# THE IMPACT OF INSTRUCTIONAL RESOURCES ON CHILDREN'S LEARNING ACHIEVEMENT IN SELECTED PRE-SCHOOLS IN NAIROBI NORTH DISTRICT, NAIROBI PROVINCE IN KENYA.


**By**

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**Thesis submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Education Early Childhood Education in the Department of Educational Communication and Technology of University of Nairobi.**


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## DECLARATION

This thesis is my original work and has not been submitted for an award of degree in any other institutions.

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**Kiruki Janet Njoki**

This thesis has been submitted with the knowledge of the supervisors.

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## DEDICATION

This study is dedicated to my dad, Mr. John Kiruki Mukabi.

## ACKNOWLEDGEMENT

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## ACRONYMS

| | | |
|---|---|---|
| ECD | - | Early Childhood Development. |
| KCPE | - | Kenya Certificate of Primary Education. |
| KCSE | - | Kenya Certificate of Secondary Education. |
| MED | - | Masters in Education. |
| MOEST | - | Ministry of Education Science and Technology. |
| NACECE | - | National Centre for Early Childhood Education. |
| NAEYC | - | National Association for Children for the Education of Young Children. |
| QAS | - | Quality Assurance and Standards |
| SACMEQ | - | Southern African Consortium for Monitoring Education Quality. |
| UNICEF | - | United Nations Children Education Fund. |

# CHAPTER ONE

# INTRODUCTION

## 1.1. Background to study

Children acquire most of the knowledge, concepts and skills through their senses as they interact with the environment. As children grow and their perception organs of sight, hearing, taste, smell and touch mature, their perception abilities increase tremendously. It is therefore important for parents and teachers to provide children with materials that they can see, hear, touch, smell and taste in order to ensure that they learn more about the world around them. When children are exposed to concrete experiences of the world around them, they develop images in their brains, which help to improve their memory. These images are referred to as schemas by Piaget (1954).

According to Piaget (1979) as cited by Kabiru and Njenga (2009), children need to be actively involved in the learning activities for them to construct knowledge. They should be given the opportunities to explore, experiment, manipulate, observe and ask questions. In so doing, they acquire knowledge which contributes to their mental development. To help children construct knowledge and build schemas, they need to be provided with plenty of concrete learning and play materials. Piaget's constructivist theory implies that the teacher should be a facilitator of children's learning. The teachers do this by providing an environment that stimulates children to find out about things on their own as they play and consequently construct knowledge. His views are relevant to the study as he states that instructional resources are related to children's learning achievement.

Brunner as cited by Kabiru and Njenga (2009) emphasized that learning activities should be organized in a sequential and spiral manner. In his enactive stage he said that teachers need to emphasize knowing through doing. Children need to be involved in doing things, manipulation, construction and experimentation using objects from the world around them. Teachers need to encourage children to speak as they carry out their actions. They should be encouraged to label their actions and describe what they are doing. This helps them to develop their language, express their thoughts and ideas. The important role-played by senses in helping children to understand the world around them and therefore to learn and acquire new knowledge, concepts, skills and attitudes has been emphasized by most of the early childhood educators especially Piaget, Dewey, Froebel and Montessori as cited by Kabiru and Njenga (2009). All these early childhood educators emphasized the importance of instructional materials on children's learning achievements. They learn through their senses using concrete learning and play materials. Play materials provide opportunities for them to use their sense organs. They touch, see, hear, smell and taste and therefore learn better (Njenga and Kabiru, 2009).

Froebel as cited by Njenga and Kabiru (2009) emphasized the role of spontaneous play and use of toys in helping children to learn. He said that children must enjoy and be happy when learning. The best way to ensure that children enjoy their learning is to allow them to play with toys. He said that play is very important because it helps the children to bring out what is inside them. Children are able to express their inner feelings and develop their potentials. They also discover, explore, develop concepts and hence acquire optimum learning. Froebel therefore emphasized that children should be given opportunities to play as this helps them learn.

According to Dewey as cited by Kabiru and Njenga (2009), children learn through activity and by doing. He believed that children were valuable and that childhood was an important phase in the lives of children. Learning should be actively involving personal experience. Rousseau as cited by Kabiru and Njenga (2009), also emphasized the use of concrete materials and this has remained the cornerstone for ECD programmes in the world. According to Montessori cited by Kabiru and Njenga (2009), children learning through their senses. She developed the Montessori learning kit with concrete materials that help the children to develop the sense of sight, hearing, touch, smell and taste. She believed that when these senses are well developed, children acquire a lot of information and skills. Whatever they acquire they remember better and for a longer period. Through the use of these kits children acquire a lot of knowledge, concepts and skills. This shows there is a relationship between the use of instructional materials and children learning achievements.

## 1.2 Statement of the Problem

According to UNICEF (2005), research conducted by Kenya Institute of Education (KIE) as well as periodic field mission of Senior Ministry of Education officials revealed that most classrooms in Kenya lack basic teaching materials and hence are usually unattractive and non-stimulating. Eshiwani (1983) noted that school learning resources have an effect on performance.

Similarly, Mwangi (2001) in his study contends that failure to use instructional resources in teaching led to students' low learning achievements. This study was therefore, designed to find out the impact of instructional resources on children's learning achievement at pre-school level in selected pre-schools in Nairobi North District of Nairobi Province in Kenya. This study was

conducted in Nairobi because there was no research done on the impact of instructional resources on pre-school children's learning achievement in Nairobi province.

### 1.3 Purpose of the Study

Instructional materials are part of pre-school education. Children learn better when they handle and play with a wide variety of instructional materials. However, in most pre-schools in Kenya, children are taught with a few instructional resources. The purpose of this study was therefore to find out the benefits accrued from teaching using a variety of instructional resources in selected pre-schools in Nairobi North District of Nairobi Province.

### 1.4 Research Objectives

The following objectives guided the study:

1. To find out the difference in learning achievement between children taught using a few print instructional resources and those taught using a variety of instructional resources.
2. To find out difference in retention of learnt concepts between children taught using a few print instructional resources and children taught using a variety of instructional resources.
3. To find out the available instructional resources in pre-schools and their utilization in the learning process.

### 1.5 Research Questions

The following were the research questions of this study:

1. Is there any significant difference in learning achievement as measured by pre and post-test among children who have been taught using a variety of instructional resources and those taught using a few print instructional resources?
2. Is there any significant difference in retention of learnt concepts as measured by the post-test among children taught using a few print instructional resources and those taught using a variety of instructional resources?

3. How are the available instructional resources used in the learning process in pre-schools?

### 1.6 Hypothesis

The study proposed the following hypotheses:

1. There is no significant difference in learning achievement as measured by pre-test and post-test between children taught using a few print instructional resources and those taught using a variety of instructional resources as measured by pre and post-test.
2. There is no significant difference in retention of learnt concepts as measured by the post-test between children taught using a few print instructional resources and those taught using a variety of instructional resources.
3. There is no significant relationship between the availability and use of instructional resources and children's learning achievement.

### 1.7 Significance of the Study

It is expected that the findings and the suggestions in this study would be significant to teachers, parents, sponsors, policy makers, curriculum developers and pre-school children. This study would be of benefit to the Quality Assurance and Standards (QAS) to ensure provision and use of a variety of instructional resources in pre-schools.

This study would stimulate pre-school stakeholders to ensure that children are provided with adequate instructional materials in their learning process. The study would also enlighten the sponsors on the need to provide sufficient instructional materials to pre-school children in their learning process.

### 1.8 Limitations of the Study

This study used a quasi-experimental design and it was not possible to control the subjects. It was not possible to control the respondents as the researcher would control items in a laboratory

experiment (Owino 2002). The results of the study were affected by extraneous variables such as teachers experience in teaching and children being at different levels in terms of ability.

### 1.9 Delimitations of the Study

This study used information collected in selected pre-schools in Nairobi North District, in Nairobi Province. Schools were selected from different parts of the District. The selection of the schools was based on public and private categories. The respondents in this study included the heads of schools, teachers and pre-school children.

### 1.10 Basic assumptions

The following assumptions were formulated for the study.

1. That the schools under study had adequate instructional resources.
2. That teachers had the required professional qualifications for teaching in pre-schools and they also used instructional resources to teach.
3. That use of a wide variety of instructional resources to deliver instruction would increase children's learning achievement.
4. Pre-school children involved in the study have the same characteristics.

## 1.11 Operational Definition of Terms

**Instructional Resources**

Instructional resources are tools used for teaching and learning and support the teacher in delivery of knowledge. They help emphasize specific knowledge and make learning easier and more meaningful.

**Learning Achievement**

This term refers to the learner's ability to comprehend and retain concepts and principles taught in a formal set-up.

**Instruction**

Form intended or used for teaching people concepts.

**Academic Performance**

Grades representing the sample of a learner's achievement with regard to attained academic skills or knowledge.

**Few**

Small number, not many

**Variety**

Assortment

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This chapter deals with a review of literature that relates to the research problem. The literature reviewed in this study is about importance, influence, types and selection of instructional resources. The discussion involves the desirable characteristics of instructional materials for 3-6 years old children. Other areas discussed include instructional resources and different activity areas and use of instructional materials, the theoretical and conceptual framework as well as instructional resources, commonly referred to as teaching and learning aids or educational media.

## 2.2 Instructional Materials in Relation to Learning Achievement

Eshiwani et. al, (1988) indicated that most schools that registered poor results spent less money on purchasing and developing teaching materials. Availability of textbooks is important in teaching mathematics and English especially during the private studies. Other resources like libraries contribute a lot to performance in schools. Schools that do not have such facilities or have ill-equipped libraries tend to perform poorly in national examinations. Poor learning environment in the developing countries has always been identified as one of the key factors that leads to poor performance in examinations. Raju (1973) considered some individual secondary schools to be pathetic since they lacked suitable teaching aids and had poor teaching facilities. A study conducted by Heynemann (1980) showed that a school library has a significant effect on the learners' academic performance. He found out that the simple presence of a school library is significantly related to achievement in Brazil, China, Botswana and Uganda. Bett (1986) carried out a study in the area of resources and their impact on achievement. The study found out that

poor support from the local community in the development of learning materials and facilities was prevalent in most schools.

### 2.3 Importance of Instructional Materials for Pre-schools

Children cannot learn effectively without the real, direct firsthand experience. The physical environment needs to be wide-ranging both in-door and outdoor with natural and manufactured objects. Frequent lack of attention to the external environment must come from some bizarre assumption that knowledge acquired indoors is superior to that gained outside. The important thing for early childhood educators to remember is how the provision of materials will be helpful to the adult to assist children develop their ideas, feelings or relationships, movement and embodiment (Morrison, 1991). When children join early years groups, it is important to bear in mind that material provision, together with the people they spend time with, are the essence of the early years environment indoors and outdoors (Morrison, 1991). The environment is the mechanism by which the early childhood educator brings the child and different aspects of knowledge together. Observing, supporting and then extending is the key to good learning (Bruce, 1987).

### 2.4 Influence of Instructional Materials on Learning Achievements in Children 3-6 years old

Past research in areas of instructional materials, studies over the past 30 years have demonstrated repeatedly that the availability and management of adequate supplies of textbooks, teachers' guides and supplementary reading books have a major impact on student performance. This is the case especially if used properly by teachers in the classroom. In fact, the availability and use of instructional materials are among the most important factors in improving learners,

achievement, which is widely recognized as being more important in the poorest countries (MOE, 2003).

Mukundi (1999) identified the lack of facilities as a major contributing factor towards poor performance in Kiambaa Division. The schools that had adequate learning facilities recorded satisfactory and good performance, while those that had inadequate learning facilities performed dismally. Based on the findings, she concluded that availability of facilities permitted high degree of learning achievement, while low level of availability of facilities led to poor performance. This therefore shows that instructional materials influence children's learning achievement.

The Kenya Technical Working Group, (Republic of Kenya, 2003) recognizes that the availability of Educational materials has a major bearing on educational outcomes. These materials included textbooks, equipment, furniture, library facilities and student writing material. A survey carried out in Kenya by the Southern African Consortium for Monitoring Education Quality (SACMEQ, 1999) as quoted by Republic of Kenya (2003) revealed that there was a critical shortage of textbook equipment and physical facilities. There were also major inter and intra-provincial resources variations in availability, directly contributing to their performance in national assessments. The group underscored the fact that the availability of textbooks and other learning materials has perhaps been the most constraining resource to educational quality in most rural schools in Kenya. Mulwa, (2005) and Court, (1974) identified the distribution of equipment as a major factor that counts for scholastic differences among schools.

School resources and class size were identified as factors influencing the examination performance. The more resources available, the better for the pupils as they will have adequate learning materials. Lack of teaching and learning resources would in most cases lead to pupils' poor performance. In his review of the determinants of school achievement in the third world countries, Eshiwani (1982) have identified school resources as one of the policy related factors that may cause poor academic performance. Therefore to improve children's learning achievement they should be provided with instructional materials to use in their learning process.

The availability of the teaching and learning resources makes a difference in the achievement by students. Court and Ghai (1974) found that the distribution of resources such as books and equipment account to scholastic difference among schools. It was observed that good teachers as they teach, keep in mind what they teach and what they use for teaching. Learning is passive and boring if learning resources are not incorporated effectively, organized and exploited in the learning process. It is the proper organization of the learning resources that the use of appropriate teaching and learning strategies will enhance the acquisition of the subject matter. In a study on the factors that affect the teaching of science in Changwithya location in Kitui District, Kyalo (1984) established that lack of teaching equipment in most rural schools discouraged teachers from doing their best. He concluded that if schools were well equipped, it would motivate the teachers to facilitate learning. This shows that children need to be provided with instructional materials so that they can learn effectively.

Teaching resources enhances retention of about eighty percent (80%) of what is learned according to ASESP (1994) and Obonyo (1987) who concur with this statement as they noted

that instructional materials such as text books, visual and audio materials not only enhance communication between the teacher and the learner but also facilitates child centred learning and learning through discovery. They motivate and encourage participation by the learner in the learning process, help clarify concepts and add meaning to the texts. However, Obonyo argues that teaching/learning resources can only facilitate learning if they are compatible with the instructional objectives. Performance in examination is very important in the education system as well as to the individual learner. This is because the results provide a means for assessing the degree of past achievement of the learning objectives and in the process serve to stimulate the learner to put the necessary effort into learning (Eshiwani, 1993).

According to (Ministry of Education, Republic of Kenya, 1988) and Eshiwani (1993) many scholars have discussed similar factors associated with the instructional process. They include the instructional resource materials, physical facilities, human resources, instructional supervision and school management. According to Fuller (1985), there are some elements whose qualities have been found to be consistently related to achievement. These are desks, instructional materials especially textbooks, school library activities, teacher quality, length of instructional programme and school administration. There are many studies that have explored the relationship between teaching materials and other related inputs and students learning and achievement in developing countries. Among the most important instructional materials that have shown to have a significant influence in the teaching learning process are textbooks and other reading materials. The availability and use of such materials have a positive effect on pupils achievement (Psacharopoulos and Woodhall 1985; Fuller, 1987). Without such materials, classes will always be teacher centred and didactic, in which case pupils will not learn how to

work independently or in groups (Republic of Kenya, 2002-2008). Heyneman (1981) found a strong consistent relationship between pupils achievement and the availability of books. This therefore shows there is a positive relationship between books and children's learning achievement. Children will achieve more when they use instructional materials as they will be able to solve problems using them to acquire knowledge and skills.

With availability of textbooks and learning materials, pupils and teachers are forced to apply more active teaching and learning methods. Pupils are encouraged to look for solutions by themselves instead of reading ready-made answers (UNESCO, 2001). Fuller (1987) found that sixteen out of twenty four studies completed after 1970 concluded that the availability of learning materials contribute significantly to students achievement. The Provincial Working Committee on Improvement of Educational Standards in Western Province in Kenya (1998) found that inadequate supply of learning resources and lack of essential facilities was responsible for falling standards in schools in performance in national examinations in Western Province. Available evidence demonstrates that educational inputs which include physical facilities and instructional materials have an impact on pupils learning and achievements thus the best educational programmes can be frustrated by lack of instructional materials (Rosenberg 1998, Lockheed and Verspoor 1991, Farreh and Heinann 1987).

Mutebi and Matovu (1994), appropriately stated that we learn and remember 10% of what we hear, 15% of what we see, 20% of what we discuss with others 80% of what we experience directly or practice and 90%. of what we attempt to teach others. This implies that teachers should strive to use a variety of teaching resources to arouse the learners' curiosity and interest.

Since learning refers to relatively permanent change in behaviour which can adequately be achieved through employing a variety of instructional materials, teachers should often strive to use them (Nzai, 2006).

According to Orenge (2007) in his study on "Analysis of Factors which Contributed to Poor Students Performance in KCSE examination in Nyacheki, Gucha District," provision and maintenance of physical facilities for instance land, school buildings, playgrounds, equipments and means of transport, teaching and learning materials like textbooks, stationery, chalks, dusters and chalkboards were also crucial in school. According to the Report of the Presidential Working Party on Education and Manpower Training for the next Decade and Beyond (Republic of Kenya, 1988) the resources were to be planned for properly and utilized in an effective manner to bring about efficient provision of quality and relevance in education. According to Fuller (1986) greater availability of textbooks and reading materials raises the quality of learning activities and leads to an increase in student achievement.

According to Muthini (2003), inadequacies of instructional materials in schools constitute one of the most important factors adversely affecting the quality of education. A number of studies have established that less money is spent on instructional materials as compared to the amount spent on other uses. Since less money is spent on instructional materials and essential facilities, majority of schools lack facilities and instructional materials, thus low learning achievement (Republic of Kenya, 1997 and Oduor, 2002).

UNESCO (2000) noted that the availability of a range of teaching related equipment, supplies, furniture and various forms of printed media for teachers and learners is critical in facilitating the process of teaching and learning worldwide. The report further notes that access to a range of resources and services enable teachers to enrich the teaching environment. The report also notes that developing countries incur high recurrent expenditure on teachers salaries, which severely restricts the funds available to improve classroom and teaching resources by the Government (Njuguna, 2004). This is relevant to the study since Kenya is one of the developing countries and much is spent on other facilities and little is spent on instructional materials and hence low learning achievement in children. Lockheed and Verspoor (1991) point out that the learning environments in many schools in the developing countries are poor. To improve learning, they suggest that resources be availed and well managed.

According to Mwangi (2001) most schools spent only 3% of their finances on instructional resources. Though it was difficult to get the exact amount spent on instructional resources, it was found that a large number of teachers were not provided with instructional resources besides textbooks. It was therefore recommended that the schools increase the allocation of funds for purchase or development of relevant instructional resources for economics. In his findings, instructional resources were found to be significant in determining the learning achievement in economics at the secondary school level. However, a majority of teachers did not use them. It was found during interviews that there were hardly any instructional resources that could be used to reinforce the teaching of economic concepts which led to low learning achievement in students.

### 2.5.0 Types of Teaching and Learning Resources

Teaching and learning resources can be classified in various ways. They can be broadly classified into three groups or categories namely primary, secondary and tertiary. The primary category includes actual objects seen in their natural environment such as grazing cattle, carrying babies, singing birds and musical instruments. The secondary category includes models and preserved specimens for example sounds recorded on cassette or produced on radio, mounted leaves and specimens of animals such as fish and birds. These do not have the reality of the primary category. The tertiary category includes resources such as films, pictures, charts, photographs, maps and chalkboard.

Another common way of classifying teaching and learning resources has the following categories: visual materials, printed materials, various types of boards, graphics, games, audio-visual aids and audio aids and resource persons. Items under the category of visual materials appeal to the sense of sight. They include real resources, specimens, models and diorama.

When children come into a room or hall they often focus on the materials and equipment that is available. A colourful slide or an attractive home-corner can sometimes make the difference between joining in the fun or staying close to an adult. When we put out activities and equipment we need to be aware of the amount of space that is needed and the number of children who may wish to join in. Some equipment for example trains, tractors, building blocks and tricycles need large amounts of floor space and there may not always be enough space for all of them to put out (Tassoni, 2002). The following are the instructional materials that could be availed for children to interact with.

### 2.5.1 Materials Used in Creative Play

There are different types of materials that can be used in creative play as presented by Tassoni (2002).

**a) Sand**

Sand can be used in a wet or dry form. Children can use it to create an imaginary environment for diggers, animals and other toys. A sand tray is also an area where children can learn to play creatively together, sharing their imaginative experiences. Sand can also be used as part of a collage picture or to provide an interesting sound in a shaker made from a clear plastic bottle Sawdust beans or peat can be also be used in collage activities but health and safety issues should be considered.

**b) Water**

From an early age, water plays an important part in creative play-starting in the bath. Children will play at a water tray, washing bowls, paddling pool or bath for a long time. In creative play, water can be transformed by adding ice, colouring, bubbles, and even a variety of smells such as lemon.

**c) Painting and Drawing**

There is a wide variety of drawing materials on the market for instance pencils, felt tipped pens, wax crayons and chalks. Children can use these as a medium on their own or mixed together. Drawing can be free or topic related. Children can use drawing materials such as wax crayons, to explore and rub a variety of textures for example bark and walls. The medium provided to 'draw' on will encourage children to explore their imagination. Papers can range from thin tissue to thick paper that children can make themselves. Children can use a variety of brushes depending upon their manipulative stage. Other things that can be used to apply paint include:

potato printing, scrubbing pads and nailbrush painting, blowing paint with straws, painting with rugs or scrunched up newspapers, printing with a roller, sponge painting, drawing with wax and painting over with coloured paint, roller painting using an old deodorant bottle and finger painting. Paint can be bought ready-mixed or in powder form. The type of paint provided for a creative activity will depend upon the consistency required.

**d) Malleable Materials**

They can be bought in forms such as clay plasticine, whereas materials such as playdough can be made at home or in the work setting Tassoni, (2002). Paper 'mache' can also be provided either as strips of paper dipped in glue or soaked pulp that can be moulded and dried out ready for painting.

### 2.5.2 Indoor Equipment

Indoor means inside the house. In this case there are play equipments that are suitable for indoor as recommended by Gilley (1975).

**i) Library Equipment**

In addition to a supply of well selected books and pictures, library equipment should include low moveable bookcases, a round table, chairs and stock pillows. Magazines catalogues and encyclopedia can be used for reference. Puppets and accessories, flannel boards and accessories, a picture collection from which children can create their own stories and a magnetic board with letters, numbers and pictures are desirable supplements to the library centre.

**ii) Blocks and Accessories**

Needed in the block area are solid block units in single, double and quadruple units ramps, triangles, cylinders, curves and 'y' shapes, large, hollow wooden blocks and boards and sets of blocks that they may be assembled are also desirable. Toys, traffic signs, cars, buses, rockets, dump trucks, hauling trucks, fire trucks, trains, farm and zoo animals and figures of people can be used with block shelves, carts and bins can serve as storage receptacles.

**iii) Nature and Science**

Glass containers are needed for Aquariums and terrariums in the science area. Pet cages and cages for insects are also desirable as are butterfly nets, jars, scales, magnets, magnifying glasses, prisms, weights, and indoor and outdoor thermometers. Pulleys, levers, an electrical board with switches, contacts and lights, a compass, a collection of rocks and shells and an assortment of objects to sort, smell, touch and taste should be included. A variety of plants that are labeled and a watering can are also meaningful additions.

**(2) Manipulative Equipment**

Representative manipulative items include wooden beads, pegboards with sticks, a dollhouse with furnishings and small dolls. Board and card games, geometric form boards, table-sized blocks and sorting collections such as buttons, seeds and painted bottle caps can be included.

**i) Music and Rhythm**

A piano, record player, tape records, autoharp and selected records with storage rack are desirable items. Instruments for children should include scarves for creative rhythms, pairs of dowel sticks, triangles, shells, drums and other rhythm instruments.

### ii) Art Materials

Wooden or formica-surfaced clay boards should be supplied for art work. Other equipment that is needed for this area includes water-base clay, oil clay, modeling dough, and damp sand. Scissors should be blunt ended although few pointed pairs and a few left-handed styles are needed. Scissors can be used on old magazines and assorted papers and fabrics. For painting, assorted brushes (one-half inch and one-inch tips with long handles) are preferred. Other useful styles are flat brushes for use with tempra and flat brushes (one and one-half inch wide) with short handles for wall and house painting.

## 2.6. Selection of Appropriate Instructional Materials for Children (3-6 years old)

There are several factors which affect the selection of appropriate instructional materials for use in the classroom and which should be seriously considered before a teacher decides to use any types of instructional resources. According to Ayot and Wanga (1987) the following is the check list for deciding on instructional resources:

i) The subject to be taught and the teacher's needs.

ii) Availability of relevant instructional materials such as text books, visual and audio-visual aids.

iii) The topic to be taught.

iv) The objectives of the lesson.

v) The age group of learners and their ability in class.

Therefore to enhance children learning achievement the above factors should be considered when selecting appropriate instructional materials for pre-school children.

The number and age of children enrolled in a pre-school determines the quantity and the requirements of equipment. Certain basic items are essential for all programmes. These can be obtained from a variety of sources. Some equipment and materials will have to be purchased while others can be made by parents and volunteer groups (Gilley, 1975).

## 2.7 Desirable Characteristics of Instructional Materials and Equipment For Pre-Schools

Certain characteristics of instructional materials and equipments enable teachers to make the most effective use of it in establishing learning and development opportunities for young children. Desirable features of instruction materials and equipments are:

### i) Stimulating

Instructional materials and equipment should stimulate children to develop intellectually, emotionally and socially as well as physically (Gilley 1975). The potential to develop auditory and perceptual discrimination skills is an important factor to consider when selecting equipments. The variety of types of materials and equipments should challenge the wide range of abilities and interests that are usually found in an early childhood group. That children become discouraged when play equipment is beyond their capabilities. They are also bored by equipment that does not challenge them. All these factors should be considered.

Materials and equipment stimulate children in groups as well as in individual activity and thereby becomes an important socializing tool. They also serve as a vehicle to explore ideas and are a prop for learning experiences. In addition to facilitating the teaching of specific skills, materials and equipments should also promote practice of skills. For instance, playing with blocks helps children to distinguish sizes, shapes and quantities. Blocks lead to varied structural

arrangements and to practice in developing perceptual and problem solving skills. Word working equipment and puzzles develop eye-hand coordination as well as manipulative skills. Motor control and physical adaptability skills can be improved by outdoor as well as indoor equipment. Riding a tricycle is excellent coordination activity, and sand play offers opportunities for manipulative and quantifying activity.

**ii) Safety**

All equipment and materials must be safe for children to use. Hazardous features that one should avoid include, as sharp and pointed edges that could injure a child. Some plastics crack easily and leave jagged edges. These and metal toys that are likely to rust should not be used. Wooden toys, after considerable use sometimes tend to splinter and to break. It is also good safety practice to avoid equipment with small pieces that can be easily swallowed (Gilley 1975). The size, height and weight of materials and equipments should be such that children can easily handle it. This can be achieved by securing 'child-sized' equipments. The ages, sizes and maturity of the children should determine the choice of particular toys and furnishings.

**iii) Serviceable**

Ease of maintenance and strength are desirable features of equipment. Wheel toys and other equipment with movable parts should be constructed of easily replaceable parts. Outdoor equipment must be able to withstand adverse weather conditions. The climate of a given locale determines, the materials and paint that are best suited for outdoor equipment. In some instances, stained wood finishes are more durable than painted wood finishes. Surfaces should be painted with nontoxic and nonflammable paint (NACECE, 1990).

**iii) Multipurpose**

Ideally, equipments and materials should serve more than one purpose. That is, it should lend itself to creative interpretation by the child who uses it. For instance, blocks can be used to build houses, stores and roads. In such play blocks can become what the child chooses it to become. Thus, equipments that stimulate the child's imagination encourages creative play and a desire to explore (NACECE, 1990).

**iv) Variety**

An adequate variety of equipment and materials is desirable. Equipment that help to teach number and colour recognition, size and shape discrimination; texture height and weight; balance relationships; sound discrimination and manipulative skills is especially valuable (Gilley, 1975).

## 2.8 Display of Materials

The displays in the classroom are part of the learning environment. The way materials are displayed can affect children's learning. The display, whether on the walls or tables should be at a height where children can reach and see clearly. The displays should be arranged properly for example by theme or activity area. Wall displays should be fixed properly and the teacher should see that they stand straight in relation to natural vertical and horizontal lines for example walls and floors. Display of concrete materials are better arranged in learning centres. There should be enough working and movement room between the corners. It is important that some of the children's work be displayed for some time. It gives them a feeling of success and confidence (NACECE, 1990).

## 2.9 Instructional Materials and Activity Areas

The National Centre for Early Childhood Education has recommended a variety of instructional materials in regards to different activity areas (NACECE, 1990).

### a) Instructional Materials and Language Learning

Much of the knowledge children absorb it best acquired by exploration in the real world where they may freely, actively, construct their vision of realities rather than be passively instructed about it. Young children learn by observing what happens when they interact with materials and people. Development of their skills is achieved through hands on learning. According to Sawdners (1979) visual and relevant pictures should be used because they are generally understood and remembered easily. Children understand things they see more easily than abstract ideas presented just in words. Direct experience involving learning through doing, leads to a deeper understanding of the subject and the issues involved. He recommended the use of multi-sensory materials. People receive experiences through all five senses and thus understand better.

Distribution of resources like books and equipment were cited as major factors which account for scholastic differences among schools. Eshiwani (1996) reports that the achievement of students is enhanced by the availability of books. Maengwe (1985) observed that the use of class readers enabled all the children to read. Teachers are required to plan activities in such a way that there is sufficient variety to meet the needs and interest of each child. This is because different media appeals to different people in different ways. This may be organized in both learning centres and

group activities. Learning centres encourage both autonomy and self-control. They allow children to take responsibility of their own learning and engage in activities that interest them.

**b) Physical Facilities and Learning**

According to Ayot (2000) most people agree that the physical facilities in schools such as classrooms, desks, tables, chairs, outdoor playing equipment have a direct link to achievement. Eshiwani (1988) in his study done in Western Province in Kenya concluded that the presence or absence of school facilities distinguished between high achieving and low achieving schools.

**c) Instructional Resources and Science Learning**

Some low and non-cost materials can be used to achieve objectives in the syllabus. To remember what they have learned, children can be taught a song that carries a science message (knowledge) by singing accompanied by instructional resources like masks, puppets or pictures. This will make them get involved in a physical action which will make a science concept being taught memorable.

**d) Instructional Materials and Mathematics Learning**

Through physical games and exercises, children develop healthy minds and bodies. It also cultivates in them the skills of cooperation and friendship. Children learn to remember better when they are involved in a play activity that may include elements of competition and team work. As children use blocks and packing boxes of various sizes, they learn about size, shape and weight. Learning names of geometrical shapes and relating to concepts of shape to toys and materials in the environment are important.

**e) Instructional Materials and Creative Arts**

Logiblocks are simple structured materials to represent basic shapes of different sizes, colour and thickness. They can be used to identify shapes, sizes, colour and thickness. The logiblocks can be used as templates for simple drawings. Young learners can gain confidence in their artwork if they can draw around simple shapes. The activity can be either strictly directed by the teacher that is, drawing animals using only circles or drawing a person using squares only or left to the imagination and creativity of the learners it can be completed by colouring (NACECE, 1988). Children can also be given different materials like commercial colours, flowers, leaves, waste cartons, water, brushes, paper brushes in a colouring activity. They can be arranged in small groups. These groups are easily arranged. Children can be asked to name various uses of colours and why they are used. Primary colours can be identified in nature, sky, sun, moon, sea and flowers.

**f) Children and Play**

When children are playing, they are learning all the time and therefore it is very necessary that they are provided with a setting in which satisfactory learning can take place. This means a rich and varied environment with a great variety of different kinds of play materials and warm, friendly accepting atmosphere is important. Materials should be within children's reach so that they can choose what they want and put them away when they are finished with them.

With regards to play and its role in acquisition of knowledge and skills his curriculum consisted of the following aspects.

i) The gifts and occupations. The gifts are the play materials which he emphasized needed to be provided for children to help them learn effectively. The occupations are the

activities which teachers should provide for children to enhance their learning. According to Froebel, gifts included play materials such as balls, cubes, cylindrical pieces and small blocks. Occupations were activities such as drawing, colouring with water colours, modeling with clay, paper foldings, weaving and sewing.

ii) Froebel also emphasized the importance of the development of children's fine motor skills which are the last to develop for pre-schoolers. The development of the muscles prepares children in writing.

iii) He stressed that self-activity in children and development of self-esteem and confidence are important.

**2.10 Effective Use of Instructional Materials**

Instructional materials are used by the teacher to support his or her teaching and make it most effective, appealing to the site and senses of his learners. They are used to support the teacher in delivering his information and they help in emphasizing a point with learning as a by-product (Ayot and Wanga, 1987). When instructional materials are used properly, they may help the learners to perform concrete physical actions or utilize abstract symbolization skills. The teacher will sometimes use them as a means of shifting the responsibility of learning from teachers to learners by introducing a wide range of different types of sensory experiences into the classroom. Learners need concrete sensory experiences when they are young but some teachers never seem to realize this. They seem to depend on abstractions and their teaching become concrete only when they use instructional resources. So the role of instructional materials in a learning situation is very vital. Therefore, children should be provided with instructional materials to improve their learning achievement.

Instructional materials are used to increase learning, to generate more interest and to create a situation where the learners would fully engage in classroom activities. When instructional materials are applied adequately they give the learners practical experience which can help them develop skills and concepts more easily. The selection of good instructional materials can enable the learners to present their work in a variety of ways in an abstractive manner. When the teacher becomes the sole active transmitter of information of which the children are passive receivers the latter may forget what he has been trying to impart to the class after a very short period of time (Ayot and Wanga, 1987).

### 2.11 Theoretical Framework

Acquisition of new knowledge is largely attributed to the interaction between the learner and the learning environment since it is during the process of interaction that the learners existing cognitive structures are adjusted to accommodate new knowledge (Kieran, 1985 as cited by Origa, 2000). This study was based on the constructivism theory of learning. Constructivism view learning as a dynamic process in which learners construct new ideas or concepts on their current, past knowledge and in response to the instructional situation (Crow, Kaminsky and Podell, 1997).

The theory implies that learners do not passively absorb information but construct it themselves. This study used eclectic constructivism version, which embraces both radical constructivism and social constructivism. This version regards learning as a constructive process in which learners build internal representation of knowledge as well as personal and social interpretations of such experiences (Bednar, et al, 1991) as cited by Origa, (2000). Knowledge is constructed as

individuals experience and interact in the physical and social worlds. Eclectic constructivists, are of the view that learning episodes involves both the construction and transfer of knowledge. In this study children in the experimental group were introduced to a variety of instructional materials, guided by the teacher to discover and explore. Explorations were done in an environment rich in manipulative materials. Learner to learner interaction, learner to teacher interaction and learner environment interaction was encouraged. The control group was taught with few instructional materials. The teacher's role was that of a guide, a collaborator and team leader by introducing helpful intervention as learning progresses.

A major theme in Brunner's (1966) theoretical framework as cited by (Crow, Kaminsky and Podell 1997) is that learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. Children need to participate in the process of acquiring knowledge. Children should therefore be provided with instructional resources, activities and tools that are matched and capitalize on their developing cognitive abilities. In his first stage of cognitive development enactive stage, children acquire knowledge and skills by actively engaging in activities. Children need lots of opportunities to engage in hands on activities with a variety of materials if they are to learn effectively. They need to be involved in doing things, manipulation, construction and experimentation using objects from the world around them (Crow, Kamnisky and Podell, 1997).

Piaget as cited by Kabiru and Njenga (2009) in his cognitive constructivism theory also emphasize that children construct knowledge and build schemas and hence need to be provided with plenty of concrete learning and play materials. He viewed children as active learners who construct their own knowledge. To Piaget, children are like little scientists who test their own

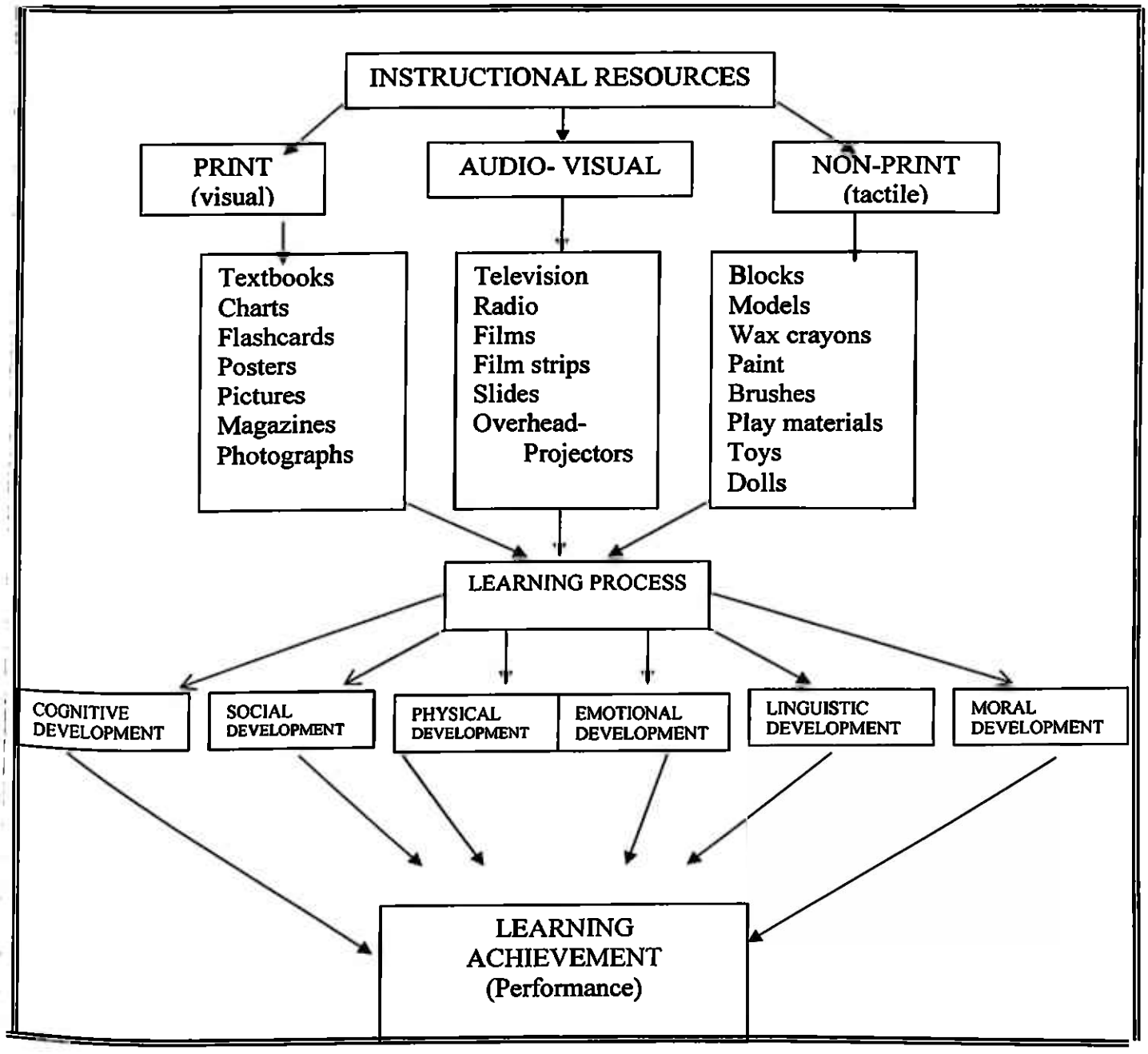
hypothesis to discover how the world works. They should therefore be provided with instructional materials to experiment with so that they can discover concepts by themselves. Among his four factors that determine cognitive growth, manipulation of objects allows children to develop and refine their understanding. This is relevant to the study because it deals with the relationship between provision and use of instructional materials and children's learning achievement.

Constructivism is both a theory of learning and a strategy to instruction. It builds on the 'constructivist' theory of the child Psychologist Jean Piaget and asserts that knowledge is not simply transmitted from teacher to learners but rather it is actively constructed in the mind of the learner. This theory suggests a strong connection between doing and learning. In this case, instructional resources allow learners to take charge of their own learning through direct exploration, expression and experience. The most integral part of constructivist theory here is that learners shift the role from being taught to learning and the teacher changes role from 'expert' to collaborator or guide (Resnic & Kafai, 1996) as cited by Owino, ( 2002).

## 2.12 Conceptual Framework

Figure 2.1 below describes the relationship between types of instructional materials, learning process, different developmental aspects and learning achievements in pre-school children.

**Figure 2.1: Conceptual Framework**




Own Concept, paraphrased from Brunner (1966) and Piagets (1954) Theories of learning.

The above figure shows instructional resources which have been divided into print, non-print and audio-visual. The print resources which include textbooks, charts, flashcards, pictures, posters, magazines and photographs when used in the learning process lead to development in the six developmental aspects which then leads to learning achievement. The non-print resources include blocks, models, wax crayons, paint, brushes, and play materials which also help children acquire skills, knowledge and concepts which lead to development in all the aspects and then lead to learning achievement. The audio-visual include the television, radio, films, slides and projectors among others.

For effective learning to take place in pre-schools, problem solving abilities should be enhanced in children. Resources to tackle such problems by children should be ideally provided if meaningful learning is to take place. When different types of instructional materials are used in the learning process they enhance development in all the aspects. When children use instructional materials during learning they learn to solve problems practically and later in an abstractive manner. They share materials amongst themselves as they work in a group. This enhances social development. They learn to share, take turns and solve conflicts amongst themselves. When provided with play materials they learn to perform physical activities like jumping, kicking, climbing, throwing and catching amongst others. Therefore play materials are necessary because when provided and used in the learning process they enhance the physical development and hence achievement in physical activities (Gilley, 1975).

Moral and emotional development is enhanced when children handle materials, express their emotions and learn what is right and wrong especially when playing with others. Language

development will be facilitated by the teacher providing reading materials like charts, flash cards, photographs and pictures, magazines and simple storybooks to read. All these will lead to learning achievement as children will be able to read on their own and answer simple questions (Gilley, 1975).

In this study, children's learning achievement was conceptualized as an outcome of availability and utilization of instructional materials and facilities. Children need to be provided with appropriate instructional materials in different learning areas. When instructional materials are used properly they help children to perform physical activities or utilize abstract symbolization's skills. Children need concrete sensory experience when they are young so that they can learn. Instructional resources increase learning, generate more interest and create a situation where children would fully engage in classroom activities. When instructional resources are used adequately, they give children practical experiences, which help them develop skills and concepts more easily (Gilley, 1975).

According to Brunner (1966) concept formation is influenced by the child's experience. The child needs first-hand manipulation, construction and arranging of real-world objects to form concepts during the earliest stage of development known as enactive stage (birth-7 years). Children discover as they actively participate in learning activities. At this stage, it is important for children to be given real and concrete materials to manipulate, explore and experiment with to be able to form concepts of the world around them.

## 2.13 Summary of Literature Review

In this study, the researcher reviewed literature from studies done previously. It was clear that when instructional resources were used, children scored high marks. Different types of instructional resources and their impact on children's learning achievements were discussed. The theoretical framework and conceptual framework were discussed. The constructivism theory on which the study based was discussed.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter outlines the procedures employed by the researcher. These include the research design, target population, sample and sampling techniques as well as the research instruments. Other areas described are pilot study and data collection procedure as well as data analysis.

## 3.2 Research Design

This study used a quasi-experimental design. According to Best and Kahn (1993), this design provides control of when and to whom the measurement is applied. This design is often used in classroom experiments when experimental and control groups are such naturally assembled groups as intact classes that may be similar. According to Polit and Hungler (1989) as cited by Owino, (2002), quasi-experiments are practical, feasible and can be generalized. Mason and Bramble (1997) as cited by Owino, (-2002) point out that quasi-experimental design can be carried out in field settings. The study used this design since the study was on natural field settings. In this study, teaching of the experimental group involved use of a variety of instructional resources while that of the control group involved a few print instructional materials. Prior to the introduction of instructional resources, the researcher conducted a pre-testing and post-testing of the two groups before and at the end of the learning. The researcher compared the group exposed to the experimental treatment and the control group. The difference between the means of the pre-test scores and the difference between the means of the post-test scores (mean gain scores) were tested for statistical significance.

### 3.3 Target Population

Neil (2005) defines target population as the collection of all individuals or items under consideration in a statistical study. This study used stratified sampling to select the target population. Schools in Nairobi North District fell into public and private categories. There were fifty-six pre-schools in Nairobi North District. Twenty-five pre-schools were private while thirty-one pre-schools were public. There were two hundred and fourteen teachers and nine hundred and forty three children. Pre-school children from one of the public pre-schools and one of the private pre-school were involved in the study. Teachers and head teachers from each of the schools were involved. The researcher applied random sampling in each of the categories. This infers that there was representation of each sub-group or category. The researcher further carried out random selection of schools.

In the pre-test stage, teaching of the experimental group used a wide variety of instructional materials while that of the control group involved a few print instructional materials. A posttest for the two groups sought to establish the significant difference. Random sampling was necessary to block any method that could bring differences in results.

### 3.4 Sample and Sampling Technique

A sample refers to part of a population from which data is collected. This study used stratified sampling. Kothari (2004) describes that if a population from which a sample is to be drawn does not constitute a homogenous group, stratified technique is generally applied in order to obtain a representative sample. Under stratified sampling, the population is divided into several sub-population that are individually more homogenous than the total population (the different sub-

populations are called 'strata') and then a selection of items from each strata to constitute a sample.

This kind of sampling takes care of the diversities in the population. The researcher divided the population into categories to create strata. Schools, children, teachers and head teachers from the two sub-groups were randomly selected. The researcher listed all public and private pre-schools and their names cut into pieces rolled and put into two containers where the random technique involved picking the required sample. This enabled generalization of each sub-group in the research findings. Two headteachers from the two pre-schools used in the study were involved. Five pre-school teachers also participated in the study. Thirty children in the experimental group and thirty in the control group participated in the study.

### 3.5 Research Instruments

This study used the following instruments.

**a) Observation**

In this study, the researcher made use of a structured observation schedule. This involved observation of children during the learning process as they interacted with the resources to check whether they assisted them solve problems and acquire skills. The researcher also recorded the types of instructional resources using a checklist. The observation took place in the natural setting in the selected pre-schools.

**b) Interview**

Five pre-school teachers were required to answer questions about the teaching profession, types of instructional resources used and how they assisted children use them in the learning process.

The head teachers answered questions with regard to the life history of the school, the number of teachers, the number of children and who provided the instructional resources used in the pre-school. The questions posed to children were about the types of play materials they used in school and the types of instructional resources they enjoyed using most and the reasons why.

**c) Questionnaires**

The head teachers answered questions about the population of the school and expenditure on play and learning materials. The questions to the head teachers were simple and brief. These questions enabled the researcher to solicit information required. Respondents expressed their opinions on types of instructional resources in determining children's learning achievements and the type of curriculum used in their schools. Five teachers answered questions about their educational background, types of instructional resources they used and their opinion about the impact of instructional resources on children's learning achievement. They described the relationship between the use of instructional resources and children's learning achievement.

**d) Pre-test and Post-test**

Pre-school children from the two schools were subjected to a pre-test before the intervention and a post-test after the intervention. The content in the pre-test was different from that in the post-test. Mean scores attained in the pre-test and the mean scores attained in the post-test by the experimental and control group were compared to determine gains of the intervention.

### 3.6.0 Pilot Study

The researcher conducted a pilot study in two pre-schools randomly selected from public and private categories. This involved administration of research instruments to ascertain their effectiveness in soliciting information for the study. The instruments were pilot tested and corrections made. The researcher deleted some information that was not necessary from the research instruments while she retained the necessary information for the actual study. Pilot testing of these instruments was an important exercise that enabled the researcher to establish validity and reliability of the instruments. Schools chosen for pilot study were not involved in the main study.

### 3.6.1 Validity

According to Kothari (2004), validity is the critical criterion and indicates the degree to which an instrument measures what it is supposed to measure. To ensure validity, a pilot study was conducted in two sample pre-schools which were randomly selected. Observation schedules, interview schedules and questionnaires were prepared and administered to the subjects in these pre-schools. After the pilot study, ambiguities and omissions in the questionnaires and the observation schedule that had been overlooked were rectified and unnecessary statements were deleted.

### 3.6.2 Reliability

Reliability refers to the consistency or repeatability of measures of behaviour. This means that what is observed today should be the same tomorrow if everything is held the same. Borg, (1989) defines reliability as the level of internal consistency or stability overtime, of the measuring

research instruments. To ensure reliability of the research findings, the researcher pre-tested the instruments on a few pre-school children, teachers and headteachers to assess the appropriateness of the instruments. The feedback was used to adjust the instruments accordingly by rephrasing questions to make them clear. Responses were compared to different questions and by different interviewees to assess their relevance and consistency to the questions. At the end of the pilot study period, a preliminary analysis was done on data obtained from a sample of schools. The results represented what was anticipated and this was an indication that the instruments could be used to solicit information for the study.

### 3.7 Procedure of Data Collection

The researcher visited the school to brief the respondent about the study after acquiring a permit and distributed the questionnaires.

The researcher observed the available instructional resources and a checklist used to note them down. The researcher wrote field notes as she interviewed the teachers and head teachers on use of instructional resources. Questionnaires which were in closed form were provided to the teachers and head teachers where each was expected to fill in details about instructional resources and children's learning achievement. The researcher went to the schools to collect the questionnaires.

### 3.8 Data Analysis Techniques

The study used the Statistical Package for Social Science (SPSS) programme as a tool for processing and analyzing data. The researcher used various statistical analyses for data obtained from the pre-test and the post-test. The analysis of data involved use of percentages, frequencies,

mean scores and comparison of mean scores. The research questions and objectives guided the study in descriptive statistics to describe information obtained from interviews, observation schedule and questionnaires.

### 3.9 Concluding Remarks

This chapter dealt with the design of the study focusing on areas of methodology. The section discussed target population, drawing the sample size, sampling procedure, validation of the research instrument and data analysis. The population focus for the study was headteachers, pre-school teachers and pre-school children. Personal interviews, questionnaires, observation schedule and pre and post-test were used to collect data. The instruments were adjusted accordingly to ensure validity and reliability. Data was both qualitatively and quantitatively analyzed.

# CHAPTER FOUR

# ANALYSIS AND DISCUSSION OF RESULTS

## 4.1 Introduction

This chapter presents the results obtained from the analysis of the data results of pre-test and post-test. The chapter also contains analysis of the two questionnaires on the impact of instructional resources on children's learning achievement in selected pre-schools in Nairobi North District Nairobi Province in Kenya.

## 4.2 Demographic Information of Respondents

The study sought to investigate the impact of instructional resources on children's learning achievement. The data for the study used self-administered questionnaires interviews, tests and observation schedule. From the observation schedule, different types of instructional resources were available in the pre-schools under study. These included charts, counters, flash cards, paint, brushes, assorted shapes, cut-outs and play materials. A pilot study was conducted and corrections were made on the questionnaires. Questionnaires were administered to the head teachers and pre-school teachers. A total of seven questionnaires were administered and all of them were returned. To find out the demographic information of the teachers they were asked to indicate their gender, age, academic levels, professional qualifications, teaching experience and years of service. Findings revealed that 100% were female. They handled children with care as they acted as mothers. This made children feel free as they manipulated the resources in the learning process which lead to high learning achievement. Data on teachers age is presented in table 4.1 below:

**Table 4.1: Age of Teachers**

| Age in years | Frequency | Percentage |
|---|---|---|
| 0-27 | 1 | 20 |
| 28-30 | 2 | 40 |
| 31-45 | 2 | 40 |
| Total | 5 | 100 |

**Source: Field Survey 2010**

The above table shows the age of the pre-school teachers, which ranged between twenty-six and forty five years. Data revealed that 1 (20%) of the teachers was twenty six years old, 2 (40%) ranged between 28-30 years old and 2 (40%) had their age ranging between 31-45 years. This showed that all were mature to handle children and assist them to use instructional resources in the learning process.

Teachers were required to indicate their years of teaching experience. Data was presented in table 4.2 below.

**Table 4.2: Teaching Experience**

| Age in years | Frequency | Percentage |
|---|---|---|
| 0-3 | 1 | 20 |
| 4-6 | 2 | 40 |
| 7-9 | 1 | 20 |
| 10- and above | 1 | 20 |
| Total | 5 | 100 |

**Source: Field Survey 2010**

From the above table 4.2 (20%) of the teachers had a working experience that ranged between 0-3 years, (40%) 4-6 years, (20%) 7-9 years and (20%) between 10 and above. Most of them had a teaching experience of over five years. This suggested that the majority of the teachers had been teaching for a considerable duration of time enabling them to give reliable information regarding the impact of instructional resources on children's learning achievement. This also suggested that they were able to select the appropriate instructional resources relevant to the concepts taught and helped children use resources in the learning process.

The teacher respondents were further asked to indicate their professional qualifications. Data is presented in Table 4.3.

**Table 4.3: Professional Qualifications**

| **Professional qualifications** | **Frequency** | **Percentage** |
|---|---|---|
| Certificate in Early Childhood Education | 4 | 80% |
| Diploma in Early Childhood Education | 1 | 20% |
| **Total** | **5** | **100%** |

**Source: Field Survey 2010**

Data tabulated in table 4.3 shows that (80%) of the teachers had gone through certificate training in Early Childhood Education and (20%) had gone through Diploma training in Early Childhood Education. This suggested that they had proper training and adequate knowledge in Early Childhood Education matters. The teachers were able to identify appropriate teaching and

learning resources, select most appropriate teaching methods and approaches and use the best learning resources that enabled the children to learn using more than one of their senses and hence high learning achievement.

### 4.3 Pre-test

A pre-test was administered for sixty children to determine any gains as a result of the intervention. Assessment was through activities, oral questions and simple written questions. They were tested on number value, number recognition and picture reading. The results were analyzed in terms of mean scores. In mathematics, the experimental group scored a mean score of 55.3 while the control group scored a mean score of 55.2. The difference in mean score between the two groups was 0.1. In the English pre-test, the experimental group scored a mean of 50.4 while the control group attained a mean of 50.27 the difference in mean score was 0.13.

### 4.4.0 Activities Undertaken

The experiment was carried out in two pre-schools and sixty children were involved. The subject matter covered in the experiment was restricted to the requirements of the pre-school syllabus. The concepts covered were number value and number recognition in mathematics and picture reading in English. Participants in the experiment were learners of different abilities.

### 4.4.1 Control Group

Participants who received the control treatment were exposed to a teacher centred instructional approach in which classroom communication was predominantly one way from the teacher to the learners. Learning resources included books, charts, flashcards and chalkboard diagrams but no

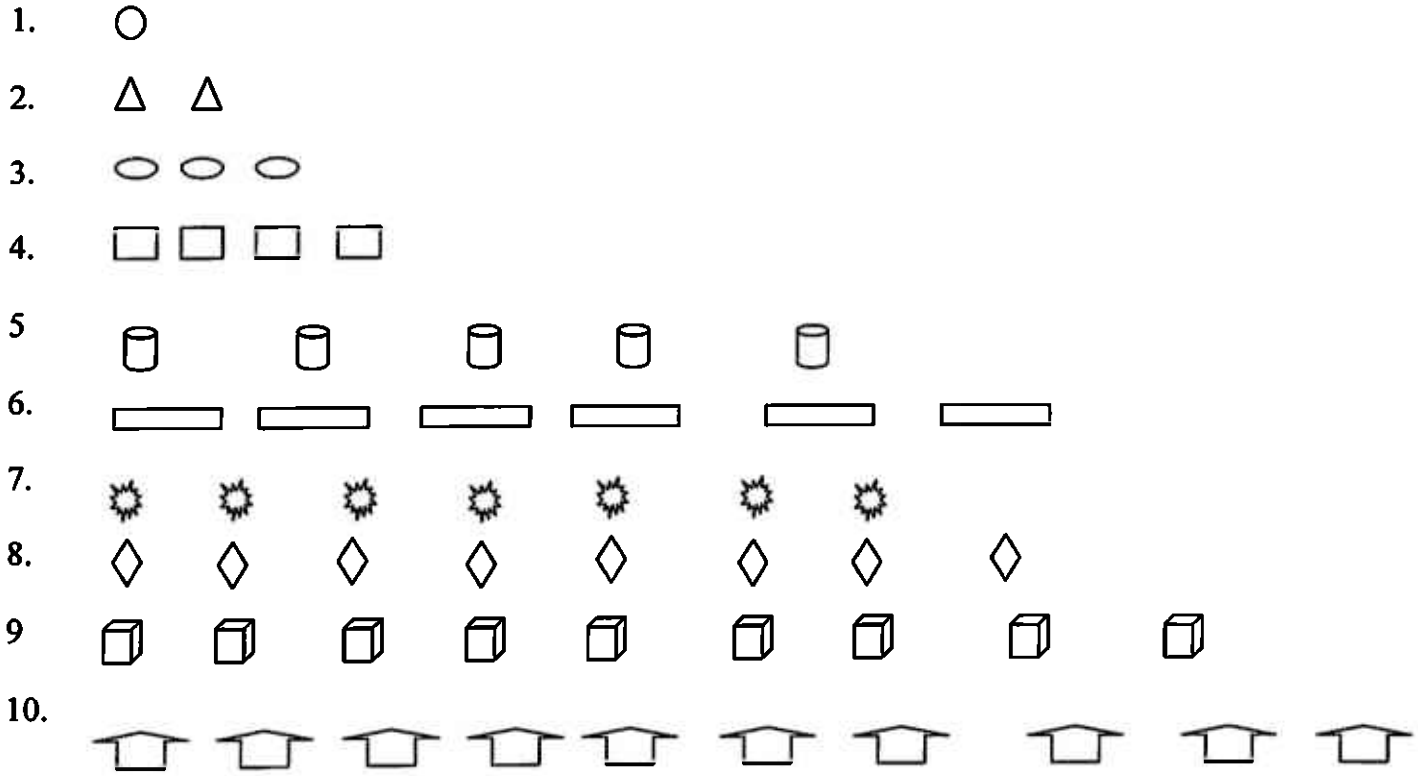
manipulative materials. The teacher prepared charts and flashcards that were used to teach the concepts of number value, number recognition and picture reading. Charts were displayed on the chalkboard as the children were taught, flashcards were also displayed and the teacher drew diagrams on the chalkboard as she taught these concepts to help children recognize numbers, tell their values and read the pictures.

### 4.4.2 Experimental Group

Participants who received experimental treatment were involved in an instructional approach which was similar to the control group except for the instructional resources used. Learning resources included manipulative resources like counters, assorted shapes, plasticine in addition to books, charts and flashcards. Children were taught both mathematics and English. In mathematics, children were taught number value and number recognition concepts. In English picture reading concept was taught.

## 4.5 Teaching Number Value Concept

When learning number value concept, the experimental group was engaged in several activities. They sorted out and grouped cut-out numbers putting ones, twos, threes and so on in separate groups. They used cards which had numbers written on them. They arranged number cut-outs and number cards in order from one to ten. They filled in missing numbers using number cards and on a master card. They were able to arrange the cut-outs in sequence and the correct number of objects against the numbers as illustrated below.

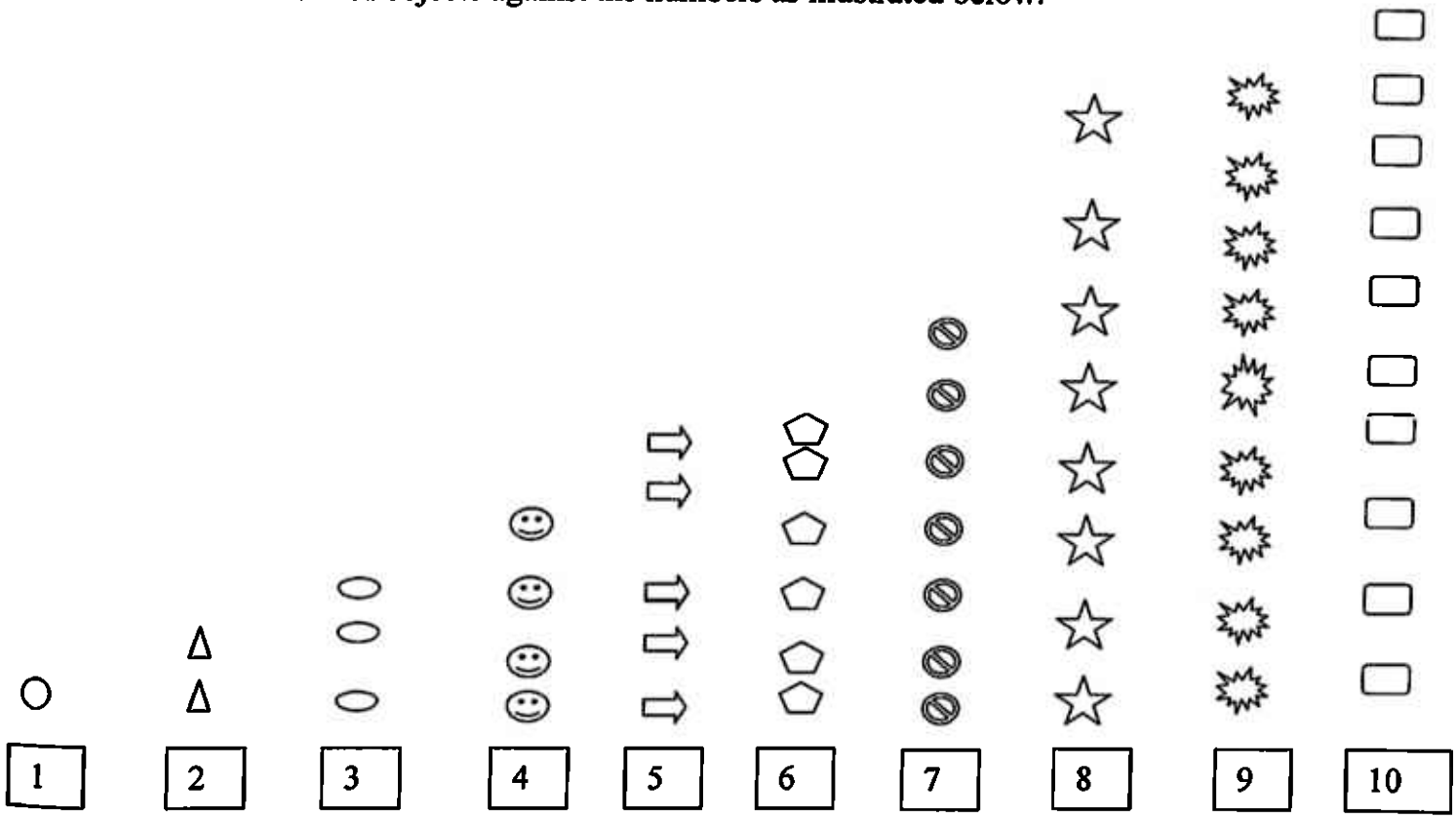


**Source: Field Survey 2010**

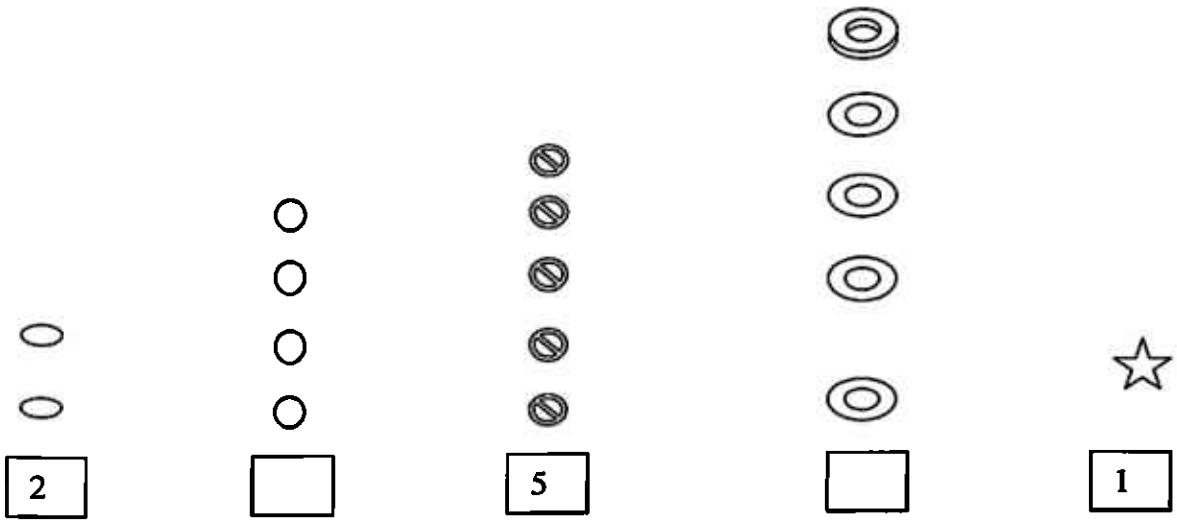
Children in the control groups were taught using a chart which had numbers written on them and some drawings just similar to the ones used in the experimental group without manipulative resources. The teacher also helped children count the number of objects drawn on the chalkboard to help them learn the concept.

### 4.6 Teaching Number Recognition Concept

Children in the experimental group were engaged in several practical activities. Children sorted out and grouped cut-out numbers putting ones, twos, threes up to ten in separate groups. Children used cards which had numbers written on them. They filled in missing numbers using number cards and on master cards. Most of the children were able to order number cut-outs in sequence and the correct number of objects against the numbers as illustrated below.




**Source: Field Survey 2010**




**Source: Field Survey 2010**

Children were engaged in a fishing game. They picked cards of number symbols and a combination of number symbols and values. They were able to say the numbers they had fished and how many objects are represented in that card. They played skittle games by throwing a ball at a line of skittles (cards on which numbers are written). The game was aimed at knocking one skittle at a time as each skittle had a number written on it. Children were expected to say the number written on the skittle that had been knocked down. There were outdoor activities where children jumped the number of times named. They engaged in a race and each child was given a number according to his or her position in the race. Children also learned number poems and sang number songs. The instructional resources that were used to reinforce the understanding of number recognition with the experimental group included flashcards with numbers on them, wall charts with numbers on them, bottle tops, seeds, beads, cut-out numbers, blocks, skittles, scissors, old calendars, sticks, number cards and ropes which were used for jumping.

To teach the control group, numbers were written on charts and flash cards. Children were helped to identify the numbers written and name them. Diagrams were also drawn on the chalk board to help them recognize the numbers. Children were not provided with concrete instructional resources.

### 4.7 Reading Readiness: Picture Reading Concept

Picture reading is a way of letting children look at pictures and discuss among themselves freely about what they see in the pictures. Pictures used were on familiar things and events which helped develop interest in the children. Participants in the control group were taught using blackboard diagrams, flashcards and charts with pictures. The teacher discussed the pictures with the children. Participants in the experimental group were taught using flashcards, picture charts, picture-books, picture cuttings, books on alphabets, paint, brushes, colours, plasticine seeds and pencils. They drew some of the pictures from the books on alphabets and coloured them. They discussed the colours and shapes of the pictures they drew. They also used pasticine to model some of the items from the pictures like cups, balls and flowers and used the plasticine to write the names below the pictures.

Pictures of animals found at home were displayed on the children's tables. They went through the pictures and discussed among themselves what they saw. They were able to tell the colours of the animals they saw in the pictures. Children were issued with picture books and charts and were allowed to go through them, discuss them and enjoy themselves. The teacher asked them questions and they were able to answer. They were able to tell the number of animals, name them and say what they were doing.

Pre-school children enjoyed using real instructional resources such as soil, water, live animals and plants. They also enjoyed using paint, brushes, musical instruments, straws, counters, containers, and pictures. They enjoyed manipulating the resources and they were stimulated to learn the concepts being taught. They did not enjoy using manuals, flash cards and assignment cards, because they were not stimulating compared to the manipulative. Children enjoyed when they were actively involved in the learning process.

### 4.8 Analysis of Data from Questionnaires

Seven questionnaires were used for the study. Two head teachers questionnaire solicited information on the life history of the school, the population, amount spent on instructional resources and their sources. More information on whether parents contribute towards the provision of resources, care of resources and teaching staff qualifications was solicited (Appendix A). The second questionnaire was administered to five pre-school teachers (Appendix A). Using the questionnaire the researcher solicited information on teachers age, gender, educational background and teachers teaching experience in years. The questionnaires further solicited information about types of instructional resources used by the teachers in the learning process, storage of the resources and teachers expressed their opinion on the effects of instructional resources on children learning achievement. A total of seven questionnaires were collected back for analysis.

Instructional resources, were stored after use in the cupboards and the store. Those that could not be used later like leaves, paint, flowers were discarded. The schools did not provide all the resources needed in the learning process. Those provided include manuals, printed charts,

chalkboard, manila papers, paint and brushes. Parents provided other resources like exercise books, pencils, razor blades, scissors, glue and plasticine. Children collected some resources from the local environment. Most of the resources available in the pre-schools were not enough for all the children. Some were shared among the children in groups.

From information obtained from the teachers there was a difference in performance in children taught using a variety of resources while compared to those taught using a few instructional resources. Resources discourage rote learning and make abstract ideas more concrete as the children handle and manipulate them. To ensure that the resources used were appropriate for the children, teachers considered the level of the learners, selected resources that were relevant and provided up to date information, were safe and easy to use and manipulate. The resources were large for visibility, catered for individual difference and captured and maintained the learners interest while learning.

Most of the pre-school teachers interviewed used a variety of instructional resources in the learning process while a few used just a few resources like charts, flashcards and counters. About the factors that they put into consideration when developing and selecting resources, teachers quoted availability, durability, children learning abilities, interest, relevance and safety as some of the factors they considered when selecting resources. Teachers provided a variety of instructional resources to the children to ensure that the learning environment was stimulating. Children were organized in groups and at times were let to work individually and through this, they were able to use the instructional resources effectively with the guidance of the teachers.

According to the pre-school teachers, instructional resources were important since they made learning real, as children were actively involved as they manipulated the resources. Learning was interesting to the children since they participated as they were practically involved in their learning. They also helped children understand concepts taught as they could solve problems practically.

According to the pre-school teachers' interview and from information obtained from the questionnaires response, when the instructional resources used are selected according to pre-schools children's needs, interest and ability they enhance learning and hence good performance. This therefore showed that when appropriate resources are used in the learning process, children learn concepts well and perform well. In the two pre-schools, where the experiment was carried out, there were three teachers in the private pre-school and two in the public pre-school. Five teachers from the two pre-schools participated in the study. The children who participated in the study were sixty in number. Each school had thirty children.

### 4.9 Provision of Instructional Resources in the Private Schools

In the private school, some instructional resources were provided by the parents as they brought their children to school and the school bought some. This was done once a year. Teachers provided children with instructional resources to ensure that the environment was stimulating and they improvised some

### 4.10 Provision of Instructional Resources in the Public Schools

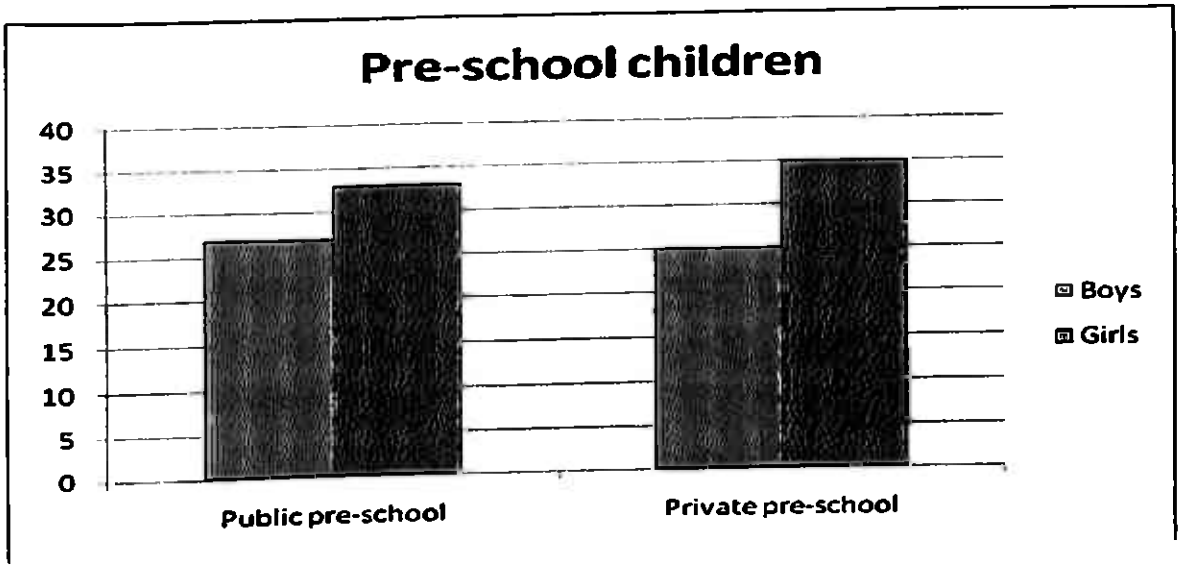
Parents paid money for purchasing instructional resources. Once the resources are in the school, the pre-school teachers are responsible of storing them in a special place. Other teachers would borrow them for use and return after use. Teachers collected some from the environment.

### 4.11 Use of Instructional Resources

Different types of instructional resources were used in the learning process. Children worked with the instructional resources at individual level and at times in groups. Since some of the resources were expensive, teachers improvised some to close the gap. They used materials found in the environment. Pieces of wood, cupboard and carton boxes were used to make models. Local plants were used to make dyes and plastic bottles of different volumes were used as measuring jars. To ensure that instructional resources were effectively used in the learning process, teachers provided a variety of resources to the children and guided them on how to use them to learn the concepts taught. From the response obtained from the pre-school teacher's questionnaires, when instructional resources are used in the learning process, they enhance children's manipulative skills, make the lesson child centred, build self-esteem and enhance social interaction and leadership skills in children.

**Figure 4.1: Public and Private pre-school population**

The figure below shows the population of the pre-school children in both public and private pre-schools.




**Source: Field survey 2010**

In the private pre-school there were 25 boys (42%) and 35 girls (58%). In the public pre-school there were 27 boys (45%) and 33 girls (55%). In both public and private pre-schools, girls were the majority as shown in the figure above and table 4.4 below

**Table 4.4: Public & Private pre-school population**

| **Gender** | **Number** | |
|---|---|---|
| | Public | Private |
| Boys | 27 | 25 |
| Girls | 33 | 35 |
| **Total** | **60** | **60** |

**Source: Field Survey 2010**

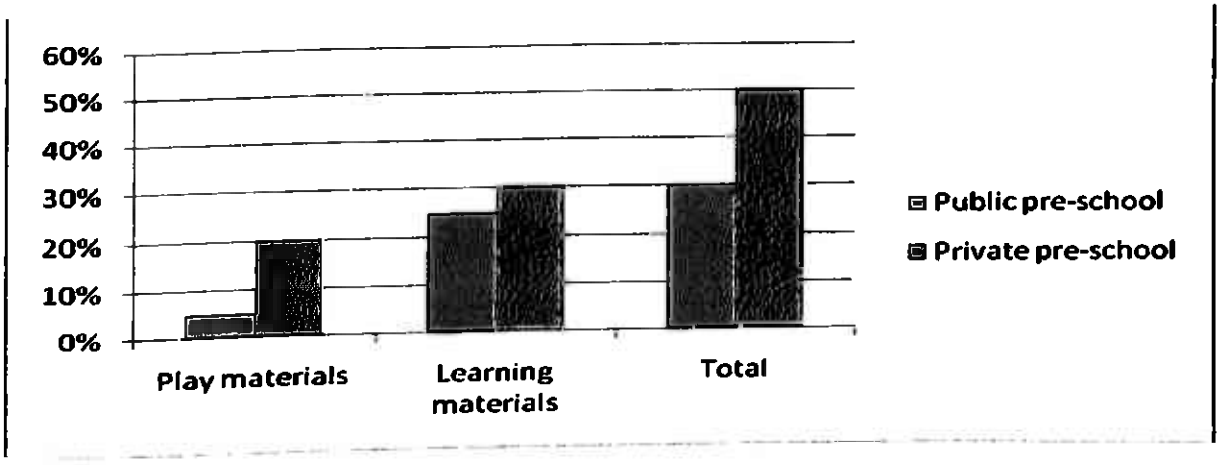
The headteachers were further expected to state approximately how much money they spent per annum on play materials and learning resources. Table 4.5 below shows the percentage of money spent on playing and instructional resources by public and private pre-schools.

**Table 4.5: Percentage of Money Spent in Playing and Instructional Resources by the Public and Private Pre-schools.**

| **Resources** | **Percentage** | |
|---|---|---|
| | **Public** | **Private** |
| Play resources | 5 | 20 |
| Learning resources | 25 | 30 |
| **Total percentage** | **30** | **50** |

**Source Field Data 2010**

**Figure 4.2: Percentage of Money Spent on Playing and Learning Resources Per Annum**




Source: Field Survey 2010

On the percentage of money spent on playing and learning materials, private pre-schools dominated. Percentage spent on playing materials was found to be lowest in public pre-schools at 5% as compared to private pre-schools at 20%. Percentage spent on learning materials in public

pre-schools were slightly lower than in private pre-schools at 25% as compared to 30% in the private pre-schools. In total private pre-school spent a higher percentage in playing and learning materials at 50% compared to public pre-schools at 30%. Children in the private pre-schools performed better than those in the public pre-schools since they had more instructional resources that were used in the learning process.

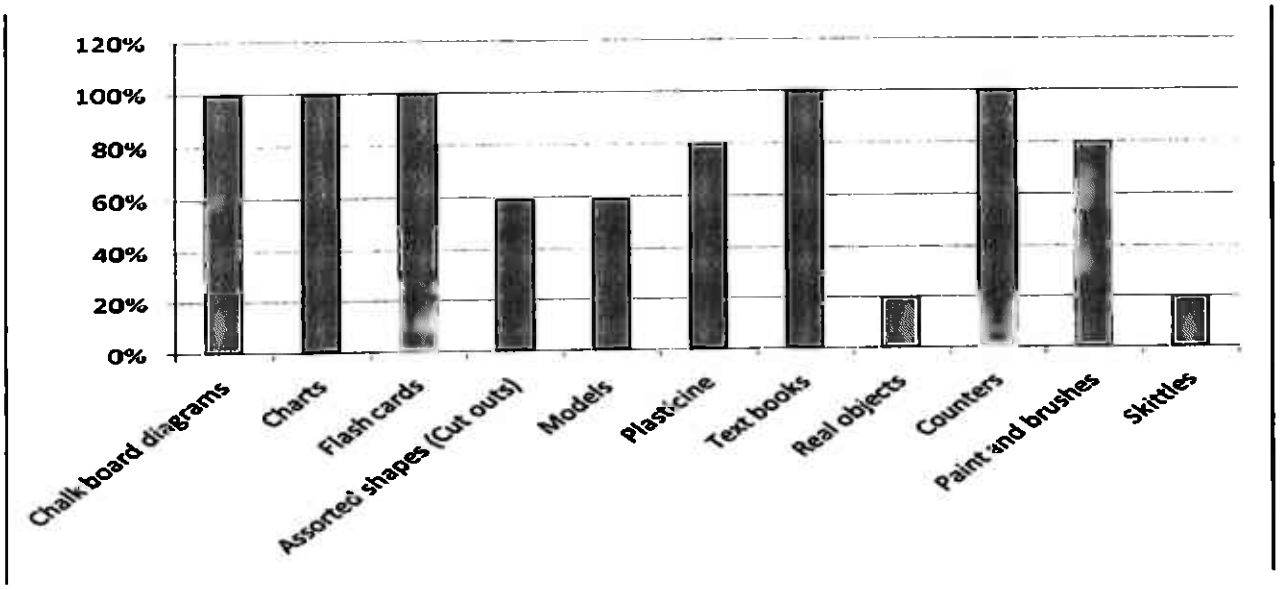
Teachers were expected to give information about types of instructional resources they used in the learning process. The table 4.6 below shows the percentage of instructional resources used by pre-school teachers.

**Table 4.6: Percentage of Instructional Resources used by Pre-school Teachers.**

| Instructional Resources | Frequency | Percentage |
|---|---|---|
| Chalkboard diagrams | 5 | 100 |
| Charts | 5 | 100 |
| Flashcards | 5 | 100 |
| Assorted shapes (cut-outs) | 3 | 60 |
| Models | 3 | 60 |
| Plasticine | 4 | 80 |
| Test books | 5 | 100 |
| Real objects | 1 | 20 |
| Counters | 5 | 100 |
| Paint and brushes | 4 | 80 |
| Cut-out numbers (Skittles) | 2 | 20 |

**Source: Field Survey 2010**

**Figure 4.3: Instructional Materials used by Teachers**




**Source: Field Survey 2010**

Chalkboard diagrams, charts, flash cards, text books, and counters were the most used instructional materials by teachers. Plasticine, paint and brushes were used by 80% of the pre-school teachers each. Assorted shapes and models were used by 60% of the pre-school teachers while the least used instructional materials were real objects and skittles at 20% each. These results are summarized in the figure 4.3. Most teachers did not use real objects and skittles. This made it hard for the children to understand concepts taught without real learning instructional resources. When real objects and skittles were used in the experiment, children understood the concepts taught better. They were able to solve problems and score high marks in the post-test. This showed that real objects and skittles made learning practical and real to enable children perform better. The figure above therefore suggested that since all teachers used instructional resources, they were able to give reliable information on the impact of instructional resources on childrens learning achievement.

### 4.12 Statistical Analysis of Pre-test and Post-test Results

A pre-test was administered to pre-school children in both the control and experimental groups before the experiment. Sixty children did the test during the fourth week of second term of the school calendar. The purpose of the test was to find out the level of mastery of knowledge of the number value, number recognition and picture reading the pupils had before the learning procedures. The test was administered in simple written questions, practical activities and oral questions.

### 4.13 Data Analysis and Interpretation of Pre-test and Post-test Results

The data analysis of pre-test and post-test results was presented as shown in figure 4.4

Tables 4.7 and 4.8 below shows the marks scored in mathematics pre and post tests by the experimental group respectively.

**Table 4.7: Mathematics Pre-test Results for Experimental Group**

| | | | | |
|---|---|---|---|---|
| 56 | 48 | 48 | 56 | 56 |
| 60 | 40 | 52 | 52 | 44 |
| 56 | 84 | 56 | 64 | 40 |
| 52 | 80 | 80 | 60 | 36 |
| 64 | 40 | 36 | 48 | 32 |
| 56 | 60 | 64 | 68 | 72 |

The mean $\bar{X} = \frac{1660}{30} = 55.30$

**Source: Field Data 2010**

**Table 4.8: Mathematics Post-test Results for the Experimental Group**

| | | | | | |
|---|---|---|---|---|---|
| 60 | 72 | 56 | 76 | 60 | 64 |
| 56 | 60 | 56 | 76 | 60 | 40 |
| 68 | 80 | 56 | 40 | 60 | 80 |
| 76 | 56 | 56 | 40 | 44 | 80 |
| 40 | 40 | 56 | 40 | 84 | 68 |

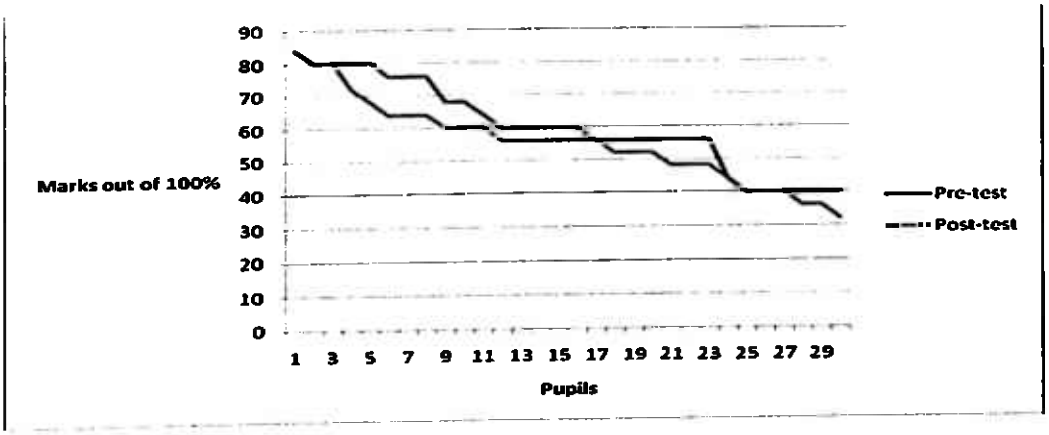
The mean $\bar{X} = \frac{1765}{30} = 58.83$

**Source: Field Data 2010**

The difference in mean score 58-83 – 55.30 = 3.53

The figure below illustrates the relationship between the post-test and pre-test trends for Mathematics for the experimental group.

**Figure 4.4:Mathematics pre-test and post-test analysis for the experimental group**




**Source: Field Survey 2010**

From the above figure 4.4, which was derived from the raw data shown in table 4.7 and 4.8, children performed better in the post-test than in the pre-test since they were taught using a variety of instructional resources. After the experimental group was taught mathematics using a

variety of instructional resources a post-test was administered and the children attained a mean score of 58.83 while compared to the pre-test results where the children attained a mean score of 55.30. This showed that the instructional resources used in the experiment lead to better performance as shown in table 4.8 above.

Table 4.9 and 4.10 below shows the marks scored in the mathematics pre-test and post-test by the control group.

**Table 4.9: Mathematics Pre-test Results for the Control Group**

| | | | | | |
|---|---|---|---|---|---|
| 60 | 48 | 60 | 52 | 56 | 56 |
| 44 | 40 | 48 | 48 | 52 | 64 |
| 48 | 76 | 16 | 16 | 60 | 64 |
| 64 | 68 | 56 | 40 | 44 | 72 |
| 60 | 64 | 68 | 68 | 76 | 68 |

The mean $\bar{X} = \frac{1656}{30} = 55.20$

**Source: Field Data 2010**

This showed that the few print instructional resources used lead to higher scores. Instructional resources should therefore be used in the learning processes to help children understand content taught and hence achieve higher marks as shown in Table 4.10.

**Table 4.10: Post-test Mathematics Post-test Results for the Control Group**

| | | | | | |
|---|---|---|---|---|---|
| 44 | 60 | 68 | 52 | 60 | 40 |
| 44 | 40 | 60 | 60 | 64 | 56 |
| 64 | 60 | 48 | 72 | 52 | 60 |
| 60 | 32 | 40 | 56 | 68 | 56 |
| 76 | 56 | 48 | 64 | 68 | 60 |

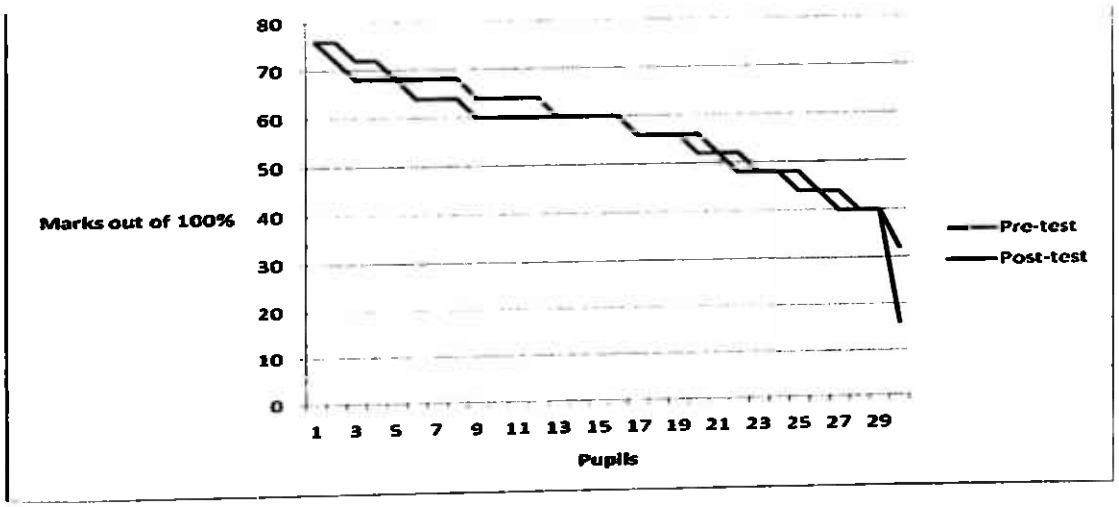
The mean $\bar{X} = \frac{1735}{30} = 57.83$

**Source: Field Data 2010**

Difference in mean score 57.83 – 55.20 = 2.63

The figure 4.5 below illustrates relationship between the pre-test and post-test trends for mathematics in the control group.

**Figure 4.5: Mathematics Pre-test and Post-test Analysis for the Control Group**




**Source: Field Survey 2010**

The post-test results were higher than the pre-test scores as seen in the raw data in Table 4.9 and Table 4.10. Children scored a mean score of 57.83 in post-test while compared to the score in the pre-test which was 55.20. The difference was 2.63.

Table 4.11 and table 4.12 below show the marks scored in English before and after the experiment was carried out by the experimental group.

**Table 4.11: English Pre-test Results for the Experimental Group**

| | | | | | |
|---|---|---|---|---|---|
| 36 | 40 | 60 | 44 | 64 | 56 |
| 40 | 48 | 76 | 60 | 60 | 40 |
| 40 | 48 | 32 | 56 | 52 | 68 |
| 68 | 48 | 64 | 36 | 48 | 64 |
| 40 | 72 | 36 | 40 | 40 | 32 |

The mean $\bar{X} = \frac{1512}{30} = 50.40$

**Source: Field Data 2010**

**Table 4.12: English Post-test Results for the Experimental Group**

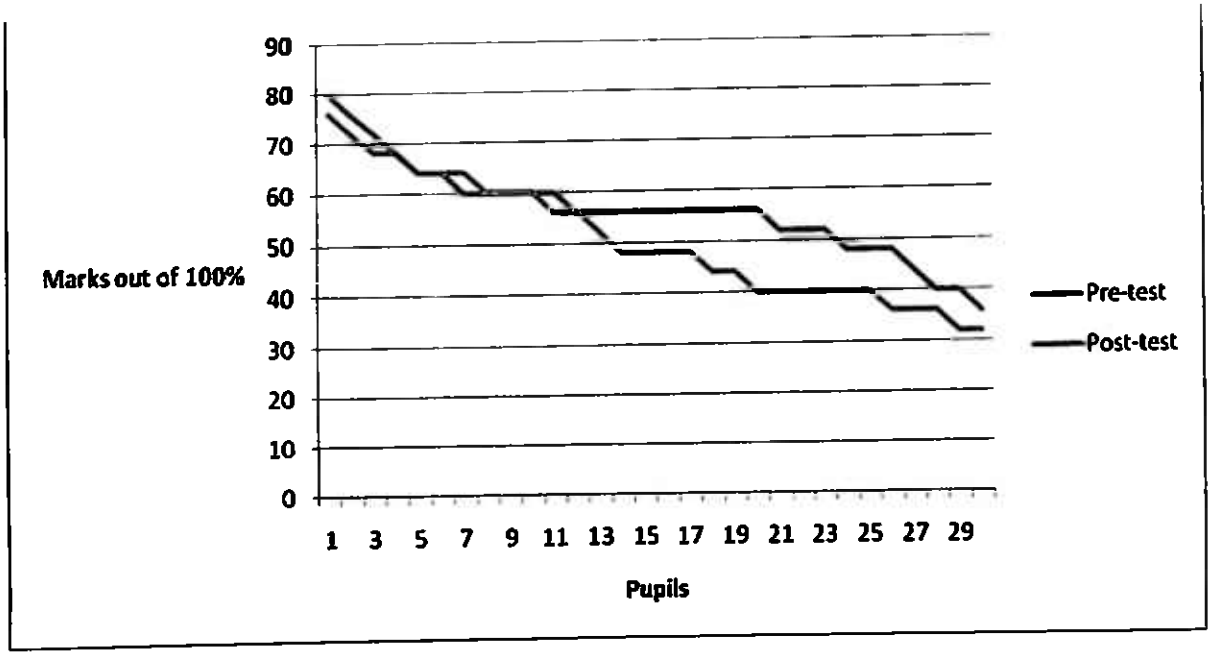
| | | | | | |
|---|---|---|---|---|---|
| 60 | 40 | 56 | 60 | 56 | 76 |
| 64 | 48 | 72 | 48 | 52 | 44 |
| 56 | 56 | 64 | 68 | 60 | 52 |
| 40 | 56 | 60 | 56 | 56 | 56 |
| 52 | 80 | 56 | 60 | 48 | 36 |

The mean $\bar{X} = \frac{1673}{30} = 55.77$

**Source: Field Data 2010**

The figure below gives the trend for the marks scored by the experimental group in the pre-test and post-test that was administered to the children.

**Figure 4.6: English Pre-test and Post-test Analysis for the Experimental Group**




Difference in mean score 55.77 – 50.40 = 5.37

**Source: Field Survey 2010**

The above figure was derived from the raw data in table 4.11 and table 4.12 of the marks scored before and after the experiment was carried out. Children performed better in the post-test than in the pre-test. They scored a mean score of 55.77 in the post-test while compared to the pre-test as shown in table 4.11 where the mean score was 50.40. The post-test results were higher than the pre-test results since the children were taught using a variety of instructional resources. As the children manipulated these resources, they were able to understand the content taught. This showed that instructional resources used in the experiment influenced children's learning achievement. A variety of instructional resources should therefore be used in the learning process

to help children understand concepts taught and hence perform better. This shows that instructional resources used in the experiment influenced their performance.

Tables 4.13 and 4.14 shows the marks scored by the control group before and after the experiment was carried out.

**Table 4.13: English Pre-test Results for the Control Group**

| | | | | | |
|---|---|---|---|---|---|
| 48 | 64 | 56 | 60 | 44 | 56 |
| 60 | 48 | 44 | 44 | 40 | 56 |
| 60 | 56 | 48 | 56 | 60 | 32 |
| 56 | 60 | 44 | 48 | 48 | 52 |
| 56 | 44 | 32 | 44 | 44 | 48 |

**Source: Field Data 2010**

The mean $\bar{X} = \frac{1508}{30} = 50.27$

**Table 4.14: English Post-test Results for the Control Group**

| | | | | | |
|---|---|---|---|---|---|
| 40 | 24 | 68 | 80 | 68 | 40 |
| 48 | 56 | 56 | 32 | 64 | 68 |
| 72 | 20 | 20 | 76 | 60 | 68 |
| 56 | 60 | 76 | 56 | 76 | 40 |
| 40 | 72 | 16 | 44 | 48 | 76 |

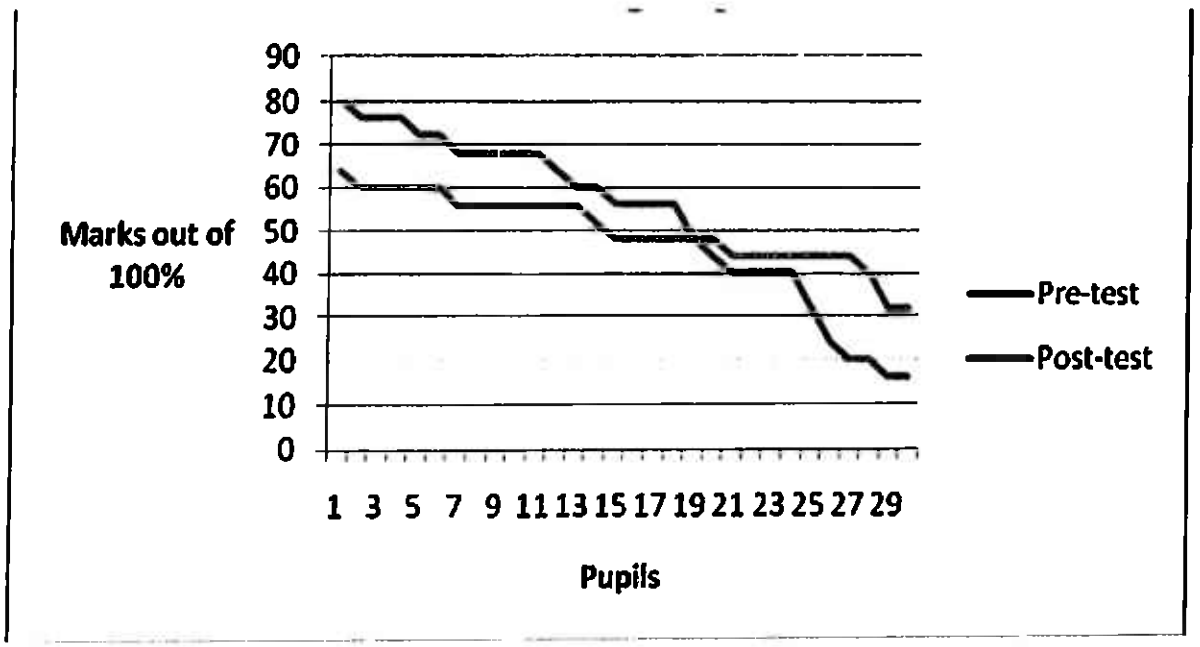
The mean $\bar{X} = \frac{1582}{30} = 52.73$

**Source: Field Data**

Difference in mean score $52.73 - 50.27 = 2.46$

The figure below shows the trend for the marks scored by the control group in the pre-test before and post-test after the experiment was carried out.

**Figure 4.7: English Pre-test and Post-test Analysis for the Control Group**




**Source: Field Survey 2010**

The figure 4.7 above show that children scored higher marks in the post-test while compared to the pre-test as shown in tables 4.13 and 4.14. Children scored a mean score of 50.27 in the pre-test and 52.73 in the post-test after they were taught using a few print instructional resources. The difference in the mean score showed that the few print instructional resources used lead to children attaining a higher mean score. This showed that when instructional resources are used in the learning process, they help children understand the concepts taught better as learning becomes real and their learning achievement is higher. A few print instructional resources that were used influenced their performance.

The post-test was administered to all the participants in the control and experimental groups. The test was administered to all the children in the groups having studied the concepts of number value, number recognition and picture reading. Sixty children sat for the test. Post-test was used to find out the impact of instructional resources in the learners who had been exposed to a few print instructional resources and those exposed to a variety of instructional resources. The test covered the major concepts. Learners sat for the test after three weeks of the instructional period. The results of the test showed that children's mean performance in the post-test improved considerably compared to their performance in the pre-test.

Children who were taught using a variety of instructional resources performed better than those taught with a few print instructional resources. Therefore, there is a relationship between instructional resources and children's learning achievement.

### 4.14 Discussion

When using teaching and learning resources, it is important for the teacher to remember that instructional resources are not complete on their own and should be accompanied by explanations. All labels and titles for charts and diagrams were clear and well written. The resources should be relevant to the lesson. In this study, all the resources that were used were relevant to the content taught. The resources should not be displayed for too long. Once they have served their purpose, they should be brought down and new ones put up. Merely using instructional resources does not guarantee effective teaching. To make teaching and learning effective, the resources must be appropriately selected and used. Resources used in the study were selected according to the children's interest, availability and children's learning abilities. Teachers used the resources effectively to ensure that the children grasped the concepts they

were taught. Children should be provided with sufficient resources so that they are actively involved in their learning. Teachers must become familiar with the various types of instructional resources and ensure they are available and are utilized if greater value is to be derived from their use. In this study, a variety of instructional resources were used in the experiment. Children in the experimental group understood concepts taught and performed better than their counterparts in the control group. The instructional resources used helped them score high marks.

### 4.15 Expected Impact

Instructional resources should meet the needs of the learners, fulfill the requirements of the subjects and facilitate the teaching and learning process. They should enhance the retention which makes learning more permanent. They should stimulate and sustain interest in the children, provide first hand experience with the realities of the physical and social environment. During the experiment, children were taught using resources, which they manipulated and learning was real and practical.

Resources used in the learning process should help children develop a positive attitude towards learning since they make learning real and help children solve problems practically. They should make learners active in the learning process. They should make it easier for the teacher to explain concepts. This saves times as explanation is brief and precise. They should make learning child-centred rather than teacher-centred. Resources should help learners discover new things as they manipulate them. As children manipulated resources, they were able to discover things on their own. This made them enjoy the learning. They discussed the new things they discovered among themselves.

When learners undergo learning in a practical situation where they manipulate resources, they discover ideas and understand concepts and acquire skills better. Knowledge gained and skills acquired last for a long time. Learning becomes real and meaningful as it involves all the senses. When given a test on what they have learnt using resources, they perform well. This was confirmed in the study as the children could remember what they learnt using instructional resources and learning was real as they manipulated resources.

### 4.16 Results

The chalkboard is one of the most important instructional resources. This study found out that all teachers respondents used the chalkboard. It should be used extensively and effectively. Like other instructional resources, effective use of the chalkboard lies in the professional and skillful use by the teacher. The teachers used the chalkboard as one of the instructional resources, learner's ideas and suggestions were recorded on the chalkboard in the learning process. They were involved in writing numbers and letters on the chalkboard. Diagrams were drawn on the chalkboard to explain the concepts that were being taught. This made children understand content taught as they could follow what the teacher was writing and drawing on the chalkboard. Some teachers kept their handwriting neat, legible and uniform while others were not keen on the way they used the chalkboard. For those who were organized in the way they utilized the chalkboard, children followed what the teacher was teaching and answered questions correctly on what was being taught. When the chalkboard was effectively used, it helped children understand the concepts being taught because illustrations were well done and therefore they

could follow what the teacher was teaching. When they were actively involved in working on the chalkboard, this helped them perceive the intended information.

When clear charts with nice prints which can be seen by all the learners are used, learning becomes effective since children can easily read what has been written. Horizontal labeling in straight lines and attractive drawings captures and holds the attention and interest of learners. Charts used for the suitable age and level of maturity of the learners make children understand the concepts being taught. When effectively used, charts stimulate the interest and motivate learners. They provide ideas from which a discussion may be developed. They involve learners in the learning process when they read the content written on them. They act as information store as they can be used for quick reference. Charts also provide summaries information for easy retrieval. In this study, teacher respondents used charts and they said that they stimulated learners and they enjoyed reading them and understood concepts taught using them.

When pictures are used to introduce a lesson, introduce a theme of a story, develop vocabulary or conclude a lesson, help children understand the concept being taught. Pictures need to be relevant, appropriate to the age and level of maturity of the learners to make learning effective and hence good performance. The teacher need not to use many pictures at the same time and this may cause confusion. Clarity, right size and accuracy need to be considered by the teacher when using pictures. When learners are given enough time to study the pictures, it becomes easy for them to grasp the concepts. Pictures should be large enough to be seen by all the learners. It is important that learners be organized in small groups for proper viewing of the pictures. Pictures need to be correctly mounted. They arouse interest, develop learners imagination,

clarify concepts hence improve performance. This was confirmed in the study when the teacher used pictures to help children read them. The children enjoyed reading and discuss them among themselves in groups. They were able to answer both written and oral questions from the pictures. Therefore, use of pictures in the learning process helped children attain high marks in the post-test. Use of pictures as instructional resources hence influenced children's learning achievement.

Real resources capture the learners interest, that's make learning and teaching more effective. Their use encourages the teacher to refer more to the immediate environment. Use of real resources motivate, and stimulates learners, enhance the development of manipulative skills. Real resources can be used for both individualized and group learning and hence help children develop socialization skills, turn taking and sharing. Real resources enhances retention of concepts and sourcing and care for real object trains learners to be responsible. In this study, children were able to remember and retain the concepts they were taught using real instructional resources. They shared them among themselves in groups and were able to solve problems and answer questions. Teacher respondent who used real instructional resources said that learning was interesting when real resources were used. Children performed better when taught using real resources.

Models make learning effective when used in combination with other instructional resources such as illustrations. Learners need to be given the opportunity to handle the items and ask questions. It is important that the teacher makes it clear to learners how big or how small the model is relative to the real item. When the teacher uses models to teach a concept, it is

important to ensure that all the learners are able to see instructional resources. Items should not be passed round the class while the teacher is giving an explanation or giving instructions as they would interfere with their attention. In this study, models were used in the learning process. Children were allowed to handle and discuss them. They were able to answer questions asked with ease.

When appropriately selected and effectively used, it is easier for the teacher to explain concepts or special features of what is being taught. Learners get a chance to manipulate them and learning becomes real. In this study, learners were involved in making models, they internalized the concepts since they were actively involved in the learning process. Models should therefore be used while teaching to make children understand concepts and perform well.

In this study, the experimental group which was taught using a variety of instructional resources performed better than the control group which was taught using few print resources. The experimental group attained a higher mean score in the post-test as compared to the control groups as shown in tables 4.7 to 4.14. This was an indication that instructional resources influenced children's learning achievement. These findings concur with Origa (2000) in his study on the impact of construction on the learning of geometry among girls in Kenyan secondary schools. In his study, the experimental group attained superior mean scores compared to the control group. The control group was taught using charts, textbook diagrams and chalkboard diagrams while the experimental group was taught using the same resources above plus concrete resources.

It was therefore concluded that instructional resources used had an impact on children's learning achievement. Children taught using a variety of instructional resources attained higher marks while compared to their counterparts.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTION FOR FURTHER STUDIES

## 5.1 Introduction

This chapter provides a summary of significant findings from the study. It gives a conclusion to the findings and recommendations. In the chapter, there are suggestions for further studies.

## 5.2 Summary of Findings

This research proceeded to investigate the impact of instructional resources in selected pre-schools in Nairobi North District, Nairobi Province in Kenya. Data was collected through use of questionnaires, interview, observation checklist and performance examinations.

The data analysis for the study was carried through descriptive and inferential statistics. At the descriptive level, results were reported in terms of means, frequencies and percentages It was found that utilization of a wide variety of instructional resources lead to a higher performance. Utilization of a variety of instructional resources in the learning process gave rise to good performance while use of a few print instructional resource resulted to low performance.

On the objective of finding out the difference in achievement in pre and post-test, scores of learners who had learnt using a variety of instructional resources performed better than those who learnt using a few print resources. It was found out that there was no significant difference. The children's scores in the two tests were quite homogenous. However, the group that studied number value, number recognition and picture reading concepts using a wide variety of instructional resources scored higher than those who learnt the same concepts using a few print resources. On the objectives to find out differences in retention as measured by the post-test in

children taught using a few print instructional resources and children taught using a variety of instructional resources, mean pre-test scores were lower than post test scores. This was a clear indication that use of a variety of instructional resources in the learning process led to higher achievement in post test.

On the objective to find out the available instructional resources in pre-schools and their utilization in the learning process, it was found out when available resources were used in the learning process, they made learning real, interesting and made children understand concepts taught and they could remember what they learnt better.

### 5.3 Conclusions

From the researchers experience and data collected, the experimental group attained superior mean score compared to the control group. Children who used charts and flashcards (Plane representation) only found it difficult to pick up concepts in the absence of concrete instructional resources. A combination of plane representation and concrete resources led to a better performance. This seems to suggest that concrete resources were effectively used in reinforcing the understanding of number value, number recognition and picture reading concepts. Learners showed a lot of interest in the charts and concrete resources as they manipulated them to learn the concepts taught.

It was found that when instructional resources such as textbooks, flashcards, models, real resources, charts, counters, cut-outs (skittles) among others were used, they enhanced learning achievement. Utilization of instructional resources gave rise to good performance whereas low

level of availability and utilization of resources led to low performance. It was therefore concluded that instructional resources have an impact on pre-school children's learning achievement. Children who were taught using a variety of print and concrete instructional resources performed better than those who were taught using a few print resources.

### 5.4 Recommendations

This study recommend that the Ministry of Education through Kenya Institute of Education (KIE) should prepare a set standard of instructional resources for pre-schools that would enhance children's learning achievements and encourage all schools to buy and use them.

Since most pre-schools did not use a variety of instructional resources, this study recommended the need to sensitize pre-school teachers through in-service training programs and seminars on the importance of using instructional resources in the learning process. Pre-school teachers should also use a variety of instructional manipulative resources to make learning real, interesting and practical since children will learn concepts taught better. They will construct knowledge on their own when they are actively involved. Schools should increase their allocation of funds to purchase or develop relevant instructional resources for pre-school children. According to Fuller (1987 as cited by Mwangi, 2001), effective teaching took place where teachers used instructional resources in the process of teaching. It was therefore recommended that policy makers in pre-school education develop instructional resources that would enhance children's learning achievement at pre-school level.

In order to improve performance in pre-schools, the following measures should be put in place. Schools should endeavour to avail adequate instructional resources by exploring the following possibilities.

- Community fund raising
- Appeal to potential donors
- Educational planners should identify appropriate instructional resources

### 5.5 Suggestions for Further Studies

The researcher recommends that the same study be replicated on a larger sample. The sample could be drawn from other parts of Nairobi or different geographical locations and districts altogether.

The same study could be conducted to take control of certain extraneous factors like the socio-economic background of pre-school children, level of motivation and effective teaching.
Further research to be conducted in other subjects in the pre-school curriculum. Additional research is recommended for determining the general attitude of school administrators, teachers and children on instructional resources use in the learning process at the pre-school level.

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# APPENDICES

## APPENDIX A: QUESTIONNAIRE

**The Headteacher's Questionnaire**

This questionnaire is expected to elicit information from you as the head of the school. The usual way to respond to this questionnaire will be by ticking the appropriate answers or writing brief answers where applicable.

**Do not write your name anywhere in this questionnaire**

Please put a tick (√) in the appropriate box or briefly write out your answers where necessary.

1. How old is your school? .....

2. Who is the sponsor of your school?

   Government [ ]

   Private [ ]

3. What is the pupil's population in your school?

   Girls [ ]

   Boys [ ]

   Total [ ]

4. Approximately how much money does your school spend per annum on:

   Play materials [ ]

   Learning resources [ ]

5. Where do you get instructional resources from?.....

   .....

6. In your opinion, do you think different types of instructional resources determine children's learning achievement? Yes [ ] No [ ]

If yes describe briefly.....

.....

7. Are the instructional resources available in the school used effectively in the learning process? Yes [ ] No [ ]

8. Indicate the number of teaching staff qualified under the following:

Certificate in Education [ ]

Diploma in Early childhood education [ ]

Bachelor of Education in Early Childhood [ ]

Any other, please specify.....

.....

9 What percentage of school budget is allocated on resources? .....

10. Do parents contribute towards provision of instructional resources? Yes [ ] No [ ]

If they do, what percentage?.....

11. Once the resources are in the school, who is responsible for them?.....

12. Since resources are expensive, what do teachers do to close the gap?.....

.....

## Pre-school Teacher's Questionnaire

This questionnaire is expected to elicit information from you as a pre-school teacher in the current school or other schools you taught before. The information expected from you includes your professional and academic qualifications, teaching experience and instructional resources available and their importance in the learning process. The questions are brief and it is expected that you will either tick the appropriate answer or write out brief responses.

**Do not write your name anywhere in this questionnaire.**

Please tick (√) appropriate answer or briefly write your response where necessary

1. Gender Male [ ] Female [ ]
2. Age (years)
   i) Under 25 [ ]
   ii) 26-35 [ ]
   iii) 36 – 45 [ ]
   iv) 46 - 55 [ ]
3. Educational Background
   O-level [ ]
   Certificate [ ]
   Diploma [ ]
   Bachelor of Education [ ]
   Any other, please specify.....
   .....
4. What is your teaching experience in years? [ ]
5. Do you use instructional resources while teaching? Yes [ ] No [ ]

If yes, list them down.....

.....

6. Where do you get the instructional resources from?.....

.....

7. In your opinion, what do you think is the relationship between types of instructional resources and children's learning achievement?

Describe briefly.....

.....

8. In the learning process, what is the use of instructional resources in the learning process in pre-schools?.....

.....

9. In your opinion, what types of Instructional resources do children enjoy using while learning?.....

.....

10. Which instructional resources don't children enjoy using in the learning process?.....

.....

11. After teaching using instructional resources, what happens to them?

Are they discarded? [ ]

Are they stored? [ ]

If stored, where are they stored?.....

12. Do you have a storage corner or place for storage? Yes [ ] No [ ]

13. Does the school provide all the instructional resources needed? Yes [ ] No [ ]

If yes, name them.....

14. Do parents provide resources? Yes [ ] No [ ]

If yes, list them.....

15 Are the resources available enough for each child in the class?

Yes [ ] No [ ]

If no, do they share?.....

16. In your opinion, is there a difference in performance for children using resources and those who do not use them? Yes [ ] No [ ]

If yes, explain.....

17 How do you ensure that the resources you use are appropriate for the children?

.....

## Appendix B: Observation Schedule

Children will be observed as they carry on different learning activities. The researcher will observe them as they manipulate the available instructional resources and as they engage in play activities. Field notes will be taken. A checklist will also be used and tick (√) will be put against the available resources.

| **Print** | | **Non-print** | |
|---|---|---|---|
| Charts | [ ] | Play materials | [ ] |
| Textbooks | [ ] | Models | [ ] |
| Flashcards | [ ] | Paint | [ ] |
| Pictures | [ ] | Brushes | [ ] |
| Magazines | [ ] | Plasticine | [ ] |
| Photographs | [ ] | Counters | [ ] |
| Assorted shapes | [ ] | Blocks of wood | [ ] |
| Cut-outs | [ ] | Weighing balances | [ ] |
| | | Containers | [ ] |

Others (specify) .....

.....

## Appendix C: Interviews

### Interview Schedule for the headteachers

1. When was the school started?
2. How many teachers are there in the pre-school?
3. Who provides the instructional resources to the pre-school and how often?
4. What types of instructional resources are provided in the pre-school?
5. In your opinion, are the available instructional resources effectively used in the learning process?

### Interview Schedule for the Pre-school teachers

1. When did you join the teaching profession?
2. What types of instructional resources do you use for teaching?
3. What factors do you put into consideration when developing instructional resources?
4. How do you help children use the instructional resources effectively in the learning process?
5. How do you ensure that you have provided children with a stimulating learning environment?
6. From your teaching experience, what is the importance of instructional resources?

**Interview for the children**

1. What is your name?

2. How old are you?

3. What types of materials do you play with?

4. Which instructional resources do you use while learning?

Ma

Fill in the missing numbers

1 2 3 4 5 6 7 8 9 10

Count and circle the correct answer.

△ △ △ | 5 | 4 | 3 |

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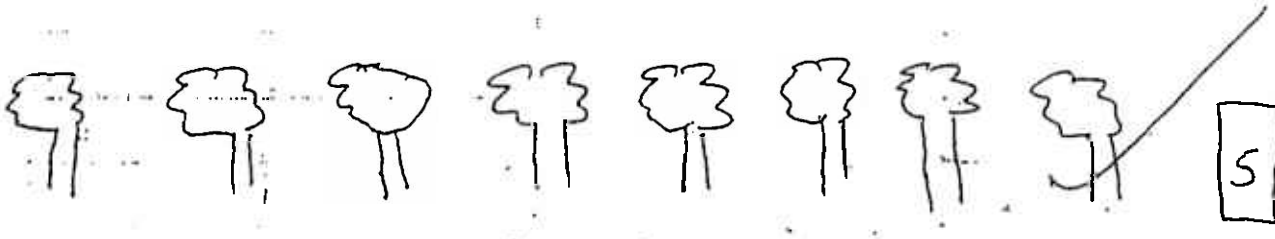

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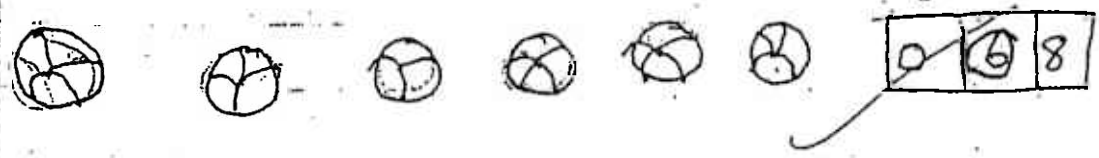

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Write the names of the numbers

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|---|---|---|---|---|---|---|
| One | Two | Three | Four | Five | Six | Seven |

Onesmus Mutie

Mathematics post-test exam

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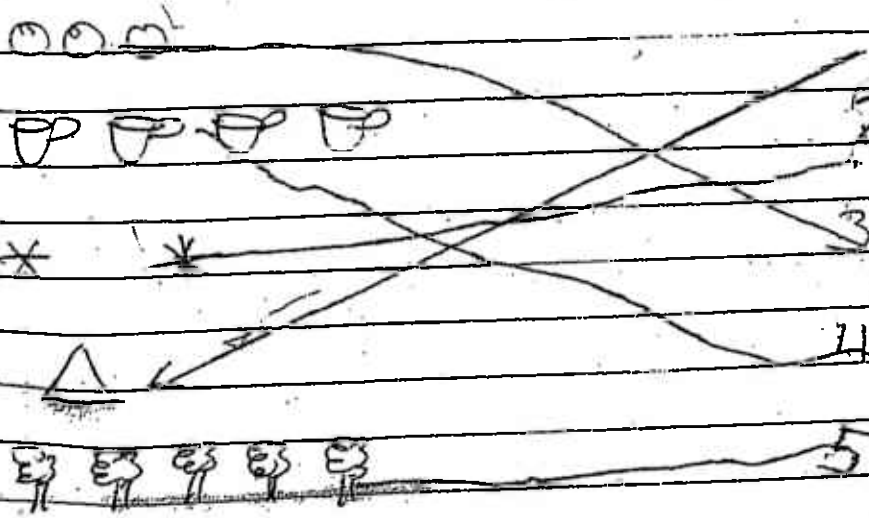


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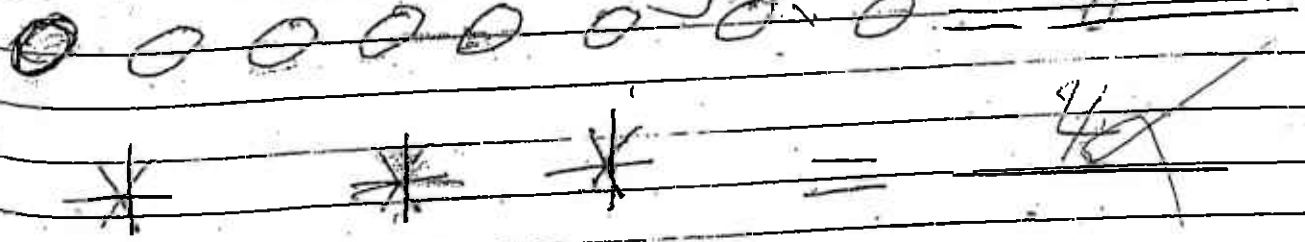

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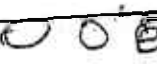
3 = 

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Mathematics post-test exam

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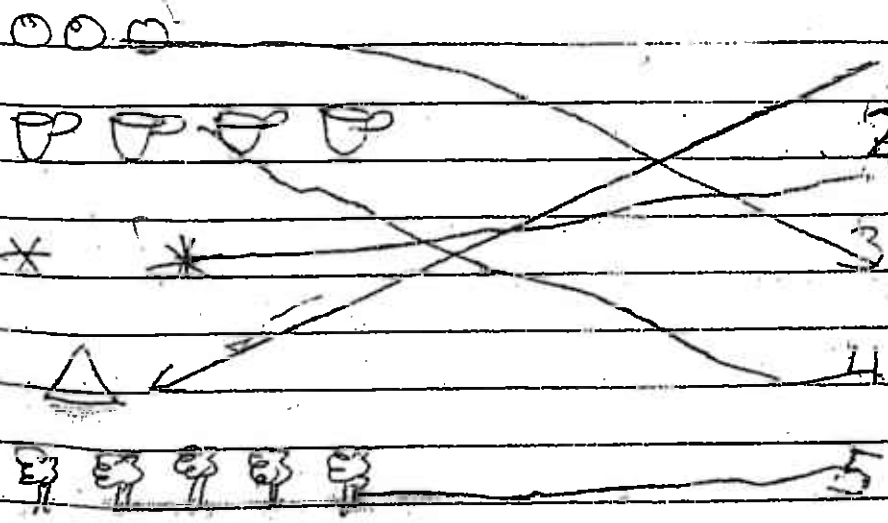


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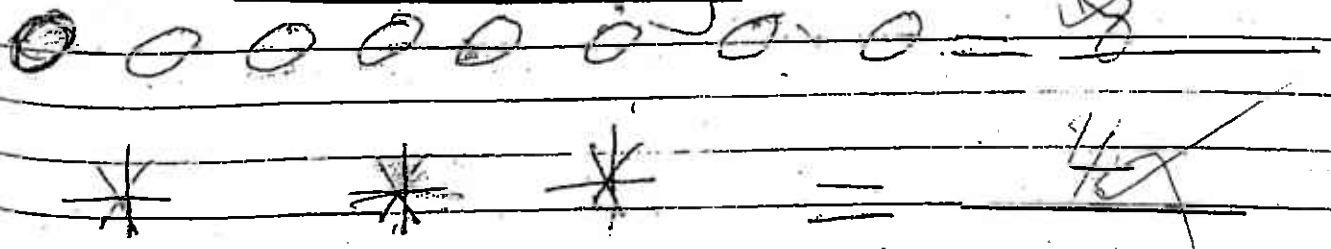

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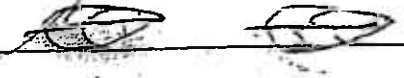
3 = 

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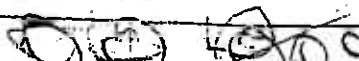
6 = 

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English pre-test exam.

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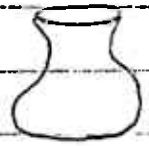

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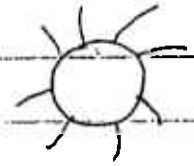

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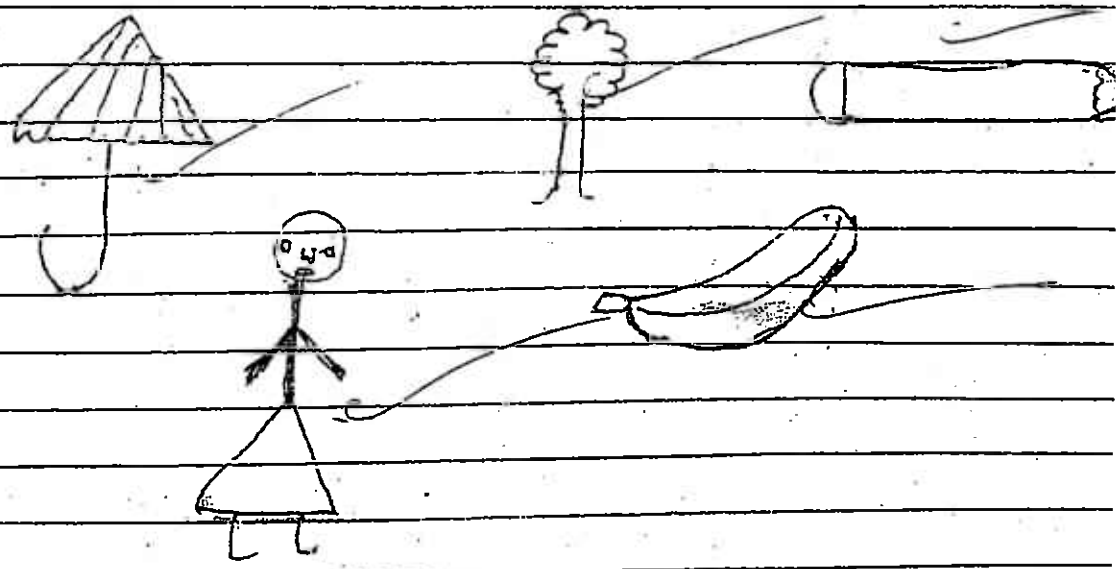
Stephan Njuguna

# English Post-test exam

## Read pictures



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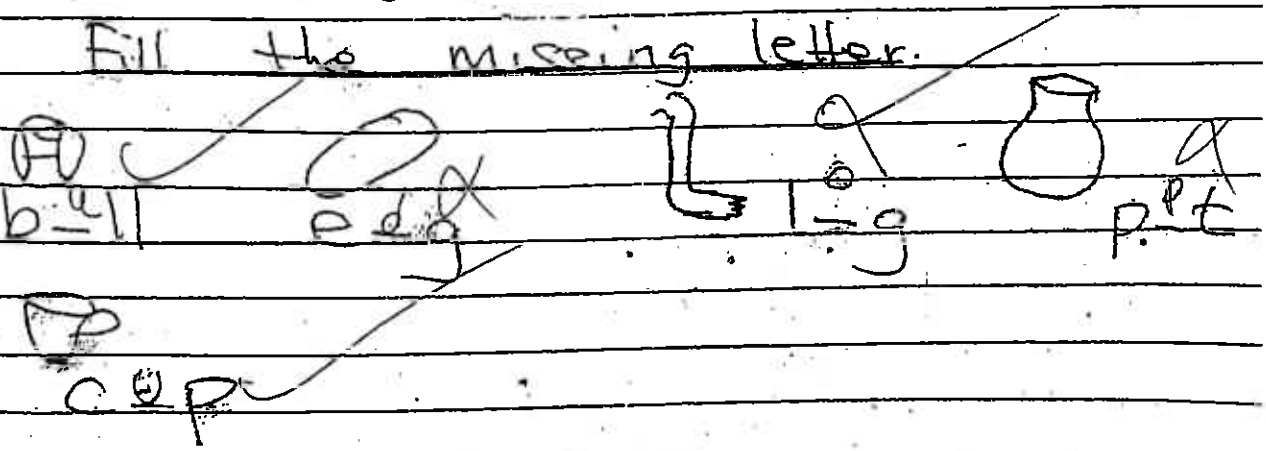


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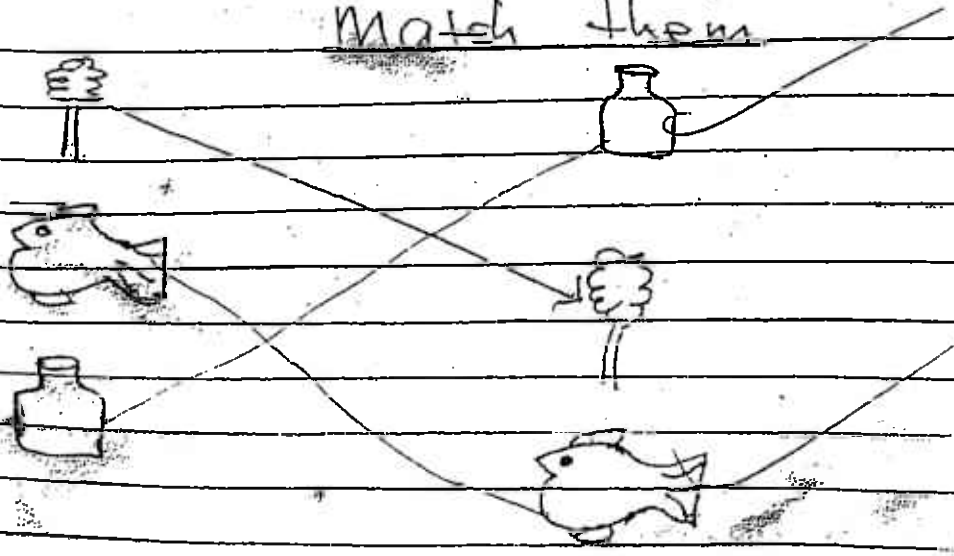

REPUBLIC OF KENYA

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Our Ref: NCST/RR1/12/1/SS/536/3

Date: 16th June 2010

**Ms. Janet Njoki Kiruki**
**University of Nairobi**
**P. O. Box 92**
**KIKUYU**

**Dear Madam,**

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on ***"The impact of institutional resources on children's learning achievements in selected pre-schools in Nairobi North District, Nairobi Province in Kenya"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi Province** for a period ending ***30th September 2010.***

You are advised to report the **Provincial Commissioner and the Provincial Director of Education, Nairobi Province and the Director of City Education, Nairobi City Council** before embarking on the research project.

On completion of the research, you are expected to submit two copies of the research report/thesis to our office.

**P. N. NYAKUNDI**
**FOR: SECRETARY/CEO**

Copy to: