CONTRIBUTION OF PHYSICAL CLASSROOM CONDITIONS ON CHILDREN LEARNING IN EARLY CHILDHOOD CENTRES IN ENGINEER ZONE, NYANDARUA COUNTY, KENYA

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MAY 2015
DECLARATION

I declare that this project is my original work and has not been presented in any other university/institution for consideration of any certification. This research project has been complemented by referenced sources duly acknowledged. Where text, data (including spoken words), have been borrowed from other sources, including the internet, these are specifically accredited and references cited using current APA system and in accordance with anti-plagiarism regulations.

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DEDICATION

I wish to dedicate this work to my Almighty God who has been my inspiration throughout the writing. I also dedicate it to My husband George, my son Ben, my daughter Mercy and my Mum Martha for their tolerance and support throughout my study.
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<td>CS</td>
<td>Class Size</td>
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<td>DEO</td>
<td>District Education Officer</td>
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<td>ECD</td>
<td>Early Childhood Development</td>
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<td>ECC</td>
<td>Early Childhood Centers</td>
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<td>IAQ</td>
<td>Indoor Air Quality</td>
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<td>NACECE</td>
<td>National Centre for Early Childhood Education</td>
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ABSTRACT

The mushrooming of Early Childhood Centres in Kenya and other environmental factors have given rise to many challenges in ECD education in the country. The challenges continue to change the conditions in which the children find themselves in learning as well as their performance. This research project focused on the contributions of the classroom physical conditions on the learning of children in Early Childhood Centres in Engineer zone, North Kinangop Division, Nyandarua County. This study sought to establish the contributions of teaching materials, the creativity of the teacher in organization and the physical environment, to the extent that these factors affected learning in pre-schools. The study was based on Conditions of Learning theory put forward by Robert Gagne in 1985, which stresses on the importance of classroom conditions in facilitating better learning. In this particular research, the descriptive research design was employed using the survey method to obtain the data that was manipulated to give results of the project. The method was both preferable and convenient, since taking a representative sample made it easier to carry out an in-depth analysis of the problem. Further, the whole population could not be accessed by the researcher, which made the researcher to use a representative sample. Thus, representative samples for the study were obtained from the population using the stratified sampling technique, and grouped into strata for analysis. The data obtained from the study was analyzed both qualitatively and quantitatively to give the desired information about the population. The study established that some of the centres in this area did not have good conditions in terms of availability of materials, ventilation in the classroom, enough space and playing grounds, which may affect the learning ability of the children. The conditions have an effect on the children’s emotional, social as well as mental development, which are important factors in the learning ability and performance of the child. Research has often centred in the identification of problems and issues behind the poor performance in some Early Childhood Centres of which in this study, the government was put on the spotlight by neglecting some developments concerning the Early Childhood Centres in the country. This was due to the reluctance in construction of enough classrooms and provision of adequate instructional materials as well as failing to ensure that maintenance of facilities is done in early childhood centres across the country. This research provided a crucial link between the classroom physical conditions and the level of learning of pre-school children. It also created grounds for recommendations to the relevant stakeholders in pre-schools to create, develop and improve the physical conditions in the classroom for a better learning environment.
CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.0 Introduction

This section gives an account of the background of the problem and the problem statement. Further, it presents the purpose of this study, the objectives and the research questions that were addressed in the research. The section also describes the significance of this study, the limitations as well as the delimitations of the study. Finally, the basic assumptions are outlined followed by a definition of the key terms used in the research.

1.1 Background to the study

According to Gichara (2010), research proves that many children in the country study under very difficult conditions, some in classrooms that have leaking roofs, some have no doors or windows while others have no good floors. Therefore, it is clear that the provision of a conducive environment for learning enhances the ability of understanding and integrating learning concepts in children in pre-school setting (Gichuba, 2009).

There are growing concerns that the performance of most pupils can be traced from the skills they learnt in the pre-schools that they attended. Policy makers and education experts are therefore urging the need for recognition of the pre-school education as a critical factor that affects learning of children even in their school age (MOEST, 2001). This is because the quality of foundation in the pre-school environment may dictate the formal and informal skills that they will acquire and utilize in their later years.
Pre-school learning is considered important in Kenya’s education curriculum as a pre-cursor to later stages of study. Many people believe that the learning process in pre-schools should be improved by introducing all the curriculum areas such as mathematics, language and environmental activities at this tender age (Kipchumba, 2006). However, the mode of application to be used in this approach differs on whether formal channels should be used, or the children should be taught informally using play and basic instructions. Studies on the subject by other researchers indicate that early intervention programs had a positive impact on the children’s learning and achievement. In this perspective therefore, children in such pre-school environments have access to high quality programs that have benefits to them which should be acquired through conducive learning conditions.

When the researcher first got to Nyandarua County in the beginning of 2008, the contributions of the post-election violence were evident and most of the pre-school learning was conducted in torn tents that were offered by the government and other aid agencies like Red Cross for internally displaced people in the area. The pre-school children used furniture mostly used by pupils in upper primary classes while some were sitting on bare ground. Both teachers and the children complained of poor health conditions in terms of dust, poor ventilation and congestion that resulted in poor air circulation in the tents.

It is evident that such conditions have been experienced in other parts of the country and continue to be the order of the day in some regions. This is evident through an article that was written by The Standard Newspaper in 25th February 2012 on page 6, which was presented as ‘Getting education by all means’. In the feature, the children were learning in structures that did not have walls, with pieces of torn sacks acting as the roof and the children sat on the floor. In
this kind of environment, the learning resources like text books and wall charts were inexistent and the conditions were not conducive for adequate learning to take place. This feature made clear the extent of problems existing in the pre-schools in Uasin Gishu County.

The Standard Newspaper also wrote a similar article in May the same year, showing children who studied under rocks, tents and trees. The feature written on 30th May 2012 on page 8 sought to show the problems that many schools have to endure in the course of learning in the country. It is evident that the provisions of the Sessional Paper No.1 of 2005 on the aspect of basic education, and the Kenya Education Sector Support Programme (KESSP) as outlined by KIE (2008) are yet to be achieved.

It is evident that children perform better when their classes are organized, have enough space and conducive conditions, which give a chance for the children to develop good starting points for their ideas as noted by Whitbread (1999). In this respect, when the learners in a pre-school environment are given chances to interact with various resources and displays in the classroom, they become eager to interact with many ideas that enhance their learning.

MOEST (2001) clearly indicates that the learners are affected by the conditions of their learning environment, including the availability of physical resources for example, chalkboard, desks and books to aid learning. Further, the distribution of these resources is crucial as well as the time the individual is allowed to interact with them. In addition, their gender sensitivity aspect may affect the learning of the children. This is because some boys feel more comfortable when they share materials with other boys than with girls (Ngware, 2008).
Improving the performance of learning in pre-school environments therefore requires a critical study of the physical classroom conditions that learners find themselves in, as well as having a critical view on how the conditions may either promote or inhibit the learning and achievement of the learners. One of the critical factors to consider is conducive physical learning conditions which promote performance and learning in preschools.

The researcher focused on the contribution of classroom conditions on learning in Engineer Zone after the post-election violence and found that, during this time, many families had been displaced and relocated in Engineer Zone, meaning that the conditions under which learning took place were very poor for both children and teachers. Although the political situation in the country went back to normal, it was evident that such conditions were a revelation to the reality that many other schools find themselves in this condition to date. These conditions may affect the learning in many schools in Engineer Zone and the County at large since the administrations are not yet able to cater fully for the education needs of the children in preschools.

1.2 Problem Statement

Classroom conditions are an important concern for study and research, especially on their contributions on learning. The structures of learning for example classrooms in some pre-schools are not conducive for learning since they lack walls or even roofs. In addition, the floor of such learning environments may not provide the physical comfort needed for concentration and learning.

Further, some pre-schools in Engineer zone go through many problems in pursuit of offering quality education to the children. The organization of the classes, the space within the classrooms and availability of teaching/learning resources are serious challenges facing many pre-schools in
the zone. The researcher therefore found it necessary to assess the contributions of physical classroom conditions on learning through research.

1.3 Purpose of the Study

The purpose of this study is to establish the contributions of physical classroom conditions on learning of children in pre-schools within Engineer Zone of Nyandarua County in Kenya.

1.4 Research Objectives

The objectives of this study are:

i.) To establish availability and appropriateness of textbooks and other learning materials used for classroom instruction in the early childhood centers.

ii.) To examine the suitability of the classroom environmental conditions in terms of crowding, adequate furniture, floor and roofing, blackboard, ventilation and tidiness in the ECDE centers provided in relation to the learning of the children.

iii.) To examine teacher’s ability to plan and organize a creative learning environment for children through provision of learning corners.

iv.) To identify the challenges faced by ECDE teachers in provision of good learning environments.

1.5 Research questions

i.) How appropriate and available are textbooks and other learning materials used for classroom instruction in the early childhood centers?
ii.) How suitable is the classroom environment conditions terms of crowding, adequate furniture, floor and roofing, blackboard, ventilation and tidiness in the ECDE centers in relation to the learning of the children?

iii.) How do teachers plan and organize a creative learning environment for children through provision of learning corners?

iv.) What are the challenges faced by ECDE teachers in the provision of good learning environments

1.6 Significance of the study

The study provided a rationale for parents to provide better learning facilities like classrooms for the children to have the right physical conditions for effective learning to take place. The quality and quantity of the resources are an important resource for learning, and given that parents play a role in their construction and availability in pre-schools, this research provided the rationale to pursue such motives.

The study was useful in providing information to pre-school teachers and administrators on how the physical conditions affect learning in their schools. It showed the need to improve such conditions and provide a better environment for conducive learning.

The study finally assisted teacher trainers to offer quality advice and guidance to institutions regarding various factors in the classroom environment that improve learning in pre-schools. The findings indicated a rationale to the teacher trainers to provide their students with guidance on acquiring and utilizing physical aids and how physical factors may affected learning in the classroom.
1.7 Limitation and Delimitation

This section provided the limitations of the study. Further, the delimitations of the research were discussed.

1.7.1 Limitation of the study

Geographical factors limited the extent of the research since some schools had poor accessibility. The researcher therefore used any available means to gain access to the selected schools for the purpose of this study.

The researcher also encountered challenges due to lack of cooperation from the teachers and administrators who were relied on to give factual information in the course of this research. The researcher therefore used public relation skills in order to establish a cordial relationship that assured their cooperation in the study.

Financial and time constraints also limited the research study. The researcher therefore used the available resources efficiently to achieve the objectives of this research.

1.7.2 Delimitation of the study

This study was confined in Engineer Zone, Nyandarua County. The study provided an analysis using ECD Centres in the area which covered private and public ECD Centres. The researcher did not however study all the public and private schools in the area of study, but only used a sample. The findings of this research study are generalizable in similar locations in Kenya and are also useful to stimulate further research in other parts of the country.
1.8 **Assumptions**

The study assumed that the respondents provided accurate and reliable information that enabled the researcher to formulate realistic and workable recommendations.

The study also assumed that learning aids are an integral part of teaching and learning in the pre-schools. Therefore, their availability and appropriateness to the purpose affected the learning process in pre-schools.

1.9 **Theoretical Framework**

The relevant theory to this study is the Conditions of Learning Theory that was put forward by Robert Gagne in 1985. The theory postulates five categories of learning outcomes that learners achieve in the classroom.

Gagne (1985) addressed intentional or purposeful learning, which is the kind of learning that happens in learning institutions such as schools or training programs. The theorist believed that aspects in the environment have an effect on the learning process. He identified a variety of human capabilities, which he defines as the behavioural changes (learning outcomes) in the learners that a learning theory ought to explicate. Gagne (1985) postulates that learners who participate in classes with the right learning conditions achieve various types of learning outcomes such as acquisition of intellectual skills, verbal skills, motor skills, cognitive capabilities and the right attitudes. When the right conditions are put in place, learning and remembering can easily happen (Gagne, 1985).

The essence of Gagne’s theory in this research pertains to the manner in which it addresses learning, where the explanation of the concept describes the conditions within which learning
occurs. It describes aspects in the ordinary life and especially in schools where learning takes place (Gagne, 1985). Gagne’s experimental studies sought to show that learners placed in different classroom conditions show a significant difference in their learning capabilities. He describes internal and external conditions, but most relevantly, the external conditions are those in the environment such as congestion, availability of learning materials, the teacher and other environmental aspects (Gagne, 1985).

As regards to this theory, provision of a conducive physical environment and the appropriate learning conditions in a suitable manner may assist the learners to understand, build up information and improve their ability to remember, which is instrumental in their learning. In this light, appropriate physical learning conditions should be put in place to simplify the process of acquiring knowledge and synthesizing the knowledge for useful education pursuits even in the future.

1.10 Conceptual Framework’

The researcher has identified the following independent variables that may directly affect children’s performance in all curriculum areas in preschools. These include provision of textbooks, enough learning aids, adequate furniture, appropriate classroom environment in terms of crowding, floor and roofing, blackboard, ventilation tidiness and class size (number of children per class). The dependent variable in the study is learning. The researcher showed how the independent variables affect the dependent variable of the study.
Independent variables

Textbooks and other learning materials:
- Availability of textbooks
- Reading charts
- Photographs
- Drawings

Classroom environment:
- Ventilation
- Furniture
- Blackboard
- Floor and roofing
- Classroom size

Intervening variables
- Policy guidelines
- Parents' attitude
- School administration

Creative learning environment
- Pictorial corners
- Nature corner
- Home corner

Dependent variable

Children learning:
- Reading skills
- Drawing skills
- Counting skills

Challenges faced by ECDE centres:
- Inadequate material improvisation
- Less dynamic change in materials
- Lack of thematic utilization of materials

Outcome:
Improved children learning

Fig 1: Relationship between Variables in the Study
The above figure shows the relationship between dependent, intervening and independent variables in the research study. The independent variables of the study are the contributing factors to the learning of the children in the pre-school as indicated by the arrows. However, between the dependent and the independent variables, there are intervening variables whose contribution or lack of contribution could yield different results even if the independent variables are improved. The arrows linking the boxes in the independent variables section seek to show their interconnections in creating good classroom conditions necessary for learning. The direction of arrows from the independent variable to the dependent variable from left to right in the conceptual framework implies that if the independent variables are improved and the intervening variables are enabling, then positive learning could take place.

1.11 Operational Definition of Terms

The following are definitions and explanations of the key terms related to the study:

**Classroom Physical Conditions**: It is a combination of internal factors that have an effect on the growth and development of children within a learning environment such as ventilation, furniture and textbooks.

**Learning Aids / Resources**: Materials utilized by teachers to aid them in teaching children in the classroom.

**Learning Ability**: The standard of excellence, which is estimated by the learning activities in science, language and mathematics such as increased writing skills, oral skills, drawing skills and coloring skills.

**Private ECD Centres**: Preschools owned by individual or non-governmental sectors.
Public ECD Centres: Preschools owned by government and receives its financial support.

Pupil Text Book Ratio: This is the number of textbooks available against the number of children during a learning period.

Suitability of Class Environment: This is the appropriateness of conditions within a learning area to enhance the achievement of set learning outcomes.
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

In this chapter, the study focuses on literature review on the contributions of classroom physical conditions on learning of pre-school children. The literature review was undertaken on aspects of the instructional resources such as realia, books, charts and their connection to children learning. In addition, appropriate classroom environment and book ratio in preschools was addressed in relation to children learning. Further, it incorporated topics on the contributions of adequate and appropriate physical environmental factors such as furniture as well as the impact of environmental conditions within the classroom on learning in pre-schools.

2.1 Learning Resources available in ECD Centres

According to Twoli (2007), instructional materials, teaching resources, learning aids and audio visual aids are aids that teachers use to facilitate learning and also increase interest of learners in the learning process. Teachers use resources to enhance learners’ participation in class for effective learning. On the other hand, Obanya (1989) views instructional materials as didactic materials (those that are instructive, demonstrative and specially designed to teach) which are supposed to make learning possible. Further, Isola (2010) called them objects or devices that assist the teacher to make a lesson clearer to the learners.

According to Oladejo & Maruff (2011) there is a considerable difference in the performance of children taught using instructional resources because those taught using instructional material obtained highest achievement scores. The same observation was also made by Isola (2010).
Further, Twoli (2007) notes that for other children, learning is more effective if they look at objects, observe a process or watch people doing some work. Yet for others sounds and feeling such as those from the radio, television, movies and talks by resource persons make their learning easier.

Hall & Paulucci (1970) concluded that the use of audio visual materials will not ensure effective learner learning automatically. The teacher should learn how to select material carefully, preview and use them effectively. In addition, the materials should only be used when and where possible to realize performance in the classroom (Ngware, 2008). When resources are presented to the class they should only be accompanied by clear explanation or suggested study guide.

According to Hallack (1990), the availability, relevance and adequacy of educational resource elements contribute to academic performance and that school buildings that are not attractive, classrooms that are over-crowded, non-availability of playing grounds and surrounding environments that are not attractive can contribute to low performance. Fuller (1985) postulated that children who had to use two or more text books were three times better in performance than those who did not have books in schools. Montessori (1952) stated that the learner should be provided with a rich and suitable environment in the classroom where the child would be free to move and play.

Eshwani (1983) states that difference in instructional resources in preschool seem to account for differences in achievement. Instructional materials such as books, charts, models, visual aids and play material have some bearing in school performance. Schools that were found having well and enough instructional materials are also performing well academically.
Wachieye (1990) says that the use of learning resources involves the use of more than one of the human senses at the same time during learning process. As per the studies, the psychologists also found that different human senses accounts for varying percentages of learning. It is estimated that taste account for 1%, touch 1.5%, smell 3.5% and sight 83% (Kipchumba, 2006). It is believed that 20% of what is heard is retained while 50% of what is seen is retained and hence the need for visual teaching aids and active learners participation. Further, Wachieye states that teaching learning materials provide significant gains in formal learning by improving the learners’ abilities. These include retention, remembering, thinking, reasoning, interest and imagination, better understanding and personal growth and development. When resources are used there is great opportunity for learners to move about, talk, love and interact freely under such conditions. The learner work independently and collaboratively which make learning interesting.

In addition, the use of creative learning environments enables learners get the opportunity to handle and manipulate objects hence increasing their understanding; this is learning by doing (Ngware, 2008). They help in providing conducive environment for capturing interest as well as sustaining attention and learners’ motivation. Use of such educational resources saves energy and time because most of the concepts are easily clarified and understood. They promote learning as clear images are formed when learners see, hear, touch, taste, and smell as their experiences are direct and concrete. Learning through the use of senses is the most natural and easiest way of learning. To this end, Bryant’s (1983) research in Kenya, states that, creative learning environments such as learning corners, nature corners and pictorial corners affect the children’s academic performance in preschools because they are insufficient. This could be
attributed to the fact that instructional resources are not widely used in most pre-schools, and also teachers may not know how to arrange them appropriately. However, there is need for more research on how the usage of such resources as charts, abacus and beads among others impact on children’s learning in pre-schools.

2.2 Pupil Text Book Ratio and Classroom Learning Environment in ECDE Centres

This is the number of textbooks available per pupil during the learning period. It is calculated as: total text books provided divided by the number of pupils in a class. Text books deliver the curriculum and they are the most important instructional material that enhances learning. When text books are available, instructional time is not wasted as when teachers and learners copy text on and off the blackboard as stated by Lockheed (1991). Availability of text books is critical to learning since there is a positive correlation between pupil’s performance and availability of text books, (Gichuba, 2009).

According to the report, “What Quality of Primary Education is Children in Urban Schools Receiving? Evidence from Nairobi by Ngware (2008), all the books used in 55% of the schools studied were approved by the Ministry of Education”. The percentage of institutions using all accepted books ranged from 50% in community owned schools to 71% of private and religious group-owned schools. Government policy on pupil-textbook ratio stipulates that lower primary and preschools should have a ratio of at most 1:3 while upper primary should have a ratio of at most 1:2 in all main subjects (Mutai, 2001). The pupil-textbook ratios in Science, Mathematics and English in both lower and upper primary classes were examined in all schools. Results of the study showed that some government-owned institutions had not attained the required (minimum standards) pupil textbook ratio in preschools, lower and upper primary. However, other schools...
in private religious and private NGO owned schools had relatively higher pupil-textbook ratios. For example, in the three subjects, the private individual owned schools had a mean ratio of 2:5 and 6:7 as the ratio of the number of books to that of children in lower and upper primary, respectively, while the government schools had mean ratios of 1:4 and 2:7 at the same levels.

Most of the institutions assessed on pupil-text book ratios which recorded levels below the approved for lower classes were in informal settlements like slums while those with higher ratios were in the formal settlements such as Mathira (Wambui, 2011). It is probable that children in non-government schools in informal settlements had reduced degree of access to Science, Mathematics and English textbooks in their institutions. In private individual-owned schools, it is the upper classes that had ratios way above the standards while in community-owned schools, it is the lower classes that were disadvantaged. Missing out in learning experiences during the lower classes could mean that such pupils will be disadvantaged in terms of achievement for the rest of their schooling career. Fuller (1986) stated that greater availability of text books and reading materials raises the quality of learning activities and educational achievements.

Similar research carried out in India, Chile, Brazil, Malaysia and Ghana, Heinemann (1981) found out that the availability of textbooks had a positive effect on learner’s achievement and is crucial to educational performance. Beebout (1972) asserts that the availability of text books had a positive correlation on achievement amongst pupils in Malaysia.

Eshiwani (1987) in his study in Kenya reports that schools which usually appear in the top ten in the national examination, have adequate text books. In a later study, Eshiwani describes a significant relationship between use and presence of textbooks and achievement in primary schools.
Eshiwani (1993) in his research on the determinant of school achievement in Kajiado District, found that pupils who had their own text books perform much better in examinations than their colleagues who did not have text books, especially in Kiswahili, Mathematics and English. He also found that the more money a school spends on text books, the higher the chances of it performing well in examination. Therefore, textbooks are an important learning input that provides the learner with different learning experience.

2.3 Physical equipments and organization of the learning environment

Physical equipment like furniture should be enough and appropriate for the size and age of the children. According to NACECE (2000) the type of furniture provided in a pre-school has a great influence on the physical development of children. It can affect their posture and the extent of fatigue they are exposed to. The furniture can also influence how they play and learn.

According to Journal of African Studies and Development (2011, p. 135-143), all the ECD teachers noted that children were exposed to soil related infections because of the unavailability of adequate and age appropriate furniture, earthen floors and proper resting space. One of the teachers said: "The problem is that children sit on the floor and they also sleep on the floor because the school does not have furniture and a rest room". As a result, children are exposed to diseases such as scabies, colds and pneumonia. An estimated 47% of children between 5 to 9 years of age from developing countries are infected with the three main types of soil transmitted worms; hookworms, round worms, and whipworm (WHO, 2007). The most common nutritional problem caused by worm infections is iron-deficiency anaemia. Iron deficiency is also linked to impaired cognitive functioning (Guthrie, 1989).
According to Catherine (2009) the tables and desks should be arranged properly to allow easy movement, group work, play and management of group behavior. The arrangements should enable children to have a clear view of each other. For a teacher to organize the classroom, he/she should pay attention to the physical sitting arrangement (how the tables, chairs and benches have been arranged).

Further, Boro (2011) stated that it is important to provide adequate and appropriate furniture. It should be kept in mind that young children are active, curious and cannot sit still for long periods. They are not strong enough given that their bodies are still growing. Therefore, the furniture and equipment provided should be designed in such a way that they support their healthy development, since children who are healthy perform better in school.

Studies that were conducted by the Ministry of Education indicated that schools with permanent buildings and desks performed significantly better than those schools with few or none, (Ministry of Education, 1993).

2.4 The Impact of Environmental Conditions

According to Schroeder (2002), there is a growing body of work linking educational achievement and learners performances to the quality of air they breath in classes. Poor Indoor Air Quality (IAQ) is affecting many schools, and its impact is too vital to over-look. According to NACECE (1990) buildings should be adequately ventilated and should have enough light. The Ministry of Public Health and Sanitation states that a classroom with poor ventilation creates a high chance for the spread of air borne diseases such as tuberculosis.
Schroeder (2002) therefore notes that those involved in school planning and design ought to enhance academic outcome by creating better learning environment, quiet, safe, comfortable and healthy environments that are an important component of successful teaching and learning.

The poor Indoor Air Quality (IAQ) systems identified causes infections including irritated eyes, nose and throat, upper respiratory infections, nausea, dizziness, headache, and fatigue, or sleepiness which have collectively been referred to as "sick building syndrome" (EPA 2000). Poor indoor air quality makes teachers and learners sick and teacher cannot perform well as healthy ones do (EPA 2000). Kennedy (2001) also stated that improved ventilation can bring about less asthma, better school attendance, and improved academic performance.

Most notably, poor IAQ has been associated with increased learner's absentism. For example, Smedje & Norback (1999) found a positive relationship between air borne bacteria, mold and also asthma in children, which in turn increase absentism rates in ECD Centres (also Rosen & Richardson 1999; EPA 2000).

Temperature and humidity affect IAQ in many ways. Perhaps most significantly because their levels can promote or inhibit the presence of bacterial and mold. For example, Wyon (1991) showed that learner performance at mental tasks is affected by changes in temperature. These findings support the idea that learners will perform mental tasks best in rooms kept at moderate humidity levels and moderate temperatures (Harner, 1974; Wyon, Anderson, and Lundquist, 1979).

While we certainly seek to avoid such extreme conditions in schools, a surprising number of classrooms lack adequate ventilation and evidence is accumulating to support the common sense
To this end, occupants of a classroom without good ventilation cannot function normally and cannot learn at their full capacity (Krogh, 1982).

According to Schroeder (2002) the purpose of ventilating classrooms and school buildings, at minimum, is to remove or otherwise dilute contaminants that can build up inside the classrooms. Such contaminants come from people breathing, from their skin, clothes, perfumes, shampoos, deodorants, from building materials, cleaning agents and from a host of other agents, which their sufficient concentrations are harmful to the children.

Schools need especially good ventilation because learners breath a greater volume of air in proportion to their body weight more than adults do (Kennedy 2001; McGregor 1998). This is because schools have much less floor space per person than that found in most office buildings (Cranford, 1998). According to NACECE (1995) classrooms should have windows and adequate ventilation to allow in enough air and light.

One of the first symptoms of poor ventilation in a classroom is a buildup of carbon dioxide caused by human respiration. When the carbon dioxide levels reach 1000 parts per million (about three times what is normally found in the atmosphere), headaches, drowsiness and the inability to concentrate arise (Moore 1998). Cranford (1998) found that increased carbon dioxide levels in classrooms owing to poor ventilation decreased student performance on concentration tests and increased learner’s complaints of health problems as compared to classes with lower carbon dioxide levels.
2.5 Challenges Faced by ECDE Centres In Provision of Learning Environments

Many ECDE centres lack adequate teaching and learning resources and facilities suitable for ECDE in their learning environments (Kipchumba, 2006). These include lack of proper ventilated classrooms, furniture suitable for children and safe clean water. This implies that teachers do not have adequate teaching and learning resources to enable them implement the curriculum effectively. Ngware, (2008) noted that such problems were caused by inadequate funds and resources to buy such tools. The lack of such funds affects the implementation of the ECDE curriculum negatively as creation of a sustainable learning environment helps deprived children to improve their academic performance (Wambui, 2011).

Further, Kipchumba (2006) indicates that there is lack of thematic utilization of resources. Such indications have been substantiated by research which indicated that most teachers do not use clear themes when collecting and using resources which makes it challenging to achieve overall learning outcomes (Ngware, 2008). Indeed, materials should also be changed from time to time to make sure that they are relevant to the learning of the children in ECDE. This makes achievement of learning outcomes easier, even when destroyed learning materials are repaired and reused in the classrooms (Ngware, 2008).

2.6 Summary of Literature Reviewed

The chapter has reviewed relevant literature on the subject of instructional resources such as realia, books and charts and their connection to children learning. Aspects of appropriate classroom environment and book ratio in preschools have also been discussed. In addition, the literature has been reviewed on adequate and appropriate physical environment factors like furniture and the impact of environmental conditions within the classroom on learning in pre-
schools. It is clear that physical classroom conditions may affect learning, and was necessary therefore to substantiate such deductions through research.
CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.0 Introduction

This chapter discusses the main methodology of the study and the description of the research design. The sub-sections include; research design, target population, sampling procedure and sample size, instruments, validity, reliability, ethical considerations and procedure for data collection.

3.1 Research Design

The study adopted descriptive research design using survey method. This design enabled the researcher to understand the problem at hand in a systematic and in an objective manner. The research design also was set in such a way that the researcher was able to collect data from a large sample. The researcher therefore identified and described specific behavior in the area of study, and also observed visible physical characteristics of the learning environment in preschools.

3.2 Variables

The following variables were used for the purposes of this study.

3.2.1 Dependent Variable

Children Learning

This is the general standard of excellence measured in terms of learning activities such as coloring, counting, reading, writing and drawing. This was measured by giving learning
activities to the children and evaluating how well the children were able to perform. The researcher also gave language, science and mathematics activities.

3.2.2 Independent variables

Availability of Textbooks and Other Learning Materials

The study sought to assess the availability of textbooks and reading charts that are used in the learning process. It further sought to determine whether learning materials such as photographs, drawings and flash cards were present and in use in the classroom.

Physical environment in the classroom

The study sought to identify the ventilation in the classroom, the furniture available and the conditions of the floor. The conditions of the blackboard, as well as the floor, ceiling, and the walls of the classrooms were also assessed.

Creative Learning Environments

Further, the creative learning environments that contribute to learning were addressed such as pictorial corners and nature corners in the classroom. In addition, the study established whether there were hospital corners and home corners in the classroom.

3.3 Location of the Study

The study was carried out using selected Early Childhood Centres within Engineer zone, in Nyandarua County. Nyandarua County was purposively sampled because there is inappropriateness of physical learning facilities in pre-schools in this targeted area. In the area, some of the buildings used as classrooms had earthen floors and some lacked proper roofing and
therefore leaked in situations of heavy rains. Some classes had more pupils than their appropriate sizes, and that the ventilation in the classes was very poor including so much congestion. In addition, many pre-schools had not laid emphasis on acquiring instructional materials within the classroom or even creating learning corners for the children and there were inadequate text books or learning materials. With these conditions, the researcher believed that the selection of the target area would give the right sample for this study.

3.4 Sampling Technique and Sample Size

Engineer zone was selected using the purposive sampling method. On the grounds of convenience in terms of accessibility to the researcher, Engineer zone in Nyandarua County was selected and the researcher believed that any other zone in the County may have had the same conditions intended for the purpose of the research.

The stratified random sampling technique was used in selecting samples from the targeted population, which led the researcher into dividing the population into strata (Mugenda & Mugenda, 1999). The target population was grouped into two strata, which included both public and private schools. This technique covered all the diversities in the population that is pre-school children and preschool teachers and also the representativeness which would allow for generalization of the results.
Table 3.1: The Population and Respective Samples for the Study

<table>
<thead>
<tr>
<th>Category</th>
<th>Population size</th>
<th>Sample size</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private schools</td>
<td>9</td>
<td>3</td>
<td>30%</td>
</tr>
<tr>
<td>public schools</td>
<td>13</td>
<td>4</td>
<td>30%</td>
</tr>
<tr>
<td>Preschool teachers</td>
<td>44</td>
<td>13</td>
<td>30%</td>
</tr>
</tbody>
</table>

The presented table shows the actual populations and sample sizes used in the study. The researcher also used purposive sampling technique within the strata, where selection was based on the experience of the researcher on the physical conditions of some of the pre-schools that had been visited earlier. A 30% representative sample was taken from each stratum for the purpose of the study.

3.4 Research instruments

In carrying out this study the researcher used the following research instruments:

- Observation schedules
- Questionnaires

3.5 Observation

The researcher used observation by being at the scene of activities in the pre-school environment. This was crucial in obtaining detailed accounts of the actual activities which gave an accurate set of data to answer the research problem. The use of observation guided the
researcher in the evaluation and confirmation of the physical learning conditions since much was learnt by observing what the children were doing and how they did it. The observation was done using schedules that were constructed to reflect the objectives of the study. Further, the comments on the items were given based on the status of the environment, with ratings being given on whether the conditions were poor, fair, good or very good.

3.6 Questionnaires

The questionnaires were given to the teachers in the ECD Centres, who were given one week to answer the questions, after which the researcher collected the questionnaires for the purposes of analysis. Questionnaires were appropriate for this study since they contained detailed answers to information that the researcher needed for the research study. The questionnaires were constructed based on the information required, with sections covering the demographic and specific information that was targeted.

3.7 Validity

To establish the validity of the instruments the researcher analyzed each item against the objectives. This process was also repeated with the supervisors from whom expert judgment was sought. Validation of the instruments ensured the accuracy or the meaningfulness of the results obtained from the research and assured that such results represented the actual parameter of the study.

3.8 Reliability

The researcher tested the reliability of instruments using the test-retest technique, where the same instruments were given to the same participants on separate occasions. An initial test was administered to the respondents, where the filled questionnaires were analyzed manually. The
same questionnaires were administered to the same group after two weeks and the responses analyzed by the researcher. A comparison between the answers was done using the Spearman’s correlation technique in SPSS for windows. A correlation coefficient of 0.72 was got and considered high enough to judge the instruments as reliable for the study.

3.9 Administration of the Research Instruments

The researcher observed and recorded the various physical classroom conditions including the available furniture, the number of textbooks against the number of children, the ventilation types as well as the class size.

The administration of the questionnaires was done by the researcher in the selected schools, by physically visiting and administering the questionnaires to the relevant people in the pre-schools.

3.10 Data analysis

The data in this research was analyzed both qualitatively and quantitatively. The quantitative data was presented using tables and descriptive statistics methods, while the qualitative data was presented using descriptive prose. In their interpretation however, the researcher independently interpreted the two sets of data separately.

3.11 Ethical and Logistical Considerations

The researcher first sought permission from the Graduate School to conduct the research. Further, permission was also sought from the National Commission for Science Technology and Innovation (NACOSTI), Nyandarua County Commissioner, County Director of Education and Deputy County Commissioner of Nyandarua County and letters granted which allowed the researcher to carry out the research. Finally, a letter of introduction was sent to the head teachers
in the pre-schools where the research was to be conducted, for formal introduction and permission to conduct research. The researcher explained the purpose of the study to the respondents and assured them about the confidentiality of their responses and identities. The researcher adhered to the appropriate behavior in respecting the respondents and giving them room for voluntary filling of the questionnaire. Confidentiality of the information obtained was assured through safeguarding such information with passwords that ensured it was only accessed by the researcher.
CHAPTER FOUR

RESULTS, INTERPRETATIONS AND DISCUSSIONS

4.1 Introduction

This chapter presents in details the results and discussions of the inferential and descriptive data used in the study. The data was collected using observation schedules which constituted the qualitative findings of the research and questionnaires which provided the quantitative findings. In the chapter, the interpretations of the data are given and a discussion in each section of the results. The research objectives that were focused on were:

i. To establish availability and appropriateness of textbooks and other learning materials used for classroom instruction in the early childhood centers.

ii. To examine the suitability of the classroom environmental conditions in the ECDE centers provided in relation to the learning of the children.

iii. To examine teacher’s ability to plan and organize a creative learning environment for the children.

iv. To identify the challenges faced by ECDE teachers in provision of good learning environments.
4.2 Demographic Results of the Respondents

The ages and qualifications of the teachers are given:

Table 4.1: The ages and academic qualifications of teachers

<table>
<thead>
<tr>
<th>Age brackets (years)</th>
<th>Number of teachers in the age bracket</th>
<th>percentage</th>
<th>Level of education attained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 25</td>
<td>2</td>
<td>15.4%</td>
<td>Untrained and ECDE Certificate</td>
</tr>
<tr>
<td>25-35</td>
<td>7</td>
<td>53.8%</td>
<td>Diploma and ECDE certificate</td>
</tr>
<tr>
<td>36-45</td>
<td>3</td>
<td>23.1%</td>
<td>Diploma and ECDE certificate</td>
</tr>
<tr>
<td>Above 45</td>
<td>1</td>
<td>7.7%</td>
<td>Degree</td>
</tr>
</tbody>
</table>

The characteristics of the teachers in terms of their ages and academic qualifications are shown in table 4.1. Most of the teachers that were covered in the research had ECDE Diploma and ECDE certificates, with a large proportion of such teachers being 25-35 years. The results in table 4.1 indicate a low proportion of untrained teachers and Degree Holders who taught in the pre-schools, where such teachers were below 25 years and above 45 years.

4.3 Availability and Appropriateness of Textbooks and other Learning Materials

The first task of this study was to establish availability and appropriateness of textbooks and other learning materials used for classroom instruction in the early childhood centers. To
establish this information, the researcher was attempting to achieve the following research objective:

To establish availability and appropriateness of textbooks and other learning materials used for classroom instruction in the early childhood centers

The ECD teachers were asked to indicate the availability of textbooks and other learning materials used for classroom instruction and their appropriateness in the early childhood centres. These materials were relevant textbooks used in the ECD Centres and other learning materials such as pencils, rubbers, crayons, pictures and charts. They were also asked whether their children shared textbooks and to give the ratio to which they shared. They were also asked to give the answer as to how they obtained textbooks and other instructional materials. The results are presented in the following sections.

4.3.1 Text Books and Their Ratio

The researcher established that in most of the schools, many of the pupils shared textbooks while the teacher had only one textbook. In the given cases, the teachers had to write on the blackboard for the learners to copy. Both public and private pre-primary schools however used the children’s fees in purchase of books and other learning materials.

The researcher also tended to understand the children book ratio and the extent of sharing such materials in the classroom. The results indicated that classes where 1 book was shared by 2 children constituted 4%, where 1 book was shared by 3 children constituted 15%, in cases where one book was shared by 4 pupils the percentage was 29%, while in the rest of the classes (52%) where more than 4 children shared one textbook.
From the results, it was clear that children in more than 90% of the classes used in the study shared textbooks with more than two of their counterparts, and such indications led to the poor learning ability seen among preschool children in the observed schools.

According to this study, some Government owned institutions had not attained the required (minimum) standards of pupil-textbook ratio in pre-schools. However, the private owned schools had relatively higher pupil textbook ratios, for example; in Mathematics, English and Science, the Private individual owned preschools had a mean ratio of 2 books for 5 children, while the Government pre-schools had a mean ratio of 1 book for 4 children. The results of this study showed that in pre-schools where adequate text books were available, the children’s performance recorded higher results than in pre-schools with insufficient textbooks. These findings are supported by a study by Gichuba (2009) which indicated that availability of textbooks is critical.
to learning since there is a positive correlation between pupils’ performance and availability of textbooks.

4.3.2. Other Learning Materials Used for Classroom Instructions

The research established that more than half of the respondents reported that learning materials such as pencils, rubbers, crayons and exercise books had a ratio of one item per one child. However, it was found that most of the preschools did not have learning pictures or charts, with some classes having three or less charts that were shared by the whole class. Even some of those that possessed the charts, the charts contained images of animals that could not be easily identified by the children because they had not been drawn properly by the teacher. For instance in one of the classrooms, the researcher could not identify whether a drawn animal was a sheep, a cow or a dog because the drawing was not proportional and was not clear. Some of the words in the charts had very small fonts that could not be easily read by the learners.

In isolated cases within the sample, the pictures and charts were displayed very high on the walls beyond the children’s eye-reach although most were legible to the children in most classes. However, the charts in some classes contained information that was beyond the academic level of the pre-school children, making them irrelevant to their intended functions. It was also established that a great proportion of the sampled classes did not display children’s work as anticipated. It is important to note that the researcher realized that comparatively, classes with a better array of charts and pictures contained children who understood and integrated new concepts in their learning. Indeed, such children demonstrated better memory and reading skills compared to those in classes without charts or with ones that could be deemed inappropriate or poorly drawn.
4.4 Suitability of the Classroom Environmental Conditions in the ECDE Centers in Relation to Learning

The second task of this study was to examine the suitability of the classroom environmental conditions in the ECDE centers provided in relation to the learning of the children. This information was sought by trying to achieve the following objective:

To examine the suitability of the classroom environmental conditions in the ECDE centers provided in relation to the learning of the children.

The researcher observed the classroom environmental conditions provided in the ECDE centres in relation to the learning of the children. These conditions included the sitting arrangements, tidiness of the classroom, classroom conditions, classroom organizations, windows, doors, space within the classroom, chalkboards, floors, ventilations and roofs. The researcher presented the findings under the following subheadings:

4.4.1 The classroom environment

The researcher noted that in a number of preschools within Engineer zone, there were no doors or windows, while some had them but they were not lockable. It was evident that materials were not safe in the unlockable classes and were mostly destructed by pupils in the upper classes when the children were away. Further, the lack of doors and windows made the classrooms very cold especially with regard to the fact that the climate of the region is very chilly. In addition, the learners also walked for long distances to the school, and some of them with shoes in bad condition. Moreover, the floors were earthen in some classes with some having potholes while others had leaking roofs. The researcher also realized that the learners encountered difficulties in understanding concepts especially during the morning hours when the weather is cold and chilly.
because they could not respond to questions asked verbally by the teacher. The region experiences rains for most of the periods within the year, which makes school attendance for most children a challenge. These findings concur with a research conducted by Gichara (2010) which found that many children in the country study under very difficult conditions, some in classrooms that have leaking roofs with no doors or windows, while others have no good floors.

In addition, the researcher noted that some of the classes were untidy, with litter and dust within the classroom. In such classes, the researcher realized that some of the learners were sneezing and there were cases of respiratory infections. In cases where the build-up of the dirt was higher, the researcher noted that learning was affected because of those who had to go for treatment and therefore missed classes. However, there were outstanding classes that were observed by the researcher because of their high level of cleanliness and even the provision of a dustbin placed outside the classroom for the disposal of litter.

The researcher observed that the seats were inappropriate in the pre-schools where some children were sitting on the desks while others used tables that were higher than their reading level making them uncomfortable. However, it was noted that there was an attempt by most of the private schools to provide appropriate and suitable chairs and tables for the preschoolers while some of the preschoolers in public schools were using benches and desks which are not appropriate for them. This inappropriateness of furniture makes it difficult for the preschoolers to learn and interact well as they are uncomfortable and occupy most of the space in the classroom.

The researcher noted that many of the pre-schools’ classrooms had an average of 36 children and were too small in size, therefore leading to congestion and crowding in the classroom. Further, the sitting arrangements were also poor leading to unnecessary congestion even in classrooms
with relatively higher spaces. Policy guidelines indicate that a classroom should have minimum measurements of 8m by 8m, which should handle not more than twenty five (25) learners. Such interactive arrangements in a pre-school classroom make the learners eager to discover a wide range of concepts.

In many of the classes that the researcher visited and established inappropriate class sizes, there was an evident of dirty air in such classes. Further, inappropriate class sizes directly affected learning because the children lacked to move and interact with the others. Such results are in line with the findings of Whitbread (1999), who contends that learners understand better when their classes are organized in ways that provide enough space for the learners and give an arrangement for starting point for their ideas.

The research further identified various reasons that made pre-school children in the selected schools share seats, which in most instances affected the comfort of the child, sitting posture and consequently learning. In 35% of the schools however, the children did not share seats. However, the remaining schools gave information on the reasons that made learners share seats. The results obtained showed that 14% of the children shared seats because their classes were small, 30% shared seats because there were no enough finances to purchase more, 37% cited problems of high enrollment, while the remaining 19% cited other reasons such as breakages of desks not repaired and teacher preference on the class arrangement. Figure 4.2 presents this information.
The reasons for seat sharing in classes

The results indicate that inadequate funding and the evidently high enrollment levels were the dominant reasons for seat sharing in the selected schools used for this study. The researcher observed that such sharing limited the movements of the children to perform various learning activities and in some cases, children could not sit properly and therefore were uncomfortable during learning processes. In view of the classroom conditions presented in this sub-section, the researcher sought to identify whether they may affect learning. This prompted the giving out of some learning activities and the results of the endeavor are presented in the next sub-section.

4.4.2 Impact of Classroom Conditions on Learning

Although the aim of this research was not to compare the learning environments in public and private pre-schools, the researcher found it necessary to seek the link of environmental conditions learning activities because there were contrasting findings in the classroom conditions between the two types of pre-schools that were shown by the collected data in the area. The
The researcher therefore conducted an assessment of the learners in the various schools to perform reading, drawing, counting and memory skills. The results obtained were analyzed in different targeted preschools that were used for the study. The researcher gave a score of 10 to children who possessed one of the four skills evaluated. A score of 20 was given for children who had any two of the four skills tested, 30 for children with any three of the four skills tested and 40 for those who possessed skills in all the four areas. The analyzed results of the study are presented in figure 4.3.

Figure 4.3 The Learning Ability

The researcher identified that private preschools offered better physical materials compared to public preschools. In perspective, the children from public preschools exhibit lower levels in grasping the four crucial skills that were evaluated and it is therefore clear that the classroom conditions affect the children learning ability. The unfavorable conditions in the public
preschools included the high number of children which resulted to congestion within the classrooms that limited the space for learning activities, over sharing of text books by many children and the sharing of seats by numbers of children that is inappropriate for learning among other factors. The researcher therefore confirmed that in classes with good environments, the children performed better in the skills evaluated in the study. The findings therefore, are in line with earlier research by Lockheed et al. (1991) and Eshiwani (1983) that good classroom conditions are critical for learning. Indeed, inappropriate classroom conditions affects the learning of preschool children in schools (Gichuba, 2009).

4.5 Teacher’s Ability to Plan and Organize a Creative Learning Environment

The third task of the research was designed to examine the teacher’s ability to plan and organize a creative learning environment for children. This was meant to fulfill the objective given as:

To examine the teacher’s ability to plan and organize a creative learning environment for children.

To meet this objective, the researcher observed the various creative learning environments in the classes under study. Further, the researcher enquired from the teachers on their knowledge of the subject and also enquired through the questionnaire important factors like age and experience that would make the teachers capable of providing a good creative learning environment. The findings are discussed in the following sub-sections.

4.5.1 Creative Learning Corners

The researcher observed that most of the classrooms in the target sample of the study did not have learning corners. Indeed, many of these classes were those that were too small for the
teachers to set up learning corners. However, the researcher also discovered that many of the teachers did not understand the importance and techniques of arranging learning materials although the space was also inadequate for the purpose. Most of the available materials were not in line with the curriculum requirements and were beyond the comprehension of the children. It was clear from this research that the in-availability of creative learning corners was wanting since they support learning in pre-schools. The importance of the corners confers with the findings of Gichuba et al., (2009), who noted that learning corners should be created for learners in pre-schools to maximize their learning and cover their free time. Such corners help the children to be socially responsible and are important for the integration of a variety of activities guided by a single theme.

4.5.2 The Planning and Organization of Creative Learning Environments

The organization of the creative learning environments in the classrooms was not appropriate because the spacing of the items used in the learning corners were not adequate. Further, there were no labels in some of the items used in the learning corners and in some classes where the labels were present, they were not legible to the learners because of the small font sizes used. However, it was commendable that most of the charts were placed at a suitable eye-level and legible, except in isolated cases where they were beyond the eye level of the children and therefore not legible. The researcher noticed that most schools however could not use a versatile approach in the learning corners to use items for more than one theme. The researcher also identified comparatively that, some classes had a better organization and planning of the creative learning environments than others. Therefore, the researcher tended to understand the
characteristics of the teachers in terms of their ages and experiences that would make them more capable of creating such conditions. The findings are presented in the following sub-sections.

4.5.3 Pre-School Teachers’ Age Brackets, Qualifications and Experience

Although getting the contributions of preschool teachers was not part of this study, the researcher sought to explain the characteristics of teachers that could make them more capable to plan and organize a creative learning environment in the classroom. This research established that 53.8% of the teachers are between 25-35 years, where the details of such results are presented in figure 4.1. This result imply that most of the preschool teachers have a considerable experience in the education and care of young children, given that most of them are also parents. Further, the dominance of the age brackets in 25-35 and 35-45 showed that the teachers are energetic and can facilitate learning activities in preschools.

Based on the qualifications and experiences of the teachers, the researcher obtained the following results after manipulating the data. The information is presented in figure 4.4.
The research established that 69% of the teachers had a certificate qualification in ECDE, 15% of them had diploma qualifications, 8% had a degree qualification and finally 8% were untrained. Given that more than 90% of the teachers had commendable ECDE qualifications, it is evident that they possess necessary professional skills in imparting knowledge to pre-school learners.
The teaching experiences of the teachers were reported as shown in the figure 4.5.

![Bar chart showing teaching experiences of teachers.](image)

**Figure 4.5: Teaching Experiences of Teachers**

The results indicate that more than 75% of the preschool teachers considered in the study have taught less than 3 schools with an experience of less than five years, with 54% of these noted to have taught only one school with less than 3 years of teaching experience. The lack of considerably long experiences and exposure in teaching pre-school children indicates that overall, the teachers lacked enough knowledge and skills to set the right physical classroom environment and materials for quality learning. Therefore, this could be the reason that the learning corners are either absent or inappropriately placed in most of the preschools although such conditions may be caused by other challenges that face ECDE Centres. The researcher sought to identify these challenges and the results are presented in the following section.
4.6 Challenges Facing ECDE Centres in Provision of Good Learning Environments

The fourth task of this study was to identify the challenges faced by ECDE teachers in provision of good learning environments. This was done by trying to meet the following objective:

To identify the challenges faced by ECDE teachers in provision of good learning environment

This entailed giving questionnaires to the pre-school teachers who were the respondents of the study, and asking them some of the challenges they faced in the acquisition and utilization of classroom materials and organizing an appropriate learning environment. The results are presented in the following sub-section.

4.6.1 Challenges faced by ECDE teachers

The challenges that were identified are presented in the table 4.3

Table 4.3: The Challenges Identified

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate learning resources and finances</td>
<td>79%</td>
<td>21%</td>
<td>100%</td>
</tr>
<tr>
<td>Lack of thematic utilization</td>
<td>67%</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td>Under-utilization of the already available materials</td>
<td>53%</td>
<td>47%</td>
<td>100%</td>
</tr>
<tr>
<td>Less dynamic utilization of the available materials</td>
<td>60%</td>
<td>40%</td>
<td>100%</td>
</tr>
</tbody>
</table>
The results indicated that the inadequacy of resources as well as financial resources is the most prevalent problems in the ECDE Centres, with 79% of the respondents sharing the problem. In addition, the researcher identified that there was less thematic utilization of materials, with 67% of the respondents with the problem. Other problems identified include under-utilization of the materials that were available as well as less dynamic utilization of the materials. It is clear that these problems are the most prevalent in the research area that led to the conditions that the researcher observed in the classroom which hindered learning in the pre-schools. These results concur with the findings of Wambui (2011), Kipchumba (2006) and Ngware, (2008) on the challenges facing ECDE Centres in Kenya and their contributions to lower learning levels in pre-schools.
CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the summary of the research study and presents the results of the findings and conclusions, which seek to address the questions that guided the study. The chapter is organized into three sections: the first section indicates the summary and conclusions; the second section postulates the implications of the study while the last section gives recommendations and recommendations for further research.

5.2 Summary of the Study

This section provides the summary and discussions established in the study. It provides an overview of the findings of the research project, in line with the objectives of the study. In the section, the discussion topics are elaborated in line with the analyzed data that was used for the study.

5.2.1 Availability of Text Books and other Learning Materials

The study established that most preschools do not have adequate textbooks that are used for instructions as well as other learning materials in the classroom. The relative textbook and number of children ratio identified in this study established that most classes have pupils who have a very limited access to text books, given that such materials are shared with three or four other counterparts. It is clear that such children may not grasp most of the concepts explained by the teacher and may end up not having the required skills that need to be acquired.
The inadequacy and inappropriateness of learning and instructional materials in most preschools was further postulated by this study. Most of the classes where pictures and charts were on display, they were either poorly drawn, having very small printing fonts or too high to be read easily by children. In some cases, the charts were placed in classes with inappropriate academic level of children. In such classes, most of the children could not read the illustrations and therefore could not learn well from them.

5.2.2 Suitability of Classroom Environments in ECD Centres

The sharing of seats in preschools has been postulated by this study to lead to poor learning because in most public pre-schools where there was congestion arising from sharing of seats, it was found out that they had a comparatively lower learning ability than their counterparts in some private pre-schools. The researcher established that in most pre-schools, seats are shared by two or three children, making them uncomfortable and unable to learn properly. In most of the preschools where children had their own seats, there was an evidence of high number of learners who were able to read, draw, count and memorize various aspects of their learning. However, the study established the causes of seat sharing such as the size of the classrooms, inadequacy of funds and high enrollment among other factors.

Environmental conditions on the other hand have been proved to considerably affect learning. The research established that some schools incorporated in the study were littered, very dusty or lacked enough windows for ventilation. Such conditions often led to sicknesses and consequently higher rates of absenteeism. In such classes therefore, the ability of the children to learn concepts and tackle learning challenges was very low.
Class size and aspects of congestion contribute to low learning levels and deteriorating levels of learning outcomes. The researcher noted that in smaller classrooms that exceeded the number of learners, the ability of children to participate in learning activities was greatly reduced. In addition, the congestion caused discomfort among the children and further that the teachers lacked enough space to move and check the work of the learners. Appropriate conditions were mostly found in classes in privately owned pre-schools compared to those in publicly owned, where there was also fresh air in such classes and it is clear that such conditions provided a suitable environment for learning because of the good performance in the evaluation skills used by the researcher.

5.2.3 Teachers' Ability to Plan and Organize Learning Environments

Creative learning corners were lacking in most of the pre-schools. Some of the classes used for the study were too small to handle any extra creative learning components, while some of the teachers also did not understand their importance. The lack of such critical learning components contributed to poor performance in the evaluations, which cut across both public and private pre-schools.

Publicly owned preschools had teachers with a considerably higher level of experience and qualifications compared to the privately owned according to this study. Such an observation may be caused by their job security and ability of public entities to choose the appropriate age and qualifications of teachers in their hiring process compared to private schools which mostly lack funds to pay qualified teachers. In perspective, such teachers may have higher productivity and expertise in placing the right conditions for learning. The age, experience and qualifications of teachers also indicated their ability to organize learning activities within the classroom and
enhance the attainment of positive learning environments (Bryant 1983). However, the contradicting results of the teacher aspect with the evaluations of the skills done in this research indicated that the quality of the teacher does not necessarily guarantee positive learning outcomes in the absence of the right physical conditions.

5.2.4 Challenges Faced by ECDE Centres

Although the availability of funds to purchase materials and equipment has been cited as a key problem in many previous studies, the researcher noted that there were some other challenges that may also limit the assurance of a conducive environment. The researcher therefore established the following challenges that are faced by ECDE centres in establishment of appropriate environment for learning:

(i) Lack of Adequate Teaching, Learning Resources and Financial Constraints

The researcher identified that most of pre-schools lacked the learning resources and funds to purchase the necessary equipments and materials. It became clear that most of the pre-schools did not have play and learning tools that could be used for the purpose. This study established that most preschools did not have adequate funds to repair the floors, roofs and furniture in the classroom. Further, the inadequate books and other materials in creative learning corners could be pointed to the scarcity of financial resources at the ECD centres.

(ii) Underutilization Of Materials

The researcher established that although some of the schools had materials that could have been used to set up a conducive environment, the use and/or improvisation of such materials was inadequate. Such a condition was prevalent in private preschools, where materials that could be
used were available but not fully utilized. Teachers in such locations were also unable to use locally available materials that could solve such inadequacies. In the creation of learning corners for example, some preschools could not use some easily available materials like plant products and small containers to create such learning corners.

(iii) Less Dynamic Utilization Of Materials

The researcher realized that some schools were not frequently changing the materials in their physical environment. Some preschools that were used for the study used blackboards that had been acquired more than ten years back, while the condition of the seats had not been checked for many years. Further, the floors of some classes and the walls were worn out with no repair. Indeed, dynamicity was seen as a problem, with reluctance to change or repair in order to improve learning conditions.

(iv) Lack Of Thematic Utilization Of Materials

The researcher identified that most preschool teachers lacked the ability to use the available materials for diverse learning purposes. Even when some materials were available like a home corner, they were not used in the versatility of other learning concepts other than the one designed for in that particular creative learning environment. The lack of thematic utilization of materials made a number of preschools to make an oversight in some important learning concepts that could have been elaborated in a better manner if some of the available materials selected for one theme were extended to cover more learning pursuits.
5.3 Conclusions of The Study

The study indicated that congestion and limited access to materials were the main challenges most of the preschools. Therefore, the Government should improve on existing policies that seek to establish the right class sizes and appropriate number of pupils in relation to the size of the class, and ensure that such guidelines are backed by law.

The issue concerning textbooks in relation to the number of pupils has been postulated by the study, and has been noted to affect the children learning ability. There is therefore need for the government to provide enough text books in all public preschools and revise the guidelines that will ensure that private and public preschools provide each child with a textbook. Such guidelines may be implemented if the government establishes an inspectorate arm for preschools in its quality assurance segment.

To address the issue of high enrollment that limits the child’s individual access to materials and also causes of congestion, the government should seek to build more preschools and equip them with the right materials. There should be assurance that preschools admit a given number of children, in line with its capacity to deliver adequate services to them. These policy guidelines can be implemented when the QASO officers regularly inspect preschools enrollment and education.

Finally, teacher trainers and institutions should focus on enhancing the creativity of the teachers they produce. The study has established that although the materials may be available and the teacher is also qualified, the lack of creativity and innovativeness may limit the extent to which the teacher organizes the classroom for quality learning. Thus, the courses should be structured
in ways that make prospective teachers think out of the ordinary and use commonly used materials to improve learning.

5.4 Recommendations

The study indicated that congestion and limited access to materials in some classes created challenges for most preschools. Therefore, the government should revise and enforce policies that seek to establish the right class sizes and appropriate number of pupils in such classes.

The issue concerning textbooks in relation to the number of pupils has been postulated by the study, and has been noted to affect the children learning due to their inadequacy. Therefore there is need for the government and the relevant stakeholders to join hands in order to provide enough textbooks and other facilities in all public and private preschools and place guidelines to ensure that all the preschools provide each child with textbooks and other learning facilities. Such guidelines may be implemented if the government establishes an inspectorate arm for preschools in its quality assurance segment.

To address the issue of high enrollment that limits the child’s individual access to materials and also causes congestion, the government should seek to build more preschools and equip them with the right materials. There should be assurance that preschools admit a given number of children, in line with its capacity to deliver adequate services to them. These policy guidelines can be implemented when the QASO officers regularly inspect preschools enrollment and education.

The study also established that some of the teachers in preschool do not possess enough training and the government should establish in service training so that better techniques and methods can
be taught in placing the right environment for learning. Indeed, preschool forms the foundation of education which calls on the government therefore to channel more resources towards it.

Finally, teacher trainers and institutions should focus on enhancing the creativity of the teachers in such institutions. The study has established that although the materials may be available and the teacher is also qualified, the lack of creativity and innovativeness may limit the extent to which the teacher organizes the classroom for quality learning. The courses therefore should be structured by curriculum developers in ways that make prospective teachers think out of the ordinary way and use commonly available materials to improve learning.

5.5 Recommendations for further research

There are a number of factors in the classroom physical environment that may need more research work in the future. They include:

i) Research work may be done to identify the contributions of classroom physical environment on a specific learning outcome or on curriculum areas studied in preschools.

ii) Further research may also be done to establish the contributions of external classroom conditions and play materials that are found outside the classroom on learning.

iii) Research may also focus on a specific aspect in the physical environment like learning corners and its importance in the learning of preschoolers.

iv) In addition, research may also address the involvement of the government, the quality of the school management and the collaboration of external preschool stakeholders and how they affect learning outcomes in preschools.
v) Finally, further research work may assess teaching methods used by preschool teachers and seek to establish plausible teaching methodologies and techniques in preschools.
REFERENCES


Caswell, F (1982), Success in Statistics, Hong Kong: Wing King Tong Ltd.


APPENDICES

Appendix I: Pre-School Teachers Questionnaire

Part A: Demographic information

Kindly fill or tick in the spaces provided. Information provided will be treated as confidential.

1. Kindly indicate your gender
   Male [ ]
   Female [ ]

2. Kindly indicate your age from the choices below
   a. Below 25 Years [ ]
   b. 25 – 35 years [ ]
   c. 36 – 45 years [ ]
   d. Above 45 years [ ]

3. Kindly indicate your highest professional qualification
   a. Untrained [ ]
   b. Certificate [ ]
   c. Diploma [ ]
   d. Degree [ ]
   e. Any other (please specify) [ ]

4. How many schools have you taught? (tick one)
   a. Only one ( )
   b. 1-3 schools ( )
   c. Over three schools ( )

5. Do children share seats in your class? Yes ( ) no ( )
If yes, why?  
A. The class is small.  
B. No funds to buy additional seats.  
C. High enrolment.  
D. Other (Specify):  

6. Do your children share text books in the classroom? Yes () No ()

7. If yes, what is the ratio of text books to children?
   1 book per 2 children ()
   1 book per 3 children ()
   1 book to more than 4 ()
   Other (Specify)  

8. How do you obtain textbooks and other instructional materials?
   1. Made by teachers ()
   2. Bought ()
   3. Donation ()
   4. Other (Specify)  

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PART B: Open-ended questions

9. What creative learning structures have you availed in your classroom for learning?

10. How well do you think the ventilation in your classroom affects learning?

11. How is the adequacy of the teaching/learning materials in your classroom affecting learning?

12. What challenges do you face in the acquisition and usage of learning materials in the classroom?

13. What do you think are the solutions to the challenges in part (14) above?

14. How appropriate do you think the measures taken by pre-school stakeholders in creation of good physical conditions contribute to a positive learning environment?

Thank you for your cooperation
# Appendix II: The Observation Schedule

<table>
<thead>
<tr>
<th>Items to be observed</th>
<th>Observations and comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
</tr>
<tr>
<td>1. Classroom tidiness</td>
<td></td>
</tr>
<tr>
<td>2. Appropriate furniture</td>
<td></td>
</tr>
<tr>
<td>3. Number of children in the class in relation to the class size</td>
<td></td>
</tr>
<tr>
<td>4. Classroom ventilation</td>
<td></td>
</tr>
<tr>
<td>5. Availability and condition of instructional aids</td>
<td></td>
</tr>
<tr>
<td>6. Availability of creative learning corners</td>
<td></td>
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</tbody>
</table>
Appendix III: Respondents Letter of Introduction

To the Head Teacher,

Dear Sir/ Madam,

I am a Masters student in Early Childhood Studies from Kenyatta University conducting a research study on “Contributions of classroom physical conditions on learning in early childhood centres in Engineer Zone, Nyandarua County”.

However, your school has been selected to assist in providing the required information as your views are considered important to this study. I am therefore, kindly requesting you to fill this questionnaire. Please note that any information given will be treated with utmost confidentiality and will only be used for the purpose of this study.

Thank you,

Sincerely yours,

Phyllis Njeri Wainaina.
Appendix IV: Approval Of Research Project

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: kubps@yahoo.com
dean_graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 57530

Internal Memo

FROM: Dean, Graduate School
TO: Ms. Winaina Phyllis Njeri
C/o Early Childhood Studies Dept.
KENYATTA UNIVERSITY

DATE: 18th April, 2015
REF: E55/OL/25142/11

SUBJECT: APPROVAL OF RESEARCH PROPOSAL.

This is to inform you that the Graduate School Board at its meeting of 15th April, 2015 approved your M.Ed. Research Proposal Entitled “Effects of Physical Classroom Conditions on Learning Outcomes in Early Childhood Centres in Engineer Zone, Nyandarua County”.

You may now proceed with your Data collection, subject to clearance with the Principal Secretary, Higher Education, Science and Technology.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed supervision Tracking Forms per semester. The form has been developed to replace the progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

SILVERIA THIONG'O
FOR: DEAN, GRADUATE SCHOOL

Cc: Chairman, Early Childhood Studies Dept.

Supervisors:

1. Dr. John T. Ng'asike
   C/o Early Childhood Studies Dept.
   KENYATTA UNIVERSITY

2. Dr. Esther Waitaha
   C/o Early Childhood Studies Dept.
   KENYATTA UNIVERSITY
Appendix V: Research Authorization

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: kubps@yahoo.com
       dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: E35/OL/25142/11
Date: 18th April, 2015

The Principal Secretary,
Higher Education, Science & Technology,
P.O. Box 30040,
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. PHYLLIS W. NJERI- REG. NO. E35/OL/25142/11

I write to introduce Ms. Njeri who is a Postgraduate Student of this University. She is registered for a M.Ed. degree programme in the Department of Early Childhood Studies in the School of Education.

Ms. Njeri intends to conduct research for a thesis Proposal entitled, “Effects of Physical Classroom Conditions on Learning Outcomes in Early Childhood Centres in Engineer Zone, Nyandarua County”.

Any assistance given will be highly appreciated.

Yours faithfully,

MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL
MINISTRY OF EDUCATION, SCIENCE & TECHNOLOGY

Email: xdenyandcounty@yahoo.com
Cellphone: 0725711938
When replying please quote

REPUBLIC OF KENYA

NYA/CTY/36/VOL 1/26 26TH MAY, 2015

PHYLIS NJERI WAINAINA
KENYATTA UNIVERSITY
P.O. BOX 43844-00100
NAIROBI

RE: RESEARCH AUTHORIZATION

Reference is made to the National Commission for Science, Technology and Innovation letter ref. NACOSTI/P/15/0478/6315 dated 25TH May, 2015 on the above subject.

You are hereby granted permission to conduct your research in Nyandarua County for the period ending 30TH June, 2015.

YUSUF J. KARAYU
COUNTY DIRECTOR OF EDUCATION
NYANDARUA

Copy to:

Secretary/CEO
National Commission for Science, Technology and Innovation
County Commissioner - Nyandarua
THE PRESIDENCY
MINISTRY OF INTERIOR AND COORDINATION
OF NATIONAL GOVERNMENT

COUNTY COMMISSIONER
NYANDARUA COUNTY
P.O. BOX 3
OL KALOU

Telegram: ...................................................
Fax No. 020-2196509
Email: county.nyandarua@yahoo.com
When replying please quote
REF. NO. CTY/CORR.3/3/ VOL.1/54

26th May, 2015

Phyllis Njeri Wainaina
Kenyatta University
P.O. Box 43844-00100
NAIROBI

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "Effects of physical classroom conditions on learning in early childhood centres in Engineer zone, North Kinangop Division, Nyandarua County," I am pleased to inform you that you have been authorized to undertake research in Nyandarua South Sub-County for a period ending 30th June, 2015.

You are advised to report to the Deputy County Commissioner, Nyandarua South before embarking on the research project.

DORCAS RONO
FOR: COUNTY COMMISSIONER
NYANDARUA COUNTY

cc. Deputy County Commissioner
NYANDARUA SOUTH
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2233471, 2241349, 310571, 2229829
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

Ref: No.

NACOSTI/P/15/0478/6315

Phyllis Njeri Wainaina
Kenyatta University
P.O Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "Effects of physical classroom conditions on learning in early childhood centres in engineer zone, north Kinangop Division, Nyandarua County," I am pleased to inform you that you have been authorized to undertake research in Nyandarua County for a period ending 30th June, 2015.

You are advised to report to the County Commissioner and the County Director of Education, Nyandarua County before embarking on the research project.

On completion of the research, you are expected to submit two hard copies and one soft copy in pdf of the research report/thesis to our office.

DR. S. K. LANGAT, OGW
FOR: DIRECTOR GENERAL/CEO

Copy to:

The County Commissioner
Nyandarua County.

The County Director of Education
Nyandarua County.

25th May, 2015
Appendix IX: Research authorization

THIS IS TO CERTIFY THAT: MS. PHYLLIS NJERI WAINAINA of KENYATTA UNIVERSITY, 202-20318 ENGINEER, has been permitted to conduct research in Nyandarua County on the topic: EFFECTS OF PHYSICAL CLASSROOM CONDITIONS ON LEARNING IN EARLY CHILDHOOD CENTRES IN ENGINEER ZONE, NORTH KINANGOP DIVISION, NYANDARUA COUNTY for the period ending: 30th June, 2015

Permit No: NACOSTI/P/15/0478/6315
Date Of Issue: 25th May, 2015
Fee Received: Ksh. 1000

THIS IS TO CERTIFY THAT: MS. PHYLLIS NJERI WAINAINA of KENYATTA UNIVERSITY, 202-20318 ENGINEER has been permitted to conduct research in Nyandarua County on the topic: EFFECTS OF PHYSICAL CLASSROOM CONDITIONS ON LEARNING IN EARLY CHILDHOOD CENTRES IN ENGINEER ZONE, NORTH KINANGOP DIVISION, NYANDARUA COUNTY for the period ending: 30th June, 2015

Applicant's Signature

Director General

National Commission for Science, Technology & Innovation
APPENDIX X: Research Authorization

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.

2. Government Officers will not be interviewed without prior appointment.

3. No questionnaire will be used unless it has been approved.

4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.

5. You are required to submit at least two (2) hard copies and one (1) soft copy of your final report.

6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.

RESEARCH CLEARANCE PERMIT

Serial No. A

CONDITIONS: see back page