in the study; one (1) was of the opinion that images and icons influences learners' thinking skills. The other two teachers acknowledged the importance of images and icons in terms of content representation and motivation of the learners. Learner motivation is one of the most important principles of learning. Positive and desirable change in the learner is most likely to occur when the learner is highly motivated in the lesson. It is very useful for children who are slow in learning and those with learning disabilities. These kinds of learners are ready to learn when they have the necessary resources and support from the teacher. The teacher is expected to use a variety of images and icons in the teaching learning process in order to help learners develop their cognitive abilities.

Signs and Symbols
As for signs and symbols, the researcher sought to investigate the different signs and symbols used by nursery school teachers in class and how they relate in the process with the learners. These were delimited to basic mathematical symbols, numerical symbols, grading signs and the flag. The findings obtained from both observation and interview revealed that signs and symbols have an influence on the cognitive development of learners in nursery schools. Signs and symbols with respect to learners' cognitive development following the results of the observation had a high tally scoring (28.63%). As clearly seen on Table 2, the use of numerical symbols and grading signs both scored (8.63%). Still in the same light, basic Maths symbols followed with (6.67%). The findings are revealing that numerical symbols, grading signs and basic Maths symbols are used frequently by teachers and kids in primary schools. These results were later supported by findings obtained from interview where all the three (3) teachers interviewed had a positive response on the question of signs and symbols and learners' cognitive development. From the different discussions, the teachers pointed out clearly that signs and symbols have an influence on learners thinking skills in nursery schools.

5. CONCLUSION AND RECOMMENDATIONS
Overall, this study revealed that visual education influence learners' socio-cognitive skill development in nursery schools. The results have shown that real objects, signs and symbols, images and icons contributes to learners' socio-cognitive skill development in nursery schools with differing scores. Results have also shown that

teachers are more comfortable with the use of real objects as compared to images and icons. Findings also present good results for teacher use of signs and symbols in helping children develop socio-cognitive skills. The study offers new evidence as well that visual education is real in our nursery schools and has the potential to help kids to learn better. Based on the findings of this study and given that visual education is an emerging concept in the educational system in Cameroon and Africa, recommendations are made to teachers to create and use more visual tools in teaching in order to help all the kids to develop their socio-cognitive skills including those with learning disabilities. Teachers should be trained on visual education didactic skills while in teacher training schools in order for them to be able to do their job effectively, For example how to construct visual language, how to read visual language and how to present visual tools. Visual education has the potential to respond to diverse needs of the learners in the classroom. Visual education has implications for community education and educational technologies. Community education involves education plans or programmes involving parents, teachers, children and other members of the local community in the learning process (Tambo, 2012). According to Tambo (2012), educational technologies are those devices or processes that are capable of assisting the teacher teach effectively or help learners to learn effectively. Teachers should be trained on the development of visual tools. Schools should be equipped with adequate and relevant visual tools. In-service training programs on visual education curriculum should be organized regularly for all the teachers. This study was limited in terms of scope and sample. The application of qualitative approach dominated the study. However, the study suggests further research on the same subject on a larger scale with a larger sample. Immense thanks goes to all the teachers and kids who participated in the study. Thanks also go to all the authors whose findings were used.

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