EFFECT OF REFLECTIVE TEACHING ON CHILDREN'S PERFORMANCE IN PRESCHOOL SCIENCE ACTIVITIES IN NYAMAIYA DIVISION, NYAMIRA COUNTY

BY

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DECLARATION

This research project is my original work and has not been presented for a degree in any other University.

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DEDICATION

This work is dedicated to my supportive husband Francis MoturiZuriels, our children especially Dr Edna K.Moturi, Dr Caroline. B. moturi,Diana N. Moturi and Angela. K. Moturi .To my children may this work inspire you to greater heights of learning.

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Abstract

The purpose of this study was to investigate the effect of reflective teaching on children performance in preschool science activities in Nyamaiya Division, Nyamira Countythe objectives of the study included to establish the performance of children in preschool science activities when taught using traditional methods, to determine the performance of children in preschool science activities when taught using reflective teaching method and to find out the effect of reflective teaching in pre-school children's performance in science activities .The researcher used quasi-experimental design it involved random selection of two groups of pre-schools. Group 1 was experimental and group 2 was control schools. The head teachers and teachers involved in the study were randomly selected from schools selected. The researcher used simple random sampling technique with sixteen head teachers and twenty six teachers participating in the study whereby each school had one head teacher involved from their respective schools. This study was conducted by the researcher using prepared questionnaires which respondents were school head teachers and teachers. The researcher used observation checklist to determine facilities and resources available for science activities teaching and learning instrument validity was measured through research objectives of the study. The researcher visited the school she intends to collect the data from and introduced herself to the head teacher. The questionnaires were personally administered to the head teachers and teachers by the researcher and record responses. The researcher analyzed each questionnaire according to the opinion of respondents. The responses were counted, the frequencies calculated, percentages and mean score obtained. The study findings were that In addition to teaching science using traditional methods, children should be taught using reflective method in science .Science is largely a doing subject and children know more of what they do than what they hear. They need see, touch, smell and do as much as possible of their own investigations. They are unable to think through ideas and therefore hands on activities and first hand experiences make learning better for them. The teacher should give each child a

chance to contribute to learning. The study recommended that District education boards and constituency development funds should prioritize early childhood education in allocations for development projects so as to provide necessary resources and facilities to teach science activities and make pre-schools child friendly. This will improve performance not only in science activities but also in other areas. Extension of quality assurance services to Pre-schools will help to monitor and improve performance in science as well as other areas.Head teachers should move to ensure that their respective preschools have adequate science teaching and learning materials for children. This should be complimented by developing a working plan that gives preschoolers a balanced timetable for the entire subject taught.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Education is a fundamental right for every person; a key to other human rights; the heart of all development, the prerequisite for equity, diversity and lasting peace (EFA, 2000). Convention on the rights of the child (1989) sets out the right to Education to which everybody is entitled. Education is important for exercising all other Human Rights and for development (South African Charter, 1989). Article 29 of the convention attaches importance to the process by which the right to Education is to be promoted (EFA, 2000).

Reflective teaching is an outstanding model in teacher education which hasbeen taken into consideration by educators. As it is emphasized in reflective teaching model, to optimize the teachingand learning of a science activities contexts, it may be useful to embrace the conceptof the teacher as a learner and a professional. Every teacher has a professionalresponsibility to be reflective and evaluative about their practice. As a result of thisreflection teachers will be able to identify how to improve their professional activityin order to improve the quality of pupils' learning. Reflection is also animportant factor in cooperation or collaboration among teachers. Reflectivepartnerships between teachers are particularly effective and peer mentoring partnershipswill support individual teachers in reflecting on and describing their practice.

Reflective teaching refers to the process in which an experience is recalled, considered and evaluated usually in relation to a broader purpose. It is a response to past experience and involves conscious recall and examination of the experience as a basis for evaluation and decision making and as a source for planning and action. (Bartlett, 1990). points out that becoming a reflective involves moving beyond a primary concern with instructional techniques and how to question and asking "what, why" questions in regard to instructions and managerial techniques not as ends in themselves but as part of broader educational purposes. Asking "what and why" questions give us a certain power over our teaching. We could claim that the degree of autonomy and responsibility we have in as teachers is determined by the level of control we can exercise over our actions. In reflecting on the above kind of questions, we begin to exercise control and open up possibility of transforming our everyday classroom (Bartiet 1990).

Point on actual teaching episode such as a lesson or other instructional event while the focus of critical reflection is usually teacher's own teaching self reflection phase. The emphasis on higher standard in our profession carries the goal of improved quality. Becoming a reflective teacher can help you keep track of what you are doing and what each child is learning and in turn help children meet the early learning standards. It also help you slow down and take time to notice and enjoy the amazing things children do each day and the important ways you contribute to their learning.

Children's Act of 2001 represented the domestication of the 1968 rights of the child and the African Charter on the rights and welfare of the child. The acts define the way the

child should be viewed and treated in KenyaCultural Relativism and the UN Convention on the Rights of the Child' (2003).

A child at a tender age means a child under the age of 10 years. Before 2003 Early Childhood Education in Kenya was in the hands of private sectors, NGOs, Faith Based Organizations, parents and community, there was no unified curriculum. Since there is a curriculum to be followed, these colleges training teachers, universities have opened for ECE degrees to train tutors. The curriculum has the following activities, science, physical education, creative and CRE G.o.K (1998).

Education opens up a world of opportunities reduces burden of diseases, poverty and gives greater voice in society. For nations, it opens doors to economic and social prosperity, dynamic workforce, well informed citizens able to compete and co-operate in the global arena. The Kenya Government is committed to providing quality education for her citizens.

Teaching, learning activities and resources influence learning and general performance of science in early childhood education resources available determine activities the learner is exposed to. The effect of this is seen in children's performance in primary and higher levels of learning. The school and the community should ensure that locally available resources are utilized for teaching and learning of science in pre-schools. According to Kenya Institute of Education (KIE) has developed manual for environmental (science) activities for effective learning of science in early childhoodK.I.E (2003).

The content, methods and activities is based on real life experiences to make science learning meaningful. This will ensure balanced growth of the child. Since resources available determine activities, the teacher has to be creative and innovative in the choice of teaching/learning materials and activities. Science activities are learnt best through inquiry method, which includes experiments and observation of phenomena events and properties of objects in their natural situations.

According to pre-school teacher's activity guide K.I.E, (2003). A teacher should develop simple experiments, which learners can understand and do on their own. In these experiments, a learner needs to be exposed to process skills such as formulating hypothesis, observing, experimenting and recording. This approach builds children's positive attitudes towards studying science in future. The activities and materials arouse learners questioning minds and should be organized in such a way that learners come up with their own discoveries. This way, a learner gets pleasure and satisfaction, which make him/her confident. The teacher should give each learner a chance to contribute to his or her learning. The teacher should provide a variety of play materials. Activities in science help the learner explore and understand the world around him, satisfy curiosity and get answers to questions(Benthlyand Watts, 1993).

According to K.I.E, (1987) experiments are important because they help the learner to start developing some concepts and skills in science, which are vital for learning, understanding and appreciating science as a subject in later years. The process skills which the teacher must endeavor to introduce and promote in children include observing, identifying, comparing, classifying or sorting, recording, predicting, experimenting

measuring and controlling variables. The process skills also include data collecting, recognizing patterns and relationships, analyzing and interpreting, inferring and concluding and communicating the result. These together with introduction of basic facts in science form a firm foundation (Karaka, Nyangasi and Githii, 2004).

Children cannot learn much by sitting and listening to the teacher. Therefore, the teacher should allow and encourage the children to explore, investigate, discuss, play, model and practice activities. The teacher should always realize that science is doing not just being told and therefore children should be actively involved in learning. Children need real experiences because they are unable to think through ideas. They need to see for themselves, touch and do as much as possible. Learning as a result of first hand experiences is remembered. Learning by being told is easily forgotten (Nyoroh, Sayles and Munguti, 2003).

Children understand best when they do activities themselves; working with and playing with real objects. They hardly benefit from listening and watching passively as the teacher talks or demonstrate without them taking an active part. Children learn through doing. Children attempt to understand the world around them by observing, hearing, exploring, experimenting and manipulating. Their hands are on everything they come across. Teachers need to give children plenty of activities that involve real concrete materials from the immediate environment. Young children learn best through the senses. They learn when they look, listen, touch, taste and smell. A child understands concepts when presented in form of real objects, actions and situations (Njenga and Kabiru, 2007).

Reflective teaching conceptualizes teaching as a complex and highly skilled activity, which, above all, requires classroom teachers to exercise judgment in deciding how to act. High quality teaching, and thus pupil learning, is dependent on the existence of such professional expertise.

According to K.I.E (2000) the process of reflective teaching supports the development and maintenance of professional expertise. We can conceptualize successive levels of expertise in teaching – those that student-teachers may attain at the beginning, middle and end of their courses; those of the new teacher after their induction to full-time school life; and those of the experienced, expert teacher. Given the nature of teaching, professional development and learning should never stop.

Reflective teaching should be personally fulfilling for teachers, but also lead to a steady increase in the quality of the education provided for children. Indeed, because it is evidence-based, reflective practice supports initial training students, newly qualified teachers, teaching assistants and experienced professionals in satisfying performance standards and competences. Additionally, as we shall see, the concept of reflective teaching draws particular attention to the aims, values and social consequences of education KIE (2000).

1.2 Statement of the Problem

This study will investigate the effect of reflective teaching on children performance in preschool science activities.

The vision 2030 identifies science, technology and innovation as vital in raising productivity and efficiency in economic, social and political pillars (Republic of Kenya, 2006). The government intends to devote more resources to scientific research, technical capabilities of the workforce and in raising the quality of teaching science and technology at all levels in institutions of learning. Kenya intends to have international ranking for her children's achievements in science and technology (Republic of Kenya, 2006).

Science enables the learners to understand the world around them. The scientific process involves curiosity, discovery, experiment, organization of information and reporting. Science is a doing subject. It should be taught carrying out activities rather than giving facts to children. They should be provided with plenty of activities with relevant, adequate and appropriate materials to be manipulated in a rich environment. Children learn better by first hand experiences. Children need real experiences because they help the child to think through ideas. They need to see for themselves, touch and do as much as possible. Learning science as a result first hand experiences is remembered as opposed to learning by being told which is easily forgotten. (Karaka, Nyanja's and Githii, 2004).

The study seeks to find out the effect of reflective teaching on children performance in preschool science activities

1.3 Purpose of the Study

The study investigated the effect of reflective teaching on children performance in preschool science activities in Nyamaiya Division, Nyamira County.

1.4 Research Objectives

The objectives of this study were:

i. To establish the performance of children in preschool science activities when taught using traditional methods.
ii. To determine the performance of children in preschool science activities when taught using reflective teaching method.
iii. To find out the effect of reflective teaching in pre-school children's performance in science activities.

1.5 Research Questions

The following questions will guide the study:

i. How do pre-school children perform in science activities when taught using traditional methods of teaching?
ii. How do pre-school children perform in science activities when taught using reflective teaching?
iii. To what extent does reflective teaching affect pre-school children's performance in science activities?

1.6 Significance of the Study

The study highlightedthe main methods used in reflective teaching and learning of science activities in pre-school education. Information was provided on the effect of reflective teaching in preschool science activities. This may lead to improving learning process hence improving performance in science activities in pre-school. This may lay a good foundation for science learning. Curriculum planners and implementers would be provided with indicators for interventions and modification of early childhood education programme. It may assist in resource allocation so as to equip pre-schools and train

personnel for better teaching and learning of science activities. It may help mobilize parents and other stakeholders to participate in preschool science activities.

The research study findings may provide necessary information to pre-school teachers, school administrators, the parents, community and other stakeholders for the improvement of science teaching and learning in early childhood education. The findings may also be of use by the ECE trainers and other officers for training for instructional strategies in science activities in Pre-School especially planning for science activities. Policy makers for ECE may benefit from the findings in terms of resource allocation to enhance effectiveness in teaching the subject.

1.7 Limitations of the Study

Due to limited resources sampling of pre-schools further into the interior was not done. Some schools were not sampled due to their inaccessibility from the main road due to poor road condition.

1.8 Delimitations of the Study

The study investigated the effect of reflective teaching on children performance in preschool science activities. The study focused on children between ages 5-6 years old in pre-school in Nyamaiya Division, Nyamira County. The studyalso focused on teachers and head teachers of pre-schools in Nyamaiya Division, Nyamira County.

1.9 Basic Assumptions of the Study

The study assumed that the teaching and learning resources are available for teaching science activities in pre-schools in Nyamaiya Division, Nyamira. The early childhood education teacher had some professional training on reflective teaching and could plan

and organize science activities. The study assumed that the early childhood education teacher was familiar with Teacher's activity guides.

It also assumed the respondents would answer questions correctly and truthfully. Preschool teachers are academically and professionally qualified to handle early childhood science activities.

1.10 Definition of Key Terms

Activity	:	a task the preschool children perform in class
Child	:	Refers to pre-school children from age 3-6 years
Influence	:	Power to produce an effect on a situation.
Performance	:	Outcome of learning.
Pre-School	:	Education setting serving ages 3-6 before joining primary school.
Reflective teaching	:	It is the process, in which an experience is recalled, considered and evaluated usually in relation to a broader purpose.
Science	:	Organized knowledge obtained by observing and testing of facts about the physical world, natural laws and society.
Science activity	:	The act of doing things, seeing things happen, measuring and reporting findings observed in the world that surrounds the child

1.11 Organization of the Study

The study was organized into five parts. Chapter one deals with the introduction, background of the study, statement of the problem, purpose and objectives of the study. There were also research questions, significance of the study, delimitations of the study, limitations of the study, and definition of key terms.

Chapter Two dealt with literature review involving introduction, education in ECE, general objectives of science, why learn science? Cognitive development, children in learning science, science activities and purposes of practical work in science lessons. It also contains language, teaching and learning science, learner background, pre-school science activities and learning materials.

Chapter Three is on the methodology. It contains introduction, research design, target population, sample and sampling procedures, and research instruments. It also covers data collection procedures, validity and reliability of instruments and data analysis procedures. Chapter four covers findings and discussions and finally chapter five which covers summary conclusions and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter reviewed literature on teaching of science in pre-school and the activities involved. The review focused on: Early childhood education, Reflective teaching in science, Methods of teaching science in early childhood education, Cognitive development on preschool children, Preschool science activities, Sciences in early childhood education, Role of children in learning science and theoretical framework.

2.1 Early Childhood Education

The ECEC is recognized as a fundamental educational stage for lifelong learning which can play salient role in eliminating child poverty as well as combating educational disadvantage and social problems in adulthood (Hayes, 2007a; OECD, 2012). Many Western European countries are now implementing high quality accessible and affordable ECEC as research suggests that high quality ECEC improves children's emotional and social development and also enhances their school readiness as well as social integration and inclusion.

Literature emphasizes that high quality ECEC services must be delivered by highly qualified, trained and experienced personnel, which remain crucial in achieving children's early educational experiences (Hayes, 2007).

In line with the European targets and emphasis on quality, equality and equal opportunity agenda, many countries have adopted universal ECEC provision for all children irrespective of their socio-economic background.

According to Master Plan on Education and Training (2010), the overall goal is to improve the quality of life of children aged 0-6 years Republic of Kenya, (1998). The objectives of master plan on education and training are improvement of health and nutrition, affective, cognitive, physical attributes, understanding environment, developing self-confidence, free expression, spiritual and social values. To co-ordinate ECE the government of Kenya has set up an organizational infrastructure aimed at facilitating curriculum development, teacher training, research and general guidance and administration of the programme. This consists of pre-school at MOE, Pre-school section of inspectorate, NACECE at KIE, DICECE at district level (Comprehensive Education, Sector Analysis Report, 1994).

NACECE was established in 1985 and DICECE in 1985. NACECE coordinates development of early childhood education curriculum and support materials in Kenya. Materials include guidelines for trainers, teachers and sponsors of pre-schools. The widening scope of early childhood education and particularly the focus on nutritional, health care and aspects of child development has resulted in a number of innovative measures. These include community mobilization for parents and the local community in provision of a feeding programme, growth monitoring and primary health services. DICECE coordinates ECE programs at district level, the nurture of children in preschool age group is very important. It is not only the natural right of each child, but also a key variable in developing the country's human resource base.

The child is most vulnerable to environmental influences during this period. Several studies show that growth deficiencies that occur during this period are difficult and sometimes impossible to reverse. In pre-school science is taught as environmental studies. In primary school it is taught as elementary science while in secondary school it is taught as biology, chemistry, physics, general science and physical sciences. (DICECE Report 1985).

2.2 Methods of Teaching Science in Early Childhood Education

Learners learn best by carrying out activities related to what is being learnt. Teaching approaches should therefore be participatory to ensure that children acquire science process skills, enjoy learning and apply what is learnt to everyday life. Retention of knowledge that is actively acquired through activities is much higher than that learnt passively. Science is learnt through different approaches. Participatory approaches suitable in science learning include demonstration, practical activities, guided discussion, projects and field trips, it is important to have clear objectives at all times and the children should always be involved. This can be facilitated through questions, making observations, recording results and discussing conclusions. (K.I.E, 1987), Practical activities include investigating, viewing such as using lens, modeling and measuring. The teacher needs to prepare the practical in advance and if necessary try them out before the lesson (K.I.E, 1987). Learners should be given clear instructions before the lesson. The activities can be done individually or in groups or collectively as a class. Theories of learning underscore the fact that children learn through doing (Nderitu, Kihara and

Onguti, 2005). Activities can be planned depending on the environmental conditions such as weather and time available for single or double lessons (K.I.E, 1987).

Project work stimulates and motivates the learner. It instills a sense of responsibility and commitment especially if proper guidance and supervision are provided. Field trips and excursions should be encouraged. The local environment should always be considered as an exercise of cutting through the case of the school compound and local neighborhood to study plants and animals. K.I.E, (1987) states that Children learn and derive a lot of pleasure from visiting places of interest.

According to K.I.E (2003), pre-school teachers' activity guide series, science activities are learnt best through inquiry. This includes experiments and observation of phenomena, events and properties of things in their life situations. The main aim of these activities is to create awareness and understanding of the world that surround the child. This makes the child appreciate the environment he lives in. The environment includes learner, people, animals, plants and all other natural and man-made things round the child. Through participation in the activities, the child learns to be social and respect others and share facilities and materials willingly. The child interacts with the environment all the time through visits and experiments. These help the child to explore and understand the world around, satisfy curiosity and at times get answers to some questions regarding environment. Experiments help the child to start developing some concepts in science and skills which are vital for 'learning, understanding and appreciating' sciences as a

subject in later years. At Pre School, teachers should develop simple experiments which children can understand and do on their own.

These activities include skills such as guessing outcomes (hypothesis), observing, experimenting and recording. This approach will build positive attitude towards the study of science and social studies in future. The activities provided such as stories and riddles will enable the child to grow and develop morally. The activities and materials should arouse child's questioning mind and help in discoveries.This way the child gets pleasure and satisfaction which makes him or herself confident. Practical work is often regarded as being the doing activities rather than the knowing, qualities of pupils (Macintosh, 1978). Practical work involves the application of knowledge, use of theoretical concepts and theoretical evaluation of results obtained by the practical experience.

A discovery lesson is fun for both teacher and children. It provides a break from classroom routines of prescriptive lessons or programmed instructional material (Morine and Morine, 1973). Discovery lessons lead to independence on part of thinking child. Creative thinking is a problem solving process. It calls on an individual to use his own knowledge and experience to work out an answer that satisfies a deeply felt need for self-expression (Strom, 1971).

Science should be taught through multi-sensory technique. This is teaching through the senses which include smell and taste, touch, hearing or seeing (Wellington and Wellington, 1960). Multi-Sensory technique is the use of any auditory or visual sense or of any other medium appealing to senses which helps students grasp the fact, an idea, a concept or an attitude. Teaching aids assist teachers to add concreteness to their

presentation of material; and must know how to plan for, to use, and to evaluate these aids. Failure to employ this approach, the teacher comprehends little of the role senses play in the steps of thinking. Sense of hearing should always be joined to that of sight, and the tongue should be trained in conjunction with the hand (Wellington and Wellington, 1960).

The subjects should not just be taught orally and thus appeal to the ear alone, but should be pictorially illustrated. Multisensory materials utilize different senses for intensifying learning. Multisensory technique in problem solving awakens anxiety at the beginning of new topics, assumes form of demonstration by the teacher and provides information needed to solve defined problems. For example, in biology a film on reproduction should provide the information needed by students to solve their problems in this area. Slower students learn more from concrete material. However, material aids do not teach for the teacher, but should only be utilized as part of problem solving and critical thinking.

According to Kenya Pre-School Teachers' Activities Guide (K.I.E, 2003) the following methods are recommended: Oral discussion – here the teacher may explain something new or allow children to discuss freely and share experiences. This enables children to develop their language and confidence. Riddles, stories, poems and songs – the teacher should allow children to share riddles stories, poems and songs relevant to the topic. News telling- children tell news about their homes clothes they wear, places they visit and others. News telling helps children develop their language, confidence and memory(Gleitman and Landau, 1994).

Dramatic play- and make believe activities teacher should provide materials for children to engage in role play freely. They initiate situations in their lives. Dramatization- teacher organizes children to perform a play to enable them understand a given situation better. Role of the teacher is to organize plan and provide all required materials. Experiments- this helps children find out causes and effect relationship. Nature and science corner in class should have materials found within the environment. It should have many things for children to smell, feel, listen to and experiment with. Children should discuss activities they do as this will help to increase their vocabulary and improve their command of spoken language.

Science is thought to be a hard subject. Science teaching has focused on the academic, teaching the fundamental principles with the assumption that, through a grasp of the fundamental principles and technologies, the application of science would emerge. This is why the practitioners of science rely heavily on controlled experiment so that particular observations can be made. In science therefore high value is placed on the use of measurement and numerical analysis for the verification and validity of information. There is need to identify why practical work is done in science education so that the teacher identifies his/her role in science practical lesson Wellington, (1998) observes that we do not do practical work because science is practical subject, but so as to build a bridge between realm of objects and observable properties on the open hand, and realm of ideas on the other. Practical are therefore done with the sole intention of making observations about particular scientific principles. The teacher is vital in directing learners in making observations Wellington, (1998).

The step of generating an explanation is essentially creative and imaginative. The foundation of all learning in science is firsthand experience with real things. Science experiences need not involve unusual, elaborate or expensive apparatus and materials. This explains why a science teacher has to be creative and innovative in the choice of teaching and learning materials (Bentley and Watts 1993) argue that teachers need to adopt new and different approaches to teaching and learning sciences. One scientific concept can be explained to the understanding of learners through different approaches. The teacher need not dwell on the practical to explain a concept. Practical are in most cases done in groups. This enables learners to discuss the development of an experiment from its set up, observation to the conclusive explanation. Such skills of teaching science can be imparted on science teachers if they are exposed to similar experiences as their learners. Teachers would have an opportunity to air some of the problems they encounter in classroom settings Bentley and Watts (1993)

2.3 Reflective Teaching in Science

The general objectives of learning science are to develop ability to observe and explore the environment, develop skills for rational decision making develop creativity and critical thinking in addressing new and emerging challenges. Also develop and use appropriate science process skills and technologies for solving problems, develop positive attitudes about oneself and the environment. They also include managing and conserving the available resources, improve body fitness and maintain good health, acquire basic knowledge and develop interest in science and science related careers. (K.I.E 1987).

Graves (2002) believes that reflection is one of the most powerful tools teachers can use toexplore, understand, and redirect their practice. Reflection is about learning to seeand to understand what is seen. It is not simply being able to identify problems andframe solutions, although both are crucial." According to her, there are twopotential pitfalls which teachers should be aware of when they observe their ownteaching reflectively. The first potential danger is to follow reflective process butnot to take any action based on the obtained data to hold up a mirror,acknowledge what is there and how one feels about it, but go no further. Thesecond possible danger is to merely consider reflection as a process through whichan observed problem is solved. While it can be a part of reflective process, the maingoal is to find the underlying reasons which have caused the observed problem.When teachers are able to explore the root issues and beliefs, a shift occurs in theirunderstanding and a wider range of effective, intelligent actions becomes possible(Stanley, cited in Graves, 2002, p. 20). According to Richards and Lockhart (1996),when teachers are involved in the process of teaching some events occur that theycan use to have a better understanding of their teaching. Sometimes they take theseevents for granted and they fail to reflect on them; in fact, the events that occuraround the classroom can provide the teachers with "the basis for critical reflection.

The objectives determine content and teaching approaches. They also help reflective teaching and learning resources and instructional activities. Specific objectives are testable and are considered in constructing assessment items. The teacher is encouraged to use specific objectives to evaluate learners. (Rai and Richardson 2003) observed that instructional activities should be properly planned. This is because once achieved, they lead to achievement of general objectives and goals of education.

As part of the preparation for teaching/learning activities, two important documents are needed. These are schemes of work and lesson plan. Schemes of work are teacher's plan of action for instructional activities. Lesson plan enables a teacher to systematically and effectively teach a particular lessonRai and Richardson (2003)

According K.I.E (1987) science gives learners an opportunity to think critically. The preschool children should be accorded an opportunity to learn science as a basis for learning in future. Science syllabus recommends that teachers use three approaches when teaching science heuristically. The first method allows children to learn independently as they acquire knowledge, skill and attitudes as they interact with the environment. The other one is child centered approach which refers to learning based on the interest of the child. The teacher is a facilitator. The third approach is participatory approach. This encourages a child to take part individually or in a group, to explore and manipulate materials in the environment to enhance learning (K.I.E, 1987).

Science has intrinsic value as a body of accumulated knowledge and as a way of finding out about the world. Learning science is a means for helping individuals to fulfill their own personal potentials. Learning science helps the individual to live in a society and both to contribute to it and benefit from it. Science is as much part of our culture as is music, literature or parliamentary democracy: for this reason alone, science can be justified as a key part of any school curriculum and that claims to transmit the culture. Pre-school teachers' activities guide explains that in preschool, children learn science so as to develop their observation and discovery skills.

They learn to keep good health habits and maintain good health through a balanced diet, adequate exercise and rest. They should become familiar with their environment their culture and use easily available materials. Learning to play, carry out and analyze science teaches learners many skills which if retained and transferred to other situations can be useful in many walks of life. Good science teaching does not only create confidence on the part of the learners built also helped realize that it is possible to make sense of many aspects of science to have understanding of ways in which scientific knowledge is gained and accepted.

Cognitive Development of Pre-school Children

Cognitive development during early childhood is marked by high level of curiosity and numerous questions. The questions that children ask help them to reason and to think about cause and effect of various situations in life. These questions are extremely important because they indicate an increase in mental development. Through these questions children start understanding their environment better and why things happen the way they do. Children ask ‘what’ and ‘why’ questions in order to understand the world around them. Some children attempt to understand the world around them by observing, hearing, exploring, experimenting and manipulating (Njenga and Kabiru, 2005).

Children learn best through the senses as learning involves all things they touch, see, smell, taste and experience within their surroundings. The child understands ideas and concepts when presented in form of real objects, actions and situations (Njenga and Kabiru, 2005).

Children discover how things smell, taste, feel and look. They experiment with different things therefore making discoveries and this increases their knowledge and concepts. Children learn by doing. They learn by hands on experiences with real material and meaningful activities. Learning is an active process, which involves the whole child. They should be exposed to many types of materials in the environment. They learn through practice, observation, imitation, exploration and problem solving. As they engage in different activities they develop strategies or different ways of acquiring information and solving problems.

2.4 Science in Early Childhood Education

According to Bernett (2003), performance in investigations according to the related science concepts, pupils performed less well in investigations set in everyday contexts than in scientific contexts; and pupils had particular difficulties with investigations involving two independent variables. Teaching of science in early childhood can be influenced by among other things by; the specification of the curriculum, work scheme plan of activities and teaching strategies employed. Teachers' role is important in helping learners discover concepts. It is therefore the responsibility of the teacher to create an appropriate learning environment both in terms of stimulating resources and supportive social dynamics.

Evaluation of previous lessons helps in planning and teaching strategies. Teachers are trained in skills of writing a lesson plan. This is done through the use of preprinted pro-forma plan. Planning a lesson or a sequence of lessons involves specifying objectives, specifying Knowledge and skills, selecting and sequencing learning activities and

evaluating the outcomes. The teacher should choose tasks appropriate for development of learners understanding of science concept and procedures. It is the duty of the teacher to take note of diversified range of individual abilities and aptitudes. It is called differentiation and defined as a planned process of intervention in the classroom to maximize potential based on individual abilities and aptitudes. The teaching strategies employed on a science lesson have a great impact on the success of science.

2.5 Theoretical Framework for the Study

The study uses the cognitive-developmental theory;this theory emphasizes how children's thinking and reasoning change, qualitatively, over time. Children actively contribute to their own cognitive development by constructing their own understanding of the world. This understanding is constructed during experiences with materials and working to resolve discrepancies between prior knowledge and new information.

Differences in rates of development are attributed to differences in genetic timetables; cultural and environmental influences (Kail, 2006)Individual children need different experiences to complete their cognitive development. In early childhood Education, Children should be seen and treated as unique individuals, and allowed to develop science process skills at their own rates (Kail, 2006).

The pre-school teacher use reflective teaching method to facilitate learning by ensuring that the child is a key participant in what is happening, to gain mastery of environment. The child has to be active in terms of searching for or constructing knowledge and solving problems. The preschool teacher facilitates and motivates the child to do own investigations because he or she is a productive thinker. The teacher has to use different

methodologies through which children learn in order to cater for individual differences. The environment should be ideal for sensory approach to learning (KIE, 2003). The Conceptual framework is shown in figure 2.1

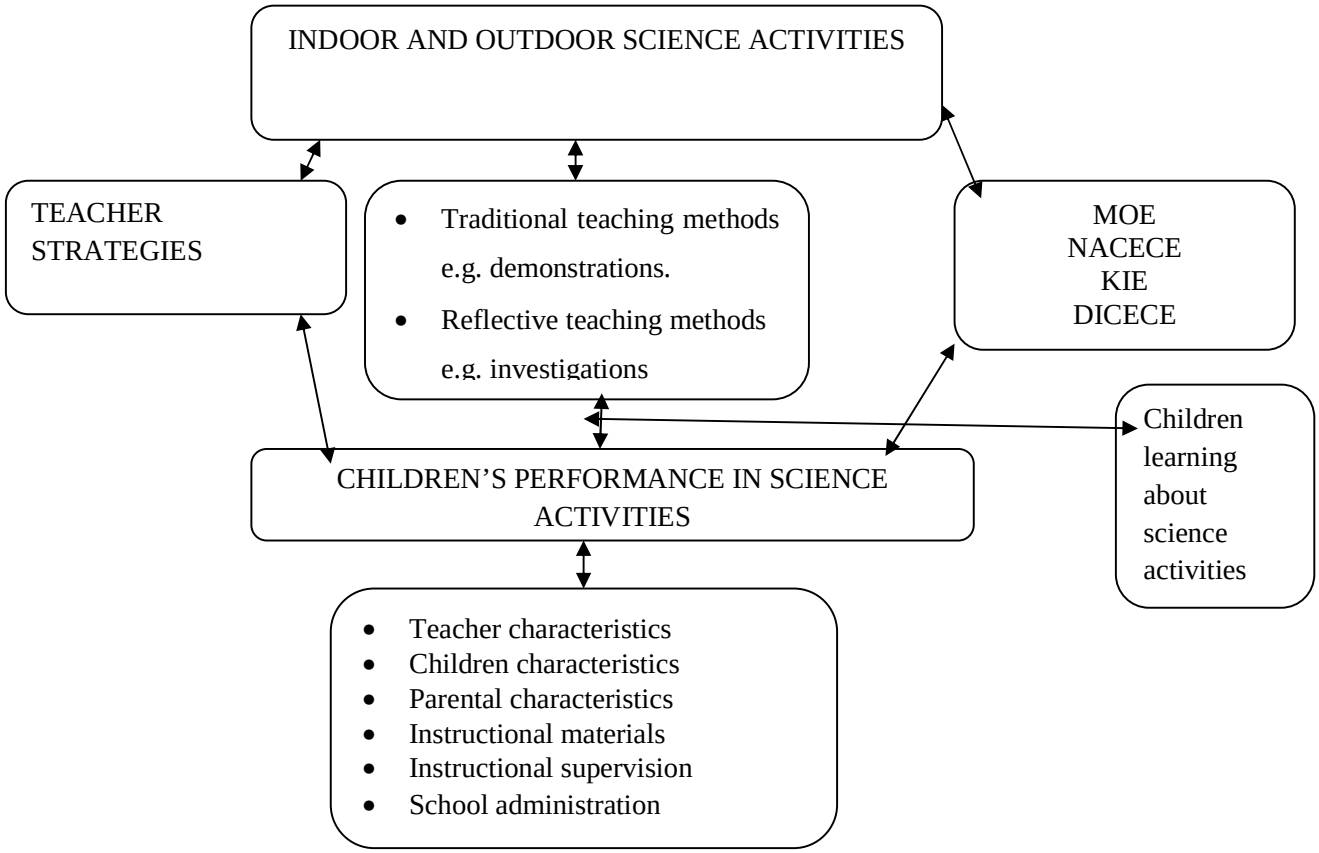

Figure 2.1: Conceptual framework for reflective teaching on children's performance in preschool science activities

The arrow in the figure 2.1 shows how variables relate with one another. The resources determine the activities and instructional methods. The methods in turn affect learning resources, activities to be planned, teacher preparations and performance. In the frame work factors that impact on performance in science activities include: Instructional strategies such children's own investigations. Teacher related factors like training,

planning of the lesson, organization of resources and methodology. Parents factors such as provision of resources for science activities. Nature of activities such as practical or theoretical. If appropriate instructional strategies are employed learning of science becomes easy, interesting and enjoyable. All these factors impact on performance of science in early childhood education.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section dealt with research methodology that was used in carrying out the research. It consisted of the research design, target population, sample size and sampling procedures, research instruments that were used, validity and reliability of the instruments, data collection procedures and data analysis techniques.

3.2 Research Design

Donald and Delno, (2006), define research design as a plan showing how problems under investigation are solved. Research used quasi-experimental design. It involved random selection of two groups of pre-schools. Group 1 was experimental and group 2 was control schools. Same scheme of work and lesson plan was developed by the researcher and the pre-school teacher for use with the two groups. Group A (experimental) was taught science activities using traditional methods of teaching. Group B schools (control) were taught science activities using reflective teaching methods. Both groups were taught for same length of time. Same test was administered to schools in both groups after the lesson. Classes were left intact. The mean scores, standard deviations, t-scores and P-values and ANOVAs were computed using SPSS software. This enabled the researcher to compare performance of the two groups of pre-schools.

3.3 Target Population

Population is the theoretical set of all possible observations for a particular experiment, to which we wish to generalize results of the research (Bory& Gall, 1989). If theobservations are numbers, then the population is described by the distribution function of theobservation which gives the probability of occurrence for each possible numerical value. Thesize of the population places an upper limit on the size of sample that can be drawn from it.In this study the population consisted of pre-schools in Nyamira Division, Nyamira County.Whichare attached to both public and private schoolsIt involved pre-school children, teachers andhead teachers.

3.4 Sample size and sampling procedures

A sample is a small group obtained from the accessible population. Each member in asample is referred to as a participant (Mugenda and Mugenda, 1999). There are Sixteen (16)pre-schools in Nyamira Division, Nyamira County both public and private. There was randomselection of ten (10) pre-schools in which research instruments were used. Seven were public schools and three private. This ensured that every pre-school had equal chances of beingselected. The selected pre-schools were grouped into two: Group A was experimental schoolswhile group B were control schools. Each group had five pre-schools. Only children,teachers and head teachers of the selected pre-schools were included in the study.

3.5 Research Instruments

The research used three instruments: tests, questionnaires and observation checklist. Test wasthe main instrument for the study. It was constructed based on research questions andschemes of work developed by teacher and researcher. Same test was administered for bothexperimental and control groups of pre-schools at the end of teaching session and scores wererecorded. The researcher examined children's performance scores for every pre-school.

Mean scores, standard deviations, t-values P-values and ANOVAs were also computed for the twogroups of schools (experimental and control). These values were used to compareperformance of children in science activities in the experimental and control pre-schools

3.6 Observation Checklist

The researcher used observation checklist to determine facilities and resources available forscience activities teaching and learning. This helped collect unbiased report on the situationon the ground. Children's investigations were observed.

3.7 Questionnaire

Questionnaires were used in the study. There was a questionnaire for head teachers andanother for pre-school teachers. Head teachers questionnaire collected information onfacilities and resources at the pre-school, their acquisition and sources of funds formaintaining the pre-school. Pre-school teacher's questionnaire collectedinformation ontheir qualifications, teaching and learning resources available at preschool and their acquisition. Alsotheir attitude towards teaching science activities and the methods they

use to teach. It also used to collect information on problems encountered in teaching science activities in preschools.

3.8 data collection procedures

The study used various methods to collect data such as observation and questionnaires. Same test was administered to children in the selected pre-schools. Observation was done toestablish facts on the ground such as facilities, science instructional material such as textbooks, science corner and presence of water in the pre-school. Observed also wereplaygrounds and play materials. Children's investigations during science lesson wereobserved. Scheme of work and lesson plan were used to teach the science lesson. Sametest was constructed and administered to children in the sampled pre-schools. The tests weremarked out of 100% and scores recorded. The researcher used an observation checklist toobserve and record facilities and resources available for use in science lessons. Questionnaires were administered to school head teachers and pre-school teachers. They were filledand collected later.

3.9 Validity of instruments

Validity is concerned with establishing whether the instrument measure what it is supposed tomeasure (Orodho, 2004). Research instruments were developed based on research questions.To ensure validity, the supervisors were consulted before the study commenced. Pre testingof instruments was done after which corrections were done

3.10 Reliabilityof instruments

Reliability of measurement is the degree to which a particular measuring procedure givessimilar results over a number of repeated trials (Orodho, 2004). Science activity lesson wastaught using traditional methods for control group of pre-schools and reflective method forthe experimental group. Same test was constructed and was administered to the two groupsafter the lesson. The test was marked out of 100% and scores recorded

3.11 Data Analysis Techniques

On completion of data collection, the researcher marked the test out of 100% and recordedthe scores. Data was grouped according to its category, that is experimental and controlschools. Performance index for every pre-school was computed and means scoresdetermined. The quantitative data was analyzed usingdescriptive statistics and presented using percentages, frequencies, figures and tables.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents data analysis, findings, presentation and interpretation of findings. The purpose of the study was to investigate the effect of reflective teaching on children's performance in preschool science activities in Nyamaiya Division, Nyamira County. The chapter is organized into sections mainly based on the research objectives and which include the types. the performance of children in preschool science activities when taught using traditional methods the performance of children in preschool science activities when taught using reflective teaching method and the effect of reflective teaching in pre-school children's performance in science activities.

4.2 Research Findings

The total number of Pre-schools inNyamaiya Division, Nyamira County is sixteen (16). Ten pre-schools were sampled for the study. Five pre-schools were in the experimental group while five were in the control group. This is 63% of target population. The researcher chose this sample size on the grounds that a larger one would give more data for better comparison of the test scores and performance of pre-school children in science activities. Questionnaires were administered to the head teachers and teachers in the pre-schools. All the questionnaires were filled and returned. Some pre-school teachers did not respond to some items. All questionnaires from head teachers were filled and returned. The total number of children who did the test was 300. Seven pre-schools are attached to

public primary schools and three are under the church.All pre- schools are day schools. Resources in pre-schools are not adequate. The situation is complicated by the fact the communities continue to maintain pre-schools, including paying the teachers' salaries. Parents pay high fees especially in private pre-schools. This has resulted to poor parents taking children to public pre-school which lack facilities such as classrooms, play materials and other learning resources.

4.3 Questionnaire Return Rate

This study targeted both the pre-school teachers and learners as responds. All the targeted teachers from twelve schools were able to fill and return their filled forms and check list making the response rate good for analysis. On the other hand all pre-school children from the targeted pre-schools filled their text appropriately. Making the response for learners good for analysis.

Table 4.1: Questionnaire Return Rate

Target respondents	Sample size	Responses	Return rate (%)
Preschool head teachers	16	16	100
Preschool teachers	26	25	96

Source: author 2014

From the Table 4.1 it can be seen that return rate was good for all the targeted respondents since it was close to 100 percent (that is, return rate for instruments was close to 100 percent and therefore it was good for analysis.)

4.4 Demographic information

Demographic information was based on the teachers' gender, age brackets, as well as academic qualifications. The teacher's demographic information is shown in figure 4.1

Figure 4.1: Sampled Teachers in Nyamira County by gender, age and academic qualification

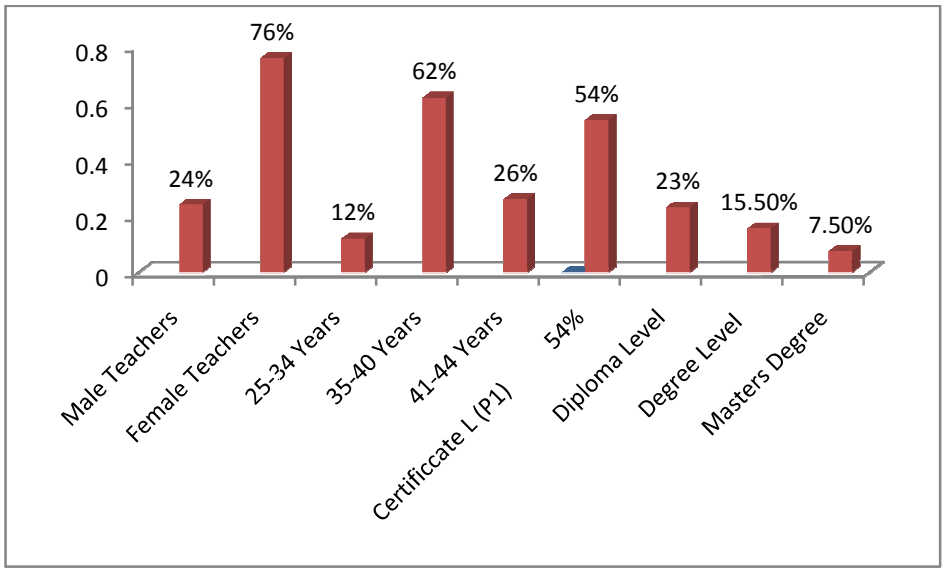

Figure 4.1 shows that, 76.0 of the pre-school teachers in Nyamaiya Division, Nyamira County are female while only 24.0 are male. Distribution of teachers by age where 31% of teachers is aged between 35 and 40 years with 13% between 41 and 44 years and those aged between 25 and 34 years being 6% .Teachers level of academic qualification shows that, majority of the teachers had attained certificate level (P1) of academic qualification at (54%) , those with diploma level of qualification were six at 23%, 15% were Degree holders at 15.5% while only 7.5% had masters degree level of academic qualification.

This implies that there were immensely more female than their male counterpart preschool teachers indicating that there may be possibility of stereotyping along gender differences where female could be favoured more than male child particularly in science activities which would affect reflective teaching on children's performance in preschool .Majority of preschool teachers in Nyamaiya Division, Nyamira County fall within the age bracket of between 35 -40years. It can be argued that, the older the teacher, the more they are experienced in enhancing and handling science activities in preschool children and finally adequacy in the level of knowledge especially on enhancing the science activities in preschool children.

4.4.1 The study established pre-school teachers' use of resources and the analysis results are shown in Table 4.2

Table 4.2: Pre-school Teachers Use of Resources

	Responses	**Return rate (%)**
Always	8	50
Sometimes	4	25
Rarely	2	12.5
Others	2	12.5
Total	**16**	**100**

From the analysis in Table4.2, It suggests that the majority of teachers use resources in teaching pre-school science activities Resources are important in teaching and learning science and they are necessary to help in children's own teaching science.

4.4.2: Availability of Teachers Activity Guide in Pre-Schools

The study sought to find out the availability of teachers guide in pre schools for teaching science activities and the findings is a shown in table 4.3

Table 4.3 Availability of Teachers Activity Guide in Pre-Schools

	Responses	Return rate (%)
Available	8	50
Not available	4	25
No response	4	25
Total	**16**	**100**

From the table 4.3 it indicates that most of the pre-school teachers are aware of the suggested activities that can enhance children's own investigations in pre-school science activities. Other science text books are important for learning science activities in pre-school.

4.4.3 Funding for teaching and learning resources Pre-Schools

The researcher sought to know the source of funding for learning and teaching preschools, and findings are illustrated in table 4.4

Table 4.4 Funding for teaching and learning resources Pre-Schools

	Responses	Return rate (%)
Governments	8	50
Parents	5	31
Sponsor	3	19
Total	**16**	**100**

From Table4.4, it was determined that the government funds most of the pre- schools learning resources. Funds are important for acquisition of teaching and learning resources for effective teaching of science activities. In order to ensure that these are sufficient learning resources, the study was able to determine that both the parents and sponsors are able to work together with the government to prevent a shortfall in the resources. Other resources are prepared by teachers and parents. Some teachers involve children in collecting locally available materials. All head teachers supported the fact that the pre-schools should improvise for the resources by involving teachers, children and parents in collecting them from local environment.

4.4.4 The study graded the performance as follows: Scores ranging between 70- 100 as above average, 40-70 as average and 0-40 as below average. The results are illustrated in Table 4.5

Table 4.5: Grading of performance in pre schools in the study

performance	Experimental	Control
Above average	100	0
Average	0	80
Below average	0	20
Total	**100**	**100**

The table gives information on the impact of the teaching methods on the two categories of schools.

From Table 4.4, it can be seen that reflective teaching has an impact on performance in science. This studyrevealed that the experimental group had a better performance as illustrated in the table. We therefore conclude that, reflective teaching should be applied to compliment traditional methods of teaching.

4.4.5: Teacher Rating of Teaching Methods in pre-schools

Teachers were asked to rate different teaching methods in pre-school science activities. Responses to items were given numerical values using the frequencies of choosing a particular method and percentages were computed as shown in Table 4.6.

Table 4.6 Teacher Rating of Teaching Methods in pre-schools

Method	**Frequency**	**Percentage**
Experiments	5	31
Observation	5	31
discussions	3	19
Poems	2	13
Story telling	1	6
Total	**16**	**100**

From the table it can be concluded that the teachers frequently use experiments and observations as teaching methods in pre-schools followed by discussions. The case of focus and storytelling was not a preferred way of teaching. Preschool teachers are aware of different teaching methods and should use them different methods in teaching science activities.

4.5 Findings on Research Question 1: What is the performance of a child taught pre-school science activities using traditional methods

The first objective sought to investigate performance of a pre-school child in science activities when taught using traditional methods. During the study, control schools were taught using this method. It was teacher cantered where teacher talk and demonstrate. Tests were administered and marked out of 100%. The results for analyzed data are shown in Table 4.7

Table 4.7: Children's Test Scores in science activities taught using traditional method

	Enrolment	**Total scores**	**Mean scores (%)**
A	51	2942	58
B	37	1960	53
C	22	1370	62
D	17	880	53
E	24	760	32
Total	**151**	**7912**	**52**

From the results represented in the table it was observed that preschool children perform well when taught using traditional method.

Table 4.8 ANOVA science activities taught using traditional method

Source	Type111sumof squares	df	Mean square	F	Sig	Eta squared
Corrected model	234.986[b]	5	42.457	2.453	.062	.281
Intercept	206790.0567	1	306790.002	10320.002	.734	.964
Total scores	150.975	2	64.234	2.900	.0723	.0134
Mean scores	4.567	1	4.087	.0453	.456	.001
Total S_2 mean	55.609	2	13.765	1.450	.214	.004
Error	7246.342	425				
Total	35024.041	436				
Corrected total	7502.003	426				

Computed at alpha .05

From the able 4.8 it is shown that the alpha value is greater than alpha value .05 which signifies that the traditional teaching method has no significant effect on children performance in science activities. Since the significant value is greater than .05 i.e. p> .062, 0.734, 0.0723.

4.6 Findings on Research Question 2: What is the performance of a child taught pre-school science activities using reflective teaching method

This Question sought to investigate the performance of a pre-school child in science activities when taught science activities using reflective teaching methods together. During the study period, teachers taught science activities using reflective teaching

method and facilitated learning and gave children a chance to participate fully in learning activities. By so doing, children formulated their own hypothesis on given activities in which they designed experiments to test their hypothesis. Same test was constructed based on the scheme of work .The test was administered after the teaching session, marked out of 100% and scores recorded. The mean scores were computed and results shown in Table 4.8.

Table 4.9: Children's Test Scores in science activity when taught using reflective teaching method.

Schools	**Enrolment**	**Total scores**	**Mean scores (%)**
F	61	5160	85
G	32	2360	74
H	27	2220	82
I	30	2210	74
J	6	430	72
Total	**156**	**12380**	**77**

In this group better performance was recorded. It was observed that reflective teaching methods have an impact on the learning and performance of children in pre-school science activities. Pre-school teachers should therefore use reflective teaching methods to teach science activities, since the study show that it leads to a good performance.

Table 4.10 ANOVA of science activity when taught using reflective teaching method.

Source	Type111sumof squares	df	Mean square	F	Sig	Eta squared
Corrected model	234.986[b]	5	52.457	3.453	.022	.381
Intercept	206790.0567	2	4306790.002	10320.002	.034	7964
Total scores	150.975	2	64.234	32.900	.0723	.0134
Mean scores	5.567	1	34.087	.0453	.056	.000
Total S_2 mean	55.609	2	23.765	2.450	.014	.000
Error	7276.342	5425				
Total	65024.041	536				
Corrected total	7502.003	426				

Computed at alpha .05

From the table 4.10 it can be revealed that significant values are less than the alpha .05 from the Anova table 4.10. These shows that reflective teaching in science activities has more impact on children performance in science activities in Nyamaiya Division in Nyamira county the alpha values are at p>0.05 sig values are 0.022, 0.034 ,0.056 and 0.014.

4.7 Research Questions 3: Is there difference in performance between children taught science activities using reflective methods and children taught science activities using traditional methods in a pre-school

The control and experimental group of pre-schools were taught using same schemes of work and lesson plans developed by researcher and the teacher. The control group of pre-school was taught using traditional methods only while experimental group was taught using reflective teaching method. The researcher and the teacher constructed a test and

marking scheme based on the schemes of work .Same test was administered to control and experimental groups after the teaching session. Marking was done by the researcher and the pre-school teacher out of 100%. The scores were recorded. Mean scores were computed and graded as above average (70-100), average (40-70) and below average (0-40). Standard deviations, t and p values were computed using SPSS software. To find out whether children's performance in both control and experimental groups of schools were different, a two sample (independent) t-test was done in which t-scores and p-values were established. The analyzed results are reported in Table

Table 4.11: Impact of reflective teaching method on children Performance in Pre-school Science in Nyamira Division, Nyamira County

Groups		Mean	S.D	df	t	p
	Control schools	51.60	11.57	8	-4.463	.002
	Experimental - schools	77.40	5.73			

The data suggests that children who are taught science activities using reflective teaching method perform better than those who are only taught using traditional methods. The difference in performance is due to interventions (treatment) done to the experimental group of schools. This finding suggests that reflective teaching method should be used to compliment traditional methods.

4.8: Discussions

The findings of the study agree with the pre-school teacher's activity guide (KIE, 2004), which requires the teacher to develop simple experiments which children can understand and do on their own. The activities and materials should be organized in such a way that children come up with their own discoveries. The teacher should give each child a chance to contribute to his or her learning. Pre-school science activities help children explore and understand world around, satisfy curiosity and get answers to questions.

The findings support Karaka, Nyangasi and Guthii, (2004) "- that a child should be an active participant in learning where they are the doers, the materials are the tellers and the teacher is the guide. The children cannot learn by only sitting and listening to the teacher. Therefore the teacher should allow and encourage the children to explore, investigate, discuss, play, model and practice science activities. Children need real life experiences because they are unable to think through ideas."

Experimental method of teaching and learning science activities is supported by (KIE, 2003), which says that science activities are best learnt through inquiry. The results of the study concur with Rai and Richardson (2003), who say that teaching or learning aids are intended to provide children with real life experiences.

Children have an opportunity to use their senses (touch, see, smell, hear and feel) to enhance learning. This helps in conceptualization of otherwise abstract ideas and helps understanding, mastery and retention of ideas or concepts. Learning aids therefore need to be used as often and should be relevant for the lesson.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the study, draws conclusions and makes recommendations and suggestions for further research. The main focus of the study was to investigate the effect of reflective teaching on children's performance in preschool science activities in Nyamaiya Division, Nyamira County.

5.2 Summary of the Study

The researcher used case study design wherequasi-experimental design was involved random selection of two groups of pre-schools. Group 1 was experimental and group 2 was control schools. Head Teachers and teachers involved in the study were randomly selected from preschools selected. The researcher used simple random sampling technique with eight teachers participating in the study whereby each preschool had one teacher involved from their preschools. A total of twenty four children participated in the study. This study was conducted by the researcher using prepared questionnaires which respondents were preschool teachers. The researcher also used the tests prepared for children science tests .instrument validity was measured through research objectives of the study

The researcher visited the preschool she intends to collect the data from and introduce herself to the head teacher. The questionnaires were personally administered to the teachers by the researcher and record responses. The researcher analysed each questionnaire according to the opinion of respondents. The researcher used observation checklist to analyse the availability of the facilities and resources available. StandardDeviations, t-statistics and P-values were also computed. The research findings are discussed below:

The Mean Scores and Standard Deviations of control group of schools were 51.60 and 11.589respectively while those of experimental group were 77.40 and 5.727 respectively. Thedifference was found to be statistically significant (t (8) = -4.463, p =.002, two tailed).Children learn through the senses. Own investigations are powerful in learning science.Learning involves all things they touch, see, smell, taste and experience within thesurroundings. The child understands ideas and concepts when presented in form of realobjects, actions and situations. They experiment with different things therefore makingdiscoveries and this increases their knowledge and concepts. They learn by hands onexperiences with real materials and meaningful activities. They learn through practice,observation, imitation, exploration and problem solving. As they engage in differentactivities, they develop strategies for different ways of acquiring information and solvingproblems. The pre-school teacher has therefore to facilitate learning by ensuring that the childis the key participant in what is happening.

The child has to be active in terms of constructing knowledge and solving problems. Theteacher facilitates and motivates the child to do own investigations. According to analysisobtained, children had higher mean scores in the experimental group as compared

to control.This is where children used reflective method of teaching in science. A 100% of schools had amean of 50 and above with the highest at 85% and lowest at 72%. The method proved to beof much help to average and below average children because they learnt practically. Intraditional method, children did not participate fully in the learning process and therefore hadlow mean scores with the lowest at 38%. This is because science is a doing subject.

This45suggests that children who were taught using reflective method performed better than those taught using traditional methods. Thedifference can be attributed to treatment or interventions done to the experimental group ofschools. The inquiry method of teaching and learning science is more appealing to children.Poor performance by the control group of schools point to the fact that children should be guided to learn through the reflective method of teaching.

5.3 Conclusion

The study intended to investigate the effect of reflective teaching on children performance in preschool science activities. The following conclusions can be drawn from the study. Itestablishes the fact that children's taught using reflective method in pre-school science activities has animpact on performance. Children's performance in the experimental group was better than incontrol group. This is where they were involved in traditional method of teaching. Schools in controlgroup had lower Mean Scores and higher Standard Deviations of 51.60 and 11.589respectively. Schools in experimental group of had higher mean Scores and lower StandardDeviations of 77.40 and 5.727, respectively. The statistically significance difference betweenthe two group of Pre-

schools (t (8) = -4.463, p =.002, two tailed) suggest that children inexperimental group perform better than those in control group of schools where onlytraditional methods were used to teach science. Thus in addition to teaching science usingtraditional methods, children should be taught using reflective method in science .Science islargely a doing subject and children know more of what they do than what they hear. Theyneed see, touch, smell and do as much as possible of their own investigations. They areunable to think through ideas and therefore hands on activities and first hand experiencesmake learning better for them. The teacher should give each child a chance to contribute tolearning.

The older the teacher, the more they are experienced in enhancing and handling science activities in preschool children and there is adequacy in the level of knowledge especially on enhancing the science activities in preschool children.

5.4 Recommendations

The study recommends the following:

i. In addition to teaching children using only traditional methods in science in Pre-school, teachers should preferably teach science activities using reflective methods so as to make performance better in science activities. Science learning should be made more practical than theoretical. Teachers should prepare science lessons in advance so as to get the necessary materials for the lesson

ii. District education boards and constituency development funds should prioritize early childhood education in allocations for development projects so as to provide necessary resources and facilities to teach science activities and make pre-schools child friendly. This will improve performance not only in science activities but also in other areas. Extension of quality assurance services to Pre-schools will help to monitor and improve performance in science as well as other areas.

iii. Head teachers should move to ensure that their respective preschools have adequate science teaching and learning materials for children. This should be complimented by developing a working plan that gives preschoolers a balanced timetable for the entire subject taught.

5.6 Suggestions for Further Research

Based on findings and the scope of this study, the researcher recommends further studies to be carried out in the following areas:

i. A replica of the study should be carried out within the preschool context in other counties to investigate. Effect of reflective teaching on children's performance in preschool science activities for comparison purposes.

Studies on how school head teachers and other teachers' attitude including those of pre-school affect performance in science activities are worthwhile. Since this study only targeted science activities, a similar study should be done in teacher's classroom practices during science activities as well

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APPENDIX I: QUESTIONNAIRE FOR PRE-SCHOOL TEACHERS

1. Name of the Pre –school……..

Zone ……..

Division ……

2. Gender Male [ ] female [ ]

3. What is your age bracket?

18 – 24 [ ]

25 – 34 [ ]

35 – 40 [ ]

41 – 44 [ ]

45 and above [ ]

5. What are your professional qualifications?

Certificate Level [ ]

Diploma level [ ]

Degree level [ ]

Other (specify) ……..……

6. How often do you use teaching and learning resources in science lessons?

a) Always [ ] b) Sometimes [ ] c) Rarely [ ]

7. Who provides these resources?

a) Teacher [ ]b) School [ ] c) Children [ ] d) Parents [ ]

8. Do you think reflective teaching method in science affect performance?

Yes [ ] b) No [ ]

9. How often do you use reflective teaching method?

10. Do you have pre-school teachers' activity guide? a) Yes [ ] b) No [ ]

Please fill in the table below the teaching methods you use to teach mathematics in your class by putting a tick (√) against the methods applicable to you.

No.	**Methods**	**Frequency used**	**Occasional used**	**Never used**
1	Role learning			
2.	Drill and practice			
3	Programmed learning			
4	Directed discovery			
5	Guided discovery			
6	Exploratory discovery			
7	Observation			
8	Experimentation			
9	Lecture			
10	Deductive			
11	Inductive			

Science Teaching & Learning materials

1) Please indicate the status of science teachings and learning materials in your school by ticking the appropriate response.

2) Indicate the answers that most likely approximate your opinions concerning the contribution of instructional resources in the learning and teaching science.

(Key: SA-Strongly Agree, A-Agree, UD-Un Decided, DA-Disagree, SD Strongly Disagree)

		SA	**A**	**UN**	**DA**	**SD**
	Instructional materials make learning more concrete					
	Cater for children's individual differences					
	Create a better understanding of science concept					
	Are valuable teaching tools for mathematic					
	Arouse learning interest in children					

APPENDIX II: RESEARCH OBSERVATION CHECKLIST

Name of school ……

Location ……

Facilities/resources	**Available**	**Fair condition adequate**	**Poor condition/ inadequate**	**Permanent**	**Temporary**
Head teacher office					
Staffroom					
ECE classroom					
Science text books					
Science corner					
Sand corner					
Water corner					
Play ground					
Playing materials					
Learning aids					
Toilets/latrines					

APPENDIX III: PRE-SCHOOL CHILDREN'S SCIENCE TEST

NAME.....

SCHOOL.....

ANSWER THE FOLLOWING QUESTIONS.

CHOOSE THE CORRECT ANSWER

1. In our school we get water from..... (Tap, Borehole, River).
2. A stone …..... in water (Floats, Sinks).
3. A paper..... in water (Floats, Sinks).
4. A padlock …..... in water (Floats, Sinks).
5. A leaf …..... in water (Floats, Sinks).
6. A string ….....in water (Floats, Sinks).
7. A piece of Cloth ….....in water (Sinks, Floats).
8. Things that sink in water are..... (Heavy, light).
9. Things that float in water are..... (Heavy, Light)
10. A feather is …..... (heavy, Light)

Activity area: Science activities

Name of the child	**Sorting**	**classifying**	**measuring**	**Weighing**
x				
y				
z				
p				

Appendix iv:

APPENDIX 1: LETTER OF INTRODUCTION

University of Nairobi

School of Education

P.O Box 30197

Nairobi.

The Principal

……Primary Schools

Dear Sir/Madam

REF: PERMISSION TO COLLECT DATA IN YOUR SCHOOL

I am student at the University of Nairobi currently pursuing a Masters' degree in Corporate Governance. As part of my assessment I am required to carrying out a research on **Headteacher'sPractices Influencing Girl Child Participation in Schooling in Public Primary Schools in Nyamaiya Division NyamiraCountry, Kenya**. Your schools have been selected for the study. The aim is to request you to kindly allow me to carry out the study in your school. Your identity will remain confidential.

Yours faithfully,

Z K Moturi

Appendix v:

Appendix vi: