UNDERSTANDING TIME WORDS BY CHILDREN AGED THREE TO FIVE YEARS OLD: IMPLICATIONS FOR EARLY CHILDHOOD EDUCATION.

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DECLARATION

I hereby declare that this work titled "Understanding time words by Children aged three to five years old: Implications for Early Childhood Education" is a product of my own research efforts under the supervision of Prof. (Mrs) J.O MALLUM and has not been presented elsewhere for the award of a degree or certificate. All Sources have been duly distinguished and appropriately acknowledged.

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CERTIFICATION

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DEDICATION

This work is dedicated to the glory of God and to my two lovely granddaughters. Kyenret Panshak Haggai, and Muplang Zuhumnan Haggai that holistic Early Childhood Education will nurture your God given potentials to become the persons He created you to be.

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ABSTRACT

The study aimed at investigating the understanding of time words used in children's literature in Early Childhood Education by Children aged three to five years old. Time words are indiscriminately used in story books, rhymes and songs meant for children in nursery and pre-primary Schools. However, Piaget's theory of intellectual development has identified time concepts as beyond the conceptual development of the preoperational child. Seven research questions were raised on understanding, use, sequence and time words within the Zone of Proximal Development (ZPD). Four hypotheses were also formulated to authenticate answers to the research questions. Ethnographic cross-sectional research design was used for the study. The population was made up of children aged three to five years old in nursery and preprimary schools. 120 pupils made up the sample consisting of 40 pupils each of age three, four and five years old. The instruments for data collection were test and observation. The test was constructed in the format of Peabody Picture Vocabulary Test Revised (PPVT-R). Data was collected over a period of six weeks through individual administration of the test and through participant observation. One way ANOVA and t-test analyses of the data reveal that children in nursery and pre-primary school understand morning, afternoon, night and age at three years and the understanding of time words increase with age. The results showed significant difference at 0.05 in the understanding of time words between children whose ages are three, four and five years old. However, no significant difference at 0.05 was obtained between boys and girls in the understanding of time words. The results also showed time words operating at the zone of proximal development (ZPD) and the sequence children acquire time words/ concepts. It was then concluded that young children in nursery and preprimary schools understand the time words used

in story books and that various number of time word vocabulary operate at the Zone of Proximal Development (ZPD) for children in nursery and preprimary schools. It was therefore recommended that story books for children in nursery and pre-primary schools should use time words understood by children at various age levels and that teaching time words in pre-primary schools should focus on time words in the zone of proximal development. Teaching and learning strategies that inculcate time words/ concept through personal experiences in fun arousing and satisfying situation were also recommended.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY.

The Nigerian Research and Development Council (NERDC) present Early Childhood Education as programmes concerned with the care and education of children from birth to five years (0-5years) (NERDC,2007) and has developed national curriculum for the care and education of children 0 – 5years..This indicates that the government realizes the significant role that early childhood education plays in the overall development of the child as well as in preparing him/her for successful school life. Earlier, the 2004 edition of the National Policy on Education (NPE) had made early childhood education an integral part of public education by requiring public primary schools to establish preprimary sections. This recognition has stimulated the establishment of preprimary school section in public primary schools. In Plateau State for instance, the number of public preprimary schools rose from 13 in 2009 to 129 in 2011, while the number of private preprimary schools increased from 217 to 283 within the same period. In these institutions, we find story books, rhymes, songs and poems permeated with time words such as morning, afternoon, now, soon, immediately, later, after, before, night, yesterday, today, tomorrow, early and evening. Examples of the books include: Baxter (1993); Hannaford (2005); Eluwa, Chima and Chijioke (2006); Oyetunde (2005); Baddoo (2001); Woode (2007); and Ankrah (2007). Children also encounter conventional time words in daily life in the schedule of activities. Conventional time words particularly concerns these children who have to be acquainted with when to be carried by parents to school and when to be picked from school to go back home.

Young children in early childhood education programmes such as the Crèche, nursery and preprimary school encounter quite a number of time words and concepts in their literature, instruction and daily activities. For example nursery school pupils celebrate their birthday either at home or at school. This means that age and birthdays are important to children. Consequently, children's speech makes reference to age and birthdays. Children often tell their teachers about their birthdays. For instance a child may say "today is my birthday and mummy made my birthday cake."

Besides age and birthdays, young children also encounter time words and concepts in many other forms. These include duration, time sequence, seasons, past, present and future, the clock, days of the week and months of the year. In daily activities and experience, children encounter duration as teachers and caregivers often tell children to get ready to stop an activity such as colouring in five minutes time and clean up. Others may announce oncoming events like mid-term break by saying that in two days time the school will go on mid-term break. The question that arises from these kinds of communication to children is whether they perceive the length of time left to finish the colouring activity and clean up or the duration they have left before the mid-term break.

In addition to this, the arrangement of early childhood programmes and institutions involves sequence of time as nursery and preprimary schools have established routines for activities on daily basis. For example, in a particular programme children know that rhyme time comes before outdoor play and that after lunch break is small group time or they will go home after alphabet time.

Time concepts are some of the first concepts children encounter in life. For example, they experience duration by the time they have to wait for a caregiver to

respond to their need for food when they are hungry or change their pampers when they are wet at a very early age. Time sequence is experienced when a three year old child may anticipate that her bath comes after dinner, therefore, she may get up from the dinner table to begin to undress herself for the bath. Similarly, a nursery one child may know that she must brush her teeth after waking up from sleep before taking her bath and then eating her breakfast before going to school. With all these experiences as well as instructions from parents, caregivers and teachers, children come to develop some vocabulary of time words. Such time words include first, last, next, before, day, week, month, hour, minutes, finish, daytime, night, late, early, today, now, soon, yesterday, and tomorrow.

The understanding of time words children encounter in childhood literature and instruction is an issue of concern to educators as we know that it is important for children to understand concepts in order to cope with learning or follow directives. The irony we find in educational programmes such as those of early childhood educational institutions is that teachers and other care providers as well as parents give specific information about time when they speak to children and assume that the children intuitively know what these words mean. But time words are abstract concepts (Richmond,1977) which Piaget (1969) portrayed as being beyond the understanding of the preoperational child. Ascertaining the understanding of time words is important in early childhood education because young children receive instruction, sing songs, say rhymes and meet literature that have time words. Moreover the curriculum of preprimary/kindergarten children at the age of five in science/mathematics and social studies have time concept/ words to be learnt. Time concepts are included in the National Early Childhood Curriculum for children

3-5 years. Under the mental development topics, time, date and season form part of the curriculum (NERDC, 2007).

The problem posed by such curriculum materials is that Piaget (1969) posits that children develop understanding of time only in late childhood from ages eight to ten years. The implication is that children younger than this age level do not understand the time words they encounter in literature and instruction. Moreover, Meadows (1993) asserts that children in early childhood education are perceptual thinkers. This means that they think about things they see, hear, smell, taste and touch, but time does not have perceptual attributes from which children may extract its characteristics through the senses. Therefore, it can be assumed that time words may be above the conceptual development of the child in early childhood since they are abstract concepts. Stressing the abstractness of time, Richard (1977, p. 20) pointed out that time is an “invisible and intangible concept. It is abstract even to adults”. Therefore, Burny, Dosoete and Valcke (2009) observed that time is a difficult concept to grasp as well as elusive to definition and description. The question that arises from that position is how children form time concepts and whether or not abstract concepts such as time words form part of the vocabulary of children in early childhood education.

Since it appears that children encounter many time words in school, the researcher is motivated to study the understanding of these time words by children in early childhood education whom Piaget (1969) has found as incapable of understanding time concepts. The study is therefore interested in investigating the time words which children in early childhood understand. This will enable educationists to ascertain whether or not the stories, songs, poems and instructions

that are laden with time words are developmentally appropriate for children at this level.

Consideration should be given to what is developmentally appropriate in early childhood education because world associations on early childhood education strongly advocate Developmentally Appropriate Practice (DAP). These associations include National Association for the Education of Young Children (NAEYC) and Organization Mondiale pourL' Education Préscholaire (OMEP). DAP is a framework which outlines practices that promote young children's optimum learning and development. In the light of this, it implies that knowledge of how children within a given age span typically develop and learn provide a general framework to guide teachers in preparing the environment, considering the curriculum and designing learning experiences.

An important issue in the education of children that is emphasized by DAP is the knowledge of the sequence in which children gain specific concepts, skills and abilities. This knowledge enables teachers build on prior development and learning. Familiarity with known learning sequences should inform curriculum development and teaching particularly in early childhood education.

Developmental psychologists (Copple and Bredekamp, 2009) have also reported optimum periods of development for certain types of skills and learning to occur. In agreement with this position, Kuhl's research (1994) shows that the first three years are optimal for oral language development and presentation in speech and language. The question is whether time words also develop as a part of language development considering the fact that they are abstract concepts. This research was interested in knowing whether the child has acquired time words

along with other words used in his/her speech in early childhood and whether he/she understands the time words that are used in the literature and instructions.

Another issue of concern in this research is the gender differences in the acquisition of time words. Girls are believed to be stronger in early childhood language development than boys including fluency, clarity or articulation, and vocabulary development (Siegler, Deloache and Einsenberg, 2006). The verbal proficiency of girls is attributed to differences in brain structure coupled with the tendency of parents to have higher rate of verbal interaction with daughters which according to Siegler et al (2006) is a strong predictor of children's language learning. It is expected that the language advantage that girls have over boys in early childhood, will also enable them to be ahead of boys in understanding time words and having more time word vocabulary in their speech than boys. However time is scientific and a mathematical concept. Boys are believed to have higher scientific and mathematical abilities than girls (Rathus, 2008). It is therefore expected that boys will understand time concepts better than girls. This study is therefore interested in finding out the gender differences in the understanding of time as each of the gender has certain advantages that may enable them to acquire time words more quickly.

1.2 STATEMENT OF THE PROBLEM

In daily interaction with young children, some language of time words is used in greeting, instruction, rhymes, stories and songs. Similarly, a number of time words permeate children's literature such words as morning, night, day, now, today, afternoon, evening, sunset, sunrise, tomorrow, soon and names of the days of the week or months of the year. It is obvious that time words are indiscriminately used in children's literature and instruction. .Adults who write story books often assume

that children understand time words in the context they are used .They might think that time words emerge gradually in children's vocabulary beginning from when they start to use words for communication. However Piaget (1969) concluded that the understanding of time words is achieved in late childhood from the age of eight to ten years old. It therefore implies that children do not understand time words before late childhood. It therefore seem that there is a gap between story book writers' understanding of children's ability to understand time words in early childhood and Piaget's position. The study was therefore undertaken to investigate the understanding of time words used in story books of children aged three to five years old.The question raised to be answered in the study was " Do children in early childhood education understand time words used in nursery/preprimary story books?" What are the implications of understanding or lack of understanding the time words for the children in early childhood education?

1.3 PURPOSE OF THE STUDY

The study set out to investigate the understanding of time words in the literature of children aged three to five years in early childhood education.

The specific objectives were:

1. To find out time words /concepts children aged three to five years understand from the Time Word Vocabulary Comprehension Test (TWVCT)
2. To find out which time words children aged three to five years understand from the story "Nina's visits her grandmother" adapted from a nursery school story book.
3. To identify the time words used by children aged three to five years in nursery and preprimary schools in the northern senatorial zone of Plateau state.

4. To investigate the sequence of the development of time words among children in early childhood education.

5. To find out the time words operating at the lower and upper limits of the Zone of Proximal Development (ZPD) in the area of time concept formation for children aged three, four and five years in early childhood education.

6. To find out which time words are in the zone of proximal development for children in nursery and preprimary schools at ages three, four and five years old which can serve as the basis of teacher's intervention for scaffolding time concepts.

7. To find out whether there is any difference in time words used by boys and girls.

8. To find if the understanding of time words will differ between children in nursery and preprimary schools in rural areas and those in the urban area (Jos).

1.4 RESEARCH QUESTIONS

The research questions answered in this study were:

1) What is the mean and standard deviation of the performance of time words of children whose ages are three, four and five years old on time word vocabulary comprehension test?
2) What is the mean score of the understanding of each time word in the story "Nina visits her grandmother" by children three to five years in Nursery and Preprimary schools?
3) Which time words do children aged three to five years use in nursery and preprimary schools?
4) Is there any difference in the number of time words used between children in nursery and primary schools in urban areas and those in rural areas?
5) What is the sequence of time word used by children aged three to five years?

6) Which time words are operating at the lower and upper limits of the zone of proximal development for children aged three, four and five years old in the area of time concept formation?

7) Which time words operate at the zone of proximal development(ZPD) for children aged three to five years in Nursery and preprimary schools?

1.5 HYPOTHESES

The following null hypotheses were generated for testing at 0.05 level of significance.

1. There is no significant difference in the time words understood by children aged three, four and five years old in nursery and pre primary schools.
2. There is no difference between boys and girls in the understanding of time words among children aged three to five years old in nursery and preprimary schools in the northern senatorial zone of Plateau state .
3. Children in early childhood Education in rural areas will not differ significantly from children in urban areas in their use of time words.
4. The understanding of time words will not differ significantly on the comprehension, ordering and sorting sections of the time word vocabulary comprehension test (TWVCT)

1.6 SIGNIFICANCE OF THE STUDY

The study is important to the field of child development and early childhood education in particular because the findings will equip all stakeholders with knowledge about time words children in nursery and preprimary schools understand. This knowledge is essential for designing the curriculum, learning materials and learning activities that are developmentally appropriate for

learning time words in early childhood education. The findings of this study will benefit the following stakeholders:

First, the study will add knowledge on time concept development of children in early childhood education and this knowledge will be used in planning early childhood time concept learning.

Secondly, the findings from this research will serve as a guide to authors of nursery school books, songs, poems, rhymes as to which time words to use in preparing learning materials for pupils.

Thirdly, the findings will also guide early childhood teachers in the selection of time words to inculcate. It will also help them to know the time words that are developmentally appropriate for children in early childhood education.

Finally, the result of the study will also point the curriculum implications of time words identified as functioning at the lower limit and upper limit of the zone of proximal development (ZPD) in time concept development in early childhood. This will help curriculum planners design appropriate curriculum for early childhood education in the area of time concept formation.

1.7 THEORETICAL FRAMEWORK

Piaget's theory of cognitive development provides the theoretical basis for this study (Piaget 1952, 1954, 1971). The theory consists of a process component and a structural component. The process components state that mental structures grow and change through the processes of organization and adaptation. Organization is the tendency to integrate systems into coherent and smooth routines giving rise to series of cognitive structures that are ordered rules, categories, procedures and so on which eventually amount to united organization of logical operations. Adaptation is the tendency of the child to adjust to stimulus from his environment. Adaptation

comprises of two complementary processes which are assimilation and accommodation. The structural component consists of four stages of cognitive development which are qualitatively different from each other. This thesis uses the structural component as an anchor for the study.

The structural component states that intellectual development progresses in four stages namely:

Sensory Motor Stage - Birth to two years: Piaget (1954) found that time at the sensory motor stage is intermingled with the impression of psychological duration inherent in attitudes of expectations, efforts and satisfaction.

Preoperational Stage - Two to seven years: This stage according to Piaget is divided into: Symbolic Thought (2-4 years) and Intuitive Thought (5-7 years).

In the symbolic thought period, children begin to use symbols to represent objects. They begin to draw, pretend and most importantly to use language. At this stage, Piaget (1969) stated that the development of time concept (that is the comprehension of time) remain incoherent. Succession and duration remain undifferentiated from distances. For instance, ‘first’ may mean ‘before’ or ‘after’ and differences in space are thought to preclude synchronous processes and lead to confused estimation of duration.

During the intuitive stage, the thought is predominated by intuition, that is, by guesses about reality rather than rational inferences. Mechanisms that assimilate new materials into already existing structures have distorting effects on the child’s apprehension of reality. At this stage, cognitive schemes are partially coordinated and frequently lead to contradictory judgments. For time concepts, Piaget (1969) said children lack the power of operational reversibility for the selection of various possible orders and succession.

Concrete Operations – Seven Years to Eleven Years: Piaget called this stage conceptual thought. According to him, time has become meaningful and that time concepts are formed at this stage. Children begin to use time concepts.

Formal Operations - Eleven Years and Above: Time at this stage has been properly understood, including long duration and historical times.

Piaget's theory of cognitive development served as a theoretical basis for this work because it gives the stages of intellectual development through which every child must go in sequential order and at approximately the same age. These stages are universal and applicable to all cultures. Moreover, the theory describes the cognitive content (structure) of each developmental stage thereby making testing in other cultures possible. Piaget's theory of development also describes time concept development in children and fitting time concept formation in cognitive structures at various stages. His work on time concept formation has clearly spelt out the incompetence of the preoperational child in understanding time concepts. In this study, Piaget's theory will served as the yardstick for measuring the understanding of time concept using time words in the story books of nursery and preprimary school children aged three to five years old and collating the time words they use (speak) in the classroom, on the playground and during break time.

The issue of children's understanding of time words in literature covers a number of interrelated concepts and principles that anchor this study. The study encompasses the following ideas, concepts and principles: cognitive development, language development, concepts and learning, education and the principle of developmentally appropriately practice.

1.8 DELIMITATIONS OF THE STUDY

The study is concerned with investigating the understanding of time words among children of three, four and five years old, which are the ages which are the focus of preschool educational programmes. Children in daycare centers/ programmes are excluded as these are custodial care arrangements not intended to promote children's familiarity with academic activities. The study also excludes children in the lower primary school as these are already receiving formal academic programme. The study focuses only on 'normal' children and excludes children with special needs. The study concentrates on investigating the understanding of time words frequently used in children's story books, with a view of understanding the conceptual development of time at this developmental level in the Nigerian culture. It is concerned with the time word vocabulary of children in early childhood education. The study excludes the teaching of time words in early childhood education but only identifies the time words which children understand in early childhood and those they can use independently which Vygotsky called the lower limit of conceptual development and time words that are maturing, which he called the zone of proximal development(ZPD). The study also pointed out the curriculum implications of time words identified as functioning at the lower limit and upper limit of the zone of proximal development (ZPD) in time concept development in early childhood.

1.9 OPERATIONAL DEFINITION OF TERMS

Early Childhood Education – The programme serving children from three to five years which include nursery 1, nursery 11, and preprimary (kindergarten) education.

Time Concepts – Words that indicate temporal sense or temporal instant within which events/activities take place, duration, days of the week, months of the year or seasons.

In this study time concepts are used interchangeably with time words.

Time words – Words that stand for temporal instants within which events have occurred, are occurring or will occur such as morning, now, afternoon, yesterday, evening, and last week. It also refers to name of days of the week, months of the year and seasons of the year.

Understanding – The ability of pupils to identify illustrations and drawing used to represent specific times of the day and activities done in the day time and in the night time. It also means the ability to comprehend time words through attaching activities and events to periods when they happen and objects to times they are used.

Nursery schools – Educational institutions which offer care and educational services to children in the years before preprimary class. These institutions offer services to children usually three and four years old. In this study, such institutions are referred to as preschools and the pupils as preschoolers.

Preprimary schools – Educational institutions that offer educational services to children usually aged five years old preparatory to entering primary schools at six years.

Time concept formation - The process of learning or understanding time words/temporal phrase.

Zone of proximal development (ZPD) - Time word/concept that is in the process of being understood as indicated by the ability of some children in an age group to sometimes use the word or rarely use the word correctly, or use the word incorrectly

or without understanding its meaning. Times words in the process of maturing or level at which learning time words is achievable with adult (teacher or parent) support or more experienced peers.

Lower limit of the zone of proximal development - Cognitive functioning which the child has already mastered. In this study, they are time words children of a given age level have understood which they used to solve problem unaided.

Upper limit of the zone of proximal development - Level at which conceptual understanding has not yet been attained by children in an age group. These are time words/concepts operating above the conceptual development of children within an age group.

Time words used - Words that convey temporal sense which children verbally expressed in the course of talking to other children, teachers and persons in the classroom or outside the classroom or at playground.

Rural areas - Settlements outside Jos metropolis where little or no social amenities such as electricity, water, good road network/street and where the occupation of the people is not much diversified, specialized or professional.

Urban area - Jos metropolis where a lot of commercial, professional and industrial activities take place with modern social amenities like electricity, pipe borne water, good road network and occupation of residents are highly diversified and specialized.

CHAPTER TWO

REVIEW OF RELEVANT LITERATURE

This section is a review of relevant literature consisting of both theoretical and empirical work done in related area. The section focused on time, time words in early childhood education, the development of understanding in children, Piaget's work on time concept formation and language development.

2.1 THE MEANING OF TIME

Time is a difficult concept to define or describe. Scholars and researchers have encountered enormous difficulties in defining it. Waller (in Noah 1988) encountered problem in defining time and he lamented that "time is a constant source of frustration, we cannot bite it to the core. Gale (1968) observed that time is so perplexing that Quinonoes wrote that time is change only to write two pages later that time's nature is its unchangeability". It is the difficulty encountered in defining time that made the St. Augustine (Gale, 1968) to ask the question 'what then is time?" He stated that "If no one asks me, I know; if I wish to explain it to one that asked, I know not" (p. 3).

The difficulty in defining time arises from the fact that time is not made up of any series of discrete and discernible unit and time especially greater intervals of time can be comprehended only by the aid of arbitrary and abstract symbols such as the clock and Calendar. Gale (1968) pointed out why the difficulty in the definition of time is encountered. He observed that what is mystifying about time comes from its use as a noun. "It is assumed that the word must function semantically as a noun and so we look about in vain for the entity it names" (p. 6).

Despite the problems encountered in defining time, scholars have made bold attempt at defining or at least describing it. Whitrow (1978, p.75) defined time as “a linear progression measured by clock and the Calendar”.

Waller (in Noah (1988) defined time as “an absolute psycho-physical continuum as when men speak of past, present, future, hour, season or year”. Likewise Kastenbuem (1984) said that time is a psychological concept and designates the totality of “before” and “after” relations between individuals and events. The events are thought of as foreseen or planned (future) or engaged in or accomplished (present); or remembered or stored (past). They may arise in the organism or its environment and may be noticed or unnoticed. Explaining further, he stated that in their temporal aspect, all events of an individual follow an irreversible order. He noted that a given event in a sense can occur once, last for a short or long time (duration) and stand in relation to other events (simultaneous).

From the psychological view, time has been defined as “a form of perception”, (Eysenck and Arnold 1972). This definition makes time a central problem to psychology and is understood when “objective” time is compared to “subjective” time which is understood through duration and sequence. St. Augustine (in Orji,1986) said time is a continuum with no beginning and no end but the human mind has ascribed three dimensions (past, present, future) for it. Orji (1986) observed that for St. Augustine, the past, present and future dimensions of time do not exist in reality; he opined that people regard as past, present and future mere images and representations. St. Augustine then drew the conclusion that time dwells in the mind but is represented outside the mind.

Swindburne (1968) pointed out that the English word time in the first sense means temporal instant. He explained that when we speak of the time when events

occur, we mean the temporal instant at which they occur. He also stated that time is the sum of temporal periods temporally related to each other. Periods are part of time in this sense. Swindburne (1968) stated that to identify temporal objects their state and change of state, we have to specify not merely where they existed but when they existed. One instant of time according to him is the present one and other instants relative to past and future. Every past instant was a present one. Every future will be present one. The present instant was future and will be past. All this is involved in what we mean by past, present and future.

Since time is not an entity or object-whole, the concept can only be understood in relation to events and not in isolation. Piaget (1954) explained that time concept cannot be understood in isolation to events. He pointed out that "for time is nothing other than forming of relationship between the events that fill it and those which are required for their formation" (p. 320). According to him, time cannot be perceived in isolation of other fundamental categories of objects, space and community.

Although we cannot pinpoint to what time is, yet as humans we feel the passage of time in our personal experience. Mac (1972) observed that both psychologically and physically human beings experience time and observe it in their environment.

Time is associated with change. Mac (1972) stated that change makes us feel the passage of time. Without change, he argued, timeless world would be a standstill, but if some kind of change took place, time world would be different "now" than it was "before". The period between "before" and "now" indicates that time might have passed. Therefore, the passage of time and change are related because the passing of time depends on changes taking place in the real world. Mac (1972) noted that some changes happen once like the falling of a leaf from a

tree. Other changes happen over and over again for example the rising and setting of the sun.

Gale (1968, p.1) presented a philosophical analysis of time in the tradition of Aristotle's physical who saw time as "the number of movements in respect of "before" and "after". In this description, time is tied with motion. It was argued that action is an attribute of a substance and time in turn is an attribute of motion therefore, time is not motion but the number of measures of motion. The analysis further stated that motion is potentially time and becomes such in actuality only when temporal succession is noted and measured by some sentient creature. Therefore, time is not a substantial entity which is capable of existing separately from other things. "It has no reality independent of changes that substances undergo".

The African concept of time is described by Mbiti. Mbiti (1976) explained that the question of time is of little or no academic concern to African people in their traditional life. For Africans, time is simply a composition of events which have occurred, that which are taking place now and those which are immediately to occur. To the African, what therefore has not taken place or what has no likelihood of an immediate occurrence is in the category of 'no time'.

Whichever definition or description we accept, we know that time is an abstract psychological concept which describes an infinite linear progression or continuum in which events occur and changes take place and that we can talk of time only in relation to these events. The clock and calendar are arbitrary devices created by man in order to measure time. It also refers to temporal instant when events occur.

Cultural Differences in Time Perception

There is controversy as to whether different cultures perceive time differently. Mbiti (1975) points out that the African idea of time concerns mainly the present and the past and have little to say about the future. Time according to him is perceived through events that come and go in minor and major rhythms. The minor rhythms are found in the minor things on earth (such as men, animals and plants) in their birth, growth, procreation and death. The major rhythms of time Mbiti said are events like night and day, the month (reckoned on the basis of the moon), the seasons and events of nature which come and go at greater internals such as flowering of certain plants, the immigration of certain birds, and insects; the movement of certain heavenly bodies.

Orji (1986) reports Kalu as stating that Africans perceive time movement in cyclic fashion. In addition, time move backwards rather than forward and people set the minds not on the future things but chiefly on what has taken place, Orji (1986) stated that Africans measure time in non abstract times. For example, 9.00 clock in the morning would mean when the sun begin to climb to her seat thereby humanizing time. Because time is humanized, the concept of distant future becomes problematic precisely because it serves events which points of reference have not occurred.

Research has buttressed the claims that Africans do not have ideas of distant future. Orji (1986) reported that in East Africa, where Mbiti carried out research, he found no concrete words or expressions conveying the idea of a long distant future in the region of two to three years.

While African perceive time in cyclic fashion with a long past, present and short future, Euro-Americans perceive time movement in a kind of linear progression

fashion with an indefinite future measurable to some extent by the chronometric clock (Orji,1986). The linear concept of time in western culture has an indefinite past, a present and an infinite future

There is also argument as to whether schooling influences the formation of time concept. Bradley (in Skinner 1990) found that the background of time concept is developed largely out of organized school situation. However other researches have pointed to the contrary. Nweze (1973) found that differences in exposure to formal education had influence on children's performance on time concept formation.

Civilization affects time awareness. Koffka (1959) pointed out that time concept in primitive man is under developed. According to him, time is too vague a concept to the future. Likewise Richard (1972) noted that the day must have been the simplest and most striking unit of time for the primitive man. He remarked that most languages do not have a term for night and day together which indicates that they were not perceived as a single unit until late in history.

Smart and Smart (1972) observed cultural difference in time awareness among minority groups. They found that children of minority groups often differ from mainstream children in being more oriented to the present and less to the future. For example in marking off portions of a line representing life space, Indian and Mexican boys projected longer presents and shorter futures than did Anglo-American. They observed that the differences were most likely the result of early childhood learning of realistic nature. They argued that among disadvantaged subgroups who can expect little reward in figure, it makes sense to bring up children with minimal risks of future disappointment and disillusions. Foffler, (in Noah 1988) observed that much of the difficulties minority students have in western – American

style schools may come from different concept of time. He pointed out that if a child does not share time assumption with the teacher or dominant culture, the child may well appear stupid and backward. Certain cultural practices or daily routines groom children for perceiving time. Almy (1975) observe that in the school culture, time almost seem to govern the programme. There is time for toileting, a time for snack, time for music and stories and a time for going home. Moreover, the concept of time has to be properly understood in education. Since school prepares pupils for future, educators have to empirically understand what mode of time children bring to school.

2.2 TIME CONCEPT DEVELOPMENT IN EARLY CHILDHOOD EDUCATION

Apart from time words used in story books and other literature materials of children in early childhood education, early childhood education experts and early childhood education institutions have emphasized the acquisition of time concepts in their programmes. This according to Hill (2005), is to prepare them to accurately understand lessons in history that will follow in later years. While Burny, Dosoete and Valcke (2009) see the significance of time-related competencies as next to the mathematical, visuospatial and linguistic abilities which acquisition in turn facilitates the acquisition of these competencies and vice versa. In other words, time concepts and mathematical skills and visuospatial abilities are mutually indispensable in early childhood education. The aspects of time that children encounter in early childhood Education curriculum activities include:

Duration

Henninger (2009), pointed out that children encounter duration when they get involved in rhythmic movements involving moving activities such as steady beats, making coordinated movements and increasing or decreasing rates of movements.

Kostelnik, Soderman and Whiren (2007) stated that rhythm is one aspect of organized time that children enjoy .Similarly, Martin (2001) stated that intervals of time (duration) are integral part of science activities with young children. According to him, intervals of time is measured in science activities such as the time it takes for a toy parachute to fall to the floor, the time it takes can be estimated by asking children to count one - one thousand, two - one thousand, three - one thousand, four - one thousand, five - one thousand and so on rhythmically. He stated that it takes about one second to say one - one thousand, so if a child counts rhythmically up to ten- one thousands, it means that his or her parachute took ten seconds to fall to the floor. Children can also use this method of time duration in daily life happenings such as the interval between seeing lightening and hearing a thunder; time to run a distance or time it takes a ball thrown by the child to roll from one point to another.

Kostelnik, Soderman and Whiren (2007) also mentioned that children in early childhood education experience duration in curriculum activities when a preschool teacher gives warning to her pupils to end an activity. For instance a teacher may give warning that “we will soon stop colouring and clean up.”After a while the teacher can stop them from colouring and ask them to clean up.

Illinois Early Learning Benchmark (2009) stated the following activities for children in early childhood education to acquire the time concept of duration.

- Observing how long activities last. For instance which takes longer time, eating crackers or drinking a glass of water?
- Setting activities for an amount of time such as jumping in 10 seconds. How many seconds can you stand on one foot?

- Estimating how many minutes it takes to walk or run to the bus stop or around the sand pitch.
- The time it takes for ice to melt or candle to finish burning.
- Counting seconds by chanting one one-thousand, two one-thousand, three one-thousand etc.
- Waiting for something they want.

These activities give children physical experience with interval of time or duration even though they have not yet grasped the concept of duration (Driscool & Nagel 2009).

Time Sequence or Routines of Time

Children in early childhood programmes encounter time sequence in the schedule of their daily activities. Kostelnik, Soderman and Whiren (2007) observed that a typical routine of the time for children in early childhood education programme may be something like:

- Arrival/greeting
- Free choice (art, block, library writer, pretend play)
- Warming up for clean up
- Clean up
- Large group activity
- Transition outdoors
- Outdoor time
- Transition indoors
- Lunch
- Transition home

Hill (2005) listed the following as activities in early childhood curriculum for learning sequence of time

- Days of the week
- Months of the year
- Seasons of the year
- Timeline activities including growth of a child, personal timeline, timeline for the day, timeline for the week, timeline for the year.

The Language of Time: developing time word vocabulary

Driscool and Nagel (2009) listed these time words as the time word vocabulary to teach in early childhood. They include today, yesterday, tomorrow, morning, afternoon and evening, seasons of the year with different weather conditions, birthday, group time, snack time, next week, now, bed time, past, present and future.

Hill (2005) also mentioned the following language of time to be listed in the curriculum of early childhood education: ‘today’, ‘yesterday’, ‘tomorrow’; time of the day like ‘morning’, ‘afternoon’ or ‘evening’; past like ‘last week’; what is coming like ‘next week’ and the uses of ‘before’ and ‘after’, ‘soon’ and ‘now’.

Keeping Track of Time

Calendars: Standard calendars, personal calendars, and linear calendar, the orbital calendar and the lunar (moon) calendar. Beneke Ostrosk, and Katz,(2009) also added calendar time for children in early childhood education so as to teach them what day it is including the knowledge of days, weeks, months and seasons.

Other time concept activities which Hill (2005) included in early childhood curriculum are birthdays, observing and measuring time including exploring the

tools for measuring time; clockwork which consists of teaching clock, teaching the half-hour and daytime and night time activities.

With this wealth of time concepts in the curriculum, it is pertinent that researchers should investigate the understanding of these concepts in early childhood education

2.3 PIAGET AND EDUCATION: THE DEVELOPMENT OF UNDERSTANDING IN CHILDREN.

What children understand and how they came to understand at various stages of development is embodied in Piaget's theory of intellectual development. Understanding according to Piaget (1971), is one form of cognitive adaptation between the individual and the environment. The child is all the time trying to make sense of the world. According to Piaget, the process of making sense of the world comprises of two complimentary processes namely assimilation and accommodation. He stated that assimilation is the process of incorporating or fitting new information to pre-existing cognitive structure. Once the new information is successfully incorporated into the pre-existing cognitive structure, the world makes sense. It implies that, understanding has occurred whenever new information is incorporated into the pre-existing cognitive structure. Accommodation on the other hand refers to the process of modifying or changing the pre-existing cognitive structure in order to take in new information. Accommodation takes place when an individual fails to incorporate new information into the pre-existing cognitive structure due to the incompatible characteristics of the new information to the pre-existing cognitive structure. This creates a situation that Piaget calls disequilibrium which is a state of not understanding the stimulus encountered. The imbalance is resolved by the individual asking question or getting clarification about the new

information. With explanation or additional information, the pre-existing cognitive structure is modified to accommodate a new concept, rule, and “object. Equilibrium in the cognitive structure is restored when the new information has been successfully accommodated. The accommodation leads to increase in knowledge and therefore cognitive growth. These two cognitive processes which Flavel (1973) called twin functional invariant work together throughout the life of an individual to lead to increase in knowledge.

Piaget stated that adaptation together with organization which he said is the innate tendency to organize knowledge in coherent and smooth routine, give rise to a series of structures of cognition that are ordered rules, categories and procedures which exist in the cognitive structure as unified organization of logical operations.

Piaget emphasized the role of equilibrium in cognitive stability. He said it is the drive for order that regulates and balances external and internal changes encountered by an individual.

What Children Understand at Various Stages of Development

Piaget (1952, 1954,) described sequential development in modes of thinking which are construed in distinct stages within each of which there is a common cognitive structure.

Sensory motor stage (birth – 2 years)

Piaget called the period from birth to two years the Sensory motor stage because he stated that the infants’ mental activity depends solely on sensory and motor abilities and experience. During the Sensory motor period, babies do not reflect on or consciously think about their world. But they do have notions about the world that Piaget called Sensory motor schemes. Reflexes like sucking and grasping and simple sensory acts like looking and hearing are basic building blocks

for the development of Sensory motor schemes. Schemes are primitive mental structures, the most basic unit of knowledge. As babies experience regularities – the constant properties of objects and the consistent reaction of people they have gathered, scheme generalization build up from specific repeated, single event and experiences. They are built out of sensory motor actions like sucking on a nipple, looking at mother's face or nibbling one's toes. Clarke-Stewart and Friedman (1987) explained that as the infant's senses, muscles and memories mature their schemes grow and change. Primitive action schemes build upon reflective sucking and grasping grow into voluntary mouthing, hitting, shaking, banging, sliding, swinging, dropping and tearing schemes.

The progress that infants make as they organize and adapt their schemes moves along in their developmental journey in varying sequences or stages. Each advance emerges from earlier experiences and each stage incorporates the mental structures that developed in the previous stage. Piaget outlined six successive sub stages of Sensory motor development (Richmond 1977).

Sub – Stage I – Practice and repetition of reflexes (birth to one month) the infant reacts by means of innate reflexes which constitute the basic material for subsequent development. The new born practices reflexive actions such as sucking, grasping, looking and listening. Accommodation appears almost immediately in that the reflex sucking is modified so that it is stimulated more easily and the nipple readily located. A toy touches the baby's lips and she begins sucking, nipple touches her mouth and she sucks, the baby spends her time fitting the world into her limited range of reflexes.

Sub Stage II – The first acquired adaptation (1-4 months) At one month, the baby begins to exercise simple actions for pleasure. A new learnt behavior pattern occur

called primary circular reactions. Her hand moves and the movement is pleasant and so she repeats it. She lays her legs gleefully over and over again. These repetition of what begins as random or reflexive actions are what Piaget called primary circular reactions. Circular reactions are the first kind of accommodation for they are the willful modification of behavior through repetition. Similar development occurs in other areas of behavior particularly seeing, grasping and vocalization. There is significant emergence of integrated pattern of response as in the combination of seeing and grasping. However, Piaget observed that objects grasped at seem to be represented only in the act itself. There appears to be no awareness of objectivity which would admit the objective existence without the act. Infants begin to develop the notion that objects are separate from themselves when they drop the rattle they stare at their fingers a bit perplexed. But within moments they have gone on to something else.

Sub Stage III – Procedures for making interesting sights last (4-8 months). Secondary circular reactions emerge. These are repetition of actions by babies for example shaking legs to see its effects on the movement of the dolls. Secondary circular reactions modify motor habits not reflexes. They encompass the elements of the infant environment as well as his own body. The first indication of object permanence appear at this stage, that it visual search for objects which have been removed.

Sub-Stage IV (8-12 months) Coordination of mean end. The baby is learning more about cause and effect. Secondary circular reactions became coordinated to form more complex secondary reactions. There is clear indication of genuine intentions with a view of achieving goal. Children show anticipatory behavior for example, door opens someone is expected to come in. This is not sophisticated

imagery. The notion of object permanence is extended by the development of superior manipulative skills. Being able to hold, turn and push objects around contributes to the discovery that objects are not changed though their orientation and appearance may change.

Sub Stage V (12 – 18) Experiments in order to see. The child walks around to explore the world at will. She/he performs endless experiments to see what will happen. She/he opens the door, pulls the cabinet, pulls the dog's fur, pull the high chair across the floor, pulls her own hair. This is called tertiary circular reactions. She/he repeats her/his pulling actions modifying it each time to see the effect of the modification, for instance, she pulls mummy's hair and she learns mummy screams, pull cabinet doors and it swings open, pull her hair and it hurts.

The concept of object permanence also develops. Babies can follow the path of hidden objects. For example, they follow the movement of a toy from under the pillow to beneath the blanket. Babies can retrieve it from its hiding place as long as they saw it being hidden. Their concept of object is still tied to their immediate perceptions.

Sub-stage VI (18-24 months)- Invention of new things through mental combinations. This is the beginning of thought. Richmond (1977) explained that children form mental representations of cause and effect independent of their immediate perceptions. A few months ago, they would open the door even though the chair was in the way and knock over the chair. Now they move the chair out of the way before they open the door for they understand how the door will affect the chair. They can perform mental combinations as they invent solutions to their problems. The concept of object permanence is now matured enough that toddlers can search for a doll hidden under the couch even when they have watched it being

hidden there. The toddler's ability to follow an invisible path is evidence that her mental representation of object have transcended their immediate perceptions.

Clarke-Stewart and Friedman (1987) observed that the ability to create mental representations is the culminating achievement of sensor-motor stage. It ushers in a new world for parents and their children who will always remember fondly the happy days of distractions when for the infant, out of sight was out of mind.

Piaget (1954) point out "that time at the sensory-motor stage is intermingled with impression of psychological duration inherent in attitudes of expectations, effort and satisfaction, that is with the activity of the subject itself" (p. 321). Piaget explained the formation of time concept along five sub-stages of the Sensory motor instead of six which he has for cognitive development in general.

Sub-stage I - (The reflex stage and primary circular reaction stage (0-4 months). The child coordinates movement in time and to perform certain acts before others in regular order. For example the child knows how to open his mouth and seek contact with the nipple before sucking.

Sub-stage II – The stage of subjective series which coincides with secondary circular reactions at 4-8 months. The child is able to perceive a sequence of events as he engenders the before and after in his activity.

Sub-stage III – 8-12 months – Piaget regarded this as the beginning of the objectification of time. As object concept is formed at this stage, the concept of before and after apply to the displacement of the object itself and no longer to the child's movement in the course of his actions.

Sub-stage IV – Objectification of temporal series at 12-18 months. The fact that the child systematically searched vanished objects by taking into consideration the sequence of displacement is evidence of his mastery of time in-action.

Sub-stage V – (Representations at 18-24 months)

This is the stage of orderly arrangement of time applied to the whole perceptual field. As the child is now capable of evoking memories, personal duration is placed in relation to that of things and that makes possible the orderly arrangement of movement in time and their measurement in relation to external points of reference.

The Preoperational Stage(2-7years).

The preoperational stage is characterized by extensive development of mental imagery (representation). Intelligence is no longer manifested by overt acts but increasing symbolic manipulation. This period is divided into two namely Symbolic thought (2-4 years) and Intuitive thought (4-7 years)

Symbolic thought (2-4 years)

During infancy, children develop the ability to mentally represent objects and actions, however, in early childhood; they begin to use symbols to represent them. They begin to draw, pretend and most importantly to use language meaningfully. They use symbols to remember things that have happened and to imagine. Symbolic thought is the major new cognitive activity in the year two to four. A symbolic representation may be verbal – a word, a made-up name or it may be physical – a doll, drawing or a stick used as dog. Piaget (1954) divided symbols into two categories first, those that are personal and those that are shared and conventional. He called the first symbols and the second signs. The most important signs are words used and understood by whole group of people to represent the same specific things, actions, and events. Piaget said that children think first in symbols and that these prepare them for using signs.

One of the ways children manifest symbolic thinking is evidence in fantasy play known as pretend play – pretending to be a bird, or pretending that a piece of wood is car, or that a piece of cloth is pillow.

Children's drawing also reflects the development of symbolic thought. Scribbling are marks that are random and repetitive straight lines, curves and spirals. Soon children are explaining what their pictures show. For instance, "this is a house and mummy and daddy are going for a walk" said a three year old" for his page of large and small lines" (Clarke- Stewart and Friedman 1987 p.310).

Words – The most important symbolic representation is language – using words to stand for things and actions. Children usually have acquired their first recognizable words by their first birth. By 1½ - 2 years they are adding 5-7 words each day (Carey, 1982). The words that children utter and understand clearly reflect their symbolic thought.

Many symbols emerge from the child's capacity to imitate. The young child copies the acts of others and during the second year of life, imitation may be deferred that is, it may be reproduced after a model has disappeared. This suggests that the child can represent the act in some internal form which is differentiated from the act itself. Imitation demands changes in existing schema to copy external model, it is therefore a process of accommodation,

Intuitive thought 4-7 years

The thought of four, five, six and seven year olds, according to Piaget (1970), is dominated, not by fantasy but by intuition, that is, by guesses about reality than rational inference. The period of intuitive thought is the period during which the mechanism that assimilate new materials into already existing structures have a

distorting effect on the child's apprehension of reality. At that cognitive schemes are only partially coordinated and frequently lead to contradictory judgments.

The intuitive way children think is manifested in the way they described their dreams (Piaget, 1954). At four, children think that dreams are real events that happen outside of themselves. One characteristics of intuitive thinking is the blending of the real with the imagined. Children cannot separate dreams from real events.

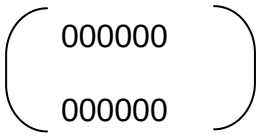
Animism is another characteristic of the intuitive stage. At this stage, children think that inanimate things are living and have feelings, intentions and thoughts just as they do. For instance the sun moves because it lives and it sets to go to sleep; an object hits the doll and the doll feels pains.

Preoperational thinking is limited by five characteristics. Clarke – Steward and Friedman (1987) explained these limitations as egocentrism, centration, non transformation, irreversibility and lack of logical reasoning.

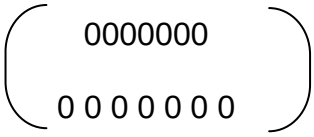
Egocentrism – it is the inability to take perspective, that is to interpret an event from someone else's point of view.

Centration – The tendency to focus on one perceptual aspect of an event to the exclusion of all others.

Figure 1 CENTRATION INVOLVING NUMBERS



Same



Different

A preoperational child would say the second row has more coins because he concentrates on the length rather than the number.

Non Transformation – Transformation is the ability of the individual to focus on the process of changing from one state to another. Preoperational children because of their preoccupation with the here and now have difficult time thinking about the process of change, for instance, children in the example of the coins are unable to mentally represent the process of change even though they directly observed the row being lengthened focusing instead on the beginning and end state. They see it as different raw rather than the same row lengthened.

Irreversibility – The inability to mentally trace a line of reasoning back to its beginning. In the example, of the coins the children were unable to reverse the lengthening process to determine that the two rows indeed have the same number of coins. “Reversibility or the ability to run an operation again in our minds allow a child to see that altering the space or shape of an object does not change its fundamental characteristics like weight, number and volume” (Eggen and Kauchak 1992 p.48).

Inability for logical reasoning – Preoperational children do not use inductive or deductive reasoning. Piaget called one kind of reasoning of children of this stage transductive reasoning that is reasoning from one particular to another rather than from general to particular. Piaget concluded that preschool children’s reasoning is a muddle of illogic. They have problem concentrating on just the logic of a preposition for example, glasses break when they fall.

- Everything that breaks is made of glasses
- The egg broke when it fell
- Are eggs made of glasses ? (Yes)

Children's thinking is also illogical because they cannot understand the difference between cause and effect. Piaget report that children sometimes think that the cause is the effect. For example, children who see a man with broken legs as a result of falling from a bicycle would think that the man rolled from the bicycle because he broke his leg meaning that children cannot express causal relationships

Conservation – The idea that the amount of some substance stays the same regardless of its shape or number of pieces into which it is divided. In the coin example, if the children answered that the bottom now has more coins then the children have not conserved the number. Conservation is determined by a number of tasks such as liquid, mass, length and number.

Clarke – Stewart and Friedman (1987) have identified three qualitative changes seen in Piaget's tasks that differentiate the thinking of preschool children from school age children. First, preschool children depend on the appearance of things rather than inferred reality. Secondly, preschool children tend to concentrate their attention on one particularly interesting or salient feature and neglect others. School children pay attention to more features, and thirdly, preschool children do not understand reversibility but school age children do.

At the preoperational stage, the development of time concept remains incoherent. Piaget (1969) found that succession and duration remain undifferentiated from distances. For example 'longer' is equivalent to 'further'. 'First' may mean 'before' or 'after' and differences in speed are thought to preclude synchronous processes and lead to wrong estimation of time.

Concrete Operation Stage (From seven to twelve years)

At this stage, Piaget stated that a much more complete and integrated mode of thinking emerge out of intuitive thought. According to him, assimilation and

accommodation achieve greater degree of equilibrium. A more flexible and enduring set of mental mechanisms exist which is less easily thrown into confusion by the appearance of outside events. Piaget called the highly organized mental process operation. Children develops the ability for logical operations, they begin to perform operations such as addition, subtraction, multiplication and division in arithmetic. In addition, intra logical operations of quality time, space and volume emerge.

According to Santrock (2004), the thinking of the child at the period is characterized by two key developments.

- Children overcome pre-operation deficiencies. Their thinking is less egocentric, they can decenter and are able to transform and reverse processes.
- As a result of these developing capabilities, they are able to perform logical operations on concrete objects. They arrive at conclusion based on reason rather than pure perception. In the area of logic – mathematical models, the possessions of the thinker now consists of rules, plans and operations, which enable him to perform the following operations:

Seriation - Seriation involves the ordering of objects according to increasing or decreasing' length, height, weight, or volume. For example when the child understands the implications that A B C D E is that E is not only less than D but also less than all others. Furthermore, it is reciprocally more than F G and H, when the child is able to achieve this operation, the child is able to know that given A>B>C, then A>C.

Logical operation – the ability to think deductively or inductively. Eggen and Kauchak (1992) explained logical operation using the illustration below. Give the child three sticks:

FIGURE 2 LOGICAL THINKING TASK

Ask the child to tell you what he knows the relationship between stick 2 and 3. **Answer–**since stick 2 is longer than 1 and 1 is longer than 3, then 2 is longer than 3

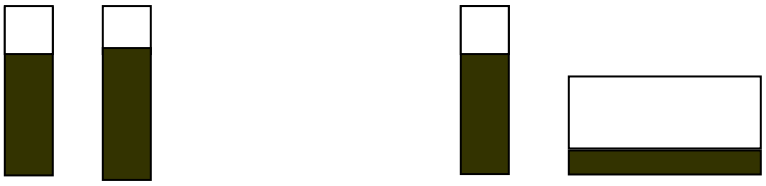
Classification – Involves putting objects that are alike together. By seven years children can sort according to single dimension such as circles and all red objects but at this time they have no notion of classification, for instance, if children are shown 10 black circles and 3 white circles. seven year old typically responded that there are more black circles than circles. Suggesting that they center on the comparison between black and white rather than class of circles and sub-circles. This show that the child has not achieved class – inclusion.

Conservation – Conservation is achieved when the child understands that quantity substance, number, class, length, weight, volume or area remain the same despite the change in arrangement or position.

Examples are:

Figure 3: CONSERVATION TASKS

Conservation of liquid



SAME **DIFFERENT**

Conservation of mass

SAME **DIFFERENT**

The child at this stage can conserve because of his ability of reversibility. Reversibility is the mental ability to return processes back to their former state. Piaget stated that conservation and reversibility are related. Conservation is conceived as the result of operational reversibility. Acquisition of conservation begins at six years to seven years. Substance (quantity) at nine to ten and volume at eleven to twelve years.

Concrete operational children are no longer dominated by perceptions and so can solve problem logically. However, they are still limited to tangible problems known in the present. Their thinking is still tied to concrete experiences such as four cups.

Piaget (1969) stated that intuitive decentration at the concrete operations stage lend the child from the idea that time is centered on particular actions or single motion to decentered time and finally to construction of coherent time concept. Children become capable of operational grouping to all relations involved in time concept formation and go on to construct a coherent system involving both duration and succession.

Formal Operation (Twelve years and above).

The major developmental change is the ability to think in abstract. The children are no longer tied to real and tangible problems. But they can think logically about the possible as well as the hypothetical. They can examine abstract problems systematically and generalized about the results. This opens a whole new range of possibilities for formal thinkers that were not available to children in the concrete operation stage. Formal thinkers are also capable of isolating and controlling variables that inform conclusion. For example a mother may complain to her 16 year old daughter that she is putting on weight of late and so should reduce the

quantity of food she takes. The daughter may also observe that the mother also of recent has been resting in the afternoon as well as going early to bed unlike when she was beginning office work when she had much to do in the house. The daughter now is attributing the increase of weight of her mother to rest rather than food.

The conclusions that can be drawn from Piaget's theory of cognitive development are:

First, the concepts children are able to form and use differ from childhood to adolescence. Concept formation moves from concrete to abstract, from simple to complex. Secondly, the thoughts of young children are different in many ways from that of older children and adults. The thinking according to Piaget can be classified in terms of several stages which a child apparently passes through from the thought pattern of an infant to that of a completely matured adult. Thirdly the child goes through the stages sequentially in approximately fixed chronological ages. Fourthly, the speed at which the child moves through the stages is governed by environmental factors such as food and health condition. Fifthly, Each of the stages is characterized by particular cognitive structure (strategies) manifested by the child in attempt to organize or make sense of his environment.

It then implies that the time concepts children form and use differ from early childhood to late childhood and finally to adolescence, and this has been clearly given by Piaget in his work on time (Piaget 1969). It is expected that his findings would be a guide to curriculum designers and teachers on the content prepared for preschool children. But we find stories, songs, and poems containing time words. This compels the researcher to investigate the understanding and use of these time words by children and ascertain whether Piaget's conclusions have any implications

for the curriculum experiences and activities school children are exposed to at school. The findings of this work will act as guide to teachers, book writers and composers of songs and poems meant for nursery and preprimary schools.

Piaget's theory and Education

Piaget's theory of cognitive development deals with development and thinking. Its main purpose is to provide a criterion for thinking. His theory provide a standard against which the activities in the classroom can be weighted and by which these activities can be theoretically justified. Eggen and Kauchak (1992) observed that the characteristics of children thinking at different ages provide us with what different ages can do for instance, class two children can add and subtract but not capable of algebra.

The theory also permits the school to separate conceptually what cannot be separated in practice. Eggen and Kauchak (1992) and Furth and Warchr (1975) stated that the theory allows the school to separate the learning aspect from the thinking aspect.

Another area in which Piaget's theory is useful to education is the source of development. Piaget's source of development centers around the word interaction (Clarke-Stewart and Friedman 1987; Furth and Wachr (1975). This has an important educational implication. It means that heredity and maturation are said to interact with environment in the development of the child's natural intelligence. When a child has a learning problem, one can always find proponents who put the major blame on heredity that is the Intelligent. Quotient constitution or on the environment (disadvantaged milieu, family constitution).

The theory is particularly useful for readiness recommendation. The match of individual students' schemata to the requirement of instruction has its roots in

Piaget Furth and Wachr (1975) observed that Piaget's theory states that the general development of intelligence is the basis on which any specific learning rest. Learning can only take place on the condition that the child has general mechanism to which he can assimilate the information contained in learning. Brainerd (1992) stated that the theory indicate that children should not be taught concepts until they are developmentally ready to learn them. Piaget's four stages suggest that children should not be taught what exceeds their current stage of cognitive development. With preschoolers (3 - 4 years), instruction should focus on preoperational concepts. Brainerd (1992) further pointed out that readiness is also concerned with the rate at which instruction should proceed. Because learning must wait development, Piagetians tend to oppose fast-paced instruction designed to accelerate children's progress through the curriculum material.

Brainerd stated that Piaget's stages enable educationist to think about the characteristics of children thinking at different ages or even more simply what children of different ages can do. For example class two can add and subtract but not capable of algebra.

The next readiness proposal deals with the order in which things are to be taught students. Ormrod (2009) observed that Piaget has provided the sequences in which children acquire concepts. Therefore, learning should mirror spontaneous development as much as possible concepts should be taught children in the same order in which they acquire them maturationally, for instance, most children understand number conservation before length observation. The sequence of teaching should be number, length, and quantity would be developmentally correct but any ordering would be wrong.

Brainerd (1992) however, argued that teachers would have sufficient diagnostic information on each child if they are to implement the proposal that they teach concepts in accord with current stage to avoid acceleration and to teach things in their correct sequence. It implies teachers have to know each child's state of conceptual knowledge that is, whether a child is at concrete operational or preoperational stage and what the child is currently taught. Teaching in sequences implies that teachers know which concepts in a sequence are already understood by a given child. Having sufficient diagnostic information available on a child mean that teachers must spend large amount of time in one-to-one testing. Teacher – pupil ratio must be low to put the recommendation into practice.

Piagetian theory has had great impact on curriculum development. Eggen and Kauchak (1992) and Brainerd (1992) observed that lessons are now organized with the most concrete experiences presented first followed by abstract and detailed ideas. They explained that the curriculum should be organized in such a manner that the child move from concrete to semi concrete and finally to abstract ideas. For example, children start with counting real objects, then pictures and finally generalized concepts. We often see mathematics teachers in nursery and primary school armed with beads, sticks, stones, boxes filled with cubes, wooden geometry shapes and other concrete manipulations are responses to Piagetian concrete operation stage.

The theory of Piaget has provided teachers with teaching methodology. Brainerd (1992) argued that in explaining the process of cognitive growth Piaget emphasized the role of the learner as an active organism in his own learning. Therefore, self-discovery learning can be used by teachers. Here the child is presented with situations in which he himself experiments, trying things out to see

what happens; manipulating symbols, posing questions and seeking his answers, reconciling what he finds one time with what he finds another time, comparing his findings with those of other children. Brainerd also added that teachers can use the method of conflict training because according to Piaget, cognitive progress occur through a disequilibrium process in which children attempt to reconcile their current beliefs about how the world works with discrepant information. Teaching strategies which promote this sort of disagreement between objectives reality and what children currently believe should be especially effective.

Conceptually, the stages describe the way children think about the world and information. Eggen and Kauchak (1992) observed that progress from one stage to another in Piagetian theory represents qualitative (different kind rather than amount) changes in thinking. For example, the thinking of preschoolers is limited to their perception, a conceptual “what you see is what you get”. They typically do no reason logically. Children in the primary school who are in the concrete operation stage are capable of logical reasoning, but require concrete objects as reference point whereas students in secondary schools can think logically and hypothetically about abstract ideas

Cross cultural studies of Piaget’s theory

Supporting context embedded nature of cognitive development, Aston (1978) reported that children of pottery making families in Jalisco, Mexico performed better on conservation of substance task than do their peers from non-pottery making families. Likewise eight – year old English children performed better on liquid conservation (tall and wide glass) than Wolof children. Aston asked: “Does the difference between the Wolof children and English children reflect non universality of Piagetian theory or the differences between cultures?”

Greenfield and Bruner (In Ashton, 1978) found that Eskimo children do not exhibit egocentrism and concluded that it is not universal but depended on the cultural conditions and values. They therefore concluded that the individualist western culture result in developing egocentrism in children.

The effects of rural urban environment on cognitive development are unclear. The data suggest a differential effect depending on the specific cognitive skill involve

Meadows (1993) reported that research has shown that adult-child interaction demonstrates that the child's understanding and use of language in a situation is highly sensitive to context. The influence of home culture on intellectual performance has also been studied.

Shafer (1988) has reviewed socio-cultural correlates of intellectual performance and concluded that social and cultural correlates do actually affect intellectual performance. The quality of the home environment plays an important role in determining how well children perform on intelligence tests. The Home inventory developed for observing and measuring the environment was developed by Caldwell & Bradley (1978). This instrument allows the interviewer to visit an infant or preschooler at home and gain a good idea of just how intellectually stimulating or impoverished that home environment is. It consisted of 45 items each scored yes or no depending on whether the statement is true or not true of the family. The other described the daily routine and child-rearing practices, observes the mother as she interacts with her child and notes the type of play materials that parents make available to the child. The result of study showed that there is a relationship between the quality of home environment as measured by homework and children's

performance on Intelligent Quotient test. The aspect of the home that mattered most were:

- Parental involvement with the child
- Provision of opportunities
- Availability of age-appropriate play materials for variety of daily stimulation.

The kind of stimulation that parents provide was also studied (Eggen and Kauchak 1992). The stimulation that influences children's cognition is the warm and responsive stimulation for example a smile in turn for a smile or an answer cheerfully in response to a question. An intellectually stimulating home environment is "one in which parents are warm, responsive and eager to be involved with their child" (Shafer 1988). In addition they describe new objects, concepts and experiences clearly and accurately and they provide the child with a variety of play materials that are appropriate for age or developmental level. They encourage the child to ask questions, to solve problems and to think about what he is learning. As the child matures and goes to school, they stress the importance of academic achievement and expect her to get good grades.

2.4 FACTORS THAT AFFECT THE CHILD'S UNDERSTANDING

Interaction – One major source of cognitive development is interaction Eggen and Kauchak (1992) point out that heredity and maturation interact with the environment in the development of the child's natural intelligence. Furth and Wachr (1975) asserted that if the child has learning or personal problems, one can always find proponents who put the major blame on heredity (I.Q constitution) or on the environment (disadvantaged milieu or family constitution).

Piaget (1971) too has an interactionist theory. But in his case, heredity, physiological maturation and environment and their interaction in the development

of intelligence are not primary cause of development. Piaget pointed out that these are themselves subordinated to regulatory mechanisms of growth within the intelligence itself. The regulatory mechanism he called the factor of equilibration .

Piaget also found that social interaction is an important factor is development Eggen and Kauchak (1992) saw Piaget as emphasizing social interaction in development. With interaction with adults and peers, we would each have to learn our cultures differently and that would severely limit development. Vygotsky (1986) is another strong theorist of social interaction as a major source of development. Vygotsky theorized that children grow and develop higher cognitive skills through interaction with more competent adults. The factor of social interaction has influenced education and child-rearing. For instance, it is mainly responsible for schools using play groups for children and cooperative learning techniques. Cooperative learning encourages children to get involved in service clubs and extracurricular activities at school.

Active Experience - Piaget (1964) has also pointed out that active experience is a source of cognitive development. He emphasized experience with the physical world. Direct experience through activity is the basis for the use of hand-on activities at school such as using blocks, sticks and shapes in learning elementary mathematics as well as puppets, models and other objects that children are encouraged to actively manipulate.

In the area of child-rearing, Gage and Berlinger (1975) state that the need for rich and varied experiences has profoundly influenced child rearing practices and has spawned some general social programmes. Parents are encouraged to read to their children, talk to them and take them to zoo, the market, concerts and museums. They observed that children from deprived background often lack these

experiences. However, programmes have been designed to intervene and help experientially deprived children catch up. Such programmes as “Sesame street, Sesame square and “I can read” are attempts on television to meet this goal. In United States, Clarke-Steward and Friedman (1987) pointed out that the government sponsored efforts to provide enriched experiences in the context of the classroom have yielded positive result.

Maturation - The third source of development is maturation. Piaget’s theory (1954) also stated clearly that the general development of intelligence is the basis on which specific learning rest. Learning can only take place on condition that the child has general mechanism to which he can assimilate the information contained in learning. A child’s learning of facts depends in part on the child’s general capacity to relate these specific facts to facts in a meaningful manner. Maturation promotes intelligent comprehension; Furth and Warchr (1975) found that intelligent comprehension is the most vital ingredient of the total learning process.

Maturation implies readiness and competence. Inhelder, Sinclair and Bovet (1974) pointed out that embryological studies have shown that the organism must have reached a certain level of competence or sensitivity to specific environmental stimuli before changes in competence can take place. Piaget (1971) supported this when he stated that it is not possible to understand psychological development without considering its organic roots.

From this section of the review, we are aware that cognitive performance such as the ability to understand and use time words is influenced by the interaction of heredity, maturation and environment.

2.5 VYGOTSKY'S EXPLANATION OF THE DEVELOPMENT OF UNDERSTANDING

According to Vygotsky (1978), cognitive abilities are formed and built up in social context. Vygotsky asserted that cognitive development involves the internalization, transformation and use of routines, ideas and skills which are learned socially from competent partners.

Vygotsky's theory describes how children develop higher cognitive structure. From his theory, we understand that children develop more sophisticated cognitive competence despite having only simpler ones in their own repertoire because adults (older more skilled persons such as teachers or models) have the more sophisticated competence and guide the child repeatedly through the relevant behavior. The child as an individual does not have the resources necessary for the higher level cognitive functioning but the teaching adult does. When an adult and a child interact, the adult provide the structured context within which the child can act as though he or she was competent to solve the problem and by so acting in such context the child can indeed reach the solution successfully. To begin, the adult has to provide all the cognition necessary for the task, but as the child becomes more and more familiar with it, the adult can leave more and more for the child to do until the child can undertake the entire task successfully on his own. As the child reaches the level of undertaking the entire task, he eventually takes on new examples with little or no adult support. The child's cognition has developed from less sophisticated to more advanced level and the medium of development has been social interaction that is through apprenticeship to another more skilled person. Vygotsky see cognitive development as training a child to behave in ways which the culture has developed as cognitively useful. By so behaving and

practicing and reflecting on what is done, the child internalizes the cognitive skills of the culture and can develop them and pass them on to the next generation.

The child is helped by an adult in learning and thinking of those knowledge and skill which preceding generations have constructed. According to Meadow (1993), the skills required for construction of knowledge are observation, imitation, generalization and decontextualization; but these develop under the fostering support of social interaction. The developing thinker does not have to create cognition out of an unpeopled vacuum, but may adapt and eventually internalize some of the cognitive content and processes provided by others.

Much of Vygotsky's account of cognitive development focuses on the role of language. Mental functioning, according to Vygotsky, is integrating psychological tools of a culture such as language, counting systems, mnemonic techniques, writing, diagrams and maps. Meadows (1993), observed that Vygotsky saw language as one of the most important psychological tool culturally developed way of behaving towards objects which allow high level cognitive functioning. Other psychological tools include counting systems, mnemonics, techniques, writing, diagrams and maps. Integrating any of these into a psychological function such as memory or spatial perception transforms the mental functioning in Vygotsky's view. The psychological tools are not merely facilitators or auxiliaries, but their use allow or requires qualitatively different functioning or even revolutions in thinking associated with changes in psychological tools.

Language in Vygotsky's view is the most important psychological tool, therefore, the relationship between language and thought was perhaps his central interest. (Vygotsky 1962). He proposed a distinction between pre-intellectual speech and pre-verbal thought. Children under two years use vocal activity as

means of social contact and emotional expression and are capable of systematic and goal directed activities which do not require verbal operations. The second stage is a stage of practical intelligence in which the child's language uses syntactic and logical form which have parallel, in the child's practical language solving activity but not linked with them in any systematic or useful way. In the third stage, the child starts to use external symbolic means such as language or other cultural tools to help with internal problems solving. It is at this stage that children can be heard to talk to themselves through problems or to count using their figures as aid. Finally such aids are internalized and problem solving thought uses internal dialogue and whole language to reflect on the thought than as a prop to support problem solving.

Therefore, Vygotsky saw speech as beginning to have social functions very early in life developing amongst the child's complex and rich social contacts into an increasing powerful tool. Expression of emotions and maintenance of social contacts are followed by the use of language to communicate, to make references, to represent ideas, to regulate one's own actions, initially within the context of social interactions and shared knowledge but increasingly independent of social partner of a supportive context. The child who talks to himself is regulating and planning mental activities, not as Piaget suggest that failing to communicate with others because of ego-centrism.

Vygotsky's emphasis on social interaction has two important consequences (Vygotsky 1986). These are :

a) More complex cognitive functioning will be possible in a dialogue between two individual than it is possible for those individuals alone.
b) Instruction could be a facilitator of cognitive development not as Piaget would have it that instruction without the maturation is at best irrelevant and at worst

distortion. For Vygotsky (1986), learning by transaction is at the heart of cognitive development.

Zone of Proximal Development (ZPD)

Vygotsky (1978) argued that if we are to provide learning opportunities which will enable the child to develop, we must determine at least two developmental levels –the lower and upper levels of cognitive development. The lower of these is the sort of thing which psychological and educational test measures which the child can do independently. The upper is what the child can do with such assistance as demonstrations prompts or leading questions. He defined the zone of proximal development as "the distance between actual development level as determined by independent problem solving and the level of potential development determined through problem solving under adult guidance or in collaboration with more capable peers" (p.86). Independent unaided problem solving indicates what cognitive functioning the child has already mastered, problems which the child can only solve with assistance suggest what functions are not yet matured but are in the process of maturation. Vygotsky (1978) stated that "What a child can do with assistance today she will be able to do by herself tomorrow" (p. 87).

Diagnosis of the ZPD is necessary for a full assessment of the child's abilities and for the optimum targeting of instruction. There is little profit in teaching aimed below the bottom of ZPD because the child's functioning here is already matured or from teaching aimed at the top of the ZPD because the difference from the child's actual present functioning may be too great. Therefore, he remarked that "the only good learning is that which is slightly in advance of development'' (Vygotsky, 1978, p 89). It therefore implies that teaching is good only when it awakens and arouses

to life those functions which are in a stage of maturing which lie in the zone of proximal development.

How does progress through ZPD come about? How can good learning be in advance of development? The teacher or adult “serves the learner as a vicarious form of consciousness until such a time as the learner is able to master his own action through his own consciousness and control. When the child achieves conscious control over a new function or conceptual system it is then that he is able to use it as a tool. Up to that point the teacher does the critical work of scaffolding the learning tasks to make possible for the child in Vygotsky’s words “to internalize external knowledge and convert it into a tool of conscious control’’ (Bruner, 1985 p 25).

2.6 GENDER DIFFERENCES IN THE DEVELOPMENT OF UNDERSTANDING

It is thought that gender differences exist between girls and boys in ability, behavior and interest. Siegler, Deloache and Eisenberg (2006) pointed out that based on gender stereotyping; boys are expected to be assertive, competitive, and more critical in thinking than girls. While girls are expected to be more courteous, kind, appreciative, dependable and considerate in their behavior than boys.

Interest are likewise stereotyped by expecting boys to prefer mechanical jobs, cars, sports , the armed forces, science and mathematics and the girls to be interested in home management, catering, and quiet activities. However research has shown that in general intelligence, boys and girls are equivalent on the average (Halpern, 2004). Ormrod (2009) observed that in academic performance, boys tend to show more variability than girls, therefore showing them to be at the top and bottom of the population. She stated that on the average, girls consistently earn higher grades in school than boys. But when it comes to specific abilities; girls on

the average tend to be superior in verbal ability. Halpern (2004) found that girls are stronger than boys in language skills such as reading, spelling, grammar and comprehension and word fluency. He found that these differences show quite early as girls seem to acquire language faster than boys. In babyhood, he found that girls make more pre-linguistic vocalization, utter their first word earlier and develop larger vocabularies. Earlier, Halpern (2000) found that girls are likely to suffer less speech-related problems such as poor articulation and stuttering and also reading problems. On the whole, girls tend to be more verbally precocious and parents interact more with girls (Rathus, 2008).

Siegler, Deloache and Eisenberg (2006) have tried to offer explanation for the verbal superiority of girls over boys. They think the differences between girls and boys in verbal proficiency may reflect differences in brain structure and that parents have higher rate of verbal interaction with female children such as talking more with girls.

For boys, studies such as Halpern (2004) found that they are stronger than girls in visual-spatial ability. This is the ability to imagine and mentally manipulate two or three dimensional figures. It is the ability that is important for art, architecture and engineering. In addition, people and teachers tend to believe that boys have more mathematical talent than girls, while the girls tend to believe that they are not as good as the boys in mathematics.

With regards to the development of time concept in children, Panagopoulos and Ioannidis (2002) did not find any appreciable difference between male and female respondents in time concept perception. It is expected that girls would have superiority over boys in understanding time words since they have been acclaimed to be stronger in language skills. However time is a four dimensional concept and

studies have shown that for three dimensional abilities such as spatial abilities, boys have advantage. This study therefore wishes to ascertain the gender that is better in understanding time words so that teachers can adequately pay attention to them according to their learning need when learning time concepts.

What we can glean from differences in understanding between girls and boys is that girls appear to show greater verbal ability than boys, but boys show greater visual-spatial and mathematical abilities. Rathus (2008) however noted that these differences in cognitive abilities are group rather than individual differences. Many females exceed the average male in science, mathematical and visual-spatial skills and in spite of group difference; a lot of individual boys surpass girls in reading, writing, spelling and articulation.

2.7 MEANING AND SIGNIFICANCE OF CONCEPTS IN UNDERSTANDING

A concept does not refer to a particular event, person or object, such as Nigeria, Janet or Mango, but to “class of stimuli” such as country, girl or fruit. Dececco and Crowford (1988 p.288) explained that concepts refer to stimuli that are a group of objects, events or persons with some common features or attributes which enable us to classify them into categories and give them a name. For instance, fruit refer to edible things taken from trees plants while girl refer to female children. Therefore, concepts refer to classes of stimuli that are given a name. This description is obvious for concrete objects but one runs into trouble when trying to describe abstract concepts in the same way. Therefore, a more embracing definition is required for concepts. This has been provided by Nelson (1977) who defined concepts as “organized information that is not dependent on any immediate perceptual array and is potentially nameable” (p. 220). This definition is particularly relevant in describing abstract concepts commonly used in the social sciences. For

example concepts such as war, state or national integrity and time are nameable organized information that are drawn from a variety of experiences and whose understanding does not depend on the properties of these events or things we can see, hear, touch or smell. Similarly, Bolton (1977) defined concept as "stable organization in the experience of reality which is achieved through the utilization of rules of relation and which can be given a name" (p. 23).

It is possible to extract the properties of concepts from these definitions:

i. Common attributes – these are features or traits that are similar to all instances of the concept for example the concept table has the following attributes, flat top and four legs.

ii. Categories (classes) – concepts describe groups of objects, persons or events such as king, car, or sport and not particular instance or experience such as the Emir of Kano Ado-Bayero or my father's car.

iii. Nameable – The name identifies the class of stimuli of organized information for example table, sports or president.

The use of concept as it pertains to time does not imply the general meaning of concept which refers to class of stimuli. It is rather a unique scheme. Piaget (1969) identified this when studying children's perception of time. He pointed out that "Time and space are not concepts but unique schemes. There is only one time and one space in the entire universe. But space and time result from operations just as do concepts (classes and logical relations) and numbers but in their case, the operations take place within the object itself and by the colligations of its parts play a direct part in the transformation of that unique object which is the universe of time – space" Piaget, (1969, p.33).

Concepts are basic forms of cognition on which all cognitive processes depend. They are the fundamental agents of intellectual work and as Chauchan (1975) pointed out they are “the basic unit of learning” (p. 228). Increased abstraction increases the powers of concepts as cognitive tools for organizing information. Dececco and Crawford (1988) have pointed out the significance of concepts in cognition as follows:

- Concepts are instruments of communication and the means by which we order and categorize our knowledge.
- Concepts reduce the complexity of the environment. Since they are a class of stimuli, they help us to reduce complexity of the world. In other words, they simplify thinking and save us the trouble of having much to deal with mass of time details. Without concepts, we may not have enough words to describe every experience, objects; we may not have enough words to describe every experience, object or individual as a single entity.
- Concepts help us to identify objects of the world around us. Identification involves placing on object in a class and therefore reducing the complexity of the environment.
- Concepts reduce the necessity of constant learning. Once we have learnt the attributes of a concept, we can apply to objects, persons or events over and over again where the objects, persons or events are encountered without further learning.
- Concepts provide direction for instrumental activity. Concepts enable us to know in advance the action to take. Placing the object or person in the right class enables us to arrive at important decision. This use is very important in problem

solving. In problem solving we try different classes for an object until we find one that it fits in and solve the problem.

- Concepts make instructions possible. The art of teaching uses a lot of verbal instruction. These instructions would not be possible if the child has not learnt some concepts. As the child progresses in school career up to the highest level, instruction becomes increasingly verbal utterance because the assumption is that the individual has mastered a lot of words and that the words are sufficient evoking devices when their recall is important.

However, Dececco and Crawford (1988) pointed out that Concepts can be stereotyped and inhibit learning. They explained that when concepts are stereotyped, they are rigid or inaccurate and impervious to experience. The teacher has a great deal of responsibility to take the incomplete stereotypes with which the child enters school and make these concepts complete or at least adequate. Most of these stereotyped concepts are the result of early childhood learning. Dececco and Crawford (1988) observed that the emotional aspect of early childhood may be a product of early classical conditioning and consistent reinforcement as the cases of our fears, appetites, belief and prejudice. They warned that they may be difficult to extinguish.

Concept formation

By Abstraction – The theory of abstraction states that concepts are formed through a process in which persons recognize similarities or identified elements in a set of objects, they abstract this resemblance (which is termed attributes) away from the other properties of the set of objects that are not relevant to the concept. For example, the concept “student” is formed by noting the features which all students have in common and ignoring differences in say height, colour, tribe; race and

socio-economic background. The proponents of this theory are Vygotsky (1962) Piaget and Inhelder (1974) and Dececco and Crowford (1988).But Bolton (1977) thinks that instead of abstraction, it should be resemblance on the ground that abstraction does not give explanation to the fundamental differences between formation of complex concepts and simple ones. He argued that the child first learns simple concepts like mummy or table and later he learns abstract concepts like time, religion and nationality. He pointed out that assumption are inherent in the theory of abstraction. He therefore concluded that concepts are formed through people recognizing resemblance among stimuli.

According to Bolton (1977) progress in concept formation is from particular to general. He explained that the subject first observe similar events, and then noting the resemblance between same, then develops generalization which enables him to group these particular events into closets.In abstraction, the role of the subject consists of only attending to and grouping stimuli. However, Bolton agreed with the abstraction theory that “there is no doubt that the possession of a concept allows the subject to recognize resemblance among stimuli and exposure to a variety of experiences is important in concept formation and the use of actual objects aids the development of logico-mathematical concepts.

Rules of relation – This theory has been propounded by Bolton (1977) after discarding the abstraction theory which he asserted applies mainly to concrete concepts and neglects the intentions of the subject; formulated the theory of the rule of relation which states that all concepts owe their existence to the rules of relation ranging from simple to complex. He identified certain principles of this theory.

Concepts are the expression of the ways in which experience has become organized. Even the simplest concepts are not just the observation of something merely registered by perception but every concept presupposes a certain form of organization from the subjects' intention. At the beginning this organization remains implicit but intellectual development sees the emergence of explicit rules of relation (as we reflect upon our experiences) of which the principle of classification is only but one example.Bolton sees all concepts as the result of a particular instance becoming general by being treated as examples of a type of rule. Furthermore, language stabilizes the general meaning in the process of social interaction. However, concepts differ in the extent to which they embody features of experience.

He stated that concepts are the result of the acts of coordination. The existence of a rule realm presupposes that elements subsumed by a concept are ordered by the same relation. In identifying a class of elements the principle of similarity is utilized. In physical concepts the rules of relation serve to structure the perceptible whereas in abstract concepts these rules develop into systems of operation which become detached from concrete reality to the extent that they can refer to any particular series of elements. These two however interact throughout development.

Nelson (1977) identifies recurrent themes which have been used to characterize developmental change in conceptual systems from a review of theories of conceptual development and research.Concrete to abstract knowledge – This is a fundamental dimension in conceptual development. Children begin the formation of concepts with facts of the world as they counter them and these would be concrete physical objects. Later in the process of development, the child would begin to form abstract concepts. She found that the rationalist however argue that the child begin with abstract in the form of rules or principles into which concrete facts are fitted and

followed by specific examples. The constructivist also believe that cognitive organization must go beyond the immediate perceptual given that is an abstraction.

Perceptual versus functional bases of knowledge - It is expected that concepts would be formed based on the perceptual (what things look like) components of objects. However, Nelson (1977) found that concepts are formed more on functional (what things are used for) bases than perceptual properties of a thing. Therefore he suggested that the hypothesis that younger children would form concepts based on perceptual attributes while older children would form concepts based on their functions need to be tested.

Specific to general – It is expected that children begin learning concepts with the most specific case and move up the hierarchy to more general cases, for instance, Mango before tree then a plant. This is referred to as the generalization theory. The generalization theory is opposed to the differentiation theory which states that concepts begin with global unspecified structures which become more specific better refined and more differentiated with development.

Complex to class –From the experiments of grouping objects, Inhelder and Piaget (1964) and Vygotsky (1962) and Nelson (1977) showed that children form loose complexes rather than true classes which can be defined in terms of logical operations. The pre-concept thought of the preoperational child emphasizes organization around prototype rather than critical attributes.

2.8 LANGUAGE DEVELOPMENT

Children acquire language largely on their own although family members, teachers and others in the environment have enormous impact on the development and shape of the language acquisition. Language acquisition is necessary for

children because it enables them communicate their needs. Burns & Broman (1983) have identified seven functions of language. These are:

- Instrumental – To get things ('I want … may I?')
- Regulatory – To control others ('don't do that' or 'let's do this')
- Interpersonal – To maintain personal relationship (using names or greetings)
- Personal – To express individuality or personality ('I am going to become a nurse', 'I like singing more than dancing').
- Imaginative – To create one's own world, to pretend ('once upon a time…')
- Informative – To convey information ('It is raining')
- Hearing – To discover ('why' or 'what' for, 'I wonder if…')

Similarly, Kostenik, Soderman and Whiren (2007) found that children use language for various purposes as follows:-

a. To satisfy their needs and wants (instrumental)
b. To control others (regulatory)
c. To create interactions with others (interactional)
d. To express their imaginary world (imaginative)
e. To seek information (heuristic)
f. To communicate information to others (informative)

From these uses, it can be seen that learning language is closely related to function. For instance the first words children learn are names of things in their immediate environment which they will need (Mama, milk, water). Linguists and psycholinguists have tried to explain how young children acquire language. Child Psychologists Eliason and Jenkins (2008) believe that imitation and reinforcement account for language acquisition. The young child learns language through the process of imitating the language of other speakers in the environment. Earlier,

Bandura (1977) had discovered that children learn language by having it spoken by others, followed by trying it themselves and receiving praise or corrective feedback about their efforts. Language learning is therefore explained in terms of reinforcement of imitated language. Consequently, language that is positively reinforced is learned and the one that is ignored vanishes. If the behavior increases in frequency, the behaviorist believe that the behavior is positively reinforced. Oller (2000) found that babbling becomes infant speech because parents or other adults reinforce those speech sounds which are close to adult speech. Similarly, Copple and Bredekamp (2008) observed that children learn the language of their environment; that children learn words and expression of people around them. Those around the child then provide a model and the reward that motivate the child to learn the language. The reinforcement may be in the form of attention paid to the child, talking to the child, smiling to the child, providing food, holding, the child when he produces the sound that resemble adult speech. Other forms of reinforcement according to Clarke-Steward & Friedman (1987) include praise, (good Jane), tangible rewards such as candy or social reinforcement such as taking up the child and talking to him.

The genetic (innate) theory

Noam Chomsky (Chomsky,1972), father of psycholinguistics theory of language development hypothesized that children are born with an innate, generally driven language acquisition device (LAD) that predisposes children to learn a new language. The LAD according to Chomsky is a genetically set of language processing skills that enable children to understand the rules governing others speech and to use these in their own speech. When children are exposed to language, this programme in the brain analyzes speech patterns for the rules of

grammar – such as the subject after verb when asking a question. LAD explains why children are so good at producing novel sentences that have never been heard before. Studies have been conducted in different countries of the world (Norton, 1990) and concluded that children throughout the world have innate capacity to make various speech sound (universal sounds). These universal sounds are encouraged by the specific language heard and that others disappear from the early language because they are not part of the child's environment, consequently the child learns a particular grammar, language and phonological system. Linguist refers to this process as the child's internalizing the particular grammar to which he has been exposed.

Language according to the genetic view is part of the total cognitive activity and is learned in the same way as other cognitive activities. The complexity of language structures increases as cognitive abilities increases. Language learning is therefore part of the child's broader developmental process. Slobin and Welsh (1973) found that children repeat sentences according to their grammatical development. Therefore, children language is rule-governed. Children somehow instinctively process language data around them, draw rules which they test and revise based on feedback they receive. In that way children's speech gradually approaches adult speech.

The third method of language acquisition is explained by the socio-cultural theory**.** This theory takes the interactionist position and sees language as neither purely genetic nor totally behavioristic. Socio-cultural theory stresses the interactive reality of language acquisition. Researchers such as Bohannon and Warren-Leucher (1985) concluded that language is an innate capacity triggered by the presence of language in the environment particularly where children cue their

parents and in turn supply appropriate language experiences. Therefore, language is encountered in a highly orderly interaction with the adult taking a crucial role in providing linguistic encounters for the child. What has emerged is a theory of mother-infant interaction in language acquisition called fine turning theory. This theory sees language mastery as involving the mother as much as the child (Clarke – Stewart ands Friedman 1987).

Evidence supporting social contact of language acquisition is provided by the work of McCartney (1984) who studied a boy with normal learning but raised by deaf parents. Although the child listened to television daily, by age 3 years he could neither speak nor understand English (the language used in the Television). He was instead fluent in his parents' sign language. McCartney concluded that a child must interact with people in order to learn language.

Additional evidence is provided by Snow (1977) who studied interaction between mothers and infants and found that mothers adjust their speech to meet the needs of their children's conversational skills. He found that early conversation included shorter sentences repetitions and exaggerated intonation patterns.

The Stages of Language Development

Child Psychologists, generally, agree that there are various stages of language development and that these are universal. However, the stages have been labeled differently by different linguists though they project uniform notions. Child Psychologists feel comfortable dividing the various stages into the following (Santrock, 2004):

- Crying stage (0-2 months)
- Cooing stage (2-6 months)
- Babbling (6- about 12 months)

- Holophrastic stage (12 months to 18 months)
- Telegraphic stage (18 months to 3 years)

Linguists have used various terms to label the speech produced by the child in the first three stages. These terms include pre-word, infant vocalization, preverbal period, pre-linguistic vocalization and pre-speech period and the last two stages as true speech period.

Crying Stage (0-2 months)

The first thing a normal child does at birth is to cry. The birth cry signifies that the child has a sense of feeling and feels the new airy environment. It also signifies that the baby's neurological systems as well as his general health are okay. From birth, the child uses crying to communicate his needs. Clarke-Stewart and Friedman (1987) studied infant cry and discover that babies cry for any of the following reasons or needs:

a) Pain
b) Hunger
c) Discomfort such as (in cold or wet pans) and not attention.

These cries are discomfort noisses with different tones according to the need being expressed. The sounds emanate from the child's struggles for relief. They are mostly shrill, nasalized vowel sounds produced in front of the mouth with corresponding tensed facial expression as a result of hunger, pain or any discomfort the baby must be going through. Towards the end of this period the crying reduces.

Cooing Stage (2 – 6 months)

The baby introduces a new set of pleasant noise composed of continuous vowel sounds – "eeeh", "aaah", "uuuuh", and "ooooh" known as cooing indicate that the baby feels, comfortable and he is happy Rathus (2008). Coos are likely to be heard

after a feeding when the baby is awake, alert, dry and seemly contented. Hurlock (1979) stated that cries of the baby at this stage is meaningful unlike in the crying stage where the caregiver has to task her brain in order to know exactly what the problem of the baby might be. The sounds produced are without obstruction. In other words they are relaxed, deeper and without any element of nasalization (Bloom and Lahey (1978). This stage is the onset of intonation pattern. It is believed that as the child makes the cooing sounds, it is beginning to learn to round its lips or mouth. Linguist like Bloom (1975) have observed that children produce consonants any time they are uncomfortable. The consonants are noticed as the baby cries and make sounds like “Wa, wa, wa”; “ta la la ng nga nga ha ha ha”… (Bloom and Lahey (1978) explained that these sounds came as a result of the fact that distress cries came in bursts and that each pause for breath will cause construction of parts of the air passage which results into the production of the consonant sounds.

Clarke-Stewart and Friedman (1987) observed that when the baby coos, the mother usually respond with smiling, talking to, cuddling or playing with the baby. Communication therefore becomes reciprocal between mother and child.

Babbling Stage (6 month to 12 months).

At about three or four months of age, children begin to add consonant sounds to their vocal repertoires and by six months they are constructing some consonant vowel combination such as ka, ga, ma, da, wa from there infants begin to repeat these phonetic combinations and produce babblings – baba, papa, dada, nana, mama, gaga that sound very much like meaningful speech. By seven to ten months, babies are babbling but do not produce their first meaningful word until 10-13 months of age.

Linguists believe that the babbling stage is training or preparatory period for later articulate utterances as this is the stage when the infant actually begins to practice the variations of human systems. For example, Fry (1985) found that children produce a wide range of sounds possible in all human languages. At this stage, the child consistently makes incessant vocalization (nonsense sounds) which an adult cannot really stop.

Babbling takes place as a result of the child's happy state and Glucksberg and Danks (1975) found that happy and contended children babble more and talk sooner than discontented children. They also found that parental care and attention excite the child and he babbles more thereby developing faster speech. This was in contrast to children reared in orphanage homes who were slower in developing speech.

At a later stage usually from ten months to 15 months, the child gradually selects out the particular sounds of his native language from the universe of sounds. This selection is done by the differential rewards he gets from adults (Fry 1986). Once in a while, a child may utter a sound, that resembles a real word in his native language or the language of his environment and the adult reacts by beaming a smile or repeating the utterance, the child will be encouraged to make such sounds over and over again. For instance

Child - "dada"

Mother - "daddy"

Child - "dada"

Mother - "very good daddy"

Besides the selective reinforcement, one other way a child develops phonology has to do with the sequence in which speech sounds appear at different stages of

linguistic development. Researches also have shown that this sequence is universal, that is every normal child manifests this orderly sequence. Brown (1983) found that in the case of consonants, the child first produces back consonants like /k/ before producing a sound like /p/ which is produced at the front of the mouth. Also the vowel like /I:/ as in feel is usually produce before a back vowel like /a/ as in mama.

Towards the end of the babbling period, the incessant vocalization reduces and it is replaced by a period of relative silence which lasts for about one month before the appearance of language. Glucksberrg and Danks, (1975) observed that this silence is somewhat transitional because the silence precedes the appearance of actual meaningful speech. Fry (1986) in agreeing that his relative silence actually take place said that “it is as if the child starts learning a fresh when he begins to learn to utter meaningful speech” Towards the end of this stage, the child’s vocalization begins to take on the intonation pattern of the adult language spoken in the environment.

Fry (1986, p.190) summarized the importance of the babbling stage said “During the babbling stage, the child is doing two important things: he is trying out mechanisms that will be needed for speech, combining phonation with articulation and no doubt gaining a certain control of the respiratory system and he is establishing the circuits by which motor activity and auditory impressions are firmly linked together”. Fry also observed that during the babbling stage, the child is also learning the effect of making certain movements and finding out how to repeat a movement, how to do it again and again to get more or less the same acoustic results. In one sense the child is learning a trick and the experience last him, so to speak the rest of his life.

Holophrastic stage (One word stage)

The first meaningful words spoken by children appear between twelve months and eighteen months or even two years. At this stage, children utter one word which carries as much meaning as complete sentences. Usually children utter the word while pointing at the object. Hoff (2006) points out that the one word utterance is a sentence because a sentence is traditionally described as a complete unit of thought and the child's one word represents a complete thought. For example if the child says "doggie" it could mean that the dog is eating, the dog has just entered the room or the dog is running. Recent studies show that at the holophrastic stage, the child also uses intonation to communicate his thought. For instance "Banana" for that's a banana, or I want banana but "banana!" could mean the banana has fallen into a bucket of water or Jane has taken the banana. Eggen and Kauchak (1992) reported researches that show that intonation makes the child uses language as a functional tool to communicate ideas, wants and needs.

Studies by Cruttenden (1979) showed that the child first learns words he is most exposed to and these are usually names of concrete elements present in the environment. He reported that the classes of objects first named are "items of food, names of people, parts of the body, articles of clothing, vehicles, animals, toys etc" (p.84). These names reflect the most common things given to children by adults in their conversation with the children.

Yopp and Yopp (2009) observed that the child's production of sounds cannot be exactly like that of an adult. The child engages in replacing certain sounds for others. Semi-vowels could be used to replace laterals. For example such words as "like" and "lady" could be pronounced as "jike" and "jady" respectively.

Eggen and Kauchak (1992) stated that the one word stage of language development is also characterized by two reciprocal problems. First – overgeneralization. For instance car may be used for vehicles of all types including buses and lorries. Secondly, under generalization where the child uses the word too narrowly for example dog for only the child's dog and not other dogs outside the child's house. According to them, both over and under generalizations are corrected through normal listening and talking.

Adults in trying to interpret the one word utterance expand it further or sometimes they give the wrong interpretation. The mistakes made in giving interpretation to children's one-word utterances drive the children further to want to elaborate on their speech. The children then, graduate from one-word sentences to producing telegraphic sentences.

Telegraphic Stage (Two word Stage)

Between 18 months and 24 months that is 1½ years to 2 years children begin to combine words into simple sentences. These two-word sentences may appear ungrammatical to adults but they represent far more than random word combination. Two-word sentences are incomplete sentences for example "Mummy shoe", "there book"; "give water" or "where ball". The utterances are called telegraphic speech because certain items especially the function words like "to", "the" and "from" are usually left out. The name telegraphic was used by Brown and Fraser (1963). According to them the utterances have telegraphic feature – where articles, prepositions, auxiliary verbs etc are left out.

The child gets the concept of word order (syntax) but sometimes changes the order. The child's utterances possess some basic characteristics which Glucksberg and Dranks (1975) said are under two levels of analysis, what has been referred to

as the surface – structure. These are the syntax and semantic relations represented by these surface structures. This is not far from Braine's (1978) pivot grammar. A pivot grammar is a system of syntactic rules that specifies whether a word may be alone or must occur with another word in a particular order.

Braine (1978) state that a pivot grammar contains basically two major types of sentences. First, it is the sentence that contains a pivot word and an open word as in these utterances.

"allgone milk"

Allgone mango"

"hi mum"

"hi Suzan"

The second type consist of two open words like;

"mummy shoe"

"doggie meat"

In looking at some of the first sentences in child's speech, Brown (1983) categorized the most common types of two-word utterances into two major classes.

a) **operations of reference** (Pivot word and open word)

   Nomination: That (or it or there) + book, hat, ball, chair etc

   Notice: Hi + Mummy, cat, bell etc

   Recurrence: More + milk, nut, cake, pap etc.

b) **Relational operational** (open word + open word)

   Attributive: Big train, red book, long lorry etc

   Possessive: Adam check, Mummy lunch

   Agent – Action: Adam put, Evan read.

   Agent-object: Mummy sock, mummy cup.

Action – object: put book, take baby, hit ball etc

In the reference operation, something is said about an object or event. Nomination is one type of reference operation – in this case, an object is being named for example “there bread” to a child may mean “that thing over there is bread”.

The number of two-word combination increases slowly and then shows a sudden upsurge at around 24 months. Braine (1978) recorded the speech of three children from 18 months. A reported cumulative number of different two-word combinations (or one child in successive months was 14, 24, 54, 89, 350, 1400, 2, 500. There is a rapid expansion of speech in such a short time.

The telegraphic stage is also an important time when the child’s active grammar can be investigated. Brown (1975) studied three children over Five years and concluded that during the first two years speech can be described as telegraphic. He found that children’s speech was made up of content words belonging to the large open classes called nouns, verbs and adjectives. The children did not utilize function words such as prepositions, articles, auxiliary verbs or nouns. Their language according to him was something like “pretty flower”. “all gone milk”.

Eggen and Kauchak (1992) reported that children at two years elaborate and fine-tune the choppy speech. For instance the present tense is elaborated to include the following verb forms.

Present progressive for instance “I eating”

Past regular for example “He looked”

Past irregular such as “Jimmy went”

Third person irregular for example “She went”

Children at this stage over generalized grammatical rules for instance “badder, worsest, putted” Piaget’s (1971) work help explain this tendency. For example when the child says “He goed”, he has used an existing cognitive structure which allowed the child to maintain equilibrium while “he went” requires accommodation. The telegraphic stage is characterized by deletion of redundancies in speech. This is accounted for by the structural development of the child’s brain and consequently memory span.

Advancing language development

At age three children can communicate their needs fluently and have acquired vocabulary of about 5,000 words (Clarke-Stewart and Friedman 1987). However, they still make many pronunciation errors. At this age, children learn to use sentences much more strategically. Eggen and Kauchak (1992) found that subjects and verbs are reversed to form questions and positive statements are modified to form negative statements for instance “He hit me” is changed to “He didn’t hit him” and “Did he hit him?” The form language takes is determined by its function. Syntax begin to develop fully and more complex sentences are merged into one. For instance sentences such as “The boy run fast” and “the boy fell down” are now combined to become “the boy run too fast and fell down”. This also reflects complex thinking.

At four years, the normal child has acquired the essential form of verbal interaction and by the time he/she is six years, compound sentences are spoken by the child. He /she begin to use conjunctions such as “because” and “but”. There is no final stage in linguistic development since even adults continue to refine their use of language and add to the range of utterances they comprehend. On this note

one can say there is no terminal point in language learning, not even after the critical period.

Brown (1973) analyzed the result of his five year longitudinal study and combined them with early language studies found that children acquire grammatical morphemes in 14 steps or order. The order was quite consistent for most children.

Subject noun - Banana

Present progressive-'ing'– For example Jimmy eating

And on, in – For example toy in box; Sally sit on bed.

Plurals- for instance tables

Past irregular – came, went

Possessive – Sandy's chair

Uncontractible copula (linking verbs) – am, is are, be

Articles – the

Past regular – ed. For example, Billy walked

Third person irregular – He does

Uncontractible auxiliary is – For instance, this is going fast

Contractible auxiliary – He's flying

From his work, it can be seen that there is an expanding acquisition of syntax with age and as children grow older, they are skilled in acquiring syntactic structures.

In concluding this section, it is important to observe that linguist have stated that any of these stages may not be skipped. For example, Ochs and Schieffelin (2001) reported a study which clearly revealed that children at the two-word stage could not repeat a large sentence "Mr. Miller will try". The children responded. "Miller try".

Semantic Development in Children

Semantics is the branch of linguistics that studies meaning. The whole of linguistics is an attempt to record faithfully the relationship between the physical facts of language and the meaning that we perceive from it. Therefore meaning is what is built into the organization of language. Dale (1972) defined semantics as "the knowledge that a speaker must have to understand sentences and relate them to his knowledge of the world" (p. 160). According to him, semantics also include "knowledge of individual lexical items as well as knowledge of how the meaning of a sentence is determined by the meanings of individualized lexical items and the structure of the sentence". Nelson (1989) described semantic development as consisting of the child acquiring a system of shared meanings with other members of the community. This implies that children learn content of language that is the meaning of words and grammatical construction from their daily interaction with others in routine events.

Cruttenden (1979) confessed that semantics is the least understood aspect of language development because we do not understand adult semantic competence. For example, in syntactic development, well articulated theories of language competence like transformational grammar can be taken as a model in the collection and analysis of data from children. Cruttenden (1979) observed that there is no such guiding framework in the study of the development of meaning.

Semantic development is closely related to the broader cognitive development of the child (Meadows, 1993). Linguists cannot separate questions such as 'How do children express their ideas? And what kinds of ideas do children have to express from cognitive development. For example preschoolers are able to identify their left and right hands but often unable to identify the left and right hand of a

person facing them. Meadows (1990) reported that preschoolers select the hands that are on their own left and right respectively. Also some children would not admit that they are someone's brother or sister but might rightly say that they have such number of brothers or sisters. These examples of left/right and brother/sister show how important are cognitive maturity in the development of word meanings. Meadows (1993) observed that these examples are among other examples of young children's egocentrism, that is his inability to take another persons perspective in a wide variety of situation, including language.

Linguists have identified significant stages of language development preceding the first word.These stages including the crying stage (0-3 months) which denote painful or emotional feeling; the cooing stage (3 months to six months, and the babbling stage (6 months to 12 months) which is the training and preparatory period for later articulate utterance.Towards the end of the first year of life, children begin to produce some rudiments of meaningful utterances.

For development of meaning in children's language, we rely very much on the work of Cruttenden (1979) who discovered that in the process of acquiring language, children learn words they are most exposed to. He pointed out that the classes of words first named are "items of food, parts of the body, articles of clothing, vehicles, animals, toys etc" (Cruttenden 1979 p 84). These names reflect the names of concrete objects and persons most commonly mentioned by adults in their conversation with children. For instance Cruttenden observed that a child may acquire 'table' and 'chair' before 'furniture' because 'table' and chair are more frequently used by adults than furniture.

At the holophrastic (one word) stage, Burns and Broman (1983) stated that one word utterances are usually nouns – names of common objects. These words,

according to them, convey a lot of meanings. For example, ‘milk’ may mean I want milk, here is milk or the milk has poured on the floors. The child at this stage has developed some capacity for morphemes. Morpheme is the smallest unit of meaning in a language that is the smallest meaning bearing unit. For example, girl is a morpheme but girls are two. The ‘S’ added to girl makes it a word of two morphemes. In other words we have formed two smallest units of meanings. Prefixes and suffixes have meanings and also change the meaning of root words. Once the child has developed some capacity for morphemes, language development is rapid from 18 to 36 months. During this period, the child assimilates the basic elements of linguistic culture.

The child learns the earliest word – meanings probably from non-linguistic experience. For example the meaning “flower” for a child may be something brightly colored put in a vase. He may not dissociate flower from other brightly colored leaves used for decorations. Children cannot probably recognize things by mere verbal explanation until the early school years and according to Cruttenden (1979). This is due to two factors

a) Children’s stock of word-meaning is not sufficient before this time to make explanation by definition.
b) It is often not until the early school years that children begin to view language as something which can be divorced from actual usage for the purpose of discussion

He however, pointed out that the awareness may begin earlier in those families where language is talked about. At the beginning of the one-word stage, the meaning of words is not quite like that of adults’ words. Fry (1986) observed that often the words express a composite meaning. These words are called

'holophrases' or holophrastic because children's single word utterances express complex ideas.

During the holophrastic stage, Dale (1972) reported that researchers have found some degree of semantic impression. Concerning this lack of specificity he pointed out that the word has at first an ill-defined meaning and an ill-defined value and cautioned that it refers to a nebulous, complex, factual and emotional expressions. Its factual components became clearer only gradually in the course of development. It is therefore, difficult to decode the meaning of a word for a child at this stage.

Kastelnik, Soderman and Whiren (2007) have suggested that gestures, facial expression and actions aid understanding of meaning of words uttered by children. For example, a child may express his refusal by saying 'no'. He may accompany it with shaking his head or shoulders or twisting his face. Also action and speech are often fused together. A child may say 'beat' while beating a dog or puppy or he may say 'go' while pushing his nanny or mother forward. Clark and Clark (1977) talked of a semantic phenomenon of over extension of a word which is common in the first words of the child. Dale (1972) defines over extension as "the use of a word to refer to a broader category that is appropriate in the corresponding adult language" (p. 9). Broader meanings are given to objects and concepts. Over extension goes from approximately one to two years and a half. According to Burns and Broman (1983) the main perceptual features which form the basis for over generalization or over extension are movements, shape, sound, taste and texture. All objects that exhibit some common characteristics are brought together under one umbrella. For example "daddy" is used for all men that are putting on trousers, or having big feet

(both to do with shape or speaking with low voice (sound). However Clark and Clark (1977) observed that proper names are hardly over-extended.

Apart from static perceptual attributes, children attach meanings to aspects of change and action. Burns and Broman (1983) stated that the word “all gone” may be used by the child to mean something is finished or that the thing has disappeared from sight. Gradually, over extension becomes more limited and converges towards adult usage. If this happens, Dale (1972) pointed out that we witness a phenomenon called “over-restriction’. In this case a word is used for a narrower range of objects and events. For instance, during the over extension period, the child may group under the heading of ‘car’ all four wheeled vehicles like lorry, buses and takers. But as he acquires names like buses, lorry etc he will delete them from ‘car’, ‘car’ will then mean other wheeled vehicles minus ‘bus’ and ‘lorry’. The ‘car’ will then become more restricted or limited. By the end of the one-word stage, some important changes are noticed The vocabulary is larger and the child can engage in a simple conversation. This leads us to two-word utterances.

The Telegraphic Stage.

Between 18 and 24 months, most children begin to form two and three–word sentences. For example ‘push table’. ‘Jane sleep’ or ‘see book daddy’. Like in the holophrastic stage, the two-word utterance could have different meanings for instance “push table” may “push the table” or ‘I am pushing’ the table. At the two-word stage, meaning of utterances are enhanced by intonation. Nelson, (1985) studied two year old children’s utterances and found that adults perceived the meaning of utterances through the intonation used by the child. “Goat eat corn” to mean goat is eating the corn. This is informative in nature. However when the accent changes to that of alarm, for instance. “Goat eat corn” implies that the goats

should not eat the corn and so send it away. She found that the two-word sentences belong to limited number of semantic types.

Possession - daddy car

Action - baby eat

Negation - no cake

Recurrence - more milk

In a recent study, Farar, Friend and Forbes (1993) found that interacting with familiar events (familiar toys) while with adults (mother) enhances vocabulary development of the year old children. In a five-week observation of 13 dyads (child-mother), the researcher concluded that language activities and especially meaning of words is facilitated by event knowledge. As children acquire knowledge of the event, lexical and grammatical measures reflecting both conceptual and processing effects showed substantial increase in familiar events more than unfamiliar events.

After the two-word utterance stage, we begin to witness rapid vocabulary growth. By his third birthday, the average child has acquired a thousand root words Copple and Bredekamp (2008). Recent evidence on vocabulary acquisition has shown that some three year old children can successfully extract word meaning from listening to story books being read. Senechal (1993) conducted a step by step analysis of how children learn novel words encountered in stories and identified a series of steps in the process. He found that the child must encode and maintain a phonological representation of the novel word, extract clues from semantics, syntactic and pictorial context. He observed that novel words encoded, understood, associated and stored in this way may be accessible for later retrieval. The study clearly shows that the skills involved in word learning must include working memory, language abilities and prior knowledge.

2.9 EMPIRICAL STUDIES ON CHILDREN'S UNDERSTANDING OF TIME

2.9.1 Piaget studies on understanding time concept

After a series of experiments with children, Piaget (1969 p.255) described time as "the coordination of motions at different velocities". The concept of time involves the coordination of at least two motions simultaneously. The motion of external objects in the case of physical time and the subject's in the case of psychological time. Explaining further, Piaget pointed out that single motions do not give the concept of time because in the case of single motion, temporal succession coincides with spatial succession (that is with geometrical distance in the direction of motion). So that no problem is posed but "once two motions at different velocities have to be coordinated, the correlation of their successive positions does pose a specific temporal problem; that is one that can no longer be solved in terms of spatial succession, hence our assumption that the schema of time is constructed operationally by means of co-displacements" Piaget (1969 p.38).

Piaget (1969) investigated the development of fundamental concepts of time under:

- Succession (Sequence)
- Simultaneity
- Duration
- Colligation of duration
- Equality of synchronous duration
- The additive and associativity of duration and also
- Psychological time

Piaget studied children's conception of time using the clinical method which involved questioning each child after sets of experiments. The experiments were

performed and photographs or illustrations of the experiments were taken at various phases of the experiment. At the end of each experiment, the child was asked either to rearrange the photographs based on which picture took more time or which happened before the other.

The example of the technique he used for the sequence of time is given below. Each child was presented with two flasks or jars, one on top of the other. Water from the top flask (flask I) was emptied into the second one (flask II). At regular intervals, some quantity of water is allowed to run to flask II until flask II is full and flask I is empty. The quantities run out from I correspond to graduated increase in the level of II. Next, the subject is presented with a series of cyclostyled drawings beginning from the experiment when flask I was full and II was empty and therefore at each change of level including the last. The child is asked to indicate the respective levels of the two flasks by drawing a horizontal line on the paper in green pencil. When all the levels of liquid have been transferred on sheets in 6 – 8 phases, and shuffled, the child is asked to put them in order. The instruction could go this way: “put the first drawing you made here (on the left). Next (to the right of the first) put the drawing you made when the level of water first began to drop; then the one you made immediately afterwards… (And so on). The child’s arrangement is noted. If it is incorrect, questions are asked about the mistakes until he achieves complete success.

The sample size consisted of 3 – 9 children of various ages working on the same tasks. After a series of experiments Piaget (1969) found that time develop in three stages.

Stage one (about 4-6 years)

Succession (order or sequence)

Sub-stage 1^A – children at this age cannot grasp the overall order of events because they lack a systematic method of construction.

Sub-stage II^B – Children showed initial failure at arranging things in sequence but correct their errors under questioning or by spontaneous trial and error. The child grasps the order of succession while the action (water flowing) was on.

Simultaneity – All children at this stage failed to grasp simultaneity that the correspondences (simultaneity) of levels I and II is determined by double seriation. Although the child recognized in principle that the level in II rises as they drop in I, none of them was able to remember the relationship throughout the construction of the series. In addition, children at this stage failed to grasp simultaneity of the end points (and often that of the starting points) and also the fact that the two bodies move for the same length of time. They explained that I moved longer than 11 because it went furthermore and more quickly and think that 11 stops first because it covers a smaller distance. Children at this stage discover no simultaneity and duration is judged proportional to distance, that is, the further the distance, the longer the time. Here velocity is not considered. Simultaneity at a distance or with different velocities can have no meaning to the child. He cannot grasp that bodies moving at different places with different velocities can be fitted into a unique and homogenous time scale.

Duration – Piaget (1969) found that the understanding of duration results from the grasp of simultaneity and succession. He explained that the child must understand that the duration of L1 $L_{2;}$ $l_{1,}$ l_2 are also equal. Succession and simultaneity are not grasped operationally unless they lead to the construction of a system of colligated

durations much as durations are not grasped operationally unless they can be placed in one to one correspondence with a system of successions and simultaneity.

At stage one, the concept of duration or of time interval is imprecise. If the child is asked to state whether the time it takes the water to run from L_1 to L_2 is longer than it takes to rise from II_1 to II_2 he fails to see that the two are equal. He also fails to grasp that velocity is inversely proportional to time, that is, the more rapid, the less time. Piaget pointed out that the thinking here is based on intuitive conception of duration.

In brief, results of tests show that in stage one, succession and duration remain undifferentiated from distance. 'Longer' is equivalent to 'further'; first may mean 'before' or 'after' and differences in speed are thought to preclude synchronous processes and lead to confused estimates of duration. Piaget (1969) noted that children's reaction and constant errors, in answering questions of 'earlier', 'before', 'sooner', may be a matter of words than logic. He stated that the children used the words 'before' and 'after' in spatial sense that they failed to appreciate that the researcher's questions have bearing to time. Piaget was however quick to point out that "If the two bodies moves in the same direction, the child confuses time, space and velocity which demonstrates that his errors are of a logical and not of a verbal kind for instance when the child says 1 goes on longer' because it finishes 'further'. Piaget attributed children's inadequate verbal differentiation to a lack of logical differentiation between time and space". Piaget (1969 p.83). Children at this stage use what Piaget calls egocentric assimilation instead of decentration of relations in giving their answers.

Equalization of synchronous duration and the transitivity of equal time relations.

In stage one, failure to grasp simultaneity goes hand in hand with failure to synchronize durations simply because time is thought to belong to each action separately and because the child thinks that actions can only be coordinated by their results. Children overlook the differences in size of bottles and so predicted the two of them will be filled at the same time. This Piaget called primitive intuition in which duration is evaluated by the result of an action and these results do not depend on the interval between the starting and finishing points but on the finishing point alone.

Colligation of duration and the transitivity of unequal time. At stage one, the child is unable to compare two terms at a time. For instance if the child is given two bottles and asked "which one will get filled first"? He is likely to answer 'a' because it is smaller. "Will it take more or less time to fill"? He would answer more time"? Piaget investigated the additive and associative comparison of duration where the child colligates durations into a series A B C etc and combines two partial durations- A $A^{1\ plus}$ t A A^1 B into a whole such that AC equals the duration of A A^1 combined with that of AA^1B . That is the child recognizes that the addition of two durations constitute a duration. He must also introduce an associative principle which ensures that conservation of the whole is independent of the arrangement of its parts, that is, he must be able to construct equality A A^1 and A A ^{1}B. At stage one, the child is unable to synchronize elementary durations and failure to effect addictive compositions.

Measurement of Time and Isochronisms of Successive Duration–For Isochronism (time measurement). Piaget (1969 p.176) pointed out that the

fundamental postulate on which all time measurement is based is the existence of motion and takes same time to recur under the same conditions. This interpretation of isochronism of repeated actions involves a vicious cycle since in order to ascertain the isochronism of a given motion; we have to measure duration by means of other motions whose isochronism depends in turn on measurement which postulates it.

The child at stage one is at loss with the use of watches and sand-glasses because he believes that their motions vary with the actions to be timed, that is if they move faster then the action is fast and vice versa, children in stage one believes that the speed of the measuring motion is affected by the motion they have been asked to time.

The summary of the development of time concept in stage one according to Piaget is that the comprehension of qualitative time remain incoherent. Succession and duration remains undifferentiated from distances; 'longer' is equivalent to 'further' first may mean 'before' or after and differences in speed are thought to preclude synchronous processes and lead to confused estimates of duration.

Stage Two (about 6 years to 8 years)

This stage witnesses the beginning of decentration and prepares the way for operations. Intuitive decentration introduces corrections and these corrections in turn lead to certain corrections. Piaget explained that intuitive decentration is a gradual decentration leading the subject from the idea that time is centred on a particular action or a single motion to decentred time and finally to construction of a coherent systems co-displacements.

Succession – children begin to differentiate between spatial and temporal order and articulated intuitions of time. Children at stage two were able to divorce

temporal from spatial succession but failed to grasp the correct temporal succession and approximately 10% were able to grasp both ideas. Progress in grasping duration leads to progress in grasping succession and vice versa. At this stage, children have made progress in grasping succession but no progress in handling duration meaning that grasping succession precedes that of duration. In the words of Piaget, “egocentric intuition (confusion of time with length of action and hence with work done or the space traversed) is gradually decentred by representative anticipation which extends to observed motions or else by representative reconstruction which help to divorce these motion from their result. The resulting anticipation does not however lead to an overall coordination or overall grouping of concepts” (Piaget 1969 p.93).

Duration – The child discovers the inverse relationship between time and velocity (more quickly – less time) and begins to appreciate that time internally may be divorced from speed or distance, but is still unable to coordinate these intervals. Piaget concluded that neither the qualitative operation nor quantitative operation is grasped by children at stage two. Children in stage two fail to dissociate time as a structure from its content that is, from events or motions and hence judge duration by either the starting or else by the end point of action, but never by the two together.

At this stage too, children discover through representative reconstruction that a job slowly done seem to take longer time than another job done quickly. At stage two children understand that succession is necessarily based on duration and vice versa. It is this understanding, stated Piaget (1969) that accounts for the change from intuitive regulations to operations.

Simultaneity – At sub-stage 2^A children have not grasped the simultaneity and equality of two synchronous durations but contend that II goes on for a longer time. At sub-stage 2^B, various distances become coordinated. At first neither simultaneity nor equality of synchronous duration is grasped and duration is judged as inversely proportional to the distance covered Secondly, children succeed in the comprehension of simultaneity but failed to synchronize durations. Thirdly, a few exceptional children can produce an intuitive equalization of synchronous durations but fail to appreciate the simultaneity of end points.

Equalization of synchronous durations and the transitivity of equal Time Relations. At stage two, children recognize simultaneity, divorce time from velocity and predict intuitively that the larger of the two bottles will be filled less quickly and more in time but fail to equalize or synchronize durations with simultaneity starting from finishing points or to equalize the amount of liquid run out. At 2B, children grasp the equality of synchronous durations and of the qualities of liquid run after series of trial and errors.

Colligation of duration and transitivity of unequal time. Children in stage two were able to compare two bottles at a time but failed to coordinate the resulting pairs. Children no longer judge the flow by looking at one bottle in isolation; however the pairs they choose for comparison remain uncoordinated. At 2^B, children empirically discover the correct sequences of three times but not four.

Additive and associative comparison of durations. At the beginning of this stage (2^A) children deny the equality of synchronous elementary durations even when the simultaneities of the starting point and end points are recognized. The only way to convince subjects according to Piaget is to use a stop watch.

Stage Three – about (8 to 10)

Succession – At stage three children have mastered the principle of operational grouping and their conception of time assumes an orderly and no longer intuitive perception. Children here have learnt to handle double series and correspondence without mental or practical hesitation of errors. Every of these subjects had the ability to apply operational techniques systematically and they all treated the relations involves as grouping or reversible operations. Piaget (1969) found that from the onset, subject knew that every 1 must have a corresponding 11 and it is precisely this prior knowledge that introduces the time factor of or seriation.

Duration – The child succeeds in correlating duration with the correct order of events. Here we have direct proof of how closely the concept of duration is linked to the coordination of motion and their velocity.

Simultaneity – Simultaneity and equality of synchronous durations are appreciated and correlated straight away. There is evidence of direct coordination of simultaneity and synchronism.

Additive and associability of durations – Children immediately grasp the additively of durations.

Measurement of time and isochronisms of successive duration – At stage III the child is able to construct a time scale that is both homogenous and uniform with the result that units of distance transversed at a constant velocity becomes transformed into time units. Quantitative time is therefore simply the operational synthesis of the colligation of durations (synchronous) with the equalization of successive durations Isochronism).

In summary, at stage three, subjects become capable of techniques of operational grouping to all relations involved in time concept formation and go on to construct a coherent system involving both duration and succession.

Age and Inner Time (Psychological Time)

The experience of the child with physical time gradually lead to the construction of psychological time. The child organizes time by external events. First intuitively and then by a set of qualitative or quantitative operations. At the intuitive level, in accordance with the general egocentric laws characteristics of that level children judge physical time as if it were inner time; that is as if it contracted and expanded with the contents of the actions that have to be timed. As a result, the child fails to grasp the idea of a homogenous time common to all phenomena.

Piaget (1969 p.198) has pointed out the relationship between physical time and psychological time. The construction of psychological time according to him is based on physical time and vice versa. Psychological time like physical time must be constructed by the true operations (qualitative comparisons, seriations or colligations or quantitative operations such as are in music and poetry, or else by intuitive regulations. Piaget (1969) observed that: the physical time of young children is first nothing but egocentric time, that is, the progression of inner time to external objects. But this does not imply that the child has an inborn sense of time. Time at this early stage is primitive time which results from a lack of differentiation between the time of objects and that of the objects itself. Inner time (duration) must necessarily be constructed by making reference to objects.

The Child's Conception of Age

Stage one (4 to 6 years)

At this stage, Piaget reported that the child's idea of age is essentially static and almost discontinuous. The child thinks that aging is not a perpetual and continuous process but rather a process of change towards a certain state. To the child, time ceases to follow once that state is attained, that is why aging is equated with growing up. In the first stage, age is independent of the order of birth and age differences are thought to be modified with time as a heterogeneous flux.

As regards succession, children fail to affirm that they were born after their parents and may also claim anteriority. In other words Piaget is stating that children in stage one have egocentric and pre-operational conception of succession and duration and therefore cannot base the former on the latter or vice versa. In other words they are unable to say A was born before B because A is older than B because he was born before him. Children judge age by the most external possible criteria (height or size) but not by direct intuition based on individual inner time.

Stage Two (6-8 years)

The child believes that either age differences are not maintained throughout life that is age depends on order of birth or else that age differences are maintained but do depend on the order of birth.

Stage Three (8 to 10 years)

Duration and succession have become coordinated and their relations are preserved because time has become operation. Piaget (1969) pointed out that time become operational when the child can: -

1. Tell if one event in a given series come before an event in another series

2. Give an approximate evaluation in terms of plus and minus of respective length of intervals between two events in distinct series.

Although Piaget (1969) traced these stages with the child's conception of age, he was quick to point out that "The construction of psychological time does not proceed by the same three distinct stages characteristics of the construction of physical time (Piaget 1969 p.247). However, the construction of psychological time results from two fundamental systems. The order of succession of events and the colligation of durations. The only difference is that in psychological time, we are dealing with events divorced from personal actions.

From various researches, it is possible to describe the development of time concept from infancy to adolescence.

Sensory motor Stage (0-2 years)

During infancy, the stage is crucial to time awareness. Smart & Smart (1972) stated that time is experienced at this stage in the amount of time taken to respond to the child's physiological and psychological needs. The stage is crucial to the sense of trust and signs of approaching satisfaction given hope whereas extended delays cause rage. Excess tension created by long delays leads to absence of hope and trust (Smart & Smart (1972) observed that in later childhood, such delays lead to a disturbed sense of time.

Bertrand (2006) observed children and found that even babies a few weeks old are learning about sequence and by the age of $2^{1}/_{2}$ have acquired time words like the idea of playtime after snack time become meaningful. Piaget (1954, p.321) has analyzed the development of time in the sensori-motor stage based on the inter-connection of the concept with object, space and causality. Piaget gave the impression that time concept is not formed until after the preoperational stage. Until

then “time is intermingled with impressions of psychological duration inherent is attitudes of expectation, effort and satisfaction; in other words time is linked with the activity of the subject himself”.

According to Piaget (1954) time concept is formed in the Sensory motor stage in the following sequence.

Stage I – The reflex stage and primary circular reaction stage 0 – 4 months.

The child knows how to coordinate his movements in time and to perform certain acts before others in regular order. For example the child knows how to open his mouth and seek contact before sucking; or how to steer his hand to his mouth before putting the thumb between his lips. The time characteristics of this stage is practical time, interconnecting the sequential movements of the same schema but conscious of its unfolding at most giving rise to the sensation of expectation effort, arrival at a goal that are characteristics of purely psychological duration. The child can manage to regulate his acts in time without either perceiving or representing to himself any sequence of temporal series regulating the event themselves. The only form of memory evidenced by the behavior pattern of this stage is the memory for recognition in contrast to memory for localization or evocation. Piaget (1954) pointed out there are no differentiation of the past and present but only qualitative extension of the past into the present.

Stage II – The stage of secondary circular reaction 4-8 months.

Piaget refers to this as the subjective series. This is the stage when the child begins to act on things and to make use of their interconnection through pretension of visual objects. The child at this stage is able to perceive a sequence of events when he himself has engendered that sequence or when the before and after are related to his activity.

Stage III – The Stage of complex secondary circular reaction 8-12 months.

Piaget regards this stage as the beginning of the objectification of time. It is the stage when the child form object concept that is the child begins to look for objects which have been hidden behind screens. The concept of “before” and “after” therefore apply henceforth to displacement of the object itself and no longer only to the child’s movements in the course of his actions.

Stage IV – The stage of tertiary circular reaction 12 – 18 months

Objectification of temporal series. This stage is when the child systematically searches vanished objects by taking into account the sequence of its displacement. For instance a child seeing an object first hidden in A and then in B no longer looks for it in A but in B. Time becomes an object reality interconnecting with physical causality; space and permanence and that it should incorporate action to which it had up to then been subordinated. Exploring the room of her house in a certain order is evidence of her mastery of time-in-action (Gruber and Voneche 1977).

Stage V – Representation – 18 months – 2 years.

This stage is a stage of an orderly arrangement of time applied the whole perceptual field. The child at this stage becomes capable of evoking memories not directly linked to perception. From then henceforth, personal duration is placed in relation to that of things and this makes possible orderly arrangement of movement in time and their measurement in relations to external points of reference.

Flavell (1963) observes that at the end of sensori-motor stage, the development of time cognition is far from complete but personal duration has been placed in relation to that of external things and the way is paved for an orderly arrangement of temporal happenings in terms of outside reference.

In early childhood (2-7 years) Driscool and Nagel (2009) stated that time begins to become meaningful at the preoperational stage. They stated that 3 – 4 year olds can come to the teacher and say “today is my birthday, we will eat my beautiful ice cake at snack time, right after group time and my mummy’s birthday comes after my own next week and we will have party in our house.”

This means that at three years, children have understood sequence of routines and according to Driscool and Nagel (2009), sequence enhances time awareness of present, past and future. In addition, they observed that children understood before and after at the age of four years. Such children asked questions like “when do we play outside?” they also found out that children of four years old understand time telling tools and clock vocabulary for instance, “daddy is late today”.

Other time concepts which they found that children who are four years understand include compound examples of time such as group time, snack time and last winter, while some also have grasps of major holidays, such as Christmas. Finally, they found that children four to five years have concepts of the future. This is evident in statements like “when I grow up, I will be a pilot”. At five years of age, children can tell how long it will be (in tough time units) until their next birthday and how old they will be by then. Bloom and Lahey (1978) studied time perception in preoperational stage and found that two year old children typically comment on their intentions is what they are about to do more often than what they have just done. They found that they use forms of language such as “wanna” “gonna” and “have to”. They made reference to future time more than past time in age range 2-5 years. Other studies on the comprehension of temporal reference by Cromer (in Bloom Lahey 1978) found subjects better at comprehending past sentences than futue

sentences. However, Clark (in Bloom & Lahey 1978) found children 3-4 years old more often correct in responding to items with “before” than “after”.

Hess & Croft (1972) argued that children in the pre-school age should be helped to develop time concept based on sequence and not intervals as they are developmentally not ready for understanding time duration. Likewise Hurlock (1978) stated that the ability to tell what time a thing happens in terms of another activity appears before the ability to give actual clock time. For the preschool child, Hurlock (1978) pointed out that at 3 years, children can tell their ages, how old they are and when their next birth day will be. At 4 years she stated that children know morning and afternoon. However, Driscool and Nagel (2009) pointed out that at 4 years, there is a leap in vocabulary development including time words. According to them, children understand today, yesterday and tomorrow. They know that the day is divided into morning, afternoon and evening, and also know that the year is divided into different seasons with different weather conditions. At 5 years they know what day it is and the names of the days of the week; they can tell what time they go to bed. At six years, they can tell when they have supper, when they get up, when they go to school, when afternoon begins and learn to tell time.

Later Childhood (7 years to 12 years)

Researchers agree that time concept is formed only in late childhood. Bolton (1977) reported that evidence from researches confirm that abstract concepts including time concepts develop only in later childhood and adolescence. She reports that the child begins to acquire an understanding of time concepts related to the study of history (duration) at about the age of ten. Friedman (in Bolton, (1977) found that the idea of a year was developed at 9 years and that only at about 12

years old do children understand words like recent, external, BC and to differentiate between past and future.

Skinner (1990) reported a study by Brandley which dealt with the ability of elementary school children to understand ordinary time words and the development of a concept of the universal and continuous nature of time scheme. The result indicates a gradual and continuous growth in understanding of time words. At five years the distinction between the past and present and future is established. Bradley found that words used at this stage were those referring to natural phenomenon and personal activities. Bertrand (2008) found that by 4 and 5 years, children are verbally competent speaking in past, present and future tenses. The words “day”, “week” and “time” and combined with phrases to make time concepts like “everyday”, “snack time” and “next week”. She found that by age five, children use the word “now” correctly and knows the days of the week. At nine and ten years old, the child can comprehend long period of years. At twelve to thirteen years old, the child answered questions mainly concerned with duration.

Hurlock (1978) attempted structuring time concepts acquired in later childhood. At seven years, she said children know what time it is, they also know what month and what season it is. At eight years, they know what year and what day of the month it is and can name the month correctly, but have difficulty judging length of a second (duration) Eysenck and Arnold (1972) stated that around eight years of age, the ability to reconstruct events in correct sequence and the idea of an abstract unit of time as the basis of a perspective of time corresponding to adult level come into being.

Finally Nweze (1973) in Nigeria found that time concepts develop fully between the ages of nine and eleven years.

Adolescence – 12 years and above.

The adolescence period is the period of formal operations. Children have abilities for abstract thinking (Piaget 1954). Therefore, they can comprehend time and order time sequence and duration. However, Jahoda (1963) found that historical time only develops at the age of sixteen. By historical time he meant long duration like century A.D. and B.C.

Critique of Piaget's Methodology

Piaget's method involved questioning children as well as observing their behavior. The method encouraged the child to act on some problem so that one could infer the thinking behind the child's action. Brown and Desfonges (1979) described this method as the clinical method. The researcher's questioning skill is a major determinant of the response he receives.

Piaget's sample size was very small, his three children. With this he made generalizations with regard to development of children. Hunt and Sullivan (1974) observed that the sample (his children) had the same background, genetic characteristics and race. Brown and Desfonges (1979) are of the opinion that Piaget's conclusion might have been different had he used a wide spectrum of children. They contended that the child's environment affects his/her growth and thinking as well. In conclusion they felt that for Piaget's theory to be acceptable, it must take into consideration other races, cultural backgrounds and continents.

Siann and Ugwuegbu (1980) observed that children failed Piagetian task when the theory was tested not because they were incapable of reasoning required but because experimental conditions confused them. For example, it is not that children could not solve conservation problems but the format of the trial or experiment may be confusing making them unable to solve the problems.

Similarly, investigators like Berk (2004) are critical of Piaget's work on conservation. He noted that sometimes the wording of Piaget's questions did actually hide children's conservation abilities rather than reflecting them. He pointed out that the use of words like "more" or bigger" may mean taller or longer to young children and not having greater mass or quantity.

Winnick (1979) criticize Piagetian way of analyzing data. He particularly frowned at his lack of random sampling in the use of intensive observation of individual's children, his exclusive use of Swiss middle class children as respondents and his tendency to interpret behavior from unique points of view of biological heredity.

Clarke-Stewart and Friedman (1987) also observe that Piaget's conservation tasks makes children less advance cognitively. According to them, experimenters distract the children unnecessarily to the extent that children are tricked to answer as if they could or could not conserve.

Finally Hunt an*d* Sullivan (1974) observe that the clinical method used by Piaget depends on the researcher's skillful questioning technique in determining how the child arrived at the answer. In this case the researcher could be bias even in the question and interpretation of response.

Despite all the criticisms on Piaget, Clarke-Stewart and Friedman (1987) observed that most children in preschool years do not figure out the implication of the reciprocity or reversibility, number and size. They were also unable to use oriental operations and understand conservation problems so that they could answer correctly regardless of the wording of the question or the appearance of the object. The preoperational children were also unable to back up their judgment with sound logical reasoning.

2.9.2 Panagiopoulos and Ioannidis research on understanding basic time concepts through multimedia software.

Studies on children's understanding of basic time concepts through multimedia software by Panagiopoulos and Ioannidis (2002) showed that multimedia software gave subjects superiority of comprehension of time over those who did not use software to learn time concepts. The superiority was most pronounced in experiments that involved motion or action. A positive correlation was found between age and comprehension. The study, however did not find any appreciable difference between male and female subjects in time concept perception. It also found that parental occupation did not have any significant influence on time concept comprehension of the subjects.

The study adopted an experimental design where subjects at each age level were randomly assigned to two groups. One group served as the experimental group while the other was the control group. The sample consisted of 374 school and pre-school children whose ages ranged from four years to eleven years. Children in each age level were grouped into two comparable groups. The instrument used for data collection was special multimedia software developed using high level language which stimulated standard time perception test.

The researchers recommended the application of complete multimedia technology in the area of assessing the concept of time in children.

Whereas this study was an experimental study which investigated the use of multimedia, software in assessing children's understanding of time concept, the current study is cross-sectional survey which investigates the time words children understand and use.

The study used a multimedia software test developed for the purpose. Similarly, this research is going to use a time concept comprehension test developed for this purpose from a comprehension passage.

2.9.3 Burny, Dosoete and Valcke‘s on study time concept among school children.

The third empirical study on time concept among school children is by Burny, Dosoete and Valcke (2009).

These researchers studied the development of time-related competencies in primary school children. The purpose of the study was to identify the role of mathematical, visuospatial and linguistic skills in learning time-related competencies among primary school pupils in order to get a deeper understanding of the complexity of the concept of time and the learning process involved in the acquisition of time-related competencies.

809 Flemish (Dutch-speaking area of Belgium) children from grades 3-6 participated in the study. This sample was made of up of 276 third-graders, 303 fourth graders, 124 fifth-graders and 206 sixth-graders. The study used a test battery containing visuo-spatial questionnaire called Tempo Test Recenem (TTR), measuring arithmetic skills, and the Kartrijikse Rekente St. Revisie 2006 (KRT-K-). This included instrument for measuring time intervals, transforming analogy into digital times and vice-versa, solving time problems and using calendar and using time related vocabulary.

The result of the study showed that the acquisition of time concept evolves gradually with different processing demands in different grades. Children’s performance on time-related skills was related to their mathematical performance. In grades 1-4, children who were accurate in counting and arithmetic were more

accurate at telling time than their peers who had difficulties with mathematical skills. In grades 5 and 6, the accuracy in solving time problems was related to more complex mathematical skills such as visuospatial and linguistic abilities and played vital role in the acquisition of time concepts.

The study above used a cross-sectional survey design in order to collect data from students of different grades with the aim of examining differences in quality of certain academic skills including linguistic skills in learning time-related competencies.

The three studies have shown that the cross-sectional survey is an appropriate design to use in developmental studies and therefore can be used in this study.

2.9.4 Scott's Studies on age and time concept formation

Understanding of time concept improves with age in children. Studies by Scott (1997) showed age difference in the development of time line by children aged three to six years. The study explored children's development of mental time line using 20 children in each group of three, four, five and six year olds making a total of 80 children. In the study, children were asked to identify "something that happened a long time ago", "something that is going to happen a long time from now" and "something that happened a little while ago"

The results showed that the older children were more likely to give valid responses to the questions. Scott (1997) compared each pair of questions (long/short in the past, long/short in the future) in four groups in order to find out if events cited differed appropriately in their distances to the present. He found a strong tendency for three year olds to give examples to pairs of recall and prediction questions that came from "place" on the temporal ruler. This tendency diminished markedly after three years of age. He found that older children showed signs of

finely divided temporal rulers and greater mastery of markedness. He also found that the use of conventional time measurement, the naming of temporal locations and intervals increased with age. There was increased differentiation of the past and future with increasing age.

2.9.5 Bertrand's longitudinal studies on the use of time words by children

Similarly, longitudinal study of the use of time words by children two and half years to six years showed that the children's time vocabulary increased with a leap at three years and the use of time concepts progressively being refined. Bertrand (2008) found that at age three, the child roll out 20 or more time words including some personal catch call like "last day" for the gigantic past. Bertrand found that at age three, the child mapped things on time line - "me eat first, then play". At three and half years, Bertrand found that the child showed a more refined use of time words for sequence, such as "I had it first", frequency (two times today); rhythm (every Friday) and duration (its along time). The use of "yesterday" begins to appear but without accuracy, "I am gonna feed the ducks yesterday".

The study found that at four to five years the child was verbally in the past, present or future and getting verb tenses right. At that age, according to this study, the words "day", "week ", and "time" were dragged off the shelve a lot with phrases such as "every day", "summer time" and "next week". The child could use meaningfully phrases like "in a minute", "five minutes ago" and have some sense of holidays and birthdays, but at this age, the child could not tell you what time he goes to bed or eats supper. Bertrand also found that between the ages of five and six years, the child could use most time words correctly. Precisely, he found that the child no longer confused past and future, know days of the week, and could tell

what day comes next and how old she is. In addition, the child could tell when she goes to bed but could not tell the time yet.

At six years, the child likes to hear about the past, particularly her own, her parents' misadventures. She likes to think about things in sequence. She could travel into the future in her mind, anticipating holidays and birthdays. She could not still tell the time by the clock.

2.9.6 Raucher, Shaw,Levine,Wright,Denis and Newcomb's study of the effect of music training on long-term preschool children spatial –temporal reasoning.

In an experimental study. Raucher, Shaw, Levine, Wright, Dennis and Newcomb (1997) collected data from 78 preschool children who were divided into three groups to test the hypothesis that music training will enhance the spacial-temporal reasoning of preschool children. The result showed that significant improvements were particularly made on perception of duration. The magnitude of the temporal improvement on the keyboard was greater than one standard deviation of standardized test and lasted at least one day; a duration traditionally classified as long-term. The result represented an increase on time by a factor over 100 compared to a previous study in which listening to a Mozart Piano Sonata improved temporal reasoning in college students. The researchers concluded that music produces long-term modifications in underlying neural circuitry in regions primarily concerned with music which subsequently enhanced temporal reasoning through rhythm.

2.10 SUMMARY OF LITERATURE REVIEW.

Time has been defined as an absolute psycho-physical continuum marked by past, present and future. It is a psychological concept that designate the totality of

“before” and “after” relations between individuals and events as well as temporal instant when events occur .The development of time concept amongst children from infancy to adolescence has been studied. The salient points to note are:

- Age is positively correlated with time concept comprehension (Piaget 1969, Panagiopoulos & loannidis,2002; Scott,1997).The young child’s ability to understand and use time is quite different compared to that of older children Piaget (1969).
- In infancy, time is perceived only in the routines of daily activities and in response of adults to the needs of the child (Smart and Smart 1978). Piaget (1964, 1969), (1954) stated that time concept formation in children move from coordinating movements in time from 0-4; to subjective series (4-6 month) to the beginning of objectification of time (8-12); to objectification of time when the child explores the house in a certain order 12-18 months and finally to orderly arrangement of time applied to the whole perceptual field (representation) 18-24 months.
- In preoperational stage, children lack power for operation reversibility for selection of various possible orders and duration (Gruber and Voneche 1977 and Piaget 1969).
- In late childhood, researchers agree that time has become meaningful and that time concept is formed at this stage (Bolton 1977, Nweze 1973; Eysenck and Arnold 1972; Piaget 1969).
- During adolescence children comprehend time and order time sequence and duration. In addition they understand historical time (Jahoda 1963).

The outline of cognitive development of Piaget gives four stages of intellectual development through which every child must go through in sequential order and at approximately the same age. He stated that these stages are universal and

applicable to all cultures. But the theories and works of Vygotsky (1962) and Bidell & Fischer (1992) have emphasized the role of social environment and context as having significant influences on cognitive development, therefore, dismissing the universality of the stages of Piaget's theory. Besides, Piaget's theory gives the impression that age (maturation) is the sole determinant of cognitive performance and therefore accounts for differences, but other psychologists such as Vygotsky have discussed the place of culture and environment (context) as other explanations for differences. This research is a test of the universality of stages of time concept development.

So far the literature on time in Africa has concentrated on adults (Ayoade 1972; Kalu (in Orji 1986; Mbiti 1975, 1976, and Noah 1988). These studies were concerned with perception of time and awareness among adults but without adequate information on the child's concept of time.

Two other researches (Uka 1966 and Orji 1987) were done with older children (late childhood and adolescence respectively). Therefore we are still left in the dark as to the content of the child's concept of time at the early childhood in Nigeria. This research will therefore concentrate on preschool children to fill the gap left by other researchers mentioned earlier.

Piaget's work on time concentrated on time concept formation in children throughout childhood and investigated the understanding of time with regards to succession (sequence), simultaneity, duration, age and psychological time at various developmental level of childhood but this research investigates the understanding of time words children in early childhood education encounter in their literature, instruction and daily activities. Apart from the work of Piaget, other researches by Panagiopoulos & loanidis(2002), Burny, Dosoete & Valcke (2009)

and Scott (1997) have found a positive correlation between age and the understanding of time concept by preschool and school children. Bertrand's (2008) longitudinal study on the use of time words by children found that children's time word vocabulary increased with a leap at three years of age and became refined at four years with the child being verbally capable of communicating past, present and future as well as getting verb tenses right. At five years, the children improve in the use of time words to phrases like "everyday", "next week" , "Summer time" , and "in a minute". While Bertrand's work is a study of time words used by children in early childhood, this study differs slightly in that it is a study of the understanding of time words young children encounter in literature and instruction in early childhood education as well as time words used by them.

CHAPTER THREE

METHOD AND PROCEDURE

This section describes the method and procedure used in the study under the following sub headings: research design, population, sample, sampling technique, instrument for data collection, procedure for data collection and method of data analysis.

3.1 RESEARCH DESIGN

An ethnographic cross-sectional design was used for the study. In this design data is collected across different segments of the population at a particular time to show the status of those segments or groups. A cross-section of the children aged three, four and five years old was studied by taking samples from each age level to collect data on time words simultaneously across the age levels. This provided quick information on developmental norm of the children within a short time, yet with high rate of accuracy. The data was collected through participant observation over a period of six weeks.

The study was a developmental study and the purpose was to investigate understanding of time words of children in early childhood education at the ages of three years, four years, and five years old. The study examined the difference in time words understood by the children by age. All the children that made up the sample were studied at the same point in time. The design was successfully employed by Farar, Friend and Forbes (1993) in a similar study titled “Event Knowledge and Early Language Acquisition”.

3.2. POPULATION AND SAMPLE

The population of the study consisted of children in nursery and preprimary schools whose ages were three to five years old in the Local Government Areas

that constitute the Northern Senatorial Zone of Plateau State. The local government areas and the population of nursery and preprimary school pupils in each local government area in 2010/2011 were as follows:

Table 1: Nursery and Preprimary Schools in Each of the Local Government Area of Northern Senatorial Zone of Plateau State

	LGA	NO. OF SCHOOLS	POPULATION		
			MALE		FEMALE
			TOTAL		
1	Barkin Ladi	17	1134	1092	2226
2	Bassa	28	1696	1588	3284
3	Jos East	3	30	33	63
4	Jos North	43	1894	1680	3484
5	Jos South	45	1815	1840	3655
6	Riyom	5	316	308	624
TOTAL	141		6795	6541	13336

Source- Plateau State Ministry of Education

The population was therefore made up of 13,336 pupils; 6,795 were boys while 6,541 were girls. Jos north and Jos South are located in Jos metropolis and the nursery and preprimary located in these two local governments were considered to be located in urban area. The urban area had 88 nursery and preprimary schools with a population 7,139 pupils while the remaining four local government councils were considered schools located in the rural areas with a population of 6197 pupils.

The population of pupils in Jos metropolis was heterogeneous consisting of pupils from many different ethnic groups mainly Igbo, Yoruba, Hausa, Berom, Ngas, Tarok, Mwaghavul, Eggon, Mada, Tiv Idoma, Efik, Ibibio, Ijaw, Urobo and international pupils. The languages of these ethnic groups constitute the first language of the pupils as well as English language in few cases. Many of the pupils in the urban area speak the languages of the environment which are Hausa and Pigin English. At school, English was used as both the language of instruction and communication.

In nursery schools located in the local governments outside of Jos metropolis, the classroom population was more homogenous consisting mainly of pupils from the ethnic group like Berom, Afizere, Amo, Irigiwe and Bachu. In school, English language was made the only language of communication and instruction.

In the urban area, parents were professionals, civil servants or business men and women, but in the rural areas parents were mostly farmers with a few as teachers or civil servants walking at the local government area.

In the urban area, children are raised mostly in nuclear homes with house helps working in the homes as nannies. However, some live in extended families with grandparents and other relatives living with them. But in the rural areas, pupils are raised in extended families with grandparents, uncles, married siblings and their

spouses and children. All the schools in the area of study used English as the sole language of communication and all the schools rejected the use of mother tongue or language of the environment for instruction or communication in the school premises.

The sample for the study was made up of 120 respondents selected through a multi-stage cluster sampling technique. To ensure that the sample is representative of the population, multi stage sampling was used to pick the respondents. Other studies on the developmental characteristics of young children have also used small sample size. For example Piaget's sample ranged from three to nine respondents at a time (Piaget 1969), Scott(1997) used 80 children with 20 each from ages three, four, five and six years old and Raucher, shaw, Levine, Wright and Denis (1997) used 78 children. Therefore the sample size for this study was considered adequate.

3.3. SAMPLING TECHNIQUE

Multi stage random sampling technique was used to select the sample for the study

Stage 1- Four local government areas were selected from the Northern Senatorial Zones through the hat and draw method of ramdom sampling. The name of each Local Government Area was written on a piece of paper, folded and kept in a chalk box. Someone was asked to pick a piece of paper in turn from the chalk box containing all the names of all the Local Government Areas in the Senatorial Zone. The box was shaken after each picking. The four Local Government Areas picked through this process served as the sample Local Government Areas for the study. The Local Governments were Jos North, Riyom, Jos South and Jos East Local government Areas.

Stage 2 - The selection of the school within the selected Local Government Area was also done through the hat and draw method. A list of nursery and preprimary schools was obtained from the educational zonal office of each Local Government Area and the names were listed an pieces of paper and someone was asked to pick one out of the number. The number of nursery and preprimary schools in each of the selected local government areas were as follows : Jos North contained 43, Jos South had 45, Jos East had 3, and Riyom had 5. The schools selected were Plateau Private School in Jos North, Little Quiver in Jos South, COCIN Nursery school in Riyom and Zion Christian Academy School in Jos East. In Riyom, Little Saints Nursery and preprimary school was also selected to make up the number of three year old pupils in Nursery one.

Stage 3 -Ten pupils were randomly selected through the hat and draw method of random sampling from nursery one and two and the preprimary class of each school. In each class only pupils whose ages were three in nursery one, four in nursery two and five in the the preprimary class that were eligible to serve as respondents. “Yes” and “no” were written on pieces of paper and kept in a hat. “Yes” was written on 10 pieces of paper and the children were asked to come and pick one after another. Whosoever picked “yes” became a respondent in the study. In nursery one in COCIN nursery school Riyom, only 6 pupils were three years old in the class, therefore 4 other pupils were picked from another nursery school- Little Saints Nursery school. In this schools like other sample schools the research instruments and procedure were applied to them. The respondents were therefore made up of 30 pupils in Plateau private school in jos North, Little Quiver in Jos South, Zion Christian Academy in Jos East and 26 pupils from COCIN Nusery school Riyom and 4 pupils from Little Saint Nursery school Riyom (to make up for

the shortfall of 3 year old children at COCIN Nursery school Riyom). In all 120 respondents were used for the study made up of 40 pupils in each age group. Information on the age of each respondent was obtained from the biodata of the child from the class teacher.

3.4 INSTRUMENT FOR DATA COLLECTION

3.4.1 Description of the instruments

A performance Time-Word Comprehension Vocabulary Test (TWCVT) was constructed from one of the nursery school stories told to young children (the story is presented in Appendix I). The format for the Time Word Comprehension Test was similar to the Peabody Picture Vocabulary Test- Revised (PPVT-R) (Dunn & Dunn, 1981). That is, the test consisted of illustrated plates with one plate for each target word. Each plate presented four illustrations; one representing the target word and three representing foils. The children's task was to identify the target word and distinguish it from other words by touching the illustration that represent the target word. The foils were relevant to the illustrations and narrative (that is time-word related) in the story to prevent children from selecting responses because the correct response were more familiar than foils as a result of the story telling episode. The target words were morning, afternoon, evening, night, five year old girl, six O' clock and an old woman. Seven questions were constructed from the story using seven time words. Comprehension questions from the story constituted section one of the tests. The test plates are presented in appendix 2.

Section two of the test consisted of sorting activities. In this section, illustrations consisting of typical activities done at distinct times of the day or objects found or used at these times were put in a box and the child was asked to pick out those

activities done in the day time and at night and put them in two piles according to the times:

Day time: Playing, farming, market scene and drying clothes

Night: Sleeping, lamp, stars/moon, torch and candle.

The test cards with illustrations are presented in appendix 2

Section three consisted of a series of disordered pictures of activities done in a day for the respondents to rearrange them in the sequence that they are done in the day. The illustrated cards for the ordering activity consisted of brushing teeth, bathing, going to school, playing and sleeping. The test cards are also presented in appendix 2

The scoring was straight forward. An answer is either right or wrong and every correct answer was 5 marks of 20 items totaling 100%.

Data on the use of time words was collected using participant observation. The researcher and her assistant took a two months voluntary job with the schools and observed the use of time words by children in the classroom, playground and lunch time. Observation coding sheets were designed for recording data. 45 time words from preschool literature were coded ‘a’ to ‘as’ and an observation sheet was prepared for the recording.

A list of time words was compiled from the following young children’s literature: Baxter (1993), Hannaford (2005), Oyetunde (2005), Badoo (2001), Royal School Series (2006), Eluwa, Chima and Chijioke (2006), Woode (2001), Clark (1996), Osae (2007) and Langton(1987). A total of 45 time words were identified and coded ‘a’ to ‘as’. An observation sheet was constructed in tabular form indicating the child’s name, age, sex, nationality and tribe, language spoken at home and time words spoken each week. An additional column was added for any time word not

coded but which may be used by any child. (The Observation Recording Sheet is presented in appendix 5.) The instruments was given to three specialists in child development, English education and test and measurement to assess for content validity, relevance and developmental appropriateness.

From the assessments of the four experts, the researcher compiled 45 time words which were used in the study. (The list of the coded words is presented in appendix 3.)

3.4.2 Procedure for Instrument Development

Using a table of specification, a 20 item test was constructed following the procedure explained below. (The table of specificaton is presented in appendix 4).

First, a comprehension passage was selected from a story book used in nursery schools. The story was carefully selected in such a manner that it contained the frequent time words commonly found in story books of nursery school children. The story was adapted from the story book titled ‘ Little Red Ridding Hood’ written by Nicola Baxter. The story was adapted with the title “Nina visits her grandmother” The story book was picked from the library of one of the sample schools.

After choosing the story, seven questions were constructed from it. This was followed by developing the illustrated plates which served as the answers for the questions. Each question had an illustrated plate with four options. Among the options, one was the target word while the remaining three were foils.

The second part of the test was made up of sorting items. For this section, eight cards were designed with illustrations depicting activities or objects normally done or used either in the daytime or at night.

Section three consisted of cards that represent sequence of activities done in the day by children. The cards were designed, disordered and kept in a bowl for the

children to rearrange in the order in which they are done in the day. There were five items in this section.

After the test was constructed, it was given to a test and measurement expert together with the table of specification to ascertain the relevance, accuracy, suitability and spread of the questions across cognitive domains that are appropriate to respondents' developmental level. After this, a test retest reliability coefficient of four weeks interval was carried out on fifteen children comprising five children in each age group. A reliability coefficient of 0.863 was obtained.

Pilot study was conducted using 45 children consisting of 15 children in each age group of three, four and five years old. The result of the pilot study showed that the test was valid and reliable for generating correct data for answering the research questions and testing the hypotheses. After the test-retest reliability measure and the pilot study, it was found that the item on prayer should not be included in the ordering activity because the time when children pray differ with families and religion.

The second instrument which is observation schedule was developed using time words identified in nursery school story books and an observation coding sheet was designed for recording data. Forty-five time words from nursery school literature were coded 'a' to 'as' on an observation sheet for recording children's response. An additional column was added for any time word not coded but which may be used by any child. The observation sheet was also validated by the experts in test and measurement and child development

3.5. VALIDITY AND RELIABILITY OF THE INSTRUMENT.

Test items were derived from the story read to the children as well as from the typical routine activities of the children. The comprehension questions were given to

three different independent experts one each in child development, test and measurement, English education and eliminate items that were ambiguous, repetitive and irrelevant. The child development expert determined the developmental appropriateness of the items in view of research findings on children's cognitive development. The test and measurement expert ascertained the strength and spread of the questions across cognitive domains while the English Education expert determined the accuracy of the questions for eliciting the correct kind of information. After this, the experts scrutinized for content validity in view of the purpose and hypotheses of the study. A test- retest reliability of four weeks interval was carried out to ensure consistency of response. Finally, the instruments (test and observation) were pilot tested on 45 children with similar characteristics as the sample but different in location from that of the sample.

3.6 PROCEDURE FOR DATA COLLECTION

The children were tested individually on the instrument in two sessions. In the first session the story was told to children and then a second time the story was told so that the children would identify target words from test plates. The researcher asked the children to touch the illustration that represents the words or phrase that is the answer to the question she had asked. For example if the researcher asks " when did Nina arrive at grandmother's house?'' The child was expected to touch an illustration that depicts afternoon. The procedure for the comprehension test was the same as the PPVT-R (Peabody Picture Vocabulary Revised) by Dunn & Dunn (1981) which requires that the children be asked to touch a named item on the test plate.

Section II and III of the test were administered the next day. This was a set of disordered pictures which were given to the child to rearrange according to the

order of occurrence of events in the day. Five picture cards consisting of brushing teeth, bathing, going to school, playing and sleeping were provided. After this, a box containing illustrations of activities done at distinct times of the day was given to the child to sort out those activities that are done in the daytime and at night:

A). Daytime – playing, in the classroom, drying clothes, market scene

B). Night - sleeping, lamp, stars/moon. Torch light.

The test was administered in the morning from 8.00am to 11.00am in either the school library or a room provided by the school. Session one of the test lasted 25-30 minutes with each child while session two lasted 8-15 minutes with each child as well.

Information on the use of time words was collected using participant observation. A trained research assistant was attached to the researcher as class assistant of the classes in which the children were to be observed for six weeks. The research assistant was trained on how to record observation using the coded sheets. The training took the form of explanation and demonstration. The research assistant holds a master's degree in child development. Reponses were recorded using special coding sheets prepared for recording data. In scoring, the use of time words was rated on a 5-point scale:

1. Always (100% of respondents used the time word);
2. Often (50-99% of respondents used the time word);
3. Sometimes (20-49% of respondents used the time word);
4. Rarely (1-19% of the respondents used the time word) and
5. Never (0% none of the respondents used the time word).

The assistant researcher spent three days with the researcher observing how to record the responses before she was allowed to carry on by herself.

The data collected through observation was collated based on the frequency of the use of each time word to determine the lower and upper levels of the zone of proximal development of each time word as well as time words in the zone of proximal development.

1. lower limit- these were time words that fell in scale 1 and 2. These were time words that were always or often used by all or 50 to 99% of respondents in an age group. The lower limits were given the scale of 1 and 2 as it was based on ranking therefore always(100%) rank first (1) often (50-99%) rank second (2) and words in these ranks served as the lower and refer to words that children used independent or to solve problem unaided.

2. Zone of Proximal Development(ZPD). These were time words that fell in scale 3 and 4. They were time words that were sometimes or rarely used by 1 to 49% of the respondents.

3. Upper limit of the zone of proximal development were time words that fell in scale **5** – (0%) and are time words that were never used by any child within the age group. The sample of the recording sheet is presented in Appendix 5. The behavior was observed in natural settings/real world in the classrooms, playground and lunchtime. A tape recorder was used to record pupils' talk in the classroom. playground and lunch time.

3.7 METHOD OF DATA ANALYSIS

Data collected for answering the research questions was analyzed using mean, standard deviation and percentages, while the data collected for testing hypotheses one and the research questions four was analyzed using one-way ANOVA. The rationale for choosing this statistics is that the hypotheses required a comparison of

the means of three groups namely, pupils aged three years, four years, and five years old. The formula for computing one-way ANOVA is:

$$F = \frac{MS_b}{MS_e}$$

Where,

F is the F value

MS_b is mean square between groups

MS_e is mean square error, or within groups.

t-test was used to analyze the data on hypotheses two and three because these hypotheses were testing the differences between two groups; between male and female children use of time words. and between pupils in schools in the urban area and those in rural areas.

The formula for computing t-test is:

$$t = \frac{x_1 - x_2}{Sx_1 - x_2}$$

Where,

t = t-score

S = standard deviation

x_1 = mean of group one

x_2 = mean of group two

CHAPTER FOUR

RESULT AND DISCUSSION

The research aimed at investigating the understanding of time words/ concepts in story books and other literature of children aged three to five years in early childhood education in the areas of comprehension of time words, and ascertaining time words in the zone of proximal development and time words operating at the lower and upper levels of the zone of proximal develop for each of the age groups involved in the study.

The results of the data analysis are presented and discussed in line with seven research questions and four hypotheses.

4.1 Answering The Research Questions

Research question one- What is the mean and standard deviation of the performance of time words of children whose ages are children three, four and five years old on the Time Word Vocabulary Comprehension test?

Table 2: Mean Score and Standard Deviations of Time Word Comprehension of Children Three to Five Years Old.

Age	N	Mean	Std. Deviation
3 years old	40	67.25	19.25
4 years old	40	71.25	20.34
5 years old	40	87.75	12.19
Total	120	75.41	19.62

Research question two- What is the mean score of understanding of each time words in the story “Nina visits her grandmother” by children three to five years in Nursery and preprimary schools?

Table 3: Time Word Understanding of Three Year Old Children

Time Word	N	F	%	X	FX	$\bar{x}$
Age(five year old girl)	40	28	70	4	112	2.80
Age(an old woman)	40	27	67.50	4	108	2.70
Morning	40	25	62.50	4	100	2.50
Afternoon	40	21	52.50	4	84	2.10
Evening	40	12	30	4	48	1.20
6 'o clock	40	17	42.50	4	68	1.70
Night	40	27	67.50	4	108	2.70

Figure 4- Bar Chart of Time Word Understanding of Three Year Old Children

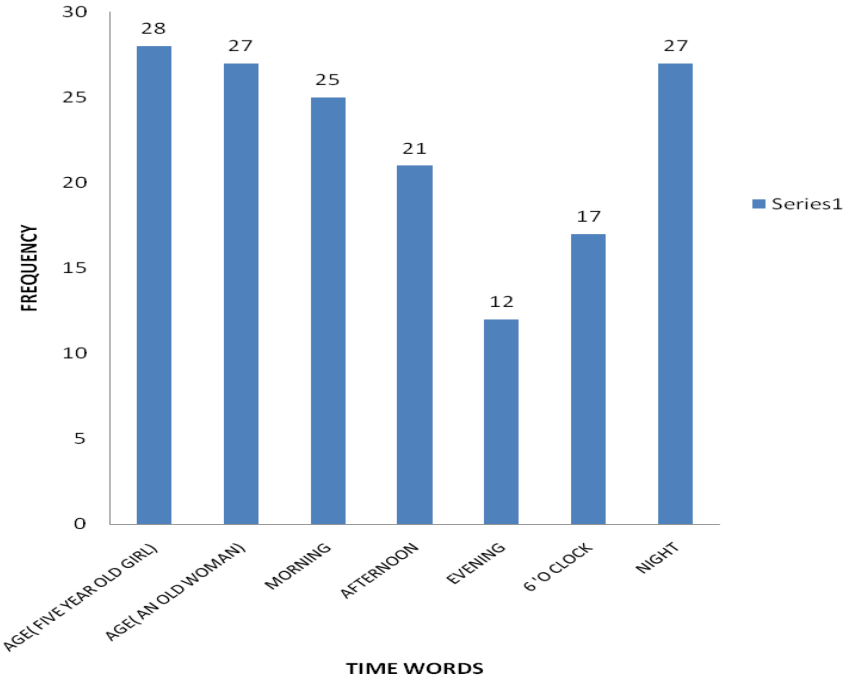


Table 4- Time Word Understanding of Four Year Old Children

Time word	N	F	%	X	FX	$\bar{x}$
Age(five year girl)	40	36	90	4	144	3.60
Age(grand mother)	40	33	82.50	4	132	3.30
Morning	40	35	87.50	4	140	3.50
Afternoon	40	29	72.50	4	116	2.90
Evening	40	21	52.50	4	84	2.10
6 'o clock	40	25	62.50	4	100	2.50
Night	40	35	87.50	4	140	3.50

Figure 5- Bar Chart of Time Word Understanding of Four Year Old Children

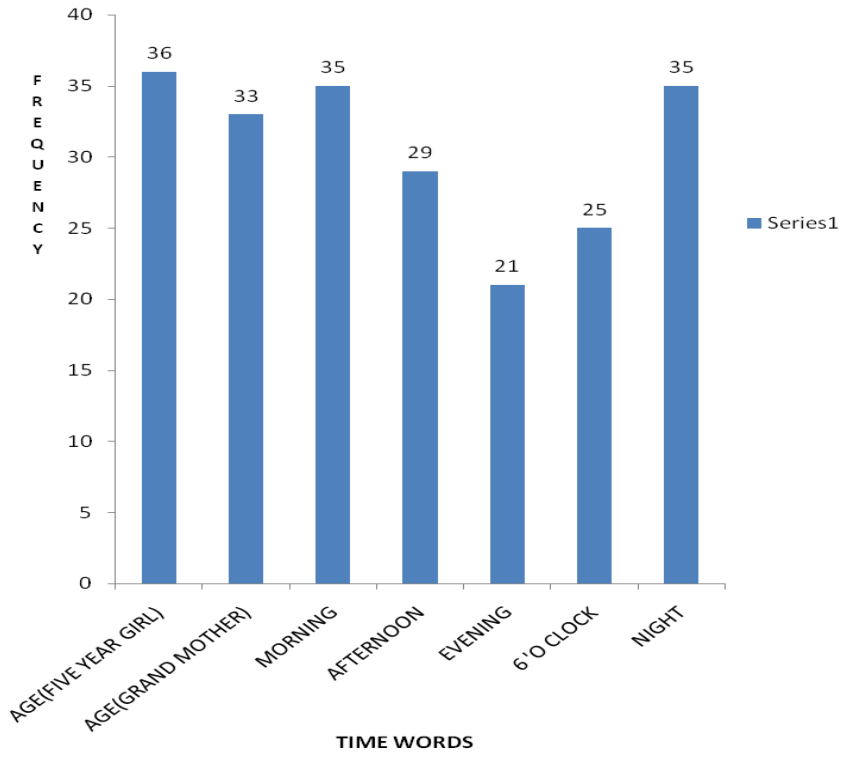
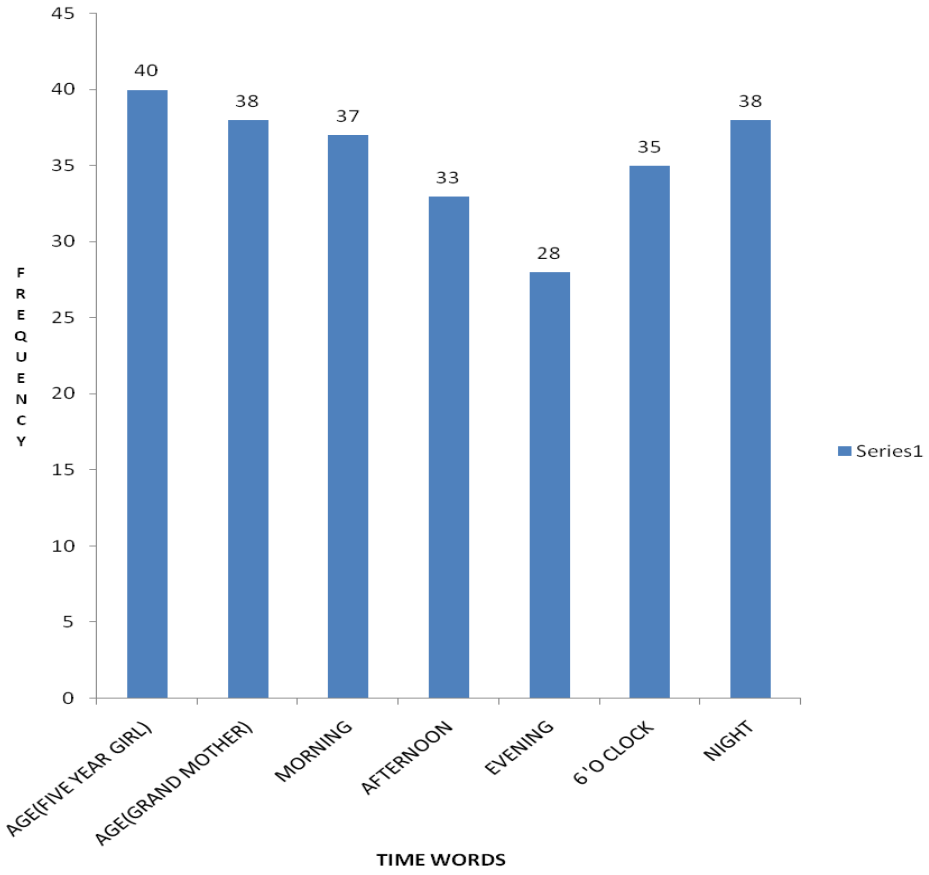


Table 5- Time Word Understanding of Five Year Old Children

Time word	N	F	%	X	FX	$\bar{x}$
Age(five year girl)	40	40	100	4	160	4
Age(grand mother)	40	38	95	4	152	3.80
Morning	40	37	92.50	4	148	3.70
Afternoon	40	33	82.50	4	132	3.30
Evening	40	28	70	4	112	2.80
6 'o clock	40	35	87.50	4	140	3.50
Night	40	38	95	4	152	3.80

Figure 6- Bar Chart of Time Word Understanding of Five Year Old Children



Tables 2- showed the mean and standard deviations of scores of respondents on the time word vocabulary comprehension test. There is increase in the mean score from three years old to five years old.

Tables 3-5 show the frequency distribution of the scores of the respondents by age on each of the time words contained in the story. At three years, the children showed understanding of age, morning, night and afternoon; while clock time and evening were not yet understood. Four year old children showed better understanding of the time words as the percentage of respondents who showed understanding of the time words were higher than those of three year old children. The number of five year old children who understood the time words contained in the story also improved over those of four year old.

Research question three- Which time words do children aged three to five years use in nursery and preprimary schools?

TABLE 6-Percentage Showing Time Words Used by Three Year Old Children

TIME WORD CODE	N	F	%
Morning	40	40	100
Afternoon	40	7	17.5
Night	40	12	30
Evening	40	0	0
Day	40	0	0
Today	40	0	0
Now	40	0	0
Soon	40	0	0
Later	40	0	0
Snack time	40	0	0
Lunch time	40	0	0
Breakfast	40	1	2.5
Dinner	40	0	0
Before	40	0	0
After	40	0	0
Sunset	40	0	0
Sunrise	40	0	0
Story time	40	0	0
Late	40	0	0
Early	40	0	0
First	40	14	35
Last	40	5	12
Yesterday	40	0	0
Tomorrow	40	1	2.5
Clossing time	40	4	10
Rest time	40	1	2.5
Break time	40	7	17.5
When	40	0	0
Sunday	40	0	0
Monday	40	3	0
Tuesday	40	2	5
Wednesday	40	1	2.5
Thursday	40	1	2.5
Friday	40	0	0
Saturday	40	0	0
Few days ago	40	0	0
Last week	40	0	0
Next week	40	0	0
Age	40	23	57.5
Saying clock time	40	0	0
Saying one's birthday	40	0	0
Month of the year	40	0	0
Season/important day	40	0	0
Past	40	0	0
Future	40	0	0
Date	40	0	0

Figure 7- Bar Chart of Time Words Used by Three Year Old Children

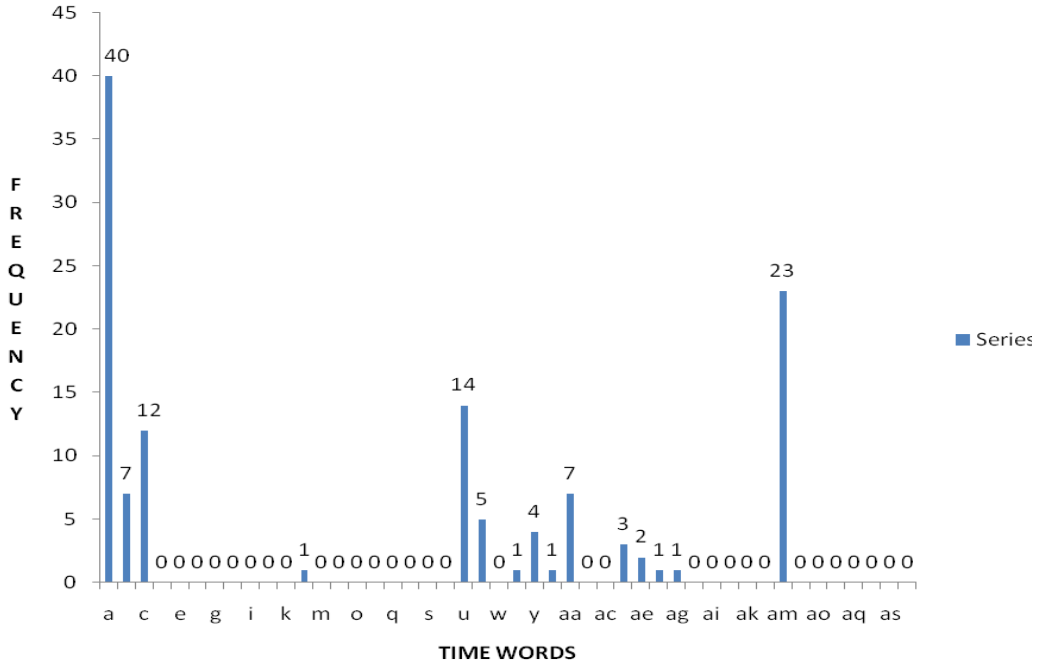


Table 7: Percentage Showing Time Words Used by Four Year Old Children

TIME WORDS	N	F	%
Morning	40	40	100
Age	40	23	67.50
First	40	14	52.50
Night	40	11	27.50
Afternoon	40	8	20
Break time	40	20	50
Last	40	10	25
Closing time	40	2	5
Monday	40	0	0
Tuesday	40	0	0
Breakfast	40	3	7
Tomorrow	40	8	20
Rest time	40	3	7.50
Wednessday	40	0	0
Thursday	40	6	15
Evening	40	0	0
Day	40	1	2.50
Today	40	12	30
Now	40	8	20
Soon	40	14	35
Later	40	31	77.50
Snack time	40	17	42.50
Lunch time	40	1	2.50
Dinner	40	6	15
Before	40	15	37.50
After	40	0	0
Sunset	40	26	65
Sunrise	40	7	17.50
Story time	40	6	15
Late	40	4	10
Early	40	0	0
Yesterday	40	10	25
When	40	4	10
Sunday	40	3	7.50
Friday	40	1	2.50
Saturday	40	0	0
A few days ago	40	0	0
Last week	40	0	0
Next week	40	36	90
Age	40	7	17.50
Saying clock time	40	21	52.50
Saying one's birthday	40	11	27
Month of the year	40	5	12.50
Seasons/day of important event	40	15	37.50
Past	40	10	25
Future	40	3	7.50

Figure 8: Bar Chart Showing Time Words Used by Four Year Old Children

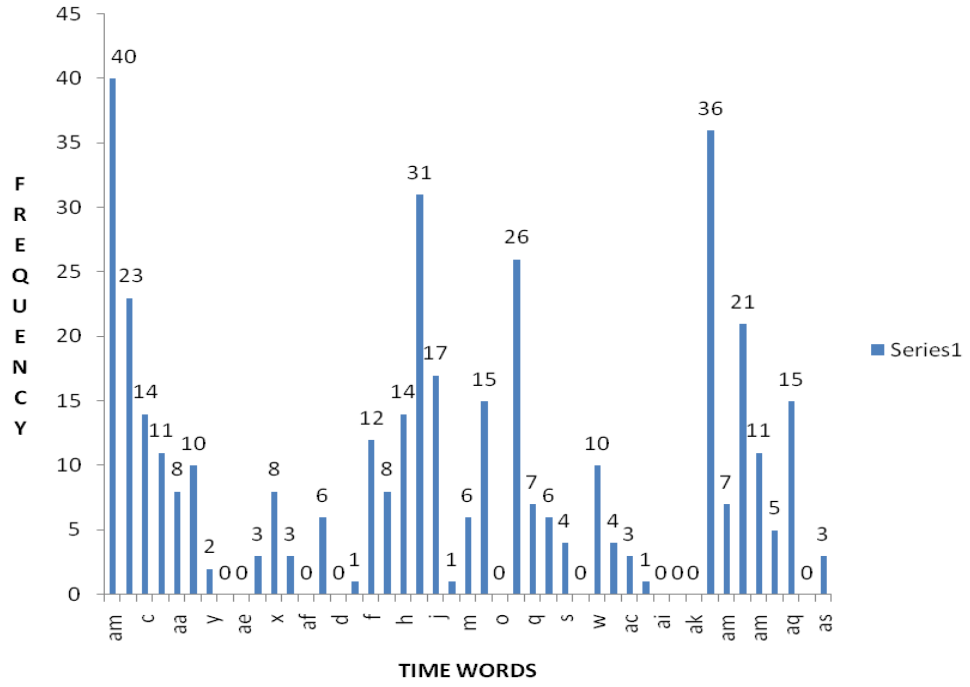
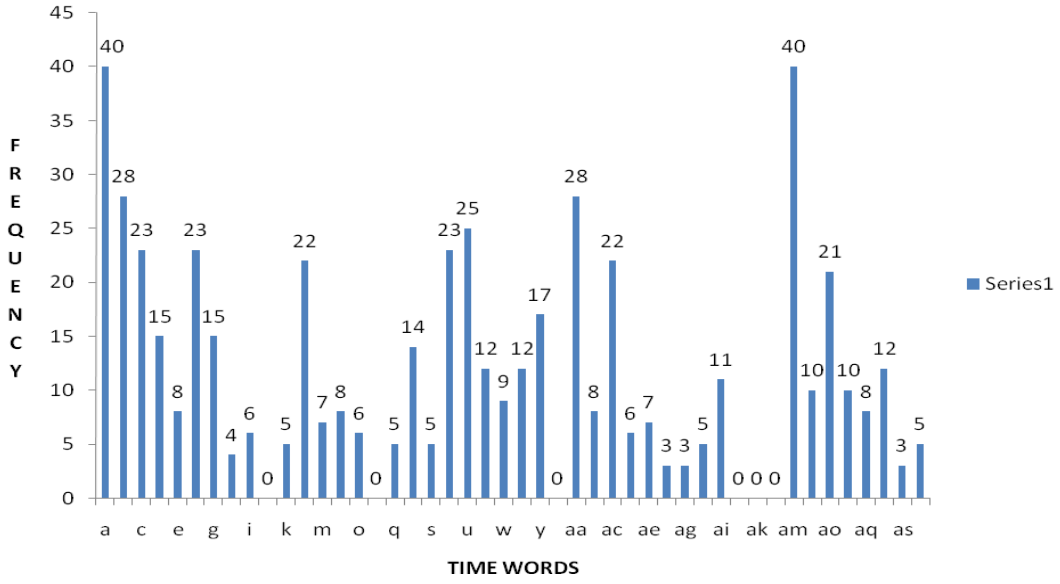


Table8: Percentage Showing Time Words Used by Five Year Old Children

TIME WORD CODE	N	F	%
Morning	40	40	100
Afternoon	40	28	70
Night	40	23	57.50
Evening	40	15	37.50
Day	40	8	20
Today	40	13	57.50
Now	40	15	37.50
Soon	40	4	10
Later	40	6	15
Snack time	40	0	0
Lunch time	40	5	12.50
Breakfast	40	13	55.00
Dinner	40	7	17.50
Before	40	8	20
After	40	6	15
Sunset	40	0	0.00
Sunrise	40	5	12.50
Story time	40	14	35
Late	40	5	12.50
Ealry	40	23	57.50
First	40	25	62.50
Last	40	12	30
Yesterday	40	9	22.50
Tomorrow	40	12	30
Closing time	40	17	42.50
Rest time	40	0	0
Break time	40	28	70
When	40	8	20
Sunday	40	12	55
Monday	40	6	15
Tuesday	40	7	17.50
Wednesday	40	3	7.50
Thursday	40	3	7.50
Friday	40	5	12.50
Saturday	40	11	27.50
A few days ago	40	0	0
Last week	40	0	0
Next week	40	0	0
Age	40	40	100
Saying clock time	40	10	25
Saying one's birthday	40	21	52.50
Month of the year	40	10	25
Seasons/day of import event	40	8	20
Past	40	12	30
Future	40	3	7.50
Saying date	40	5	12.50

Figure 9: Bar Chart of Time Words Used by Five Year Old Children



The use of time words was rated on a 5 point scale.

i) Always-1 (100%) (ii) Often-2 (50-99%) (iii) Sometimes-3 (20-49%) (iv) Rarely used-4 (1-19%) (v) Never-5 (0%).

Table 6 show that the time words used by children three years are morning and saying their own age, for example, “I am three years old”. Night, afternoon, first, break time, last, -yesterday, Monday, Tuesday, breakfast, tomorrow, rest time, Wednesday and Thursday were time words in the zone of proximal development. Thirty-one of the time words were not used at all by any of the 3 year old children. These words were evening, day, today, now, soon, later, snack time, lunch time , dinner (dinner/supper), before, after, sunset, sunset, story time, late, early, closing time, rest time, when, Sunday, Friday, Saturday, few days ago, last week, next week, clock time, month of the year, season/day of important event, past, future, and date.

Table 7 presents time words used by four year old children. At four years children used morning, say their ages, afternoon, break time, night, saying one’s birthday and today. The following words were emerging in the vocabulary of the pupils past tense, last, closing time, story time, early, evening, month of the year, now, Wednesday, day, breakfast, asking question with ‘when’, saying clock time, Sunday, tomorrow, season, Monday, Thursday, lunch time, dinner(super), Friday, saying date, soon, sunrise, yesterday and Saturday. None of the respondents at four years used any of the following words later, snack time, before, sunset, rest time, Tuesday, a few days ago, last week, next week and future .

At five years old, children showed slight improvement in the use of time words. They used the following time word fluently morning, saying their age, night, later, early, break time, Sunday and saying their own birthday. However, the following time

words were emerging day, now, story time, last, tomorrow, closing time, past, before, yesterday, asking question using ‘when’, Saturday, saying clock time, season, soon, snack time, lunch, dinner, sunrise, late, Monday, Friday, future and saying date.

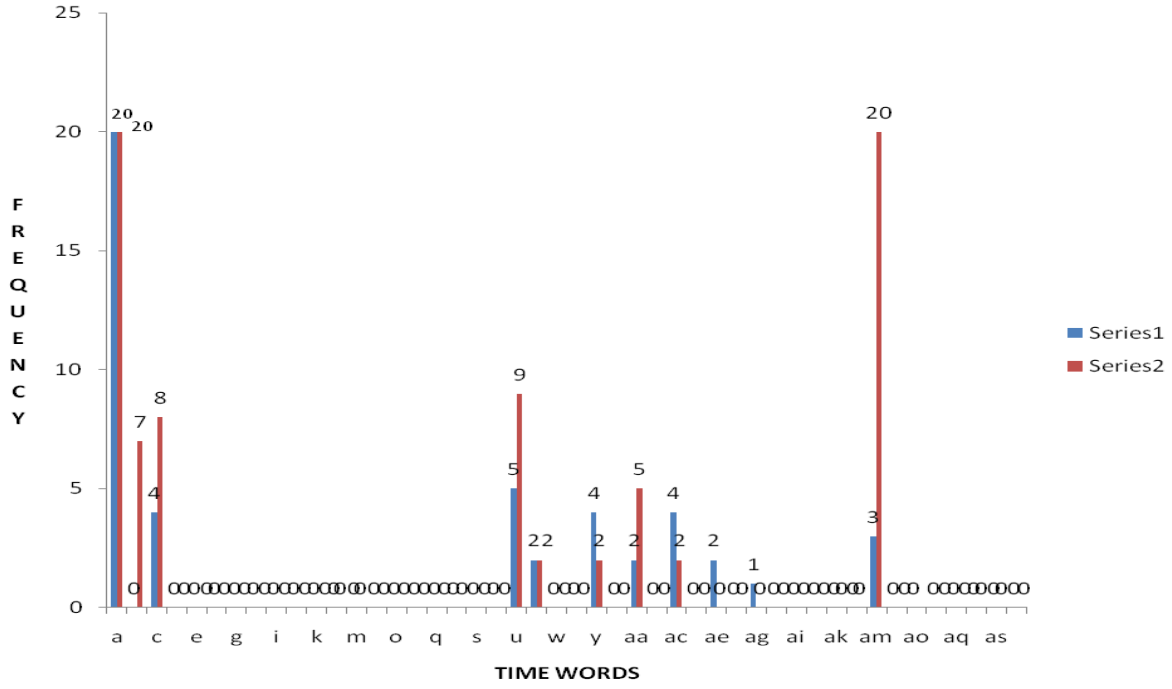
The time words that none of the respondents at five years used were snack time, sunset, rest time, a few days ago, last week and next week.

Research question four- Is there any difference in the number of time words used by children in urban areas and those used by children in rural areas?

Table 9: Comparison of Time Words Used by Three Year Old Rural And Urban Children

Time Word	Rural	%	Urban	%
Morning	20	100	20	100
Afternoon	0	0	7	35
Night	4	20	8	40
Evening	0	0	0	0
Day	0	0	0	0
Today	0	0	0	0
Now	0	0	0	0
Soon	0	0	0	0
Later	0	0	0	0
Snack time	0	0	0	0
Lunch time	0	0	0	0
Breakfast	0	0	0	0
Dinner	0	0	0	0
Before	0	0	0	0
After	0	0	0	0
Sunset	0	0	0	0
Sunrise	0	0	0	0
Story time	0	0	0	0
Late	0	0	0	0
Early	0	0	9	45
First	5	25	9	45
Last	2	10	2	10
Yesterday	0	0	0	0
Tomorrow	0	0	0	0
Closing time	4	20	2	10
Rest time	0	0	0	0
Break time	2	10	5	25
When	0	0	0	0
Sunday	0	0	0	0
Monday	0	0	3	15
Tuesday	2	10	0	0
Wednesday	1	5	0	0
Thursday	0	0	0	0
Friday	0	0	0	0
Saturday	0	0	0	0
A few days ago	0	0	0	0
Last week	0	0	0	0
Next week	0	0	0	0
Age	3	15	20	100
Saying clock time	0	0	0	0
Snack time	0	0	0	0
Sunset	0	0	0	0
Rest time	0	0	0	0
A few days ago	0	0	0	0
last	0	0	0	0
Next year	0	0	0	0

Figure 10- Multipls Bar Chart of Time Words Used by Three Year Old Children in Rural and Urban Areas

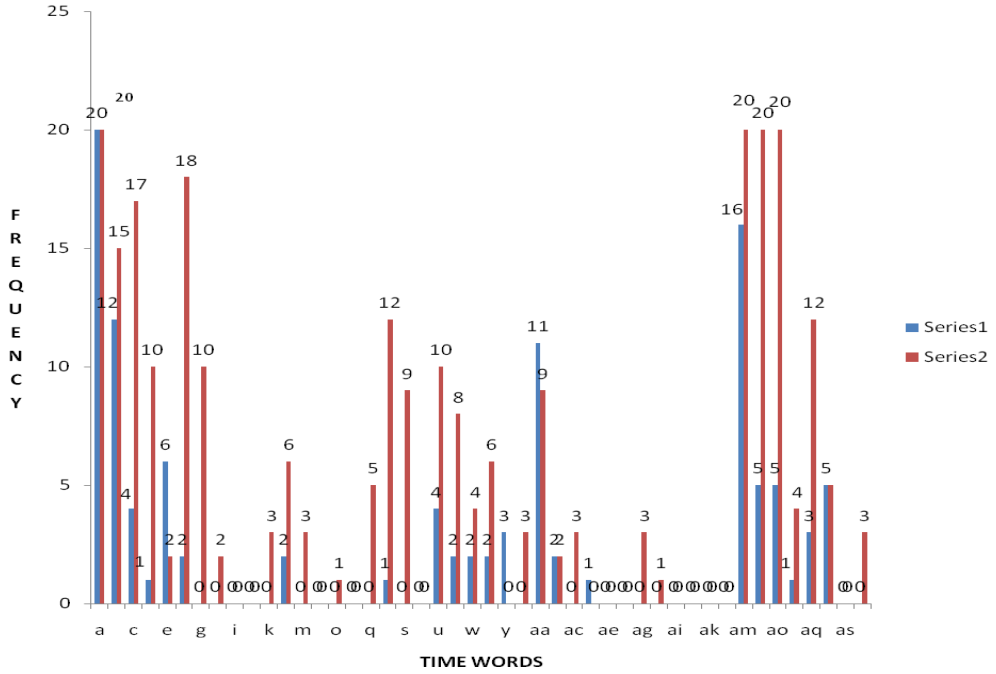


RURAL= BLUE COLOR
URBAN= RED COLOR

Table 10: Comparison of Time Word Used by Four Year Old Rural and Urban Children

Time word code	Rural	%	Urban	%
Morning	20	100	20	100
Afternoon	12	60	15	75
Night	4	20	17	85
Evening	1	5	10	50
Day	6	30	2	10
Today	2	10	18	90
Now	0	0	10	50
Soon	0	0	2	10
Later	0	0	0	0
Snack time	0	0	0	0
Lunch time	0	0	3	15
Breakfast	2	10	6	30
Dinner	0	0	3	15
Before	0	0	0	0
After	0	0	1	5
Sunset	0	0	0	0
Sunrise	0	0	5	0
Story time	1	5	12	60
Late	0	0	9	30
Early	0	10	0	50
First	4	20	10	75
Last	2	10	8	40
Yesterday	2	10	4	20
Tomorrow	2	10	6	30
Closing time	2	15	0	0
Rest time	0	0	3	15
Break time	11	55	9	45
When	2	10	2	10
Sunday	0	0	3	15
Monday	1	5	0	0
Tuesday	0	0	0	0
Wednesday	0	0	0	0
Thursday	0	0	3	15
Friday	0	0	1	5
Saturday	0	0	0	0
A few days ago	0	0	0	0
Last week	0	0	0	0
Next week	0	0	0	0
Age	16	80	20	100
Saying clock time	5	25	20	100
Saying one's birthday	5	25	20	100
Month of the year	1	5	4	20
Seasons/day of import event	3	15	12	60
Past	5	25	5	25
Future	0	0	0	0
Saying date	0	0	3	15

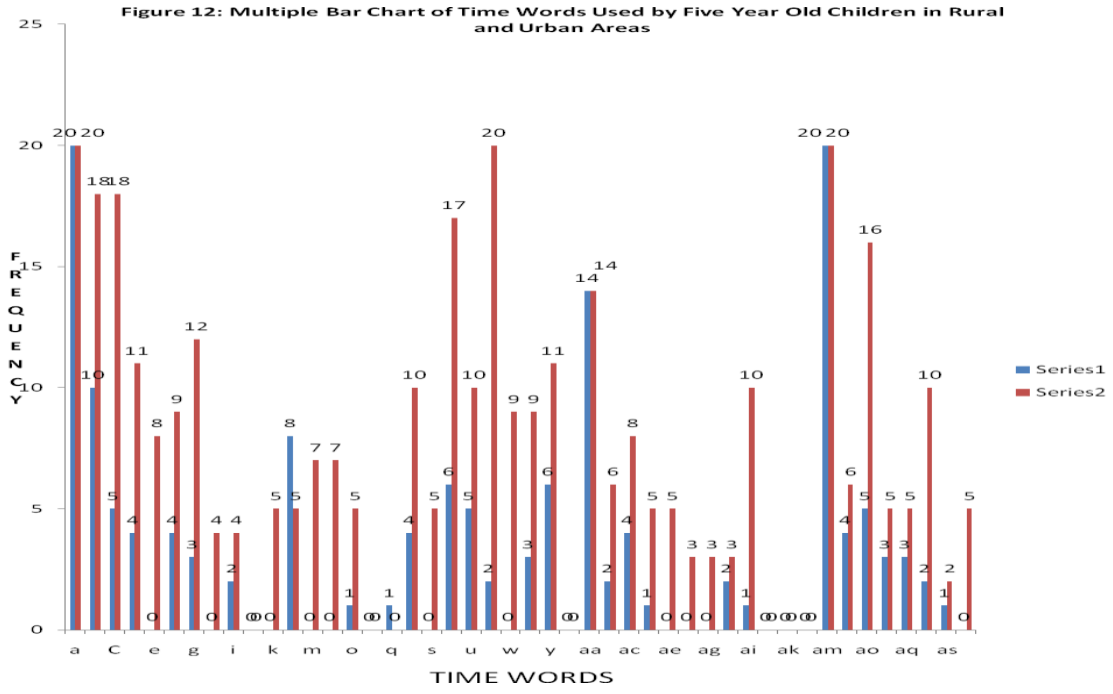
Figure 11: Multiple Bar Chart of Time Words Used by Four Year Old Children in Rural and Urban Areas



RURAL= BLUE COLOR
URBAN= RED COLOR

Table 11: Comparison of Time Word Used by Five Year Old Rural and Urban Children

Time Word	Rural	%	Urban	%
Morning	20	100	20	100
Afternoon	10	50	18	90
Night	5	25	18	90
Evening	4	20	11	55
Day	0	0	8	40
Today	4	20	9	45
Now	3	15	12	60
Soon	0	0	4	20
Later	2	10	4	20
Snack time	0	0	0	0
Lunch time	0	0	0	25
Breakfast	8	40	5	25
Dinner	0	0	17	70
Before	0	0	7	35
After	1	5	5	25
Sunset	0	0	0	0
Sunrise	1	5	0	0
Story time	4	20	10	50
Late	0	0	5	25
Ealry	6	30	17	75
First	5	25	10	75
Last	2	10	20	100
Yesterday	0	0	9	45
Tomorrow	3	15	9	45
Closing time	4	20	11	55
Rest time	0	0	0	0
Break time	14	70	4	70
When	2	10	6	30
Sunday	4	20	8	40
Monday	1	5	5	25
Tuesday	0	0	5	25
Wednesday	0	0	3	15
Thursday	0	0	3	15
Friday	2	10	3	15
Saturday	1	5	10	50
A few days ago	0	0	0	0
Last week	0	0	0	0
Next week	0	0	0	0
Age	20	100	20	100
Saying clock time	4	20	6	30
Saying one's birthday	5	25	16	80
Month of the year	3	15	5	25
Seasons/day of important event	3	15	5	25
Past	2	10	10	50
Future	1	5	2	10
Saying date	0	0	5	25



RURAL= BLUE COLOR
URBAN= RED COLOR

Tables 9,10 and 11 show that children in urban areas used more time words than children in the rural areas and for each time word the children used, more number of children in the urban areas than the number of children in the rural areas used the word except for closing time and Monday at three years old; day at four years old and breakfast and sunrise at five years old. This finding differs from the finding obtained from the difference between rural and urban children in understanding time words in hypothesis three. One explanation for this could be that the children in the urban area have more expressive English words than the children in the rural areas. The result might be different if the mother tongues were used in the rural areas.

Research question five- What is the sequence of time words used by children aged three to five years old?

Table 12 Sequence of Time Words Used by Three Year Old Children

Time Word	N	F	Rank
Morning	40	40	1
Age	40	23	2
First	40	14	3
Night	40	12	4
Afternoon	40	7	5
Break time	40	7	5
Last	40	5	6
Closing time	40	4	7
Monday	40	3	8
Tuesday	40	2	9
Breakfast	40	1	10
Tomorrow	40	1	10
Rest time	40	1	10
Wednessday	40	1	10
Thursday	40	1	10
Evening	40	0	-
Day	40	0	-
Today	40	0	-
Now	40	0	-
Soon	40	0	-
Later	40	0	-
Snack time	40	0	-
Lunch time	40	0	-
Dinner	40	0	-
Before	40	0	-
After	40	0	-
Sunset	40	0	-
Sunrise	40	0	-
Story time	40	0	-
Late	40	0	-
Early	40	0	-
Yesterday	40	0	-
When	40	0	-
Sunday	40	0	-
Friday	40	0	-
Saturday	40	0	-
A few days ago	40	0	-
Last week	40	0	-
Next week	40	0	-
Saying clock time	40	0	-
Saying one’s birthday	40	0	-
Month of the year	40	0	-
Seasons/day of important event	40	0	-
Past	40	0	-
Future	40	0	-
Saying date	40	0	-

Figure 13- Bar Chart Showing the Sequence of Time Words Used by Three Year Old Children

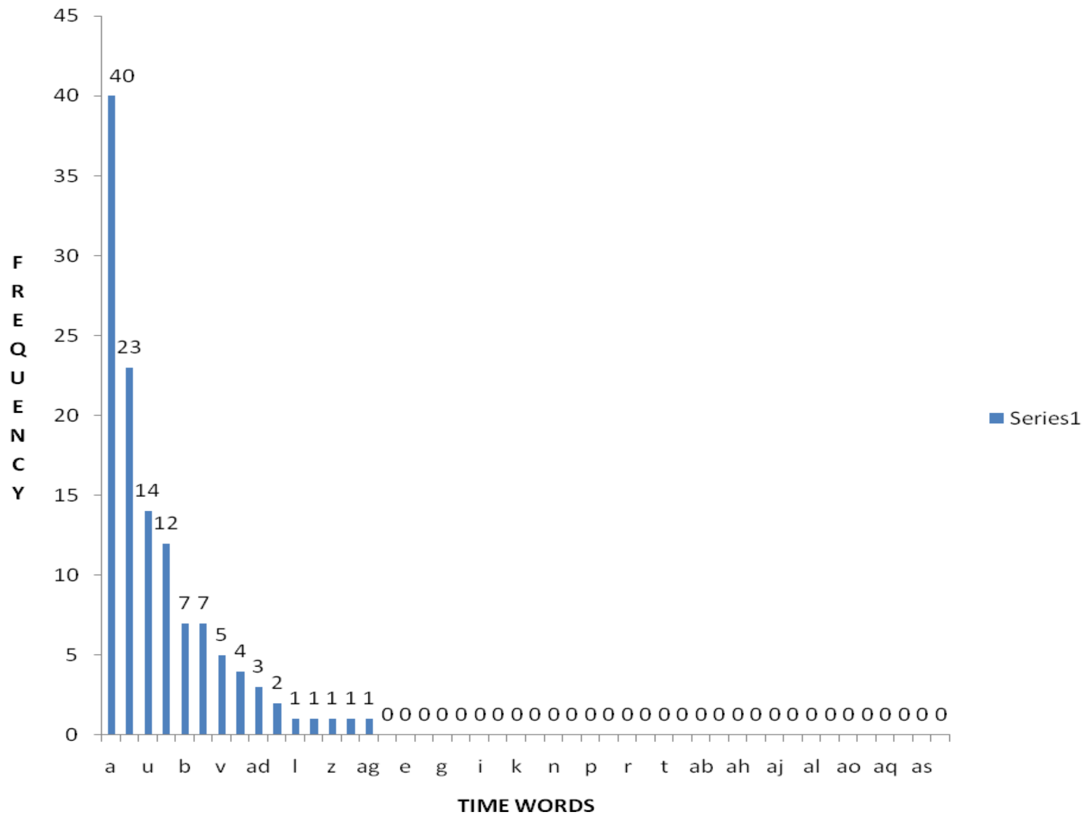


Table 13: Sequence of Time Words Used by Four Years Old

Time Word	N	F	Rank
Morning	40	40	1
Age	40	36	2
First	40	31	3
Afternoon	40	27	4
Break time	40	26	5
Last	40	21	6
Saying one's birthday	40	21	6
Today	40	20	7
First	40	17	8
Past	40	15	9
Closing time	40	15	9
Early	40	12	10
Evening	40	11	11
Month of the year	40	11	11
Wednesday	40	10	12
Now	40	10	12
Day	40	8	13
Later	40	8	13
Late	40	8	13
When	40	7	14
Saying clock time	40	7	14
After	40	6	15
Tomorrow	40	6	15
Sunday	40	5	15
Seasons/day of important event	40	5	16
Monday	40	4	17
Thursday	40	4	17
Lunch time	40	3	18
Dinner	40	3	18
Friday	40	3	18
Saying date	40	2	19
Soon	40	2	20
Sunrise	40	1	20
Yesterday	40	1	20
Saturday	40	1	20
Yesterday	40	0	-
Later	40	0	-
Snack time	40	0	-
Before	40	0	-
Rest time	40	0	-
Saturday	40	0	-
Last week	40	0	-
Next week	40	0	-
Sunset	40	0	-
Future	40	0	-
Rest time	40	0	-
Tuesday	40	0	-

Figure 14: Bar Chart Showing Time Words Used by Four Year Old Children

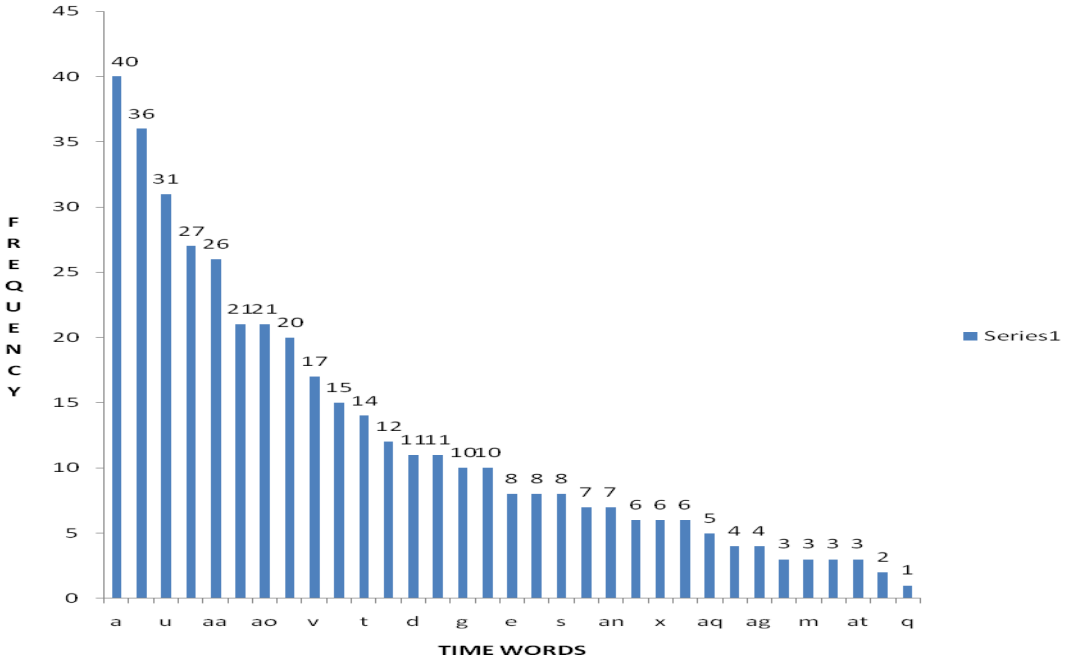


Table 14: Bar Chart Showing Sequence of Time Words Used by Five Year Old Children

Time Word	N	F	Rank
Morning	40	40	1
Age	40	40	1
Afternoon	40	28	2
Break time	40	28	2
First	40	25	3
Night	40	23	4
Today	40	23	4
Early	40	23	4
Breakfast	40	22	5
Sunday	40	22	5
Saying one's birthday	40	21	6
Clossing time	40	17	7
Evening	40	15	8
Now	40	15	8
Story time	40	14	9
Last	40	12	10
Tomorrow	40	12	10
Past	40	12	10
Saturday	40	11	11
Saying clock time	40	10	12
Month of the year	40	10	12
Yesterday	40	9	13
Day	40	8	14
Before	40	8	14
When	40	8	14
Season/important day	40	8	14
Dinner	40	7	15
Tuesday	40	7	15
Later	40	6	16
After	40	6	16
Monday	40	6	16
Lunch time	40	5	17
Sunrise	40	5	17
Late	40	5	17
Friday	40	5	17
Date	40	5	18
Soon	40	4	19
Wednesday	40	3	20
Thursday	40	3	20
Future	40	0	21
Snack time	40	0	-
Sunset	40	0	-
Rest time	40	0	-
Few days ago	40	0	-
Last week	40	0	-
Next week	40	0	-

The sequence of time word acquisition from the time words used by pupils show that children;

a) At three years old children understand the time words in the story in the following order age, night, morning, afternoon, clock time and evening. But in the use, children at this age use morning, first, afternoon, break time, last, yesterday, Monday, Tuesday and the following words were used by just one child in the age group, breakfast, tomorrow, rest time, Wednesday and Thursday.

b) At four years old the order of understanding the time word used in the story was age, night, morning, afternoon, clock time and evening. However the order in which time word were used with mastery was morning, age, first, afternoon, night, break time, today, last, closing time, early story time, month of the year, evening, Wednesday, now, day, breakfast, late, when, clock time, after, tomorrow, Sunday, season, Monday, Thursday, lunch time, dinner, Friday, saying date, soon, sunrise and yesterday.

c) At five years, the sequence in which the respondents understood time word was age, night, morning, clock time, afternoon and evening.

The order of time words used according to mastery level was morning, age, afternoon, break time, first, night, today, early, breakfast, Sunday, saying their own birthday, closing time, evening now, story time, last, tomorrow, past, Saturday, clock time, month, day, before, when, season, dinner/supper, Tuesday, after, Monday, lunch time, sunrise, late, Friday, day soon, Wednesday, Thursday, future, snack time, sunset, rest time, a few days ago, last week and next week.

Research question six- Which time words are operating at the lower and upper limits of the zone of proximal development for children aged three, four and five years old in the area of time concept formation?

The zone of proximal development was determined through the mastery level of each of the time words used by the respondents. The data is presented in tables 14, 15 and 16.

Mastery of the use of time words was determined by the score of the time word on the scale of mastery as follows:

i. Always 100% of respondents(1)

ii. Often 50-90% of respondents (2)

iii. Sometimes 20-49% of respondents (3)

iv. Rarely 1-19% of respondents (4)

v. Never 0% of respondents (5)

- lower limit of zone of proximal. These were time words whose scale ranked at 1 and 2.

- Zone of proximal development. These were time words whose scale ranked 3 and 4.

Upper limit of zone of proximal development. These were time words whose scale ranked 5

Table 15 - Zone of Proximal Development of Time Words Used by Three Year Old Children

Time Word Code	N	F	Rank	
Morning	40	40	1	Lower limit of Zone Proximal Development
Saying one's age	40	23	2	
First	40	14	3	
Night	40	12	3	
Afternoon	40	7	4	Zone Proximal Development
Break time	40	7	4	
Last	40	5	4	
Closing time	40	4	4	
Monday	40	3	4	
Tuesday	40	2	4	
Breakfast	40	1	4	
Tomorrow	40	1	4	
Resting time	40	1	4	
Wednesday	40	1	4	
Thursday	40	1	4	
Evening	40	0	5	Upper Limit Zone Proximal Development
Day	40	0	5	
Today	40	0	5	
Now	40	0	5	
Soon	40	0	5	
Later	40	0	5	
Snack time	40	0	5	
Lunch time	40	0	5	
Dinner	40	0	5	
Before	40	0	5	
After	40	0	5	
Sunset	40	0	5	
Sunrise	40	0	5	
Story time	40	0	5	
Late	40	0	5	
Early	40	0	5	
Yesterday	40	0	5	
When	40	0	5	
Sunday	40	0	5	
Friday	40	0	5	
Saturday	40	0	5	
A few Days ago	40	0	5	
Last week	40	0	5	
Next week	40	0	5	
Saying clock time	40	0	5	
Saying one's birthday	40	0	5	
Month of the year	40	0	5	
Seasons/day of import event	40	0	5	
Past	40	0	5	
Future	40	0	5	
Saying date	40	0	5	

Table 16: Zone of Proximal Development of Time Words Used by Four Years Old Children

Time Word Code	N	F	Rank	
Morning	40	40	1	
Age	40	36	2	
First	40	31	2	
Afternoon	40	27	2	Lower Limit of Zone of Proximal
Break time	40	26	2	
Last	40	21	2	
Saying his/her own birhday	40	21	2	
Today	40	20	2	
First	40	17	3	
Past	40	15	3	
Closing time	40	15	3	
Early	40	12	3	
Evening	40	11	3	
Month of the year	40	11	3	
Wednesday	40	10	3	
Now	40	10	3	
Day	40	8	3	
Later	40	8	3	
Late	40	8	3	
When	40	7	4	
Saying clock time	40	7	4	
After	40	6	4	Zone of Proximal Development
Tomorrow	40	6	4	
Sunday	40	5	4	
Seasons/day of important event	40	5	4	
Monday	40	4	4	
Thursday	40	4	4	
Lunch time	40	3	4	
Dinner	40	3	4	
Friday	40	3	4	
Saying date	40	2	4	
Soon	40	2	4	
Sunrise	40	1	4	
Yesterday	40	1	4	
Saturday	40	1	4	
Snack time	40	0	5	
Later	40	0	5	
Snack time	40	0	5	
Before	40	0	5	
Rest time	40	0	5	
Saturday	40	0	5	Upper limit of the zone of proximal development
Last week	40	0	5	
Next week	40	0	5	
Sunset	40	0	5	
Future	40	0	5	
Rest time	40	0	5	
Tuesday	40	0	5	

Table 17: Zone of Proximal Development of Time Words Used by Five Years Old Children

Time Word Code	N	F	Rank	
Morning	40	40	1	
Age	40	40	1	
Afternoon	40	28	2	
Break time	40	28	2	
First	40	25	2	
Night	40	23	2	
Today	40	23	2	
Early	40	23	2	
Breakfast	40	22	2	
Sunday	40	22	2	
Saying one's birthday	40	21	2	Lower Limit of Zone of Proximal Deveopmen
Closing time	40	17	3	
Evening	40	15	3	
Now	40	15	3	
Story time	40	14	3	
Last	40	12	3	
Tomorrow	40	12	3	
Past	40	12	3	
Saturday	40	11	3	
Saying clock time	40	10	3	
Month of the year	40	10	3	
Yesterday	40	9	3	
Day	40	8	3	
Before	40	8	3	
When	40	8	3	
Season/important day	40	8	3	Zone of Proximal Development
Dinner	40	7	4	
Tuesday	40	7	4	
Later	40	6	4	
After	40	6	4	
Monday	40	6	4	
Lunch time	40	5	4	
Sunrise	40	5	4	
Late	40	5	4	
Friday	40	5	4	
Date	40	5	4	
Soon	40	4	4	
Wednesday	40	3	4	
Thursday	40	3	4	
Future	40	0	5	
Snack time	40	0	5	
Sunset	40	0	5	
Rest time	40	0	5	Upper limit of zone of proximal development
Few days ago	40	0	5	
Last week	40	0	5	
Next week	40	0	5	

Tables 15 16 and 17 show that the time words operating at the lower and upper limits of the zone of proximal development (ZPD) for children aged three, four and five are as follows:

a) Three years old

Lower limit- morning and saying his/her age.

Upper limit - evening, day, today, now, soon, later, snack time, lunch time, dinner, before, after, sunset, sunrise, story time, late, early, yesterday, when, Sunday, Friday, Saturday, a few days ago,last week,next week,saying clock time, saying own birth day, month, season, past, future and saying date.

b) Four years old

Lower limit- morning, age, first, afternoon, break time, last, saying his/her birthday and today.

Upper limit- yesterday, later, snack time, before, resting time, Saturday, last week, next week, sunset, future and Tuesday

c) Five years old

Lower limit- morning, age,afternoon,break time,first,night,today,early, breakfast, Sunday, and saying his/her birthday.

Upper limit- future,snack time,sunset,resting time,a few days ago,last,week and next week.

Research question seven - Which time words operate at the Zone of Proximal Deve- lopment (ZPD)for children aged three to five years in Nursery and preprimary schools?

Tables 15 16 and 17 show that the time words operating at the zone of proximal deve lopment (ZPD) for children age three, four and five years old are:

a) Three years old – first, night, afternoon, break time, last, closing time, Monday, Tuesday, breakfast, tomorrow, resting time, Wednesday, and Thursday.

b) Four years old- today,first,past,closing time,early, evening, month, Wednesday, now, day, later, late, when, saying clock time, after, tomorrow, Sunday, season, Monday,Thursday,lunch time,dinner,Friday,saying date,soon,sunrise,yesterday and Saturday.

c) Five years old- closing time evening, now, story time, tomorrow, past, Saturday, saying clock time, month, yesterday, day,before,when,season,dinner,later,after, Monday,sunrise,lunch time,Friday,saying date,soon,Wednesday and Thursday.

4.2 Hypotheses Testing

Hypothesis one – There is no significant difference in the time words understood by children aged three, four and five years old in nursery and preprimary school.

Table 18: One Way Anova for Age Difference in Understanding Time Words by Children of Three, Four and Five Years Old
Anova Score

	Sum of Squares	DF	Mean Square	F	Sig.
Between Groups	9446.67	2	4723.33	15.19	0.00
Within Groups	36382.50	117	310.96		
Total	45829.20	119			

Table 18 above represents the analyzed data for testing hypothesis one.

A one way ANOVA was used to analyze the difference in the understanding of time by children in the three age groups. The result of the analysis shows that the difference in the understanding of time words by children in the three groups is significant at the 0.05 level. The null hypothesis is therefore rejected. Therefore, there are significant differences in children's understanding of time words by age. The five years old children demonstrated greater understanding of time words than the younger children.

Hypothesis two – There is no significant difference between boys and girls in the understanding of time words amongst children age three to five years old in nursery and preprimary schools in the nothern senatorial zone of Plateau State. The data testing this hypothesis is presented in tables 18 and 19 below

Table 19: t-test Examining Time Words of Boys and Girls.

	Sex	N	Mean	Std. Deviation	Std. Error Mean	t	DF	Sig. (2-tailed)
3 years old	Male	17	63.24	20.69	5.02			
	Female	23	65.44	17.32	3.61	-0.37	38	0.72
4 years old	Male	17	73.24	19.44	4.72			
	Female	23	66.74	22.84	4.76	0.095	38	0.35
5 years old	Male	17	85	14.03	3.40			
	Female	23	91.09	10.22	2.13	-1.59	38	0.12

The calculated t-value for boys and girls at each age group is not significant. Therefore the null hypothesis is accepted that there is no significant difference in the understanding of time words between boys and girls in nursery and preprimary schools

Hypothesis three – Children in nursery and preprimary schools in rural areas will not differ significantly from children in the urban area in their understanding time words.

Table 20: t-test of Difference of Time Word Understanding Between Children in Urban and Rural Areas

	Location	N	Mean	Std. Deviation	Std. Error Mean	t	DF	Sig. (2-tailed)
3 years old	Urban	20	76.25	14.41	3.22			
	Rural	20	56.25	17.91	4.00	3.89	38	0.01
4 years old	Urban	20	69.75	24.41	5.46			
	Rural	20	71.50	17.85	3.99	-0.26	38	0.80
5 years old	Urban	20	87.75	15.26	3.41			
	Rural	20	86.75	8.93	2.00	0.25	38	0.80

The analysis show that the difference in the understanding of time words by children in nursery and preprimary schools between those in rural and urban areas is significant only at three years when they are in nursery one but at four and five years old when they are in nursery two and the preprimary classes, the difference in understanding is not significant.

Hypothesis four: The hypothesis stated that the understanding of time words will not differ significantly on the comprehension, ordering and sorting sections of the time word vocabulary comprehension test (TWVCT)

Table 21: One Way Anova Testing Differences in Performance on Different Sections of the Test

		Sum of Squares	Df	Mean Square	F	Sig.
Comprehension	**Between Groups**	5154.07	2	2577.03	4.82	0.01
	Within Groups	62575.70	117	534.84		
	Total	67729.80	119			
Ordering	**Between Groups**	12951.70	2	6475.83	7.89	0.00
	Within Groups	96047.50	117	820.92		
	Total	108999	119			
Sorting	**Between Groups**	16195	2	8097.48	27.71	0
	Within Groups	34195	117	292.27		
	Total	50389.90	119			

There is significant difference in the performance of pupils' on the different sections of the test at 0.05 levels. The analysis show that all the group performed best on the sorting section, followed by the section on ordering and the performance on the comprehension section was the least to the other sections. This implies that children understand the concept of day and night before time sequence and understanding time words as they are used in children's literature.

4.3 DISCUSSION

Findings from the data analysis revealed that the children aged three to five years old in nursery and preprimary schools understood the time words contained in the story "Nina visits her Grandmother". The children demonstrated this ability by pointing to the right template containing the answers to questions on time words among options to comprehension questions from the story that was read to them. The result revealed that at three years children understood age, morning and night. At four years, they added afternoon and at five years, they understood clock time by the hour. It was found that the understanding of evening was still emerging even at five years.This means that certain time words and concepts are more frequently used and more familiar to children in nursery and preprimary schools than others. From ages three years old children are aware of activities done in the day time and night time as well as objects used in the night time.

This finding agrees with the finding of Benson (1985) who investigated children's ability to form temporal representations of the frequent time words such as "yesterday", "today" and "tomorrow". He found that children form temporal representations that distinguished between different time frames but their accuracy in doing so developed later. However, the number of time words used by Benson's respondents were 20 time words at three years. The finding confirmed the

observations of Driscool and Nagel (2009) that children in early childhood education understand some time words and do possess some time words in their vocabulary.

The result however, differs from the conclusion of Piaget (1969) who reported from the study of young children's understanding of time concepts that children four to six years lack the power for operational reversibility for the selection of various possible sequence of time, duration and simultaneity of time. Similarly, Ballweg (2012) remarked that from research evidence, time concepts like "morning", "afternoon", "evening", "yesterday", "today" and "tomorrow'' do not develop for most children until sometime between the age of seven and ten years.

The difference between this finding and that of Piaget may be understood when we take the focus of the two studies into consideration. While Piaget focused on children's reasoning on duration, sequence and age and this emphasized the process but this study focused on children's understanding of time words contained in a story and sequential occurrence of events (routine) in a day. Here the emphasis was content (whether or not the children know, that is , if they possess this cognitive structure) rather than on the process.

Evidence of follow up researches on Piaget's work indicates that he underestimated cognitive capability of the preoperational child (Flavell 1971, 1982). Conservation abilities, for example emerge earlier than Piaget presented. Subsequent researches have confirmed this. Sopphian (1995) found than preoperational children could conserve number. Explaining the contradiction of subsequent findings on young children's cognitive abilities with Piaget's conclusions, Siegler, Deloache and Eisenberg (2006) pointed out that the challenging task Piaget gave his respondents for his experiment on reasoning led to missing young children's knowledge of these concepts.

The fact that children aged three to five years old understand some time words was strengthened by the data from the use of time words by children over a period of six weeks. The finding showed that children in nursery and preprimary schools used an average time word vocabulary of two, eight and eleven time words at three, four and five years respectively. Besides these functional time words in the vocabulary of the children, quite a number of time words were emerging in the children's speech. The emerging time words ranged from (13) at three years old to (26) at four year and (23) at five years. The evidence that the children's use of time words serves as confirmation for the understanding of time words by preschoolers was demonstrated by the Missouri Preschool Project (2005) which found that young children showed the understanding of time concepts by the use of such words as morning, tomorrow, today and yesterday to describe events that occur in the present, have occurred in the past and will occur in the future. In addition, Miller (2008) observed that preschoolers develop a sense of time and are quite comfortable using a wide variety of time words for units of time in the past, present and future. She pointed out that by the age of four years, children know how old they are and can indicate this using their fingers. The confirmation that the respondents actually understood the time words was that the hierarchy of time words used by the children to a large extent corresponded with the hierarchy of the words understood from the test. The first three time words used by three years old children were morning, age and night, while the first time words understood from the comprehension test were age, morning and night.

The study also revealed that children in nursery and preprimary schools whose ages are three, four or five years old possess some time concepts in their vocabulary which they use in speech. These are shown in tables 6, 7 and 8 for ages

three, four and five respectively. These time concepts are morning and age for three year old children; morning, age, first, afternoon, break time, night, saying own birthday, and today for four year old children and morning, saying one's age, afternoon, break time, first, night, today, early, breakfast and saying clock time at five years.

Another finding of this study is that children understand time sequence. The performance of the respondents on the section of the test dealing with ordering showed that at four and five years, children understand the sequence of events done in a day. This finding agrees with the findings of Missouri Preschool Project (2005) which assessed the understanding of time in preschool. The result of the project indicated that preschoolers could follow routine and could predict based on their observation of the sequence of events when it was time for something to occur on the daily schedule.

The finding that the understanding of time words differs with age has been consistent with researchers such as Piaget (1969), Scott (1997), Bertrand (2008) and Bagwell (2012). It is therefore an established fact that understanding time concepts differs with age in early childhood education. Older children understand time words better and use more time words than younger children.

No significant difference was found between boys and girls in either the understanding or use of time words. This finding supports earlier researches on sex/gender differences in academic performance. Rathus (2008) in a review of researches on gender difference in academic performance showed that gender difference in academic performance is on the decline.

The difference in understanding time words between children in urban and rural areas is significant only at the age of three. This may mean that exposure to early

childhood education is beneficial in reducing the educational gap between children in the rural and urban areas. This finding is consistent with findings on the effect of early childhood education in improving the chances of children from disadvantaged backgrounds in school. Researches by Siraq-Blatchford and Woodhead (2009) showed that early childhood education is an effective tool for reducing the educational gap between disadvantaged groups and the more advantaged children with higher socio-economic background. In addition, research has established the benefit of preschool in improving school success of children from economically disadvantaged backgrounds. Longitudinal studies on Headstart in the United States of America (Berk, 2006) showed that poverty-stricken children who attended Headstart programmes had higher achievement test scores than controls during the first two or three years of elementary school.

Even though no significant difference was found in the understanding of time words between pupils in urban and rural areas, tables 10 and 11 show wide gap between the number of children that used each of the time words between pupils in rural and urban nursery and preprimary schools. While rural children used five (5) time words each at four and five years at the mastery level, children in the urban areas had fourteen (14) each at four and five years. The wide difference in the time words used by children in the rural and urban areas may be attributed to differences in the knowledge of English language between the two groups. Children in the rural areas might be learning and using English language for the first time in school so that would have affected their English language proficiency. Studies of preschool English language learners confirm this explanation.

Lee and Burcham (2002) found that English language learners (ELL) who enter preschool were learning English for the first time in preschool setting were six

months to one year below their peers from homes where English language was first language of the child.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. SUMMARY

The study set out to investigate the understanding of time words in the story books of children aged three to five years old in early childhood education in the Northern Senatorial Zone of Plateau State. An ethnographic cross-sectional survey design was used for the study, where a cross section of children aged three, four and five years were studied by taking samples from each age group and collecting data on time words simultaneously across the age levels. The design required collecting data through participant observation while administering the time word vocabulary comprehension test individually to randomly selected samples in four nursery and preprimary schools. A total of 120 respondents were used consisting of 40 participants in each age group of three, four and five years old. It was hypothesized that there would be no significant age, sex and location differences between the pupils in the understanding of time words contained in the story “Nina visits her grandmother.”

The researcher constructed a Time Word Vocabulary Comprehension Test (TWVCT) from a story adapted from a nursery school story book with the title Little Ridding Hood (Baxter,1993) . The format for the Time Word Vocabulary Comprehension Test was similar to the Peabody picture Vocabulary Test-Revised (PPVT-R) by Dunn and Dunn (1981). It consisted of illustrated plates with one plate for each target word. The test had three sections for testing comprehension, ordering and sorting abilities. The test was administered to respondents individually in an arranged quiet venue usually the school library or a demarcated corner of a classroom. An observation sheet with 45 coded time words was also constructed for

recording data through participant observation of six weeks in each school. The 45 coded time words were derived from preschool story books obtained from nursery and preprimary school libraries. Pupils' scores on the test constituted the data for the study as well as data collected through the observation.

The data collection was done in two schools in the second term of the 2010/2011 session and the other two schools in the third term of the same session. The data collected was analyzed using percentage for the observation data and SPSS for the test data. The analysis showed that children in nursery and preprimary schools whose ages were three, four and five years understood time words contained in the story 'Nina visits her grandmother' and that children aged three to five years old used some time words in their speech. The result also showed that there is a significant difference in the understanding of time words between children of ages three, four and five years. However no sex difference in understanding time words was found, and the difference in understanding time words between children in rural and urban areas was significant only at age three in nursery one but not at four and five years old in nursery two and preprimary class.

The assumption that young children of ages three, four and five years in nursery and preprimary schools understand time words contained in storybooks was therefore authenticated.

5.2. SUMMARY OF FINDINGS

1. The understanding of time words differs significantly between children in nursery 1 and 2 and preprimary class whose ages are three, four and five years old respectively. The one way ANOVA analysis using SPSS shows a significant difference at 0.05 levels. This finding is in line with established principles in child development that cognitive ability improves with age.

2. The percentage of children who understood each of the time words by age shows that children from three to five years understood the time words/ concepts contained in the story 'Nina visits her grandmother'. These time words/ concepts were age, night, morning and afternoon. Clock time (telling the time by the hour) and evening were understood at five years of age.
3. The time words used by children aged three to five years old in nursery and preprimary school at the lower level of the zone of proximal development (ZPD) (lower level mean that the children used the words always or often.) by age are as follows:
    a. Three years old - morning and saying their own age (two words/concepts)
    b. Four years old - morning, saying their own age, first, afternoon, break time, night, saying their own birthday and today (eight words/concepts).
    c. Five years old - morning, saying their own age, afternoon, break time, first, night, today, early, breakfast, saying clock time and saying their own birthday (eleven words/concepts)
4. The sequence in which children understood the time words in the story "Nina visits her grand mother'' was as follows: age, night, morning, afternoon, clock time and evening,
5. b. The sequence of time words used by children from three to five years old based on the frequency of the words was:
    i. Three year old children used morning, said their own ages, night, first, afternoon, last, yesterday and Tuesday with only morning and saying age at the mastery level.
    ii. Four year old children used morning, said their own age, first, afternoon, break time, night, saying one's birthday, today, last, past, closing time,

early, story time, evening, month of the year now, Wednesday and Saturday.

iii. At five years old the sequence of time words used was: morning, saying their own age, afternoon, night, today, breakfast, early, first, break time, Sunday, saying their own birthday, day, now, story time, last, tomorrow, closing time, past tense, before, yesterday, asking question using when, next week, saying clock time, saying season, soon, later, lunch time, dinner, sunrise, late, Monday, Friday, future, and saying date.

6. The time words operating at lower level (independent level) of the zone of proximal development (ZPD) based on time words that were used by 50% and above of the respondents by age are as follows:
   a. Three year old children-morning and saying their own age.
   b. Four year old children-morning, saying their own age, first, afternoon, break time, night, saying their own birthday and today.
   c. Five year old children time words at the lower limits are: morning, saying their own age, afternoon, break time, first, night, saying their own age, afternoon, break time, first, night, today, early, breakfast, saying clock time and saying their own age.
7. Time words operating at the zone of proximal development (ZPD): these were time words used by 2.5% (1) of the respondents to 49.5% of the respondents (19 respondents) within an age group. These are words classified as sometimes used or rarely used. These words are indicated for the age groups as follows:

a. three year old children-night, first, afternoon, last, yesterday, Monday, Tuesday, breakfast, tomorrow, rest time, Wednesday and Thursday.

b. Four year old children:- last, closing time, past, early, story time, evening, month of the year, now, Wednesday, day, breakfast, asking questions using when, saying clock time, Sunday, tomorrow, season, Monday, Thursday, lunch time, dinner/supper, Friday, saying date, soon, sunrise, yesterday, Saturday.

c. At five years old the following time words were sometimes or rarely used:- day, now, story time, last, tomorrow, closing time, using past tense, soon, yesterday, asking question using when, Saturday, saying clock time, season, later, lunch time, dinner/supper, sunrise, late, Monday, Friday, future, saying date.

8. Time words operating at the upper level of ZPD. These are words that none of the children in the age level used.

a. At three years, none of the respondents used the following time words, evening, day, today, now, soon, dinner/supper, before, after, sunset, sunrise story time, late, early, closing time, asking questions using when, Sunday, Friday, Saturday, a few days ago, last week, next week, clock time, month of the year, season, past, future, date.

b. None of the samples who was four years old used any of the following time words:-later, snack time, before, rest time, Tuesday, a few days ago last week, next week and future.

c. None of the respondents at the age of five used any of the following time word-snack time, sunset, rest time, a few weeks ago, last week and next week.

9. There is a significant difference in the understanding of time words between children aged three, four and five years old. The one way ANOVA age

difference in performance shows significant difference at 0.05 level F=15.189>P.0.05

10. The frequency of time words in a child's vocabulary increases with age from an average of two time words at age three to eight at age four and eleven at the age of five years.
11. There is no significant difference in the understanding of time words between boys and girls in nursery and preprimary schools.
12. At the age of three when pupils are in nursery one, there exist a significant difference in the understanding of time words between children in rural and children in urban areas. But at four and five, when these children are in nursery two and preprimary classes, there was no significant difference in the understanding of time words between those in rural and those in urban areas.
13. The number of preschool children who used time words in urban areas is higher than those of preschools children in rural areas. This implies that children in urban areas have more time word vocabulary than children in rural areas.

The finding in numbers 12 and 13 appear to contradict each other but children do understand more things than they can express. Rathus (2008) has distinguished between receptive language and expressive language in language development. The non verbal response in the comprehension test might have enabled the respondents overcome limitation in performance based on verbal skill. In addition, the children in urban area would have higher proficiency in the English language because of their multi lingual as well as mass media exposure than children in the rural areas.

5.3. CONCLUSION

The purpose of this study was to find out the understanding of time words contained in nursery and preprimary school story books by children aged three to five years old in early childhood education. The results of the study provide ample evidence that three to five year old children in nursery and preprimary school understand time word vocabularies used in the storybooks and that this understanding differs with age. There was also sufficient evidence to conclude that children aged three to five years possess time words vocabulary that operates at the lower limit of the zone of proximal development. From the 45 time words investigated in the study, children aged three years had two time words, eight at four and eleven at five years. Another fact that emerged from the study is that many time words were operating at the zone of proximal development for children aged three to five years. These time words range from 13 at three years old to 26 at four years and 23 at five years. There were time words operating at the upper limit of the zone of proximal development. These ranges from 29 time words at three to 9 at four years and 6 at five years old. We can also conclude that there is no significant difference between boys and girls in the understanding of time words and finally that while a significant difference exist between children in rural and urban areas at the age of three in nursery I, such differences become insignificant at ages four and five years of age when the pupils are in nursery II and preprimary class.

5.4. RECOMMENDATIONS

Based on the conclusion drawn from the study, the researcher will want to make the following recommendations.

1. Nursery and preprimary schools should carefully select story books and other learning materials with time words the pupils of the various ages understand. The

time words/concepts of age, night, morning, afternoon for three years old and age, night, morning, afternoon, clock time and evening for children four to five years in nursery II and preprimary classes. Schools can also procure storybooks with time words that pupils used at the lower limit of the zone of proximal development (ZPD). In addition to the list of words above, the following time words can be considered for four years old children. These are first, break time, saying their own birthday and today. For five year old children, storybooks selected can in addition to the above, include early and breakfast. Storybooks selected with time words can be considered as developmentally appropriate in terms of content because the children can read the stories or hear the stories read to them and understand.

2. The time words that have been identified as functioning at the zone of proximal development (ZPD) should be taught at the various age levels through scaffolding as recommended by Vygotsky (1978). He pointed out that there is little profit in teaching aimed below the bottom of ZPD because the child's functioning here is already matured or from teaching aimed at the top of the ZPD because of the difference from child's actual present functioning may be too great. The only good learning is that which Vygotsky (1978 p 89) said is slightly in advance of development. Such teaching will scaffold those time words and time concepts which are in the stage of maturing, that is, in the zone of proximal development.
3. Three to five years old children should be provided with a lot of meaningful experiences with time in a personal sense. Such personal experiences as bedtime-story, lunchtime, bathing time, teeth brushing time, hand washing time, small group time, free choice time and closing time so that children can gain an

understanding of temporal ideas. Time concept for them will begin to form around these activities or events especially when routines are established in carrying out these activities or events. Miller (2008) pointed out that, following and being involved with familiar sequence of routines enhances children's time awareness of present, past and future.

4. Each classroom in the nursery and preprimary schools should have the day's routine chart which the teacher uses to review the day's events. The chart could contain the sequence of routine activities to be done in the day in picture form such as rhyme/poem time, interest center time, outdoor play time, break time, eating time, story time, small group time and closing time. Krueger (retrieved 29/12/2012) recommended that teacher should create a picture schedule. These are pictures of children themselves doing routine parts of their day. This makes children to begin to associate time with the schedule of their day.
5. Time awareness strategies to promote acquisition of time concepts and time words should be used by teachers in classroom:

a. Teachers can also use photos of important classroom events which are meaningful to the children to make journals display. These displays are reviewed with the children before they go home by the end of the day.
b. Use time word when talking to children. Teachers should use time words in context when talking to children, such as yesterday, today, now, tomorrow. Talk to children about weekly activities/schedules such as gymnastics and that is tomorrow.
c. The concept of day and passage of time can be taught by creating a countdown chain for special events such as birthdays and holidays. Teachers of nursery and preprimary schools should also create paper chains to important events such as

children's birthday, mid-term break, holiday, Father Christmas day or visit to zoo/wildlife Park. Krueger (retrieved 29/9/2012) said this is done simply by stapling loops together according to the days left for the event to occur. Each day, pupils remove one loop representing the passing of one day. Doing this makes kids to connect the passing of each day as getting closer to the special occasion by removing one loop a day.

5.5. LIMITATIONS OF THE STUDY

The following limitations of this study should be considered when interpreting the result of the study.

1. Only time words spoken in English language by respondents were recorded. This is because all sample schools used only English as the official language of communication and instruction. The use of mother tongue or language of the environment might have yielded more time words and concepts. But these were not allowed in the schools therefore the researcher had to use the language which the schools use for communication and instruction.
2. In one of the sample schools located in the rural area, the number of pupils in nursery one whose ages were three years old were less than 10, they were only 6, therefore, additional 4 pupils of three years old in nursery one in another school were used to complete the number. However, data was collected from them using the same instruments and procedure as those from other sample schools.
3. The use of research assistant for observation may have affected responses due to personality attribute differences with the researcher. However the assistant researcher possessed the relevant academic qualification, she holds a master's degree in child development and was trained for using the observation coded

sheet for record the responses. Besides she was the one responsible for the observation in all schools thereby making the procedure uniform for all respondents.

4. The literature reviewed were mostly studies carried out in foreign countries. The researcher had to rely heavily on literature that is foreign to the location of study because studies done in this country and Africa in general that are related to this topic were very rare and this study will be a reference for future African researchers on time words.

5.6. SUGGESTIONS FOR FURTHER STUDIES

The limitations pointed out in this study show that there is need to carry out studies in the following areas:

1. Understanding of time words in the mother-tongue/language of the environment among preschool children.
2. Designing instructional materials for learning time concepts and time words in nursery and primary schools based on the findings of this study.
3. Engaging hands-on activities for learning time concepts among children in nursery and preprimary schools.
4. Understanding the time concepts contained in the Nigerian preprimary school curriculum.

5.7. CONTRIBUTION TO KNOWLEGDE

This research has contributed to knowledge of time concept understanding among nursery and preprimary school children whose ages are three, four and five as follows:

1) Identified time words that children age three, four, five years old can understand in storybooks, which can be used in the literature of nursery and preprimary schools pupils.
2) Identified time words in the zone of proximal development (ZPD) for children three to five years where teaching these words in nursery and preprimary schools are developmentally appropriate and relevant.
3) Identified time words operating at the upper limit of the zone of proximal development. There are time words that are too difficult for children of an age level to understand. This implies that the use of these words in children's literature will inhibit their understanding of the story and its aesthetic and emotional value to children.
4) Increase the psychological study of time concepts in preschool children in the African continent thereby enriching the literature on time concepts/words with regard to African children.

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APPENDICES

APPENDIX I: THE STORY

Once upon a time, there was a little girl called Nina. She was five years old. Nina loved to visit her grandmother. Her grandmother was an old woman who made her a beautiful dress. One morning, Nina's mother said to her, "Grandmother is sick, eat your breakfast and carry some food, fruits, vegetable and medicine to her. Be careful as you walk in the forest and don't stop for anything on the way". So off she went with a little basket on her head with some food, fruit, vegetable and medicine for grandmother. Nina wove goodbye to her mother and left.

On the way inside the forest, she met lion standing, "good morning, little girl", he said, "what a fine morning". "Good morning", answered Nina. "Where are you going?" the lion asked. "I am carrying food, fruits, vegetables and medicine to my grandmother. "She is sick". "See there is some time for beautiful flowers, go and carry some to your grandmother as well". "Oh good idea", she said and put the basket on the ground and went to pick flowers.

The lion left her and ran to the grandmother's house, sent away the grandmother, put on her clothes and climbed into her bed.

In the afternoon , Nina arrived at her grandmother's house and greeted her but a fierce lion jumped out of the bed and swallowed her for lunch.

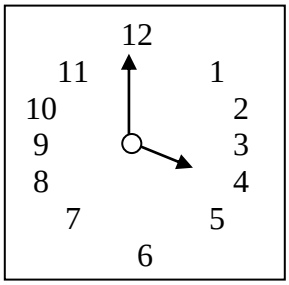
When Nina's mother did not see her back in the evening at six o'clock, she was worried. She told Nina's father. Nina's father took a torch light, and a sword and left to grandmother's house. He travelled at night but the moon and stars were shinning very brightly so he didn't need to use the torch light on the way. He arrived grandma's house at night and carefully opened the door. He flashed the torch light on grandma's bed and saw the wicked lion on grandma's bed. He pulled out the

sword, killed the lion and brought out Nina. Nina said “thank you daddy”. “Where is grandma?” Just then, they heard grandma coughing on the floor beside the bed. Nina gave grandma the food, fruit, vegetables and medicine, then they all slept. The next day, Nina and her father went back home.

QUESTIONS:

1. Nina was five years old. Which of these drawings is Nina? (a) baby b) girl (c) mother (c) grandmother.
2. Which one is grandmother among these drawings? (a) old woman b) woman c) girl d) baby
3. What time did Nina leave home to take food and medicine to her grandmother ? (a) night (b) morning (c) evening (d) afternoon.
4. What time did Nina arrive at her grandmother’s house? (a) afternoon (b) night (c) morning (d) evening.
5. What time was Nina’s mother worried that she has not returned? (a) Afternoon b) night c) evening d) morning.
6. When did Nina’s father arrive at grandma’s house? (a) evening (b) afternoon (c) morning (d) night.
7. Which of the clock is showing 6 o’clock?

a)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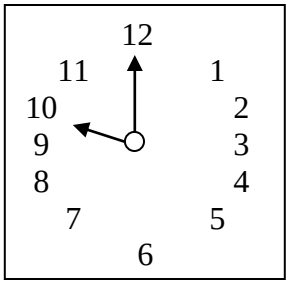
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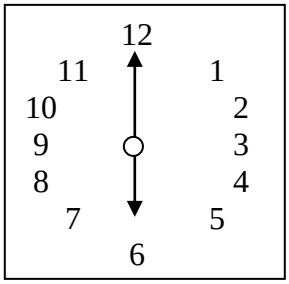
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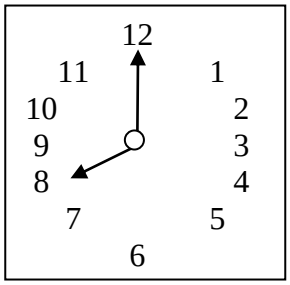
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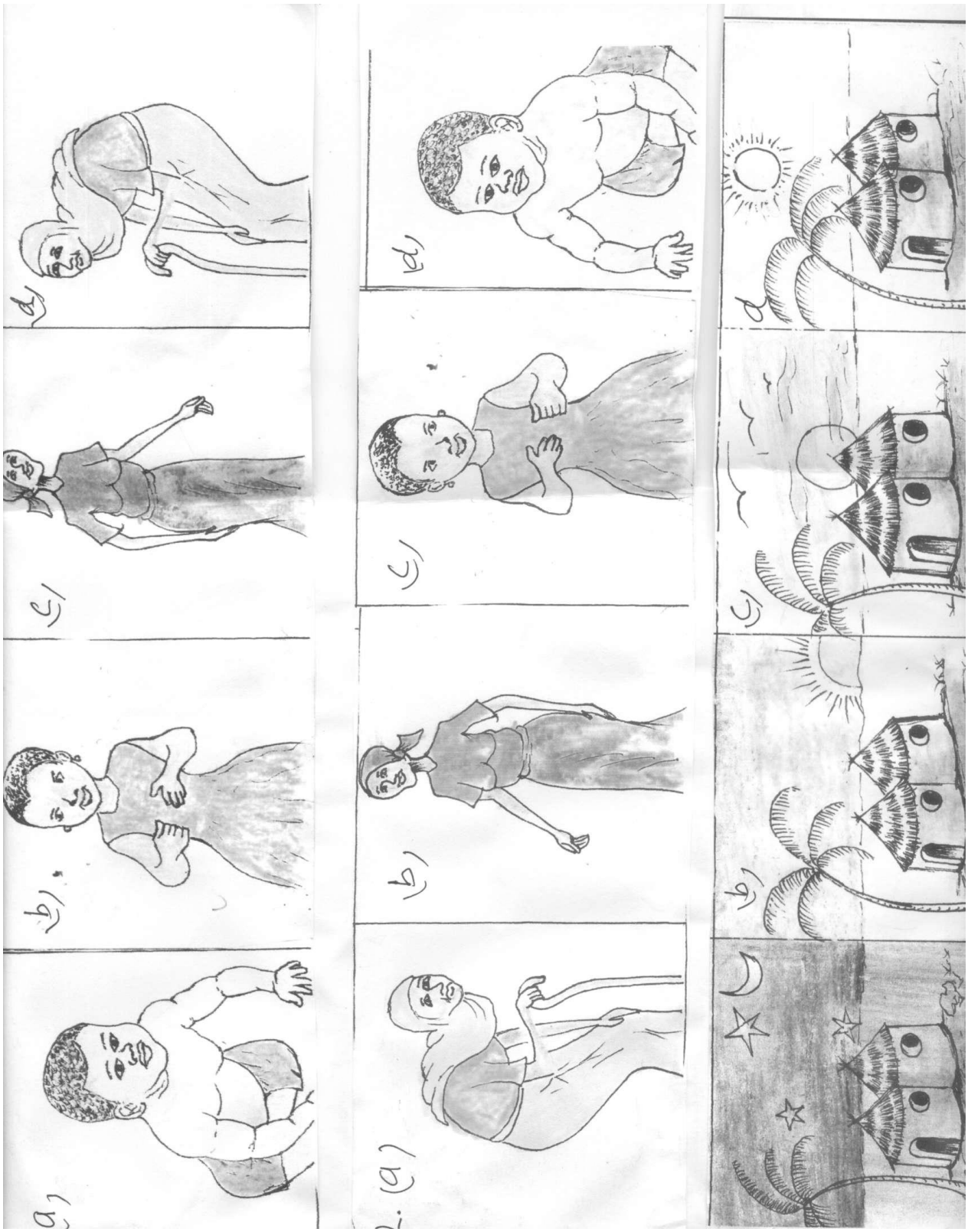
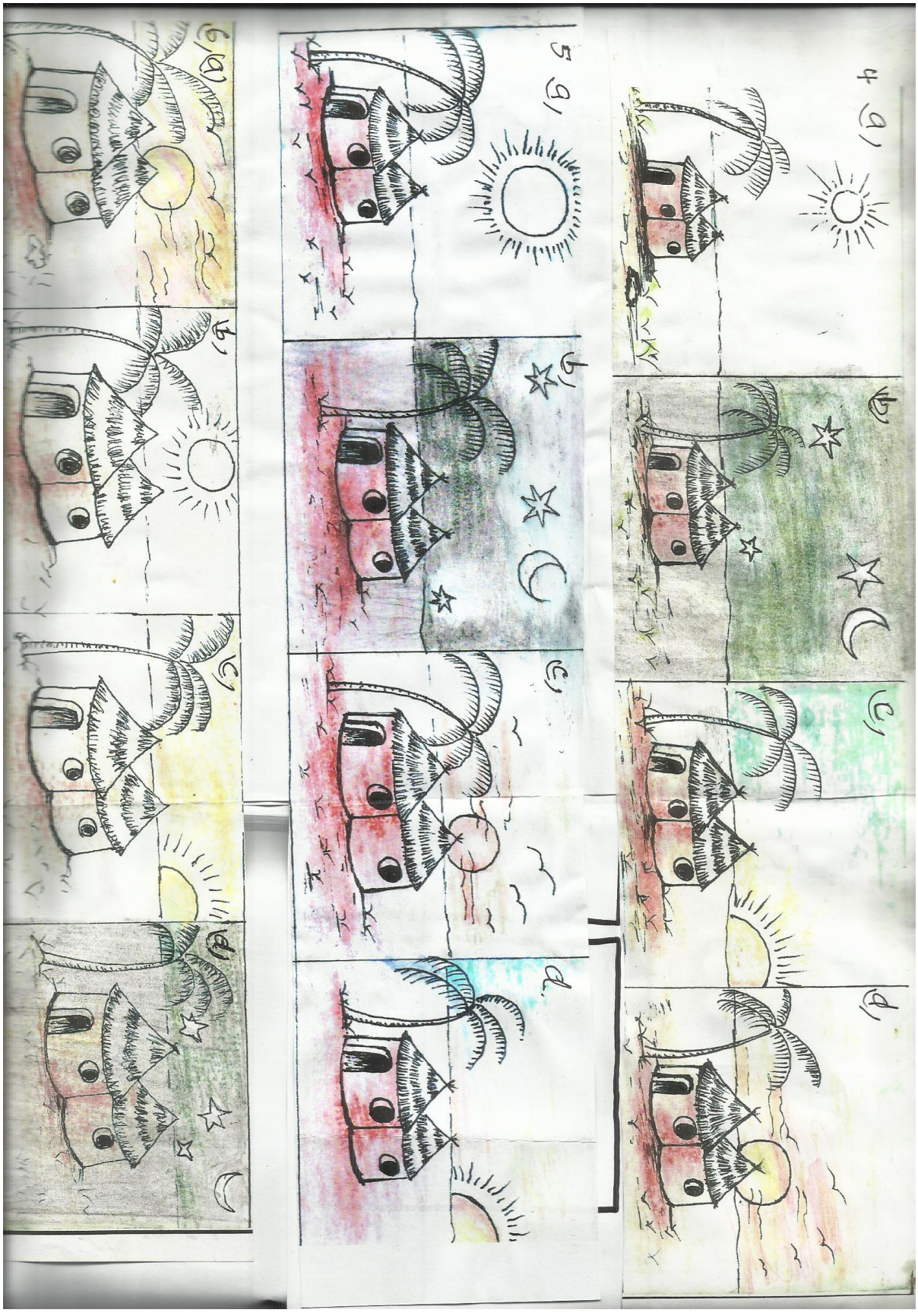
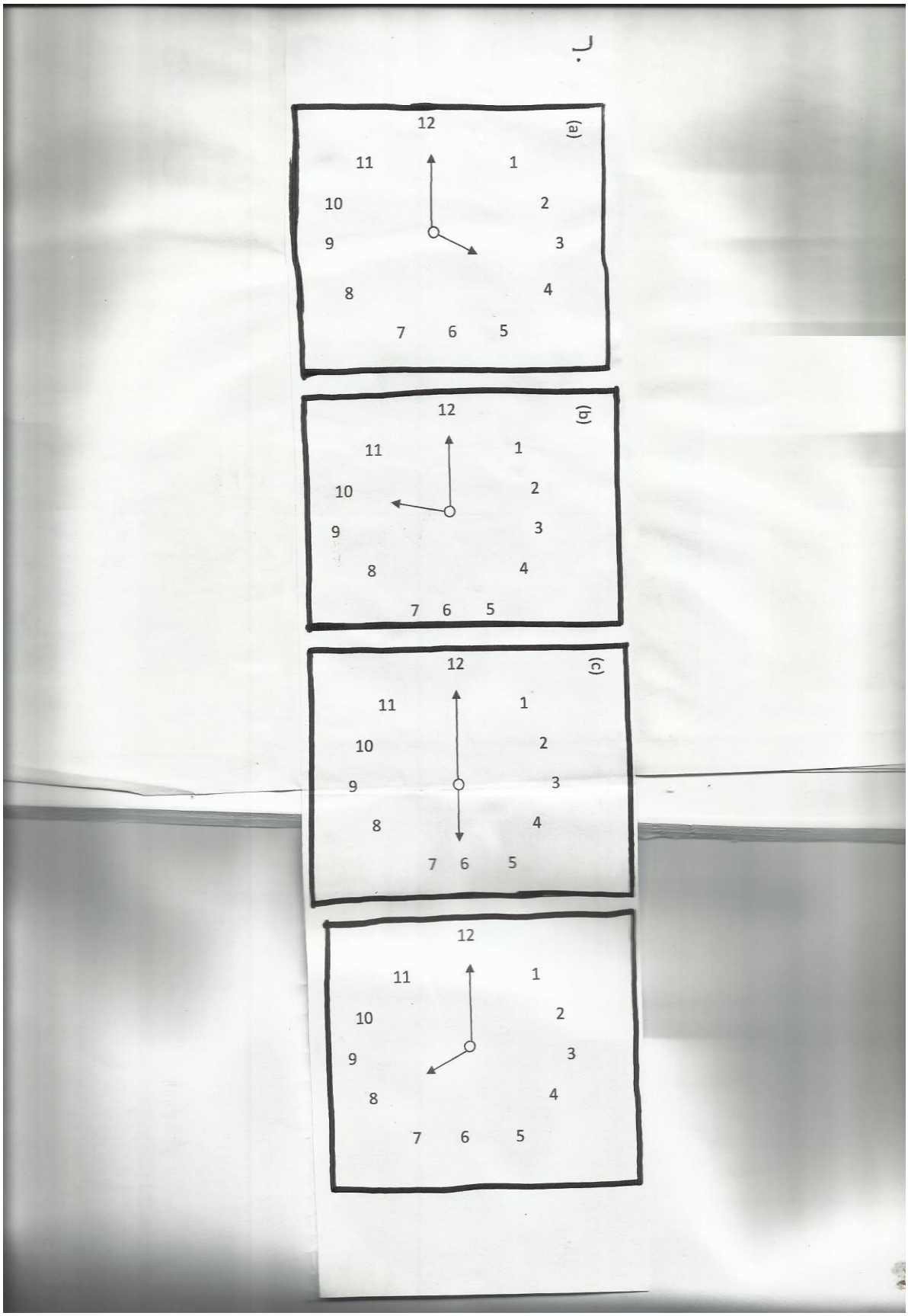
APPENDIX 2 (TEST PLATES)



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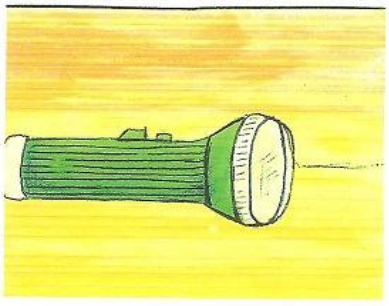

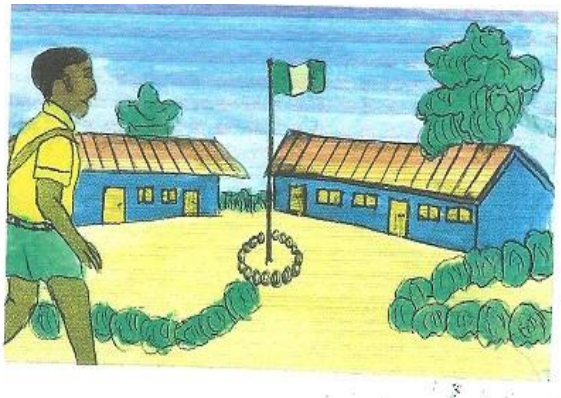

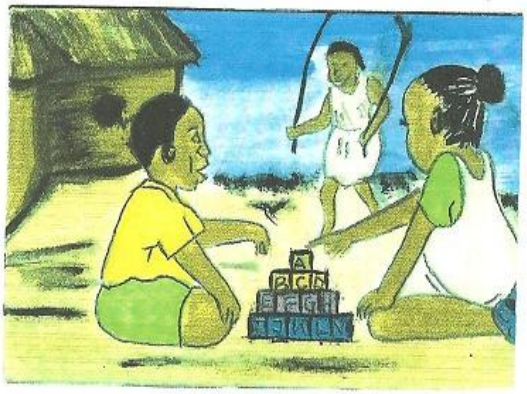

APPENDIX 3

TIME WORDS IN EARLY CHILDHOOD EDUCATION LITERATURE

The codes for the time words are represented by the letters against them as follows:

a-morning
b-afternoon
c-night
d-evening
e-day
f-today
g-now
h-soon
i-later
j-snack time
k-lunch time
l-breakfast
m-dinner (super)
n-before
o-after
p-sunset
q-sunrise
r-story time
s-late
t-early
u-first
v-last
w-yesterday
x-tomorrow
y-closing time
z-rest time
aa-break time
ab-when(asking questions with “when”)
ac-Sunday
ad-Monday
ae-Tuesday
af-Wednesday
ag-Thursday
ah-Friday
ai-Saturday
aj-a few days ago
ak-last week
al-next week
am-age (saying age e.g. “I am 3 years old”)
an-saying clock time e.g. “8 o’clock”
ao-saying one’s birthday
ap-month of the year e.g. “I was born in may”

aq-seasons/day of important event e.g. Christmas
ar-past e.g. “we visited grandmother”
as-future e.g. “we will go to church tomorrow”
at-saying date

APPENDIX 4
TABLE SPECIFICATION FOR THE TEST

S/N	TOPIC	OBJECTIVE	K	C	A	A	S	E
1	understanding time Words	To test the understanding Concept of age.		1				
2	Understanding time Words	To test the understanding of age.		2				
3	Understanding time Words	To identify the time that Nina left home For grand mother's House.		1				
4.	Understanding time Words	To touch the time illustrating when Nina arrived grand Mother's house.		1				
5	Understanding time Words	To identify which time Nina's Mother Got worried.		1				
6	Understanding time words	To touch the Illustration depicting The time Nina's Father arrived grand Mother's house.						
7	Knowing time By the clock	To touch the clock time that mother Got worried.						
8- 12	Time sequence	To arrange event in The order the are done The day.		5				
13-20	Day and night	To sort out activities done in the day and night		8				

KEY
K = KNOWLEDGE
C = COMPREHENSION
A = APPLICATION
A = ANALYSIS
S = SYNTHESIS
E = EVALUATION
MARKING
Each question carry four marks for a correct response = 5 x 20 = 100%
An answer is either wrong or right.

APPENDIX 5

OBSERVATION OF PRE-SCHOOL CHILDREN

UNDERSTANDING AND USE OF TIME WORDS AMONG CHILDREN IN EARLY CHILDHOOD EDUCATION

NAME OF SCHOOL ________________________________

PHONE NUMBER _________________________________

CLASS _________________

DATE __________________

TIME OF OBSERVATION **1) BEGINNING TIME ________________**

2) ENDING TIME _______________________

S/N	CHILD'S NAME/AGE	SEX	NATIONALITY/ TRIBE	LANGUAGE AT HOME	TIME WORDS USED	OTHER TIME WORDS

APPENDIX 6: DATA ANALYSIS

Oneway Anova for age difference in performance (H1) Descriptive score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
3 years old	40	67.25	19.24704	3.0432	61.0945	73.4055	30	100
4 years old	40	71.25	20.34163	3.2163	64.7444	77.7556	15	100
5 years old	40	87.75	12.19237	1.9278	83.8507	91.6493	55	100
Total	120	75.4167	19.62445	1.7915	71.8694	78.9639	15	100

ANOVA score

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	9446.67	2	4723.333	15.189	0
Within Groups	36382.5	117	310.962		
Total	45829.2	119			

Post Hoc Test

Multiple Comparisions Dependent Variable: Score LSD

(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
3 years old	**4 years old**	-4	3.9431	0.312	-11.8091	3.8091
	5 years old	-20.50000(*)	3.9431	0	-28.3091	-12.6909
4 years old	**3 years old**	4	3.9431	0.312	-3.8091	11.8091
	5 years old	-16.50000(*)	3.9431	0	-24.3091	-8.6909
5 years old	**3 years old**	20.50000(*)	3.9431	0	12.6909	28.3091
	4 years old	16.50000(*)	3.9431	0	8.6909	24.3091

* The mean difference is significant at the .05 level.

T-Test for sex difference across the ages (H03) Group Statistics

	Sex	N	Mean	Std. Deviation	Std. Error Mean
3 yeras old	**Male**	17	63.235	20.68674	5.01727
	Female	23	65.435	17.3148	3.61039
4 years old	**Male**	17	73.235	19.44071	4.71506
	Female	23	66.739	22.84377	4.76326
5 yeras old	**Male**	17	85	14.03122	3.40307
	Female	23	91.087	10.21991	2.131

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
3 yeras old	Equal variances assumed	1.496	0.229	-0.366	38	0.717	-2.1995	6.0158	-14.3778	9.97886
	Equal variances not assumed			-0.356	30.845	0.724	-2.1995	6.18125	-14.8088	10.4098
4 years old	Equal variances assumed	0.273	0.605	0.946	38	0.35	6.49616	6.86926	-7.40992	20.4023
	Equal variances not assumed			0.969	37.168	0.339	6.49616	6.70227	-7.08185	20.0742
5 yeras old	Equal variances assumed	1.896	0.177	-1.589	38	0.12	-6.087	3.82967	-13.8397	1.66581
	Equal variances not assumed			-1.516	27.889	0.141	-6.087	4.01523	-14.3132	2.13933

T-Test for location difference across ages (H04) Group Statistics

	Location	N	Mean	Std. Deviation	Std. Error Mean
3 years old	Urban	20	76.25	14.40714	3.2215
	Rural	20	56.25	17.90876	4.0045
4 yeaars old	Urban	20	69.75	24.41284	5.4589
	Rural	20	71.5	17.85173	3.9918
5 years old	Urban	20	87.75	15.25873	3.412
	Rural	20	86.75	8.92586	1.9959

Independent Samples Tes

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
3 years old	Equal variances assumed	1.1	0.301	3.891	38	0	20	5.1395	9.5956	30.4044
	Equal variances not assumed			3.891	36.333	0	20	5.1395	9.5799	30.4201
4 yeaars old	Equal variances assumed	1.723	0.197	-0.259	38	0.797	-1.75	6.76266	-15.44	11.9403
	Equal variances not assumed			-0.259	34.801	0.797	-1.75	6.76266	-15.482	11.9817
5 years old	Equal variances assumed	7.92	0.008	0.253	38	0.802	1	3.95285	-7.0021	9.00212
	Equal variances not assumed			0.253	30.64	0.802	1	3.95285	-7.0657	9.06572

Oneway Anova for age difference in various learning (H05) Discriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Comprehension	3 yeras old	40	60.725	22.74495	3.5963	53.4508	67.9992	0	100
	4 years old	40	60.425	23.81649	3.7657	52.8081	68.0419	14	100
	5 years old	40	74.475	22.80237	3.6054	67.1824	81.7676	14	100
	Total	120	65.2083	23.85703	2.1778	60.896	69.5207	0	100
Ordering	3 yeras old	40	71	28.62669	4.5263	61.8447	80.1553	0	100
	4 years old	40	69.5	35.36984	5.5925	58.1882	80.8118	0	100
	5 years old	40	92.25	19.80514	3.1315	85.916	98.584	20	100
	Total	120	77.5833	30.26482	2.7628	72.1127	83.0539	0	100
Sorting	3 yeras old	40	71.35	19.56783	3.094	65.0919	77.6081	35	100
	4 years old	40	83.15	22.12847	3.4988	76.073	90.227	12	100
	5 years old	40	99.675	2.05548	0.325	99.0176	100.3324	87	100
	Total	120	84.725	20.57777	1.8785	81.0054	88.4446	12	100

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
Comprehension	**Between Groups**	5154.07	2	2577.033	4.818	0.01
	Within Groups	62575.7	117	534.835		
	Total	67729.8	119			
Ordering	**Between Groups**	12951.7	2	6475.833	7.889	0.001
	Within Groups	96047.5	117	820.919		
	Total	108999	119			
Sorting	**Between Groups**	16195	2	8097.475	27.706	0
	Within Groups	34195	117	292.265		
	Total	50389.9	119			

Post Hoc Tests

Multiple Comparisons LSD

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Comprehension	3 yeras old	4 years old	0.3	5.17124	0.954	-9.9414	10.5414
		5 years old	-13.75000(*)	5.17124	0.009	-23.9914	-3.5086
	4 years old	3 yeras old	-0.3	5.17124	0.954	-10.5414	9.9414
		5 years old	-14.05000(*)	5.17124	0.008	-24.2914	-3.8086
	5 years old	3 yeras old	13.75000(*)	5.17124	0.009	3.5086	23.9914
		4 years old	14.05000(*)	5.17124	0.008	3.8086	24.2914
Ordering	3 yeras old	4 years old	1.5	6.40671	0.815	-11.1882	14.1882
		5 years old	-21.25000(*)	6.40671	0.001	-33.9382	-8.5618
	4 years old	3 yeras old	-1.5	6.40671	0.815	-14.1882	11.1882
		5 years old	-22.75000(*)	6.40671	0.001	-35.4382	-10.0618
	5 years old	3 yeras old	21.25000(*)	6.40671	0.001	8.5618	33.9382
		4 years old	22.75000(*)	6.40671	0.001	10.0618	35.4382
Sorting	3 yeras old	4 years old	-11.80000(*)	3.82273	0.003	-19.3707	-4.2293
		5 years old	-28.32500(*)	3.82273	0	-35.8957	-20.7543
	4 years old	3 yeras old	11.80000(*)	3.82273	0.003	4.2293	19.3707
		5 years old	-16.52500(*)	3.82273	0	-24.0957	-8.9543
	5 years old	3 yeras old	28.32500(*)	3.82273	0	20.7543	35.8957
		4 years old	16.52500(*)	3.82273	0	8.9543	24.0957

* The mean difference is significant at the .05 level.

APPENDIX 7

DATA ONE

TEST SCORES FOR UNDERSTANDING TIME WORD FOR CHILDREN 3 – 5 YEARS OLD

Three year old		Four year old		Five year old	
Candidate	Score	Candidate	Score	Candidate	Score
1	65	1	95	1	95
2	95	2	70	2	55
3	65	3	90	3	65
4	60	4	30	4	90
5	45	5	80	5	100
6	75	6	15	6	95
7	75	7	75	7	60
8	50	8	60	8	85
9	30	9	45	9	70
10	35	10	65	10	80
11	35	11	40	11	100
12	70	12	85	12	95
13	45	13	100	13	100
14	90	14	80	14	100
15	95	15	75	15	95
16	85	16	100	16	100
17	85	17	75	17	90
18	100	18	75	18	95
19	60	19	95	19	80
20	90	20	95	20	70
21	55	21	90	21	90
22	80	22	60	22	90
23	65	23	55	23	100
24	85	24	45	24	95
25	65	25	90	25	95
26	45	26	70	26	85
27	90	27	70	27	85
28	75	28	100	28	95
29	70	29	40	29	95
30	55	30	85	30	90
31	65	31	95	31	65
32	75	32	75	32	95
33	95	33	75	33	85
34	75	34	75	34	100
35	50	35	75	35	100
36	35	36	70	36	100
37	60	37	60	37	80
38	65	38	60	38	75
39	90	39	70	39	85
40	45	40	45	40	85

DATA TWO

TIME WORDS USED BY CHILDREN 3-5 YEARS OLD

Time word code	NUMBER OF CHILDREN WHO USED THE WORD THREE YEARS	FOUR YEARS	FIVE YEARS
a.	40	40	40
b.	7	27	28
c.	12	21	23
d.	0	11	15
e.	0	8	8
f.	0	20	23
g.	0	10	15
h.	0	2	4
i.	0	0	6
j.	0	0	0
K	0	3	5
l.	0	8	22
m.	0	3	7
n.	0	0	8
o.	0	6	6
p.	0	0	0
q.	0	1	5
r.	0	12	14
s.	0	8	5
t.	0	14	23
u.	14	31	25
v.	5	17	12
w.	0	1	9
x.	1	6	12
y	4	15	17
z	1	0	0
aa.	7	26	28
ab.	0	7	8
ac.	0	6	22
ad	3	4	6
ae.	2	0	7
af.	1	10	3
ag.	1	4	3
ah.	0	3	5
ai.	0	1	11
aj	0	0	0
ak.	0	0	0
al.	0	0	0
am.	33	36	40
an.	0	7	10
ao.	0	21	21

ap.	0	11	10
aq.	0	5	8
ar.	0	0	12
as.	0	0	3
at.	0	3	5

DATA THREE

TIME WORDS UNDERSTANDING OF BOYS AND GIRLS

Three year old			Four year old			Five year old		
Candidate	Sex	Score	Candidate	Sex	Score	Candidate	Sex	Score
1	M	90	1	M	95	**1**	M	95
2	M	85	2	M	70	2	M	55
3	M	45	3	M	75	3	M	70
4	M	55	4	M	40	4	M	70
5	M	75	5	M	85	5	M	60
6	M	35	6	M	100	6	M	80
7	M	65	7	M	75	7	M	100
8	M	90	8	M	75	8	M	100
9	M	45	9	M	95	9	M	90
10	M	75	10	M	90	10	M	95
11	M	50	11	M	60	11	M	80
12	M	30	12	M	55	12	M	90
13	M	35	13	M	45	13	M	100
14	M	70	14	M	90	14	M	95
15	F	90	15	M	70	15	M	85
16	F	89	16	M	40	16	M	85
17	F	60	17	M	85	17	M	95
18	F	55	18	M	70	18	M	95
19	F	55	19	M	40	19	M	90
20	F	65	20	M	45	20	M	70
21	F	80	21	F	70	21	M	95
22	F	90	22	F	90	22	M	100
23	F	75	23	F	30	23	M	100
24	F	70	24	F	80	24	M	80
25	F	65	25	F	30	25	M	75
26	F	75	26	F	80	26	F	65
27	F	75	27	F	15	27	F	100
28	F	95	28	F	60	28	F	95
29	F	75	29	F	45	29	F	85
30	F	50	30	F	65	30	F	100
31	F	60	31	F	100	31	F	95
32	F	55	32	F	80	32	F	100
33	F	95	33	F	75	33	F	95
34	F	60	34	F	70	34	F	95
35	F	45	35	F	100	35	F	100

36	F	75	36	F	95	36	F	100
37	F	75	37	F	75	37	F	85
38	F	50	38	F	75	38	F	85
39	F	30	39	F	75	39	F	95
40	F	35	40	F	70	40	F	95

DATA: FOUR

TIME WORDS UNDERSTANDING BY CHILDREN IN URBAN AND RURAL AREAS

Three years olds			Four years old			Five years old		
Candidate	Location	Score	Candidate	Location	Score	Candidate	Location	Score
1	Urban	90	1	Urban	95	1	Urban	95
2	Urban	55	2	Urban	70	2	Urban	55
3	Urban	80	3	Urban	90	3	Urban	65
4	Urban	65	4	Urban	30	4	Urban	70
5	Urban	85	5	Urban	80	5	Urban	100
6	Urban	80	6	Urban	15	6	Urban	95
7	Urban	45	7	Urban	75	7	Urban	60
8	Urban	90	8	Urban	60	8	Urban	85
9	Urban	75	9	Urban	45	9	Urban	70
10	Urban	70	10	Urban	65	10	Urban	80
11	Urban	55	11	Urban	40	11	Urban	100
12	Urban	75	12	Urban	85	12	Urban	95
13	Urban	75	13	Urban	100	13	Urban	100
14	Urban	75	14	Urban	80	14	Urban	100
15	Urban	95	15	Urban	75	15	Urban	95
16	Urban	85	16	Urban	70	16	Urban	95
17	Urban	85	17	Urban	100	17	Urban	95
18	Urban	100	18	Urban	40	18	Urban	100
19	Urban	60	19	Urban	85	19	Urban	100
20	Urban	85	20	Urban	95	20	Urban	100
21	Rural	45	21	Rural	100	21	Rural	100
22	Rural	95	22	Rural	75	22	Rural	85
23	Rural	75	23	Rural	75	23	Rural	90
24	Rural	50	24	Rural	95	24	Rural	80
25	Rural	35	25	Rural	95	25	Rural	70
26	Rural	60	26	Rural	60	26	Rural	90
27	Rural	65	27	Rural	90	27	Rural	90
28	Rural	70	28	Rural	55	28	Rural	100
29	Rural	55	29	Rural	45	29	Rural	95
30	Rural	60	30	Rural	90	30	Rural	95
31	Rural	65	31	Rural	70	31	Rural	85
32	Rural	90	32	Rural	90	32	Rural	85
33	Rural	70	33	Rural	45	33	Rural	95

34	Rural	50	34	Rural	40	34	Rural	95
35	Rural	45	35	Rural	70	35	Rural	90
36	Rural	45	36	Rural	60	36	Rural	70
37	Rural	50	37	Rural	60	37	Rural	80
38	Rural	30	38	Rural	70	38	Rural	80
39	Rural	35	39	Rural	75	39	Rural	75
40	Rural	35	40	Rural	70	40	Rural	85

DATA FIVE

CANDIDATE PERFORMANCE OF COMPREHENSION,ORDERING AND SORTING SECTION OF THE TEST

Candidate	Comprehension	Ordering	Sorting	Candidate	Comprehension	Ordering	Sorting
1	71	100	100	19	00	40	75
2	42	60	62	20	42	60	75
3	57	100	87	21	71	60	62
4	57	40	89	22	85	100	100
5	100	60	87	23	57	60	50
6	71	100	37	24	100	100	87
7	47	60	37	25	57	60	87
8	71	100	100	26	71	60	50
9	71	60	87	27	28	40	62
10	71	60	75	28	100	60	75
11	42	60	62	29	71	80	50
12	71	60	62	30	42	60	37
13	57	100	75	31	42	00	52
14	57	100	75	32	12	00	35
15	57	100	75	33	42	20	45
16	85	80	75	34	71	100	90
17	71	60	75	35	28	100	95
18	42	40	62	36	71	100	85
37	85	100	100				
38	57	100	60				
39	57	100	100				
40	100	100	60				

FOUR YEARS OLD

Candidate	Comp	Ordering	Sorting	Candidate	Comp	Ordering	Sorting
1	85	100	100	34	42	80	75
2	57	40	100	35	42	100	75
3	71	100	100	36	57	60	75
4	57	100	100	36	57	60	75

5	42	100	100	38	14	00	100
6	28	00	12	39	71	80	37
7	42	100	81	40	59	20	37
8	71	00	87				
9	57	00	62				
10	42	100	62				
11	14	20	75				
12	57	100	100				
13	100	100	100				
14	71	80	87				
15	57	100	75				
16	100	100	100				
17	71	60	87				
18	57	60	89				
19	87	100	100				
20	85	100	100				
21	71	100	100				
22	57	00	100				
23	14	40	100				
24	14	40	100				
25	85	80	87				
26	57	60	87				
27	42	80	100				
28	100	100	100				
29	71	60	37				
30	100	80	100				
31	85	100	87				
32	57	100	50				
33	71	80	87				

FIVE YEAR OLD

Candidate	Comp	Ordering	Sorting	Candidate	Comp	Ordering	Sorting
1	24	20	32	31	12	20	32
2	16	0	28	32	24	20	32
3	16	04	32	33	24	20	32
4	04	20	32	34	24	20	32
5	28	20	32	35	28	20	32
6	28	16	32	36	28	20	32
7	12	04	32	37	12	20	32
8	16	20	32	38	12	20	32
9	20	04	32	39	08	20	32
10	16	16	32	40	24	20	32
11	28	20	32				

12	24	20	32				
13	28	20	32				
14	28	20	32				
15	24	20	32				
16	28	20	32				
17	24	16	32				
18	24	20	32				
19	20	12	32				
20	12	12	32				
21	20	20	32				
22	20	20	32				
23	28	20	32				
24	24	20	32				
25	24	20	32				
26	16	20	32				
27	16	20	32				
28	24	20	32				
29	24	20	32				
30	20	20	32				