# MAINSTREAMING EARLY CHILDHOOD EDUCATION AND ITS INFLUENCE ON INTERNAL EFFICIENCY IN PUBLIC PRIMARY SCHOOLS IN EMBU COUNTY, KENYA

**Kamwitha Anastasia Muthanje Sr.**

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Doctor of Educational in Educational Planning**

**University of Nairobi**

**JULY, 2022**

## DECLARATION

This thesis is my original work and has not been presented for award of a degree in this University.

Date 10/6/2022

Kamwitha Anastasia Muthanje
E96/93642/2013

This thesis has been submitted for examination with our approval as university supervisors

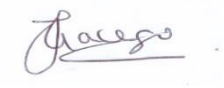
Date 13/6/2022

Dr. Ibrahim Khatete
Senior Lecturer
Department of Educational Management, Policy and Curriculum Studies
University of Nairobi

10/06/2022

……..…… Date……..

Dr. Andrew Riechi
Senior Lecturer
Department of Educational Management, Policy and Curriculum Studies
University of Nairobi



Date:13/6/2022

Dr. Juliet Njeri Muasya
Senior Lecturer
Department of Educational, Communication, Technology and Pedagogical Studies
University of Nairobi

## DEDICATION

I dedicate this work to the sisters of Saint Joseph of Tarbes and to my parents;

Mr. Lawrence Kamwitha and Mrs. Vengeslasia Wakina.

## ACKNOWLEDGEMENTS

I am grateful to the Almighty for inspiring me in undertaking the study and for His providential care through spiritual, material, moral and physical health. This study would not have been possible without the wisdom, understanding and assistance of many individuals. A special word of appreciation to my supervisors Dr. Ibrahim Khatete, Dr. Andrew Riechi and Dr. Juliet Njeri Muasya who carefully read drafts of this study and made critical comments and suggestions that kept me focused. Their patience and understanding encouraged me to seek their guidance throughout the period of the study and writing this thesis.

A special thanks to the University of Nairobi which gave me an opportunity to study in their institution. I thank members of the Department of Educational Management, Policy and Curriculum Studies for making useful suggestions about my study at the initial stages and their positive comments that helped me in refining thesis especially during the defenses.

I am especially indebted to Embu County Director of Education and the Heads of the five Sub-county Directors of Education, namely Embu North, Embu West, Embu East, Mbeere North and Mbeere South for the cooperation during the correction of the data for my studies. I also thank all the primary school headteachers, primary school teachers and Early Childhood Education teachers for their availability and responses to all the questionnaires given to them and submitting them on time.

My special thanks to the SJT communities of Garissa, Embu, Nairobi and Provincial House, who were so instrumental in my studies. A special thanks to Dr. Hussein Ali and Dr. Ekabu Kalunge for giving me moral support. I thank in a very special way Rachel Maina who helped in editing this work in a very scholarly manner. Thanks to Sr. Emily Muthoni Muraga who really worked very hard by driving me to all sampled primary schools in Embu County while collecting my research data.

It is difficult to mention by name all those whose support made this study a success, I would be unfair if I failed to acknowledge the inspiration derived from the following; Special thanks to all my Doctor of Educational Management and Planning batch of December 2013 for their moral support; to all the SJTs in the Kenyan province for their moral and material support; special thanks to my parents; Mr. Lawrence Kamwitha & Mrs. Vengeslasia Wakina, my brothers and sisters John, Martin, Eugene, Michael, Basil, Margaret, Mary Gorette, Juliet, and Jane who kept on encouraging and praying for me even in moments when things were not easy in the course of this study.

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## ABBREVIATIONS AND ACRONYM

| | |
|---|---|
| **ANOVA** | Analysis of Variance |
| **CBC** | Competence Based Curriculum |
| **DICECE** | District Center for Early Childhood Education |
| **ECCE** | Early Childhood Care and Education |
| **ECE** | Early Childhood Education |
| **EFA** | Education for All |
| **EO** | Education Officer |
| **ESD** | Education for Sustainable Development |
| **FGD** | Focus Group Discussion |
| **GAP** | Global Action Plan |
| **GER** | Gross Enrolment Ratio |
| **IIEP** | International Institute for Educational Planning |
| **MOE** | Ministry of Education |
| **MOEST** | Ministry of Education Science and Technology |
| **MUCECE** | Municipal Centre for Early Childhood Education |
| **NACECE** | National Centre for Early Childhood Education |
| **NACOSTI** | National Commission for Science Technology and Innovation |
| **NER** | Net Enrolment Rate |
| **NESP** | National Education Sector Plan |
| **PE** | Physical Education |
| **PTR** | Pupil Teacher Ratio |
| **QUASO** | Quality Assurance and Standards Officer |
| **SD** | Sustainable Development |

| | |
|---|---|
| **SDG4** | Sustainable Development Goal 4 |
| **SNE** | Special Needs Education |
| **UNESCO** | United Nations Educational, Scientific and Cultural Organizations |
| **UNICEF** | United Nations Children's Educational Fund |

## ABSTRACT

Education is the most robust devise that aid in advancement of human capital vital for economic development and growth. Therefore, this study aimed at investigating how mainstreaming of early childhood education influences internal efficiency in public primary schools in Embu County, Kenya. The study was guided by the ensuing objectives, namely; To determine the status of physical infrastructure; establish how teacher professional qualifications; examine ways in which provision of Early Childhood instructional materials and explore how pupil-teacher ratio in Early Childhood Education influences internal efficiency in public primary schools. The study adopted a correlational research design to assess the influence of mainstreaming Early Childhood and Education on internal efficiency in Embu County public primary schools. Stratified and simple random sampling techniques were used to select respondents for the study. The study used questionnaires, document analysis guide and observation schedule as instruments for collecting data for the purpose of triangulation. Quantitative data was analyzed by utilization of statistical package for the social sciences (SPSS) by generating descriptive and inferential statistics. While qualitative data was analyzed using themes. Data was presented using percentages, frequencies, standard deviation, mean and inferential statistics. The study findings showed a positive correlation between physical infrastructure in Early Childhood Education and internal efficiency in public primary schools ($r = .653$, $n = 37$, $p < .05$). There is positive correlation between teacher professional qualification in ECE and internal efficiency in public primary schools ($r = .672$, $n = 37$, $p < .05$). There is a positive correlation between ECE instructional materials and internal efficiency in public primary schools ($r = .703$, $n = 37$, $p < .01$). The study concluded that there is a positive correlation amid physical facilities and internal efficiency indicators such as participation rates. There is a positive correlation between teacher professional qualification and internal efficiency, especially promotion rates. There is a positive correlation between instructional materials and internal efficiency indicators of participation rates. The availability of instructional materials positively influences participation rates in Early Childhood Education. The researcher therefore recommends that more physical facilities should be provided by the county government which is mandated to manage Early Childhood Education. The county governments in partnership with parents and headteachers should employ more pre-primary teachers for purposes of successful transition.

# CHAPTER ONE
# INTRODUCTION

## 1.1 Background to the study

Education is the most powerful tool that can be used to transform the world. This calls for quality education that can be used to equip citizen with the capacity to interpret issues correctly and apply educational data in real life situation (Thangenda, Baratiseng & Mompati, 2016). Investment in education is essential for sustainable development. Further education contributes to development of human capital which is essential for economic development and growth (Lonescu, Lonescu Maruka, & Jaba, 2013); Voss, Micheli, Schoneberg, & Rosini, 2017); Romer, 2011; Todaro & Smith, 2011), while providing the opportunity for people to raise incomes and reduce inequality (Psacharopoulos & Harry, 2018 and Acemoglu & Dell, 2010).

Since education is deemed as investment, therefore it's essential for governments to strive to provide finance and efficiency so as to produce desired human capital. This can be achieved by intensifying and increasing internal efficiency of education. Internal efficiency of education is defined differently by different scholars. According to Lockheed and Hanushek (1994) internal efficiency is a correlation of learning (a non-monetary result to the expenses of educational inputs). In this case, the analysis employed is cost-effectiveness. Therefore, internal efficiency addresses the question of how proceeds within the educational sector could best be utilized to obtain greater educational outputs so as to improve performance of learners at any given level of education.

According to Coombs and Hallak (1987) internal efficiency is the relationship between a system's (or sub-system's) outputs (learning achievements) and the corresponding inputs. Internal efficiency is judged in terms of its cost-effectiveness and measured by the system's immediate outputs as distinct from its ultimate benefits. Johnes, Thanassoulis and Silva (2017) argue that internal efficiency occurs when outputs from education such as results or value added are at lowest level. In addition, Akinwumiju (1995) asserts that internal efficiency is the relationship between the outputs and inputs of an educational system. Indicators of internal efficiency in an educational institution include enrolment of learners, retention, promotion, dropouts and repeaters while the indicators for inputs are school resources such as hours spent in teaching, classroom, water points, textbooks, toilets, computers, electricity, school compound, school fence and teachers (Naravane, 2015, Ricardo, Kwame & Jose, 2010); Abagi & Odipo, 1997); Ouma, 2017, Mullins, 2005). Akinwumiju (1995) argues that an internally efficient education system is one where graduates complete their educational system without dropping out or repeating.

Babalola (2003) and Olubor (2004) opined that internal efficiency is the extent in which resources made available to the educational system are used to achieve objectives for which the educational system is established. Hence, the educational resources transform one set of inputs such as primary school leavers into another set of output such as secondary school graduates. In addition, internal efficiency is measured by cohort analysis. Cohort analysis is drawn from the history of a particular level of education. It shows the time a

particular cohort has taken that is from the entry point of the group of students up to the time the group exits a certain level of education. As such, it shows the level to which the educational system is capable of utilizing its raw materials (students) in the production of outputs (graduates). Thus, cohort analysis shows the rate of flow in the educational system. Therefore, if the system produces graduates in the shortest period possible, then the system is regarded as efficient. The system is inefficient if the students take long or graduate after many years than is required. In this case, if the students take long to graduate there is wastage in the education system.

Rashdan (2005) affirms that low internal efficiency show weakness of wastage in education. Educational wastage in this case refers to failure of education system to meet its quantitative and qualitative levels. The quantitative level of the educational system in this case alludes to the entire number of graduates the education system is able to have after a specified duration of time. The qualitative levels of the education system refer to the level of student' achievement after an evaluation measure is administered in accordance to the population of students who have passed or failed. In addition, students who drop out of school demonstrate the inability of the educational system to achieve its objectives. Rashdan (2005) and Afolabi (2006) noted that wastage an indicator of internal efficiency is manifested when students repeat grades or are retained in the same grade.

In addition, Afolabi (2006) noted that wastage rate is caused by those who leave school before completing their studies. Wastage may not occur among

students who pass from one grade to the other and complete that cycle within the stipulated period of time. This increases the graduate rate, that means the population of newcomers to the first grade of primary in a given year and are expected to graduate from the last grade of primary education, without consideration of age bracket and repetition.

According to Alharbi (2015), schools can improve performance through retention of teachers for a longer period of time without transferring them. Retention rates can further be improved by making students to remain in the same cohort thus encourages them to be steady in their performance. In this case, performance in this case improves since there are no disturbing experiences to students that can be caused by repeating classes or dropping out of school.

Globally, Early Childhood Education (ECE) is paramount in the development of children between births to eight years. A number of international frameworks have identified ECE to be an important level of learning and life (World Declaration on Education for All, Jomtien Thailand, 1990); UNESCO, 2000); United Nations Convention on the Rights of the Child, 1989); UNESCO, 2020); United Nation (UN), 2010); United Nations (UN), 2015). The researcher put into consideration ECE children of 3 to 6 years old.

The Presidential Circular Number 1 of 1980 in Kenya was issued which directed the management and regulations of preschools to the Ministry of Education Science and Technology (MOEST). In response to the demands of the international frameworks, the government acted upon the various

education frameworks and guidelines, sessional papers and legal frameworks ( Republic of Kenya, 2017); The Ministry of Planning and Devolution, 2007); Republic of Kenya, 2012); Ministry of Education [MOE], 2017); MOEST, 2014); MOEST, 2019); Ministry of Education, 2018); Republic of Kenya, 2012b); MOEST, 2005); Republic of Kenya, 2006); Republic of Kenya, 2010); The Basic Education Act Section, 2013); National Council for Law Reporting, 2010). The current study considered pre-primary schools incorporated in public primary schools in adherence to the National Early Childhood Education Policy Framework of 2006 and the Sessional Paper No.14 of 2012.

ECE has evolved and changed in Kenya before and after independence. Different names have been used depending on whether ECE is being offered in public or private schools, influence of philosophers and scholars from various schools of thoughts. For instance, in public schools ECE has commonly been referred to as pre-unit class, pre-school education, Early Childhood Development Centre, while in private schools there is Montessori and Kindergarten centres (Nganga, 2009; Wangila, 2017; UNESCO, 2005 & Samsonova, 2019). Currently with the introduction of Competency Based Curriculum (CBC) in Kenya, ECE is being referred to as Pre-Primary 1(PP1) and Pre-Primary 2 (PP2). However, in this current study, the author used ECE because the study was done before the introduction of Competency Based Curriculum (CBC).

Philosophers such as Maria Montessori, Jean Rosseau, Friendrich Froebel, Vygotsky and Heinrich Pestalozzi have influenced the teaching and structures of ECE globally and more so in Kenya. For instance, Rousseau (1712-1778) a French philosopher who believed education must enhance children's happiness, spontaneity, and inquisitiveness. Hence, this should occur over time commensurate to the child's own innate timetable termed as "unfolding." His perception about education of children has contributed much to the concept of readiness in ECE. Therefore, his work supports present-day belief that children's social and emotional growth is an integral role in ECE (Morrison, 2007). Wilhelm Froebel (1782-1852) also contributed much to the teaching and structures of ECE particularly in Kenya. This includes ECE teaching and its structures in Embu County public primary schools.

In Kenya, Bernard van Leer Foundation has further influenced the development of ECE. Therefore, to realize this dream, the World Bank gave funds for the expansion of the preschool system for children aged between 3-6 years. The foundation partnered with the Kenya Institute of Education (KIE) currently Kenya Institute of Curriculum Development (KICD), and established the National Centre for Early Childhood Education (NACECE) which is based at Nairobi. NACECE provided intellectual leadership and generated literary information materials based on the requirements of the young children. In addition, it trained teachers' trainers, developed curricular learning materials and formulated a decentralized network of District Centres for Early Childhood Education (DICECE) in1984. This increased access to preschools' education which aimed to reach a target of 60% coverage in the country

(Harris, 2012). There are ECE centres that were set up in Kenya after this such as DICECE, MUCECE, CICECE (UNESCO/OECD, 2005). In Embu County public primary schools, ECE centres are managed by the County Government which is mandated to do so by Constitution of Kenya 2010. In addition, the current study used no information from MUCECE or DICECE. However, the information on data of ECE and primary schools was got from the Ministry of Education offices at County level. This is because since mainstreaming of ECE into basic education, the management was mandated to the County governments such as Embu.

Mainstreaming of Early Childhood Education refers to the process of incorporation of ECE into primary schools in Kenya. Mainstreaming of ECE was envisioned by the Sessional Paper No. 1 of 2005 which enabled the ECE sub- sector to become part of basic education. Other frameworks which contributed much to mainstreaming of ECE are the Sessional Paper No.14 of 2012, Kenya Constitutions 2010 articles 43(1) (f) and 53(1) (b), the Sessional Paper No.14 of 2012, the Basic Education Act No. 14 of 2013 Article 28, the Kenya Institute of Curriculum Development [KICD] (2016). This was made possible by the County Early Childhood Education Act (2018) which mandated all the counties to provide free and compulsory ECE in public education institutions within the county. Therefore, in the present education system ECE is referred to as pre-primary (MOEST, 2005). The researcher used pre-primary 1 and 11 which are mainstreamed in Embu County public primary schools.

Mainstreaming of ECE involved review of ECE policy framework and establishment of ECE resource centres in the 47 counties. This included the establishment of the feeder schools in each of the nine pastoral counties. In addition, the capitation grants were provided of Ksh.1020 per child with adjustment for education for special needs children by the county governments. This applied to children who had enrolled in public primary centres. The entry age of ECE children was set between 4 and 5 years old. This was important because children who enroll in primary school at the right age may not drop out or repeat classes in later life of schooling. Therefore, early entry enable children improve performance and cognition abilities compared to children who may not enroll at the right age into primary schools (Right to Education Country Fact Sheet Kenya, 2014). The current study was done in pre-primary schools which are mainstreamed in public primary schools in Embu County.

ECE mainstreaming make children grow in an environment of secure and trusting relationships with minimal stress. This makes pupils likely to have cumulative learning capacity at physical and mental health level. Hence, free interaction of ECE with the primary pupils ones make them gain confidence. Hence, ECE pupils get strong foundation for emerging cognitive abilities which make them develop social skills and cognitive linguistic capacities. These skills are prerequisites for achievement in school and later, in employment and in society. Therefore, when ECE is not mainstreamed to primary schools pupils grow in stressful environment which bring greater

likelihood of developmental difficulties and other problems in life (Shonkoff, 2009).

Mainstreaming has been used in other discourses such as gender, HIV/AIDS, but in the current study it was used in line with the early childhood education. The objective of mainstreaming ECE is to make learning more efficient in primary schools. Mainstreaming of ECE is measured through a variety of parameters and indicators (UNESCO, 2019). Some of these parameters are physical infrastructure or physical environment. This includes buildings, amount of space, activity areas both indoor and outdoor, equipment and play materials, teacher's qualification that is professional qualifications growth, their experiences and competencies (Shari & Ahmad, 2016).

The Government of Nigeria, mainstreamed ECE curriculum in 18 pre-service teacher training colleges due to inadequacy of trained teachers in ECE schools. The Government of South Africa also addressed the same problem by giving funds for improvement in the teacher training colleges. Further, a similar situation in Zimbabwe was overcome through integration of the two-year training programme for teachers up to the third grade in teachers training colleges. This was in an effort to address low promotion rates caused by the shortage of trained ECE teachers in government ECE schools (Orkin, Workneh and Woodhall, 2012); Mugweni, (2017); Iwu, Chakacha and Dokora, 2014). These studies were done in ECE teacher training college in Nigeria, South Africa and Zimbabwe and aimed to mainstream ECE curriculum in colleges. However, the current study was conducted in ECE

schools attached in public primary schools in Embu County, Kenya and aimed to assess mainstreaming of early childhood education and its influence on internal efficiency.

In accordance to Republic of Kenya (2005), mainstreaming ECE was envisioned so as to make primary schools more efficient. However, mainstreaming ECE faced various challenges due to unpreparedness of primary schools. For instance, teacher quality and teacher utilization has been a constant problem in many ECE centres since the centres were under different managements. This meant that implementation of mainstreaming was to go slow. Hence, the two year in-service training programme for ECE teachers was implemented by the government to equip ECE teachers with skills to enable them be effective in teaching ECE schools efficiently. In addition, the government mounted a nine month training of ECE teachers' trainers. Despite these interventions by the government, limited teaching and learning materials, inadequate ECE centres, lack of enough trained teachers continued to face ECE sector because of attrition of ECE teachers to other well-paying sectors. However, mainstreaming of ECE was actualized by the government through intervention by the county governments with an aim to improve learning in ECE. The county governments aimed to improve ECE infrastructure, teaching learning aids and recruitment and deployment of ECE teachers to public primary schools (Republic of Kenya, 2012).

According to the Ministry of Education Embu County (MOEST) (2014), the total number of ECE teachers was 137 males and 451 females. There has been

PTR of 27:1. This is above the recommended PTR by the ECE policy guideline of 2006 and 2018. The two policy guidelines recommend PTR of 25:1 to make it easy for individualized teaching of children in ECE schools. The standard one repeater was 1022. This was an indication of wastage and inefficiency in the ECE. This was as a result of many children being promoted to standard one when they had not mastered the required concepts to warrant them promotion. The standard one Textbook to Pupil Ratio (TBPR) for the various subjects was as follows: English 1:5; Kiswahili 1:6; Mathematics 1: 5; Science 1: 9 and Social Studies 1:9. This showed that children were straining to share textbooks among themselves. Hence, inadequacy of instructional materials in the ECE and primary schools in the county was clear. These are all indications of inefficiency in Embu County ECE and primary schools. The current enrolment of ECE pupils in the county is 13997 in 399 schools (Embu County Government, 2019). This gives a ratio of PTR of 47:1 which is quite high in an ECE class and an indication of inefficiency in ECE schools (MOEST, 2014). This study was done in ECE and primary schools in Embu County but it ignored the aspects of indicators of mainstreaming of ECE such as physical infrastructure, teacher professional qualifications, instructional materials and PTR in ECE which the current study focused on in the view of how they make mainstreaming of ECE achieve its purpose of making learning efficient in primary schools in Embu County.

### 1.2 Statement of the problem

Mainstreaming is one of the several options adopted for early intervention services in the least restrictive environments such as primary schools.

However, professional and environmental barriers exist to the widespread implementation of mainstreaming at ECE level (Odom & McEvoy, 1990). For this reason, the government of Kenya put in place various policy frameworks and guidelines, legal frameworks and task forces for the establishment of mainstreaming of ECE into primary schools (Government of Kenya, 2005); Republic of Kenya, 2012). Despite these efforts, mainstreaming of ECE is minimal. Hence, the Constitution of Kenya 2010 delegated the management of ECE to the county government. However, the operation is minimal since the primary institutions lack required human and physical resources (Wangila, 2017).

Despite increasing ECE enrolment in various centres in Embu County there are inadequate classes to accommodate separately PP1 and PP2. Hence, the two classes are mostly combined which compromises learning. In addition, a teacher manages the two combined classes that is PP1 and PP2 which results to PTR of 47:1. This compromises the recommended PTR of 25:1 by the ECE policy guideline of 2006 and 2018 (Republic of Kenya, 2006); MOEST, 2018). Further, the instructional materials are very few such that children end up sharing play and other instructional materials. Hence, teachers are made to improvise instructional materials in some instances but many teachers have no access to local materials and time to make them is scanty. This is reflected in what they have been using once they transit to class one which they share in the ratio of 7:1 pupils per book. These are all indicators of inefficiency in ECE which eventually affect primary schools' education particularly in Embu County (MOEST, 2014). Therefore, this study focused on mainstreaming of

ECE and its influence on internal efficiency in public primary schools in Embu County, Kenya.

### 1.3 Purpose of the study

The purpose of this research was to assess the influence of mainstreaming ECE on internal efficiency in public primary schools in Embu County, Kenya.

### 1.4 Objectives of the study

The study was guided by the following objectives:

i) To determine the status of physical infrastructure in ECE and how it influences internal efficiency in public primary schools.
ii) To establish how teacher professional qualifications in ECE influences internal efficiency in public primary schools.
iii) To examine ways in which provision of ECE instructional materials influences internal efficiency in public primary schools.
iv) To explore how pupil-teacher ratio in ECE influences internal efficiency in public primary schools.

### 1.5 Research hypotheses

To achieve the objectives fixed the following null hypotheses:

**Ho1**-There is no significant relationship between provision of physical infrastructure in ECE and internal efficiency in public primary schools.

**Ho2**-There is no significant relationship between teacher professional qualifications in ECE and internal efficiency in public primary schools.

**Ho3**-There is no significant relationship between provision of ECE instructional materials and internal efficiency in public primary schools.

**Ho4**-There is no significant relationship between pupil-teacher ratio in ECE and internal efficiency in public primary schools.

### 1.6 Significance of the study

The findings of this study may be key to education scholars because may add knowledge about the importance of mainstreaming ECE since it is likely to improve and lay a strong foundation for internal efficiency.

The conclusion may support formulation of policy relevant to the provision of adequate physical facilities such as kitchen, water for drinking and washing, toilets for boys and girls, electricity, fences, playground, spacious and well ventilated classrooms.

The study results may be used to improve ECE and primary teachers training curriculum and especially in skill development of handling transits children to class one with less constraint. The teachers may become aware of the training institutions that can enhance their skills so as to improve preparedness of the pupils to the next grade so as to increase promotion rates of children.

The outcome may be used by the County Government in their planning to consider availing adequate instructional materials. The study may help the headteachers devise other ways of getting instructional and other teaching and learning resources to enhance participation of children.

The conclusion of the research may help the school administrators to devise effective ways of enhancing ECE teachers' creativity in improvising instructional materials to enhance children's participation in ECE schools. The findings of the study may help the ECE teachers devise the method of

promotion of ECE children to the next class since when two classes are combined; it may be difficult to make concrete promotion.

The inference of the study may help the administrators and county governments to devise ways of mobilizing community and through advocacy to come up with different ways of raising funds for purchasing instructional materials and other teaching and learning resources to enhance ECE children's participation in ECE schools.

The findings of the research may assist ECE teachers to come up with best practices to enhance children's graduation thus be able to complete their pre-primary 1 and 11 successfully by avoiding combining the two classes.

Lastly the study may help the ministry of education become aware of the most efficient ways of deploying ECE teachers to improve pupil-teacher ratio for smooth progression of ECE children to the next class to avoid wastage.

### 1.7 Limitations of the study

Limitations of the present study could have risen from the reality that public primary headteachers, teachers and ECE teachers who were the informants of this study could not be available on scheduled time due to less time and more work. This nevertheless, was subdued by the investigator by availing extra time to answer the questionnaires, a situation that perfected the response rate to a greater extent.

Some of the informants were had fear of availing necessary information due to the fear of the consequencies that might face. To overcome this uncertainty,

the informants were assured confidentiality of data they jot. This was when they were advised on not writing their personal details on the question papers so as to unvail their identity. This assurance gave them morale to answer questions freely without being coerced. This in turn increased the response rate of the questionnaires.

### 1.8 Delimitation of the study

This study was done in ECE schools in public primary schools in Embu County. The private schools were exempted because their management is different from public schools. The study focused on four key aspects: physical infrastructure, teacher professional qualification level, instructional materials and pupil-teacher ratio and their influence on internal efficiency in primary schools.

### 1.9 Assumptions of the study

That mainstreaming of pre-primary education reduces non-involvement of learners in public primary schools.

That mainstreaming of pre-primary education reduces retention rates of learners in primary schools.

That there is significant influence of physical infrastructure, teacher professional qualification, instructional materials and pupil-teacher ratio on internal efficiency in primary schools.

That mainstreaming of ECE reduces low internal efficiency in primary schools.

That mainstreaming of ECE reduces low progression rates of learners in primary schools.

That mainstreaming of ECE curbs low graduation rates of learners in primary schools.

### 1.10 Definition of significant terms

**Basic Education** refers to educational programmes offered children in ECE educational institutions and centers.

**Competencies** are the expected aptitudes of a learner with an aim of accomplishing specific tasks.

**Education for all (EFA)** refers to education availed on equal basis/inclusive without discrimination of any kind to learners of preschool.

**Education wastage** refers to incidences of dropouts and repetition in a county's education system.

**Internal Efficiency** refers to the relationship between the inputs such as provision of physical infrastructure, teacher professional qualification, provision of instructional materials, pupil-teacher ratio and the outputs such as competencies of learners in ECE schools to maximize educational performance or educational achievement.

**Inputs** are an aspect of internal efficiency which refers to pupils, teachers, furniture, equipment, facilities, finance and time added to the system so as to increase the performance or achievements of a primary school system.

**Mainstreaming** is the practice of incorporating pre-primary with primary formal education in order to maximize their competencies.

**Output** is an aspect of internal efficiency which refers to the pupils who graduate at the end of a pre-primary cycle with less retention due to dropout and repetition.

**Participation rates** refer to the total number of children who are currently active involvement in learning activities in ECE schools so as to acquire competencies required at this level expressed as a percentage.

**Physical infrastructure** refers to aggregate physical resources that facilitate teaching and learning of ECE children in primary schools.

**Pre-Primary Education** refers to education offered to children of 3 to 5 years old who are preparing to transit to primary school.

**Primary Education** refers to education imparted to a child who is 3 to 11 years of age in a basic educational institution.

**Pupil Teacher Ratio (PTR)** alludes to the average population of pupils per teacher in an ECE school.

**Repeater rates** refers to a pupil who is registered in the same class for a second time (or further) consecutive years or a pupil who is retained to the same grade for one or more years of schooling because of failure in educational achievements when it is expressed as a percentage.

**School facilities** are material resources that facilitate effective teaching and learning in primary schools.

**Transition rates** is the process where children are promoted from one lower level of education to the upper level after completing a cycle and masterly of competencies required by the level for instance from ECE school level to primary schools level when expressed as a percentage.

### 1.11 Organization of the study

This study is arranged in five chapters. Chapter one covers the background, the statement of the problem, purpose, research objectives, research hypotheses, significance, limitation and delimitation, basic assumptions and definition of significant terms of the study. Chapter two comprises of literature which is reviewed in the following sub-headings: physical infrastructure in ECE, teacher professional qualifications in ECE, provision of ECE instructional material and teacher-pupil ratio in ECE and its influence on internal efficiency, gaps in literature, and summary of related literature, theoretical and conceptual framework. Chapter three comprises of research methodology which involves the introduction, research design, target population, sampling procedures and sample size, research instruments, validity and reliability of the instruments, data collecting procedures, the data analysis techniques; qualitative data analysis, quantitative data analysis and the ethical considerations; informed consent and voluntary participation, confidentiality and anonymity. Chapter four present data analysis, interpretation and discussions of the findings while chapter five focuses on the summary of the major findings, conclusion and recommendations and suggestions for further studies.

# CHAPTER TWO

# REVIEW OF RELATED LITERATURE

## 2.0 Introduction

The chapter presents relevant literature drawn from both empirical and non-empirical studies in line with internal efficiency and education, physical infrastructure, teacher professional qualifications, provision of ECE instructional materials, pupil-teacher ratio in ECE and how each influences internal efficiency. A summary of literature review showing the research gaps to be addressed in this study, theoretical and conceptual framework is presented and discussed.

## 2.1 Internal efficiency in education

Several scholars have come up with different definitions of the term internal efficiency. Abagi (1997) defines internal efficiency as the amount of learning achieved during school attendance. Adeyemi and Adu (2012) define internal efficiency as the correlation amid the inputs and outputs. According to Adeyemi and Adu (2012), inputs include children, teachers, furniture, equipment, and facilities. Their study results revealed that teacher quality had a significant relationship with the internal efficiency of primary schools. The best predictor of internal efficiency of the schools was teacher qualifications. They recommended that the State government should intensify more effort in the training of teachers to acquire higher qualifications that would enhance the internal efficiency of primary schools. Yang (2014) asserts that the output comprises of children who graduate at the end of the education system as well as teachers, educational managers, students and nonhuman resources.

Additionally, the author considers education output as the expected results of the system's objectives, based on students' achievements. Hence, internal efficiency links inputs to outputs in a systematic fashion, which could be measured by taking the number of children who complete education system. Internal efficiency is, therefore, a question of how outputs could be achieved given available inputs. However, Chapman and Windham (2005) argues that internal efficiency is a question of how inputs could be used to provide the same level and mix of outputs. This link between the inputs and output in Chapman and Windham (2005) study informed the current study to explain how the inputs such as physical infrastructure can influence internal efficiency in secondary schools.

According to Alharbi (2015) teachers could be retained in the educational institutions through provision of skills thus improving their expertise in Arabia. This concurs with Nyanya's (2015) study findings which showed that internal efficiency is greatly affected by the qualification level of secondary schools teachers in Kenya. This was in view to reduce dropout and repetition rates in secondary schools.

Report by Taylor, Pillay, Mohohlwane and Vilakazi (2013) reveals that the education system in South Africa suffered inefficiency due to immense proportion of grade repetition, inappropriate selection of subjects and late joining of school. Grade repetition can be inefficient since learners spend large publicly funded years in school for them to achieve specific educational

results. This leads to drop out of learners from schools due to poor performance which contributes to low internal efficiency in schools.

According to Wakoli & Kitainge (2016) internal efficiency as a measure for institutional effectiveness, is perceived in terms of students' flow in a college system and their performance at the end of an educational cycle. This differs with Yang (2014) who argued that internal efficiency may be judged in terms of its cost-effectiveness, with effectiveness being measured in this context by the systems' immediate outputs, which is distinct from its ultimate benefits.

Adu (2010) argues that the more internally efficient the educational system is, the less fund for inputs it would require to fulfill its goals and objectives. Olubor (2004) reiterated that the output produced from a given quantity of inputs could be increased or kept at the same level even when the input level is reduced. Adeyemi and Adu (2012) argue that this implies that internal efficiency utilizes minimum inputs to maximize outputs. Hence, in a school system, internal efficiency is the relationship of outputs (graduates) to its inputs (resources). This argument supports Afolabi's (2006) views that internal efficiency is the extent to which the school system minimize inputs and increase outputs. In this regard, Aghenta (2000) argued that to determine the internal efficiency of the school system; one has to determine the inputs such as teaching equipment, physical facilities, and other facilities in relation to the output produced with such educational inputs.

Ayodele and Florence (2015) noted that the internal efficiency of any school system depends on the way it is managed, planned, and administered in regard

to its variables such as environment, pupil-teacher ratio, and teacher quality. The researcher in this study used participation, promotion, and graduation rates as aspects of internal efficiency aspects, significantly impacting ECE children as indicated by (Olatoun, 2012; Zaff, Donlan, Gunning, Anderson, McDermott & Sedaca, 2017). Participation in the action of taking part in internal efficiency in Education is where students are active and engaging in the classroom; students impacting on curriculum design; and students' feeling of belonging to the school community. Promotion is the publicizing of an ECE children education and a situation where ECE children are upgraded from one class to another particularly from ECE class to Grade 1so as to increase internal efficiency. Graduation rates measure how many pupils who began in the same cohort will graduate at the end of the program. These were considered to be influenced by four aspects of mainstreaming ECE into primary schools, namely physical infrastructure, teacher qualification level, instructional materials, and pupil-teacher ratio. Hännikäinen, Maritta and Rasku-Puttonen, Helena (2010) assert that participation, promotion, and graduation rates in ECE are enhanced in children through active involvement of children in play activities. According to Vandenbroeck and Lenaerts (2018), children who are well engaged in ECE activities have better participation, promotion and graduation rates which enable them to succeed in their education.

Edapeci, Śăɛ, and Ĩžd (2017) views participation rates as the degree at which ECE children freely intermingle with the teacher in the event of teaching and learning exercise. According to Technische Universtität München (2018),

promotion rates refers to the degree at which ECE children are moving from ECE schools to standard one class in primary schools. The researcher in this study sought to find out from the primary schools' headteachers if ECE classes are integrated into primary schools so as to establish whether the integration of ECE in primary schools has created a strong foundation to enable smooth promotion of ECE children to grade one.

Graduation rates refer to the degree at which ECE children make progress in their daily interactions during teaching-learning activities that enable them to smoothly transit to the next level of education which help to develop their cognition and other relevant skills (Bietenbeck, Ericsson & Wamalwa, 2017). A review of studies in the next sub-section 2.2 on physical infrastructure in ECE and its influence on internal efficiency is discussed based on participation rates in ECE.

**2.2 Physical infrastructure in ECE and its influence on internal efficiency**

Physical infrastructure refers to the whole school composition such as streams of classrooms, staff rooms, laboratories, workshops, libraries, laboratory equipment, grounds, furniture and apparatus along with types of equipment essential for imparting, implementing and managing ECE (Alimi, Ehinola & Alabi, 2012); Yolanda, Suryana, 2020) & Barrett, Davies, Zhang and Barrett et al (2017). The current study considered physical infrastructure in ECE schools to constitute components such as latrines/toilets, classes, water points, sports facilities/playground, electricity, furniture, fences, toilets for boys and

girls, and school compound as components that influence participation rates in Embu County.

Physical infrastructures in a school system are important because it protects children and teachers' well-being such as comfort, safety and performance while at school (Alimi, 2012; Vandenbroeck & Lenaerts, 2018); Barret, Treves, Shmis, Ambasz & Ustinoiva, 2018). According to Vandenbroeck and Lenaerts (2018) and Nazer and Majlinda (2020) the development of ECE facilities promotes sustainable and inclusive growth in children, resulting to high participation rates in ECE institutions. While, according to Barret et al (2018) physical infrastructure alleviates overcrowding situations in some schools due to the intensive use of classes. The study did not show how physical facilities are distributed per region, county or schools, hence the need to undertake this study.

Studies by Sando (2019), Borgman, Scharnhorst and Golshan (2018) and Borgman, Schornhorst and Golshan, (2018) showed a positive relationship associated with children's well-being between physical environmental variables such as classroom. Free play indoors and outdoors dominate exercise settings Åström, Björck-Åkesson, Sjöman and Granlund (2020) & Frimpong (2019). The researcher observed presence of wheels and the activities attached to them.

Writers such as Ngwaru and Oluga (2015) and Wokadala, Ogawa, Sharma, Kizito, Mugisha, Komunda and Ssewanyana (2019) found that half of the children sat on the desks in some classrooms while the other half sat on the

floor hence classes were overcrowded leading to low participation rates of the children in indoor activities and new infrastructure attracted enrolments of more children. This is in disagreement with Amollo (2018) who found that there was no significant association between the extent of increase in pre-primary enrolment and improvement in the status of sanitation facilities, outdoor play equipment, and assistive facilities. The current study associated presence of physical infrastructure with increased enrollment in ECE centres..

Several studies by Chepkonga (2017); Jemutai (2018); Ndirangu, Thinguri & Chui (2016); Githuka (2015); Oduya & Mwangi (2019); Ababa & Debele (2015); Uduku, (2011); Barret, Treves, Ambaz & Ustinova (2019); Yang, 2014); Fasasi & Ojo, 2014); Jeruto & Mutindi, 2017); Ncube (2004) and Tisdell & Glyn, 1992) found that majority of public ECDE centres had inadequate classes, desks, water, kitchen stores among others which had negative influence provision of quality education in Kenya. The researcher found electricity and playground inadequate in primary schools.

Writing on influence of infrastructure development on early childhood education, Kharemwa (2017) found that the financial allocation for infrastructure development by the ministry of education Siaya County Government and the management as inadequate which result to low participation rates in children. The focus of the study was on ECE centres which are managed by the county government.

According to Gur (2014) ECE institutions which were homey, disciplinary oriented provide safe play for children that enhanced children's body and

mental development attracted parents. This concurs with the study by Shaari and Ahmad (2016) who observed that physical infrastructure enhance the wellbeing of children. The researcher sought to find out how availability of different physical infrastructures in ECE enhanced participation rates of children.

### 2.3 Teacher professional qualifications in ECE and its influence on internal efficiency

According to Mak (2016) entry into the teaching career in most education systems in today's world is based on academic qualifications and professional credentials. The auther assert that professionalism basically involves high-level skills that require professional training and education which is recognized by the professional organizations, government and society. The writer opined that professionalism is knowledge on how lessons should be planned, executed and evaluated in order to facilitate the teaching and learning of the language in the classroom. Hence, teacher's professionalism especially when it is coupled with qualification is of great importance since it determines the students' academic achievement which is key in determining promotion rates particularly in ECE (Mak, 2016); UNESCO (2015); OECD (2009). Hence, a qualified teacher is one who holds a teaching certificate and/or licensed by the state, owns at least a bachelor degree from a four-year institution, well qualified in his/her area of specialization and possesses knowledge of the subject matter, human growth and development, ethical values, instructional planning and strategies, assessment, learning environment, communication and advocacy, collaboration and partnership,

continuous professional development, code of conduct and skillful use of information communication technolies (Lydia & Joash, 2015). The current study explored teacher professional qualification in ECE and its influence on promotion rates in Embu County schools.

Professionally qualified teachers play an important role in determining the promotion rates in ECE (Lydia & Joash, 2015). Several studies have found that teachers' professional qualification and experience significantly influence learners' promotion rates (Maphoso & Mahlo, 2015); Maphoso & Mahlo, 2015); For & Wages, 2001); Zaslow, Tout, Maxwell, & Clifford ,2004). Fox and Wages (2001) found that teacher professional qualification at the four year college degree level improved children's promotion rates in USA and Alabama. The current study explored the extent to which ECE teachers were professionally qualified and improved promotion rates in ECE schools.

According to Xu (2019) male teachers positively influence young children through provision of most effective instruction and model masculine, male roles. Men teachers were only 16.2% which hindered success in promotion rates of children and were interested in pre-school education for administrative purposes and not necessary to teach (Ngure, 2014; Mukuna, 2011) & Avoga, 2020); Njoroge, 2019). The researcher observed that male teachers were less than female teachers in ECE schools which could affect promotion rates.

Pre-service teacher preparedness for fostering education for sustainable development: an empirical analysis of central dimensions of teaching readiness. Several authors such as Chicioreanu (2020); Manasia, Ianos, and

Chicioreanu (2020); Gong and Wang (2018) noted that professional practice has a positive and statistically significant effect on all the other dimensions which are included in the projected model, professional knowledge (r=0.903), self-management (r=0.874) and professional engagement (r=0.889). This is in disagreement with Kasmaienezhadfard (2015) who found that there was no collaborative learning due to high qaualification of teachers. The level of teacher qualification in ECE is a necessity in influencing promotion rates in children.

A study by Chikwiri and Musiyiwa (2017) revealed that lack of qualified teachers and expertise was a challenge to transitioning learners in Zimbabwe. Inadequacy of teachers was due to freeze by the government (Orodho and Lindolo, 2014; Ndijuye and Tandika, 2019); Onyango, 2016). Notably, Ntumi's (2016) noted that preschool teachers do not have full grasp of the content of ECE curriculum which implies inadequate in-service training which result to low promotion rates. According to Nyarirwehi and Atuhumuze (2019) majority of the teachers with in-service training had diploma and had taught for 11-15 years.

According to Aman (2018) higher educational qualification and years of experience have a great positive influence on the academic achievement. A unit increase in age is associated with a 4.6% reduction in the odds of a teacher having in-service teacher training ($p<0.05$) meaning that younger people had a higher likelihood of having in-service training (Nyarirwehi and

Atuhumuze, 2019; Nafungo, 2015); Bietebbeck, Ericsson and Wamalwa (2019).

Promotion rates, achievement and participation in ECE are affected by professional qualification of teachers. Several authors such as Majoko (2018); Mupa and Isaac (2015); Wangila 2017) and Brief (2016) noted that most mainstreamed primary school teachers had inadequate pre-service and in-service training. This disagrees with Odieki and Mweru (2020) who found that teacher factors affect children's transitioning into primary school. Hence, teacher factors significantly influenced successful transition of the learners into primary school particularly teaching methods, teacher availability and teacher experience in handling transitioning pupils were important for learner transition into primary school. The present study explored the skill competency of teachers handling transiting ECE children.

According to Achieng (2018) there was needed to find ways of retaining the teachers in the profession as this would assist to reduce the expenses of recruiting new teachers. Also this would help in retention of children though may be affected by cultural practices, parent's level of education, income of the family and how children are treated (Njue 2015); Kirimi, Muteti (2016) & Deal (2015). The teachers had low level of qualification in Embu county primary schools.

## 2.4 Provision of ECE instructional materials and its influence on internal efficiency

Instructional materials have been defined differently by various authors. Awolaju (2016) views instructional materials as devices by which knowledge; skills, attitude, ideas, beliefs, and values get transmitted to the learners by the educator to make the teaching-learning process easier. According to Tuimur and Chemwei (2015), instructional materials are used by educators to simplify their delivery during the teaching-learning process. Khairuzzman (2016) refers to instructional materials as a powerful strategy to bring about effective teaching and learning. Instructional materials are tools that help in teaching (Koko, 2016); UNESCO, 2020); Ajoke, 2017); Mupa and Chinooka, 1015); Makorani and Muli, 2017); Nyakina, 2015); Rao, Sun, Wong, Weekers, Shaeffers, Young, Bray, Chen and Lee (2014) & Erukudi and Edabu, 2020). The researcher refers to instructional materials as all the instructional resources which include textbooks for various subjects which are used to enhance participation rates in ECE children.

According to Edson and Thomas (2016), instructional materials help in lesson preparation which helps teachers engage in comparison, analysis, selection, and enactment of textbooks and other instructional materials to support effective teaching practice and children's learning for a particular subject. This calls for improvisation of instructional materials is applied in many countries with the aim to enhance participation rates in learners Fabian & Danlop (2007); Igbo & Omeje (2014); Nja (2019); Malunda & Atwebembeire (2018); Isola (2019); Mariga (2017); Reads, 2016); Kipkosgei & Kabwos (2012).

These studies informed the current study on importance of improvisation of instructional materials to enhance participation rates in children.

Writing on secondary schools internal efficiency, Khondaker and Ibrahim (2018) found that instructional materials such as textbooks showed the lowest mean in the question of the adequacy of textbooks with mean (M) M=1.076 and standard deviation (SD) (SD=.333). However, in many schools instructional materials were insufficient (Owusu, 2016); Mwalyego and Shitambala, 2014); Tety, 2016); Lyimo, Too and Kipng'etich, 2017); Rasto, 2015); Mwili and Tanui, 2015); Riungu, 2018); Zwane & Malale, 2018); Onyango, 2015) & Tuimur and Chemwei, 2015). The researcher found that only reference and text books were available in primary schools in Embu County.

According to Li, Yamaguchi, and Takada (2018) interactive materials positively influence the relationship between motivation for better evaluation and learning satisfaction. Learners taught with instructional materials performed significantly better than those taught without (Yamin, 2018); Wales, Ali & Nicolai (2018). The instructional materials are useful though ECE teachers were found to have only few textbooks and reference books which lowered participation rates in ECE schools.

Barriers teachers face in implementing inclusive education in high schools. For instance, Zwane and Malale (2018) found that some high schools did not have instructional resources such as braille equipment. This is in agreement with Besong (2014) and Bukoye (2019) who found that instructional materials

were inadequate in schools in Cameroon. The current study found only textbooks and reference books were available in schools.

Ihejiamaizu & Ochui (2019) observed that utilization of electronic instructional materials significantly influence students' academic achievement in Biology. There is a positive relationship between the availability as well as utilization of instructional materials and effectiveness of Business studies teachers (Oluseyi, 2017); Mariga, 2017); Akungu, 2014); Amuhaya, 2013); Adipo, 2015); Wambui, 2013). The current study focused on instructional materials used in teaching different subjects.

According to Were (2014) nature provided the main source of teaching and learning instructional materials. It was also noted that the instructional materials available in ECE schools were mostly indoor play materials. Availability of outdoor play instructional materials encouraged children participation rates though they are inadequate in many schools (Kithungu (2019); Ochanda (2015); Anekeya (2015); Esongo (2017).

### 2.5 Pupil-teacher ratio in ECE and its influence on internal efficiency

Kenton (2014) assert that the pupil-teacher ratio (PTR) is the proportion of pupils to teachers within an entity such as state, school district or school which is an indicator that shows how resources in education are allocated. Kabuga Yusuph (2013) referred PTR as the umber of pupils enrolled in primary school versus the number of school teachers. Organization for Economic Cooperation and Development (OECD) (2006) opined PTR as a smaller number of children

per staff who enhance ECE efficiency and facilitate better developmental outcomes for children. Also, OECD (2006) argued that the PTR is associated with efficiency since it is connected with better working conditions and less stress. Hence, teachers are found to be more supportive when they are responsible for smaller groups of children. This is because a lower pupil-teacher ratio improves working condition within ECE setting since teachers can give sufficient attention to different developmental domains and create more caring and meaningful interactions with children.

According to the Department for Education, United Kingdom (2011), PTR measures the number of students per teacher which reflects teacher workload and the availability of teachers' services to their students. Hence, the lower the PTR, the higher the availability of teacher services to their students (Is, Ratiohow, & Are, 2005); Balestra, Backes-gellner, Zürich, Balestra and Backes-gellner (2017); Muthusamy (2015). According to Summary (2000), PTR compares the number of students to the number of education professionals available to serve students such as teachers, paraprofessionals, administrators and others who may be in contact with students when compared to the total number of students whereas high PTR affect the quality of education in schools with poor resources (Nyiwa, Maithya, & Gathumbi, 2017); UNESCO, 2009); Wallet, 2006), UNESCO, 2005); Medinipur, Jana and Ray, 2016) & ICF International, 2016). The researcher assessed number of ECE children per teacher.

Learning analytics: Issue on Pupil Teacher Ratio, Opanuga, Okagbue, Oguntunde and Amina (2019) observed that the PTR obtained from the analysis was higher than the national average. Majority of high school teachers have high PTR (Taniguchi (2015); Adeyemi and Adeyemi (2014); Ngirera, (2018); Murungi (2018) & Kimani; Waita, Mulei and Kalai (2016) and Bhorat (2014). The researcher observed that there high PTR in primary schools.

According to Marais (2016) overcrowded classrooms resulted to teachers being stressed since most of the time was spent on settling down children in classes hence giving individual attention to children was difficult. High PTR had negative effect on teaching in schools (Kyambi, 2019); Lokhetho, 2013); Obunga, 2016); Muthaa & Mwirigi, 2015). The study informs the researcher on importance of analyzing challenges attached to high PTR in ECE School particularly in Enbu County.

### 2.6 Gaps in the literature

The researcher in this study used correlation research design by using quantitative and qualitative approaches in data collection and analysis as the two approaches compliment one another. Little attention has been paid by the available literature on how mainstreaming of early childhood education influences internal efficiency in public primary schools. The present study therefore sought to add knowledge and literature on mainstreaming of early childhood education and its influence on internal efficiency in public primary schools.

The present study therefore sought to add knowledge and literature on mainstreaming of early childhood education and its influence on internal efficiency in public primary schools. Several researchers focus on physical infrastructure as an important factor in protecting children and teachers' well-being such as comfort, safety, and performance, there is still a research gap (Alimi, 2012). A number of scholars have noted the importance of physical infrastructure in the development and improvement of ECE programmes (Vandenbroeck & Lenaerts, 2018); Barret, Treves, Shmis, Ambasz & Ustinoiva, 2018). Despite the study focusing on the adequacy of ECE facilities, there is still a research gap on availability, number and status of physical infrastructures in ECE and how they influence participation rates in ECE children. However, Ntumi (2016) shows that teacher professional qualification in ECE influences promotion rates and measures the success from teachers' qualifications in promoting learners from one class to the other. This shows the importance of in-service training of teacher professional qualification in ECE, which influences promotion rates in ECE children. There is still a research gap in the type of teacher professional qualification needed. Also, Solheim and Opheim (2019) opined that the pupil-teacher ratio is obtained by dividing the number of full-time equivalent students at a given level of education by the number of full-time equivalent teachers at that level and in similar types of institutions. However, the ratio does not take into account instruction time compared to the length of a teacher's working day. Researchers refer to instructional materials as a powerful strategy to effectively teach and learn Khairuzzman (2016).

Instructional materials are tools that help in teaching (Koko, 2016). However, the current study refers to instructional materials as all the resources that enhance the teaching and learning process in ECE schools to enhance learners' performance in all subjects. The reviewed literature further showed a majority of researchers used descriptive survey research design. Descriptive survey research design was used by researchers such Nyarirwehi and Atuhumuze (2019); Igbo and Omeje (2014); Lyimo, Too and Kipng'etich (2017); Jacob (2014), among others. This allowed correlation design to be used in the study instead of just describing the variables. Further, from reviewed literature, it was found out that the majority of researchers used questionnaires to collect data. This creates a research gap of supplementing the questionnaires with other research instruments such as observation schedule and document analysis guide. The literature review revealed the gaps of knowledge in sampling procedures which the current study filled by using stratified random sampling in selecting schools for study and purposive sampling techniques in selecting the respondents.

The literature review showed knowledge gaps in theory which the researcher filled by adapting education production function theory which considers relationship between inputs and outputs and is basically an economic function showing maximum outputs being capable of being produced by a given set of inputs.

**2.7 Summary**

The purpose of assessing mainstreaming ECE and internal efficiency is to explore on physical infrastructure, teacher professional qualifications,

provision of ECE instructional materials and pupil-teacher-ratio and their influences on internal efficiency. The review of literature builds upon the current understanding within the fields of participation, promotion, and graduation rates aspects. The review of recent literature revealed the common themes that surface in mainstreaming ECE and internal efficiency.

## 2.8 Theoretical framework

Multiple intellectualsfor instance Owen (1991) and Hannaway and Lockheed (1986) emphasise the importance of having informative theoretical framework which foster the individual comprehension of conclusions made in scholarly research. The present study focused on mainstreaming of ECE and its influence on internal efficiency in public primary schools in Embu County, Kenya.

Several theories have been commended by various researchers on internal efficiencyof education. For instance, Kast and Rosenzweing (1972) and Gillies (1982) encourage the use of Systems Theory. They noted that a System Theory constitutes institution's energetic plexus of interconnected components and modifying a single parameter may end up having effect on several extra others.

In regard to Amanuel and Nam (2011) a system refers to a set of interconnected components which interact with the aim to have one end product. These components comprise the input transformative process and the output as end product.

When used in the learning process for instance in ECE institutions, it suggests that when adequate and high qualityinputs are utilized in the mainstreaming process, high internal efficiency is realized. This will be reflected by high level of participation, promotion, and graduation rates of ECE children.

Next theory that would have been significant for the current study is Education Production Function Theory which was advanced by James, S. Coleman (1966). Production Function signifies the process where by education outputs are changed to outputs. The education production process is compost of inputs and output factors which have effect on process. The outer and inner factors in an institution would continue being effective if all the components would be held constant. The input in an educational institution or system cycle is compost of public and private inputs. The public ones involve financial human, physical and opportunity cost in the provision of education. Diversely, private inputs involve both direct and indirect outlays of uniform , medical care, transport charges and the opportunity cost of provision of education by families. Atahe outputs of schooling comprise the graduates produced by the system from a cohort of learners.

The theory was given importance by the researcher but specifically the Education Production Function Theorry whose proponent is Mace (1979). The theory describes the relationship between the outputs and inputs and is technically an economic relationship explaining the maximum amount of output capable of being produced by each and every set of specified input. Hanushek (2008) simple education production function model analysis was

anchored on economics of education which considered school resources and teacher quality as inputs and student achievement as outcome which was not the case before since attainment or years of schooling completed were being used to measure schooling. Years of attainment posed difficulty of assuming same amount of student achievement or skills over time in every country since it counts the time spent in schools without judging what happens in schools. The attainment does not provide a complete or accurate picture of outcomes. Therefore, Hanushek's (2020) production function focused on inputs relevant to policy such as school resources, and teacher aspects.

Education in the context of this theory is viewed as a productive activity that combines various inputs of capital and labour to transform one set of input into another. For ECE schools, the major goal is not only to ensure that children graduate to complete ECE level and continue with learning. In this context, children who participate are promoted and graduate successfully in ECE the only physical embodiment of output. Thus, it emerged that the school plays a major role in determining participation, promotion and graduation rates which determines the children who proceed to grade one in primary schools. This theory is relevant to the study in that one of the main objectives of ECE schools is to prepare children to successfully transit to primary school. It is when children who graduate from ECE successfully proceed to grade one in primary schools that we can say that ECE schools accomplished its objectives. In equation form production function can be represented by:-

Inputs

A=f (B, C, D, E)

A= Achievement due to some measures taken in school such as mainstreaming

B= Physical infrastructure

C= Teacher professional qualification

D = Instructional materials

E= Pupil-teacher ratio

A is the output (which is the dependent variable). This is internal efficiency which is shown by indicators such as participation, promotion and graduation rates. And B, C, D, E are aspects of mainstreaming ECE which are physical infrastructure, teacher professional qualification, instructional materials and pupil-teacher ratio in ECE respectively. In the case where an ECE institution wishes to increase its output in form of participation, promotion and graduation rates of children which denotes high internal efficiency, it follows that inputs in form of adequate physical infrastructure, high quality teacher professional qualification, adequate instructional materials and reduced pupil-teacher ratio in ECE should be availed.

In this study the education production function theory informs this study in that the theory is related to those aspects of education production activity that can be measured for example participation, promotion and graduation rates in children. The input was determined in form of physical infrastructure in ECE, teacher professional qualifications in ECE, ECE instructional materials and pupil-teacher ratio in ECE. The output is determined in form of pupils' participation, promotion and graduation rates.

Hence, the theory is important in this study since it expresses the relationship between dependent and independent variables. That is relationship between outputs and inputs. In this case education production function theory shows relationship between internal efficiency which is shown by aspects such as participation, promotion and graduation rates, and mainstreaming of ECE shown by aspects such as physical infrastructure in ECE, teacher professional qualifications in ECE, ECE instructional materials and pupil-teacher ratio in ECE and how they impact on school achievements. The level of relationship determines whether a school is internally efficient or internally inefficient. Hence, internally efficient schools have high participation, promotion and graduation rates which ensure successful retention, completion, graduation and transition rates in children.

### 2.9 Conceptual framework

According to Amisi (2016) conceptual framework refers to relationship between variables in the study. Gathii, Wamukuru, Karanja, Muriithi and Maina (2019) opined that the conceptual framework presents a diagrammatic representation of diverse variables (independent, dependent and or intervening/moderating variables), their indicators, and the interrelationships between the variables as set in the research objectives. In this study, the conceptual framework assists the researcher to quickly perceive the relationship between mainstreaming of ECE and internal efficiency in public primary schools. This study's conceptual framework is depicted in Figure 2.1

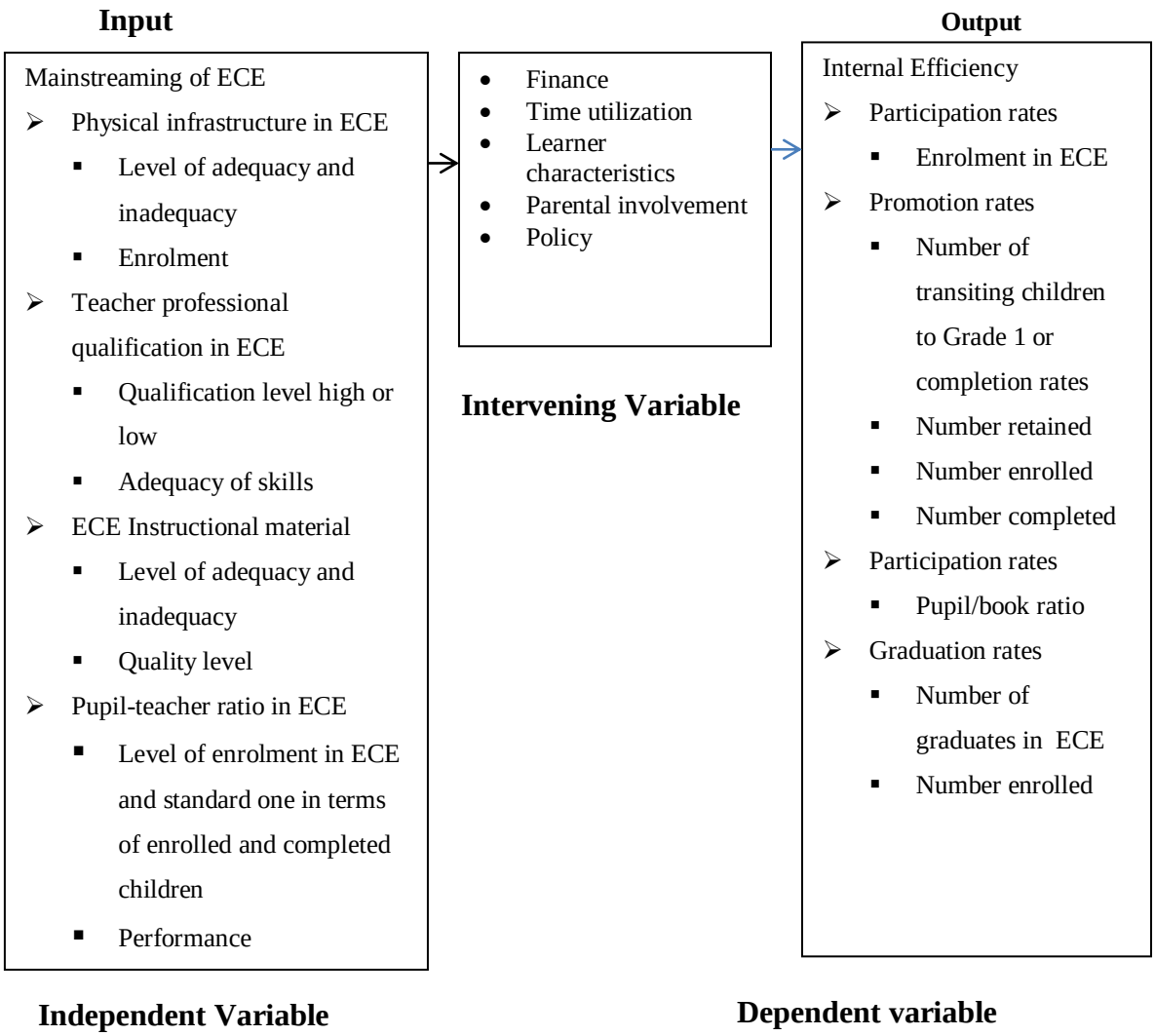


**Figure 2.1 Conceptual framework showing relationship between mainstreaming of early childhood education and internal efficiency**

Figure 2.1 Shows dependent variables such as the internal efficiency with its indicators such as participation rates, promotion rates, participation rates and graduation rates are directly influenced by independent variable which is mainstreaming of ECE and its aspects such as physical infrastructure in ECE, teacher professional qualification in ECE, provision of ECE instructional materials and pupil-teacher ratio in ECE. It is presumed that adequate physical

infrastructure leads to increased enrolment in ECE. With increased enrolment there is possibility of high retention, completion, graduation and transition rates in children and the opposite can happen if there is inadequate physical infrastructure which affects internal efficiency due to possibility of low or high progression to standard one. Hence, inadequacy of physical infrastructure results to low participation rates in ECE which can lead to low transition to standard one due to low enrolments. High teacher professional qualification can result to high promotion rates due to high retention, completion, graduation and transition rates in children which show that high number of ECE children transit to standard one. Hence, low teacher qualification can result to low promotion rates and few children transiting to standard one (low transition rates) due to low retention, low completion and low graduation rates in children which translate to low internal efficiency.

The adequacy of ECE instructional materials can result to high participation rates hence many children can be retained, complete, graduate and transit to standard one which indicates high internal efficiency. Hence, inadequacy of ECE instructional materials can result to low participation rates and few children being retained, completing, graduating and transiting to standard one. When the enrolment of Pre-primary 1(PP1) and Pre-primary 11 (PP2) are high and complete that level successfully, graduation rates are high in terms of numbers of enrolment in ECE. Therefore, the inputs during teaching-learning process do influence the outputs which result to either high or low internal efficiency depending on the level of inputs. In addition, there may be intervening variables that may affect the output even if teaching and learning

is taking place with proper inputs available. The intervening variable may include the availability of finance, time utilization, learner characteristics, level of parental involvement, and non-adherence to policy for this level of education. Hence, with adequate finance, adequate time for teaching and learning, adequate parental involvement, appropriate children for the class, appropriate policy for the level, there is possibility of high internal efficiency being experienced. Therefore, with this output being realized can result to high participation, high promotion and high graduation rates which indicate high internal efficiency of education which can guarantee successful transition of ECE children to grade one in primary schools.

Intervening variables were controlled by being considered as an independent variable in its own right. Hence, aspects of mainstreaming which are physical infrastructure, teacher professional qualification, instructional materials and pupil-teacher ratio can act on intervening variables such as finance, time utilization, learner characteristics, parental involvement and policy which further acts on internal efficiency aspects of participation, promotion and graduation rates.

# CHAPTER THREE
# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter is on research methodology and in particular, research design, target population, sampling procedures and sample size. In addition, research instruments, data collection procedures, data analysis techniques and the ethical considerations is presented and discussed.

## 3.2 Research design

This study adopted correlational research design to assess the influence of mainstreaming Early Childhood and Education on internal efficiency in public primary schools in Embu County, Kenya. According to Cohen and Manion (1994) correlation study is concerned with achieving a fuller understanding of the complexity of the phenomena on the ground. Orodho (2009) opined that the purpose of correlation research is to express in mathematical terms the degree of relationship between any two variables. Curtis, Comiskey and Dempsey (2016) contend that correlation research design is applied when there is need to discover or clarify relationships and where correlation coefficient will receive the end. Hence, correlation research design is useful in yielding information concerning the degree of relationship between the variables being studied. Borovečki and Steinberg (2018) also assert that correlation design is used to relate two or more variables to find out how they influence each other. Hence, in correlation research the researcher seek to describe and measure the degree of association between an independent and dependent variable and does not control or manipulate any of the variables but

rather examines on whether there exist a co-variation between two or more variables (Gathii, Wamukuru, Karanja, Muriithi & Maina, 2019).

This study used correlation research design to explore the relationship between mainstreaming early childhood education and internal efficiency. In particular, correlation design was used to help understand the complex relationships between physical infrastructure, teacher professional qualifications, provision of instructional materials and pupil-teacher ratio and participation, promotion and graduation rates as aspects of internal efficiency.

### 3.3 Target population

This study was conducted in Embu County, one of the 47 counties in Kenya. Embu County lies South of Mount Kenya and borders a number of counties, namely; Tharaka Nithi to the East, Nyeri to the North, Kirinyaga to the South West, Kitui and Machakos in the South. There are five sub-counties in Embu County; Embu East, North and West; Mbeere North and South. The two Mbeere sub-Counties are in arid and semi-arid areas while Embu sub-counties are in wetland areas. While Embu sub- counties are densely populated with people practicing subsistence and cash crop farming, Mbeere sub-counties are thinly populated and usually practice subsistence farming. The researcher considered Embu County for the study among the neighbouring counties since it is where the research problem was found. Hence, the findings of the study could be generalized to the other counties in Kenya. In addition, the county has been experiencing low internal efficiency due to constant poor participation, promotion and graduation rates in ECE as shown in Table 2 below

**Table 3.1 Internal efficiency in Primary schools in Embu County**

| | ECE | | | GRADE 1 | | |
|---|---|---|---|---|---|---|
| Year | Boys | Girls | Total | Boys | Girls | Total |
| 2017 | 2632 | 3146 | 5778 | | | |
| 2018 | 2864 | 3246 | 6110 | 806 | 682 | 1488 |
| 2019 | 3808 | 4043 | 7851 | 805 | 692 | 1497 |
| 2020 | 3846 | 3967 | 7813 | 987 | 696 | 1683 |
| 2021 | | | | 1498 | 1454 | 2952 |

Source: From Embu County Director's Office, 2021

Table 3.1 shows enrolment of ECE children who have been transiting to class one from year 2017 to 2021. From the table, class one children are fewer than those from ECE classes. This could be attributed to insufficient physical infrastructure, teacher professional qualification, instructional materials and teacher pupil ratio. It is clear from the figures that in ECE children are very many and as they proceed to class on e they become fewer. There is possibility that as they complete ECE cycle, they may be going to class one either in the neighbouring counties primary schools or in private institutions where learning may be favourable. So it is clear that there is low retention of children as they proceed to class one which may further lead to low completion, graduation and transition rates in ECE children resulting to low internal efficiency in primary schools as the tread continues to other classes hence the need to assess how mainstreaming of ECE influence internal efficiency in primary schools in Embu County.

Thus, improved internal efficiency in primary schools in Embu County and the same approach could be adapted to the other 46 counties in Kenya. The study targeted primary school headteachers, teachers and ECE teachers in both public primary and pre-primary schools in Embu County as shown in the Table 3.2.

**Table 3.2: Number of primary schools, primary headteachers and teachers and ECE teachers**

| Sub county | Primary schools | Head teachers | Primary teachers | ECE Schools | ECE teachers |
|---|---|---|---|---|---|
| Mbeere North | 96 | 96 | 446 | 96 | 129 |
| Embu West | 37 | 37 | 507 | 35 | 53 |
| Embu East | 71 | 71 | 778 | 68 | 75 |
| Mbeere South | 140 | 140 | 1300 | 145 | 176 |
| Embu North | 37 | 37 | 446 | 36 | 50 |
| Total | 381 | 381 | 3951 | 380 | 483 |

Source: County Director of Education/Teacher Management Records, (2016)

Table 3.1 shows the distribution of the targeted population used in this study. Gathii, Wamukuru, Karanja, Muriithi and Maina (2019) assert that target population is a group of elements with common characteristics about which a researcher seeks to make an inference. The study targeted 381 (76 female and 305 male) public primary headteachers, 3951 (2964 female and 987 male) public primary teachers and 483 (440 female and 43 male) ECE teachers. Hence, this study used primary headteachers; primary teachers and ECE

teachers (both male and female) teachers were considered in both rural and urban schools as main respondents since they were all teaching in primary schools where ECE is part of primary schools. Primary headteachers were targeted since they were in both urban and rural primary schools that offer ECE programmes. In addition, primary headteachers are directly in contact with ECE teachers, physical infrastructure, teachers, and instructional materials and have the knowledge of pupil-teacher ratio in ECE. Further, headteachers were directly in contact with ECE records which provided access to information on physical infrastructure, teacher professional qualification, instructional materials and pupil-teacher ratio and their influence on internal efficiency. Hence, information such as enrolment of ECE children, instructional materials, transition rates, retention rates, graduation rates, completion rates, absenteeism which is a form of dropout and general performance, and records such as A4 forms for teachers on qualification profile for ECE and primary teachers. Primary teachers were used since they were in a good position of giving information on progression, completion and transition of ECE children to primary section. ECE teachers were used in the study since they were in direct contact with ECE children and as such they were better placed to give information on promotion, participation and graduation rates of children and also to give data on how physical infrastructure, teacher professional qualification, instructional materials and pupil-teacher ratio influence participation, promotion and graduation rates of children respectively in ECE schools.

### 3.4 Sampling procedure and sample size

Stratified and simple random sampling techniques were used to select schools for the study from the five sub counties. Mugenda and Mugenda (2003) contend that the main purpose of stratified random sampling is to achieve desired representation from various sub-groups. In stratified random sampling, schools in the county were listed under their respective sub-counties. 10% of schools in each sub county were randomly selected which were 10, 14, 7, 4, 4 schools in Mbeere North and South, Embu East, North and West sub-Counties respectively.

Therefore, 10% of the schools in each sub county as a sample was considered based on the researcher's aim to have a sample which has the properties of normal distribution since for most such distributions, $n \geq 30$ or is sufficient for a reasonable normal approximation to the sampling distribution (Fischer, 2008). Hence, according to statistics practices (Orodho, Khatete & Mugiraneza, 2016: 161), a sample size of $n \geq 30$ has properties of a normal distribution. So, a sample size of $n \geq 30$ is sufficient for parametric and non-parametric analysis. Therefore, in this study, the researcher considered the least percentage which guaranteed $n \geq 30$. Hence, 10% of schools in the sub county were sufficient since it was the least percentage that gave $n \geq 30$ which was 39. Therefore, 10% stratification of schools per sub County was sufficient sample $n \geq 30$. Hence, a sample size of 39 public primary schools with ECE centres was sufficient for analysis. Hence, in total a sample size of 39 primary schools which had ECE centres were selected which was adequate sample size

for a correlation study since Fraenkel and Wallen (2009) recommended minimum sample size of 30 subjects.

Simple random sampling was used to select primary teachers from each of sampled primary schools. Hence, 156, 39 and 39 primary teachers, primary teachers and ECE teachers respectively were selected from each of 39 sampled primary schools. Simple random sampling which implies selecting a subset from a population was used since all respondents were in a position to give adequate information on ECE in regard to aspects of mainstreaming ECE and its influence on participation, promotion and graduation rates of ECE children. Lauren (2020) assert that simple random sampling is attuned to make conclusions of people which aid in ensuring high internal validity and that a high random sampling sample has high external validity. In this study random number method was utilised to ascertain that every primary headteacher and teacher, and ECE teacher in each sub county is assigned a number by using random number tables. Then, the researcher picked randomly a number in each sub set of headteachers, primary teachers and ECE teachers respectively in each sub county. The researcher ensured that every individual selected participated in the study which ensured validity of the findings. Hence, a total of 39 ECE teachers (9 men teachers and 30 female teachers), 156 primary teachers (109 women teachers and 47 men teachers) and 39 headteachers (13 men and 26 women headteachers) were selected using simple random sampling for the study. To avoid bias in the study findings, the researcher ensured every selected respondent participated in the study. Therefore, simple random sampling ensured that the five sub counties of Embu County namely

Mbeere North and South, Embu East, West and North which formed the strata were represented in the sample of public primary and ECE schools, primary headteachers, primary teachers and ECE teachers.

**Table 3.3: Sample size of primary, ECE schools, primary headteachers and teachers, and ECE teachers in five sub-counties**

| **Sub-County** | **Primary Schools** | **Headteachers** | | **Primary Teachers** | | **ECE Schools** | **ECE Teachers** | |
|---|---|---|---|---|---|---|---|---|
| | | Male | Female | Male | Female | | Male | Female |
| Mbeere North | 10 | 8 | 2 | 10 | 30 | 10 | 3 | 7 |
| Embu West | 4 | 3 | 1 | 5 | 11 | 4 | 1 | 3 |
| Embu East | 7 | 5 | 2 | 9 | 19 | 7 | 3 | 4 |
| Mbeere South | 14 | 11 | 3 | 16 | 40 | 14 | 4 | 10 |
| Embu North | 4 | 3 | 1 | 7 | 9 | 4 | 2 | 2 |
| Total Sample Size by Gender | 39 | 30 | 19 | 47 | 109 | 39 | 13 | 26 |
| Total Sample Size | 39 | 39 | | 156 | | 39 | 39 | |

### 3.5 Research instruments

The study used questionnaires, document analysis guide and observation schedule to collect data. Mugenda and Mugenda (2003), assert that a questionnaire is a well-planned written guideline which addresses specific research objectives or research questions with aim to obtain information from respondents about population of study. Gathii, Wamukuru, Karanja, Muriithi

and Maina (2019) opined that a questionnaire is a data collection instrument consisting of a series of questions to be filled in writing for the purpose of obtaining information from the respondents which aim to address research objectives. The researcher used unstructured (open-ended), structured (closed-ended) and partly contingent (both closed-ended and open-ended) questionnaires to gather information from the respondents. This was helpful in getting information important about the population.

Unstructured or open-ended questionnaires offered respondents opportunity to respond freely by using their own words. The questionnaires had 2 unstructured items for headteachers to get information on dependent variables of internal efficiency indicators of completion, transition, retention and graduation rates particularly on number of children enrolled and completed ECE classes from year 2014 to 2020, retention of children from year 2014 to 2020 and number of children who graduated in ECE classes from year 2014 to 2020. In addition, 5 closed ended questionnaires were used for headteachers to get demographic information.

Further, 12 contingency questionnaires were used for headteachers to get data on work experience, integration of ECE, availability of physical infrastructure such as kitchen; toilets; clean water for drinking and washing; low participation rates due to inadequacy of classes, qualification of ECE teachers, low participation rates due to inadequacy of ECE teachers, acquaintance with ECE curriculum support materials, purchase of ECE curriculum materials, lack of participation due to inadequate instructional materials, PTR in ECE

and congestion due to level of PTR. This enabled the researcher to predict the level of participation rates in ECE schools. The questionnaire for headteachers is captured in Section A, B, C, D, E and F and in Appendix III. Section F in particular captured internal efficiency indicators of completion, transition, retention and graduation rates in ECE.

Questionnaire for ECE teachers was used to get information on mainstreaming of ECE and its influence on internal efficiency. 3 unstructured items were used for ECE teachers to get information on number of classes and toilets for both boys and girls and the enrolment of ECE, ways of getting instructional materials, pupil-teacher ratio in ECE classes and how it aids promotion of children to standard one. In addition, 10 contingency questionnaires were used for ECE teachers to get data on availability of drinking water for ECE, availability of spacious classroom, professional qualification and how it aids in delivery, adequacy and quality of instructional materials, mode of obtaining instructional materials, enrolment of ECE and progression of ECE children. Hence, the questionnaire had both closed-ended questions, where the closed-ended questions restricted respondents to direct responses without further explanations. While open-ended views allowed a brief explanation of the options in the closing questions. The questionnaires had four sections (A, B, C & D) providing questions based on the objectives of the study. ECE teacher's questionnaire is captured in Appendix IV to give information on ECE teacher's demographic data, mainstreaming of ECE aspects of physical infrastructure, teacher professional qualifications, instructional materials,

pupil-teacher ratio and their influence on internal efficiency in public primary schools.

Primary teacher questionnaire aimed to get information on mainstreaming of ECE and its influence on internal efficiency. This was done by use of 4 unstructured questionnaires which sought information on availability of instructional materials, enrolment and pupil-teacher ratio in their respective classes with the aim to get ideas on how primary classes' pupil-teacher ratio may have been influenced by ECE pupil-teacher ratio as they progress to other classes which can influence internal efficiency in schools. In addition, 6 structured questionnaires sought information on professional qualification and performance in KCPE.

This was in view to get information on whether ECE laid strong foundation for other classes which can be deduced from KCPE performance. Further, 5 contingency questionnaires sought information from primary teachers on suitability/attractiveness of standard one classes for ECE, adequacy of physical infrastructures, adequacy of teachers in handling transiting ECE children, adequacy of instructional materials, pupil-teacher ratio in their classes. The information was helpful in identifying cases of teachers who may be finding it difficult to handle transiting children which may require additional training to be advocated to primary teachers to enable smooth transition of ECE children and children in other grades. Therefore, questionnaire for primary teachers covered the physical infrastructure in section A. Part B; sought for information related to teacher professional

qualifications in ECE's influence on internal efficiency in public primary schools. Part C; comprised of questions related to influence of provision of ECE instructional materials on internal efficiency in public primary schools. Part D; comprised of questions on how pupil-teacher ratio in ECE influences graduation rates in public primary schools. Therefore, questionnaires for teachers were captured in Appendix V.

Elo, Kääriäinen, Kanste, Pölkki, Utriainen and Kyngäs (2014) noted that qualitative documentary analysis guide is used in analysis of qualitative data which becomes a reality when it is credible, dependable, confirmable, transferable and authentic. Hence, scrutiny of trustworthiness through preparation, organization and reporting of results is of great worth. The researcher used content analysis to draw inferences from textual materials through classification, tabulation and evaluation of texts. The information from documentary analysis guide was useful for triangulation of data. Therefore, information got from documentary analysis guide was added to the one got through the use of questionnaires and observation schedule with the aim to give a more comprehensive and accurate information on mainstreaming of ECE and its influence on internal efficiency in public primary schools. Love, Stage and Kathleen (2003) opined that content analysis of existing documents or "texts" is one of the central sources of qualitative data. According to Mugenda and Mugenda (2003) content analysis aims to study existing documents in order to determine factors that explain a specific phenomenon. Gathii et al (2020) assert that content analysis through classification, tabulation and evaluation of its key symbols and themes

ascertain its meaning and probable effects drawn from inference by systematically and objectively identifying special characteristics of messages. Further, they viewed content analysis aids in making inferences about the content of a recorded text which are used to analyse textual information.

Observation schedule entails gathering data through vision as its main source (Sarantakos, 2013). Kawulich (2015) asserts that observation is a systematic description of the events, behaviours, and artefacts of a social setting. Observation schedule is utilized to record what a researcher anticipates observing during data collection (Orodho, 2009). Under observation method, the information is sought by way of investigator's own direct observation without asking from the respondents which helps in eliminating subjective bias if observation is done accurately (Kothari, 2004). The researcher used observation schedule to check availability of boys and girls toilets, classes which are well ventilated, water point, sports facilities, electricity, furniture in good condition, strong tall fence, playground and large compound and observed activities attached to the presence of these infrastructures. The level of availability and activities observed due to presence of respective infrastructure helped the researcher in making inferences on adequacy for participation rates of children during learning while at school. This was concluded depending on the frequency on likert scale based on rating as adequate, undecided, inadequate and very inadequate. Observation schedule helped the researcher get extra data beside what was obtained by use of questionnaires and document analysis guide which helped in triangulation of data.

Triangulation in this case refers to use of multiple methods of data sources in qualitative research with the aim to develop a comprehensive understanding of phenomena. Hence, triangulation is viewed as a qualitative research strategy to test validity through the convergence of information from different sources. Therefore, there are four types of triangulation namely investigator triangulation, theory triangulation, data source triangulation and method triangulation (Carter, Bryant, Lukosius, DiCenso, Blythe & Neville, 2014). Heale and Forbes (2013) assert that triangulation is the use of more than one approach to researching a question with the objective to increase confidence in the findings through the confirmation of a proposition using two or more independent measures. Hence, the combination of two or more rigorous approaches provides a more comprehensive picture of the results than either approach could do alone. In this study triangulation applied to use of document analysis guide, observation schedule and questionnaires as data sources.

### 3.6 Validity of the instruments

Validity is defined as the accuracy and meaningfulness of inferences, which are based on the research results (Heale & Twycross, 2015). Validity is the degree to which results obtained from the analysis of the data actually represents the phenomena under study. In this study, content validity was considered. Content validity is the extent to which the sample items on the instrument provides adequate coverage on the topic under study (Zamanzadeh, Ghahramanian, Rassouli, Abbaszadeh, Alavi-Majd & Nikanfar, 2015).

The content-related validity of the instruments was determined by giving the questionnaire to the respondents during the piloting time. The researcher then went through the filled-in questionnaires to check the responses to each item. Where irrelevant responses were given, the researcher modified the question and used simple and unambiguous language. The modification of tools in terms of language used in the tool enabled the respondents to give appropriate responses during the main study.

For the face validity which seeks to check whether the test appears (at face value) to measure what it claims to, the researcher used the supervisors, colleagues in the class and other lecturers who are expert in early childhood. In this case they were asked to rate the suitability of the instruments against the objectives of the study by indicating whether the instruments were adequate or inadequate. All the three instruments that is questionnaire, document analysis guide and observation schedule were rated by the supervisors, and colleague students as highly adequate to measure what the study intents to measure. In the process of data collection, triangulation of information from different research methods, techniques and sources was also done to verify the responses got from one set of respondents. For instance, the observation schedule was conducted to verify information obtained through the questionnaires. The standardization of the instrument was done by comparing the items in the instruments of this study against the items in instruments tools used by other researchers in the areas of study. Through the comparison, the researcher modified some instruments and aligned them with

items used by other researchers in ECE discipline to suit the intention of the research objectives.

Piloting for documentary analysis guide, questionnaire and observation schedule was carried out in 5 public primary schools which were not included in the main study. With permit letters from the University of Nairobi, NACOSTI, Embu County Director of Education, Sub county directors of education, the researcher approached the headteachers in each of the five piloting schools and explained to them the purpose for the study. With headteachers' permission, introduction letter was issued to each of the selected respondents for piloting. Then consent forms for signing were given and any question asked for clarity on the questionnaires was answered by the researcher. Questionnaire for headteachers was issued to 5 public primary headteachers for filling up. Questionnaire for ECE teachers was issued to 5 ECE teachers for filling up. Questionnaires for primary teachers were given to 20 primary teachers for filling up. The researcher requested for school documents which were written on a list from the headteachers for the purpose of content analysis and further sought permission to have observation schedule on school infrastructure and activities attached to them. This was done during break time, lunch break, class time, and during 4 o'clock break time. The researcher was committed throughout the day. Piloting took 10 days. After all the questionnaires were filled up, the researcher collected them and analysis was done systematically. After screening filled up questionnaires to make sure that all questions were answered, the researcher used content analysis strategy to analyze what was observed, extracted from document and from open ended

questions. Closed ended questions were coded and numbers assigned to the responses. The same exercise was repeated after a week and the results from the two pilot studies were correlated by use of Pearson product moment correlation coefficients which yielded 0.78 correlation coefficient of reliability which meant that the two results were highly associated. Hence, the instruments were valid to be used in the main study.

### 3.7 Reliability of the instruments

Reliability, according to Orodho (2005), refers to the degree to which a particular measuring procedure gives similar results over a number of repeated trials. According to Mugenda and Mugenda (2003), test-retest reliability of data involves administering the same instrument twice to the same group of subjects. The reliability test for the questionnaires was done using test-retest method. In this case, the questionnaires were given to the pilot respondents to fill, and then after a week, the same questionnaire was again given to the same respondents. The Pearson correlation coefficients were used to measure the reliability of 20 questionnaires. This is as presented in the following formula

$$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

After the data for the two tests was collected, it was fed to SPSS to test the reliability of the instrument. This was done by use of Cronbach Alpha model. After testing, the instrument yielded a value of 0.89; this implies that the instruments were highly reliable as noted by Orodho (2009) who opined that a correlation coefficient (r) of about 0.7 should be considered high enough to judge the reliability of the instrument.

However, to test the reliability of the one content analysis and one observation schedule, the Spearman-Brown formula was used. This is as shown in the formula below

$$n_1 = \frac{2r_{\frac{11}{22}}}{1 + r\frac{11}{22}}$$

Through this formula, the content analysis gave a score of 0.84 and observation schedule a score of 0.78. This implies that the two instruments were consistent enough to measure what they were supposed to measure.

### 3.8 Data collection procedures

According to Orodho (2009), it is advisable to request a letter of approval from the institution or government department certifying that the researcher has approval to carry out the study. Thus, a research permit to conduct the study was obtained from the National Commission for Science Technology and Innovation (NACOSTI) which was presented to the County Director of Education, Embu, Kenya. The researcher then obtained permission letters from each of the sub-county directors of education to carry out research in schools in their sub-counties. With this permit and the letters from county and sub-county directors of education, the researcher visited the selected schools in preparation for data collection.

On the day of data collection the researcher visited the selected schools. This was done per sub county starting from schools in Mbeere North sub County. The headteachers were approached and briefed about the purpose of the study. The researcher informed the headteacher that the respondents to participate in

the study were headteachers, primary teachers and ECE teachers. The researcher requested the headteacher to inform the teachers and ECE teachers about the study and organize them to participate in the study during break, lunch and games time. The researcher gave each respondent introduction letter to show the purpose for the visit which they read and asked clarity where they felt the need. This was followed by the researcher giving respondents consent form to fill in freely. Researcher also asked respondents to ask for clarity where they felt the need. After reading the introduction letter and filling in consent form, the researcher collected the consent forms. Then, the researcher explained to headteachers, primary teachers and ECE teachers that they were not to write their names and name of schools on questionnaire papers for confidentiality purposes. The researcher asked the respondents to answer questions freely and sincerely for the purpose of the research and to ask for any clarity on the questionnaire. The questionnaires were to be returned after being filled and in case of questions the researcher was within the school compound and was ready to respond to any question raised to ensure that all questions were answered. The researcher requested the headteacher for permission to access the school documents to collect data through document analysis. These were admission register, staff attendance registers, inventories, personnel records, store ledgers, examination records, log book and learner attendance register.

The researcher filled required data on documentary analysis guide on enrolment of children, total number of teachers, ECE instructional materials, staff present in school, performance at KCPE, daily turn up of teachers and

performance of children. The analysis of document was done based on five point likert scale as 1-very adequate, 2- adequate, 3- not sure, 4- inadequate and 5-seriously inadequate. The researcher did document analysis while waiting for the questionnaires to be filled. The researcher requested the headteachers for permission to have observation of activities due to presence of physical infrastructure for instance children visit to the toilets, children washing hands on water point, use of wheels on playground, writing and reading in a well lit room, working with ease and comfort at tables and chairs, protection due to presence of strong tall fence and easy movement of children in the compound during break periods. The researcher ensured that all the items in the questionnaires were responded to before collection. This process continued until all the selected schools were covered in regard to collecting data from all sampled respondents.

To conduct the research, the researcher used two days in each of the sampled schools to collect the data. The research activity was made easier through the assistance of researcher's colleague who helped in issuing questionnaires and also helped in driving the researcher to all the study schools. It was difficult to photocopy the documents for future use since the documents were very official, and no opportunity of photocopying facilities because many schools could not afford to have not even one photocopying machine. Therefore, the researcher took photos of contents in the documents for future reference.

**3.9 Data analysis techniques**

In order to analyse data collected with a view to making deductions and inferences, data was classified, categorized and analysed in accordance with

study objectives. Both qualitative and quantitative data analysis techniques were used. This was done since each data type (qualitative and quantitative data) have their own unique way of data analysis as presented in the section below;

### 3.9.1 Qualitative data analysis

Qualitative analysis of questionnaires administered to primary headteachers, ECE teachers and primary teachers, documentary analysis guide and observation schedules involved a process of data editing, coding, classification, and identifying key themes and sub-themes (Ohmann, Canham, Banzi, Kuchinke & Battaglia, 2018). Content analysis was used to analyse the responses from the open-ended questions on the questionnaire and data collected from observation and document analysis guide. Therefore, themes were identified and assigned codes, followed by classification of themes. Themes were then integrated and coding helped generate new ideas and gathered materials by topic which helped in management of data. The information collected from document analysis were interpreted by the researcher to give voice and meaning around an assessment topic (O'Leary, 2013). This incorporated coding content into themes. To analyse data got from open-ended questionnaires, document analysis guide and observation schedule, data collection and analysis occurred concurrently since data was analysed focusing on themes identified by means of coding to create categories. There was merging of codes as a result of the new information gathered during the process of analysis which enabled to construct themes and to see whether they relate to each other within the data. This led to the

formation and analysis of themes. Mugenda and Mugenda (2003) noted that in qualitative analysis data is analysed in a systematic manner in order to come to conclusion and recommendations.

### 3.9.2 Quantitative data analysis

The quantitative data collected were analysed using descriptive and inferential statistics with the help of Statistical Package for the Social Sciences (SPSS) version 24. The descriptive statistics included percentages, frequencies, standard deviation and mean (Ho & Yu, 2015). To obtain these descriptive statistics the coded data in SPSS was analysed. Tables containing percentages, frequencies, standard deviation and mean as per the variables selected were produced (Landau, 2019; Arkkelin, 2014; Mishra, Pandey, Singh, Gupta, Sahu, & Keshri, 2019). The inferential statistics used correlation and Chi-square test of association to establish significance of status of physical infrastructure, teacher professional qualifications, ECE instructional materials, pupil-teacher ratio in ECE and internal efficiency in public primary schools.

Pearson's Coefficient of correlation, according to Best and Kahn (2016) can be worked out as follows:

$$\rho = \frac{\sum \left(X_i - \bar{X}\right)\left(Y_i - \bar{Y}\right)}{n \cdot \sigma_X \cdot \sigma_Y}$$

The coefficient value $\rho$ of Pearson Correlation is between -1 and +1. The negative coefficient value shows there is a negative correlation between the two variables. The positive coefficient value shows a positive correlation between the two variables. When the coefficient value is at zero it shows that there is no correlation between the two variables. The perfect positive

correlation is indicated by +1 and perfect negative correlation is indicated by -1. This implies that the 100% variations in the dependent variable (Y) are explained by the variation in independent variable (X). According to Best and Kahn (2006) the coefficient value nearer -1 or +1 shows high degree of correlation between the two variables. In SPSS click Analyse > Correlate > Bivariate. Select the variables and move them to the Variables box. In the Correlation Coefficients area, select Pearson. In the Test of Significance area, the significance test of 0.05 was selected two-tailed.

The Chi-Square statistic was used to evaluate Tests of Independence when using cross tabulation (also known as a bivariate table) .Cross tabulation presents the distributions of two categorical variables simultaneously, with the intersections of the categories of the variables appearing in the cells of the table. The Test of Independence assesses whether an association exists between the two variables by comparing the observed pattern of responses in the cells to the pattern that would be expected if the variables were truly independent of each other. Calculating the Chi-Square statistic and comparing it against a critical value from the Chi-Square distribution allows the researcher to assess whether the observed cell counts are significantly different from the expected cell counts.

The calculation of the Chi-Square statistic is as shown below

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

Where $f_{or}$ = the observed frequency (the observed counts in the cells) and $f_e$ = the expected frequency if NO relationship existed between the variables.

As depicted in the formula, the Chi-Square statistic is based on the difference between what is actually observed in the data and what would be expected if there was truly no relationship between the variables.

The Chi-Square statistic appears as an option when requesting a cross tabulation in SPSS. The output is labelled Chi-Square Tests; the Chi-Square statistic used in the Test of Independence is labelled Pearson Chi-Square. This statistic can be evaluated by comparing the actual value against a critical value found in a Chi-Square distribution (where degrees of freedom is calculated as # of rows – 1 x # of columns – 1), but it is easier to simply examine the *p*-value provided by SPSS. To make a conclusion about the hypothesis with 95% confidence, the value labelled Asymp. Sig. (which is the *p*-value of the Chi-Square statistic) should be less than .05 (which is the alpha level associated with a 95% confidence level).

Is the *p*-value (labelled Asymp.Sig.) less than .05? If so, we can conclude that the variables are not independent of each other and that there is a statistical relationship between the categorical variables. The statistical test was found to be relevant for the study because it helped in providing understanding and interpretation of relationship between the variables under the study.

### 3.10 Ethical considerations

In conducting this research, the researcher got research authorization letter from the University of Nairobi, School of Education, department of Educational Management, Policy and Curriculum Studies which enabled the researcher to obtain research authorization permit from National Commission for Science, Technology and Innovation (NACOSTI) to enable conduct the study. The researcher presented the NACOSTI letter to the Embu County Director of Education who issued research authorization letter which was presented to the five sub county directors of education who also issued their research authorization letters which enabled researcher to visit the sampled schools in their respective sub counties. In each sampled primary school, the researcher presented all the eight authorization letters to the headteachers who allowed the researcher to discuss with them the main purpose of visiting their schools. Having obtained permission from the headteachers to use their schools for the study, the researcher issued respondents with consent forms to sign after thorough explanation of the importance attached to it. The researcher explained to them that they were free to sign or not the consent forms. In addition, the researcher assured the respondents confidentiality and anonymity which was ensured during coding responses. Then, the researcher gave introductory cover letter for the questionnaire which contained explanation on aims of the study. The researcher asked permission from the sampled schools' headteachers to use school documents which were enlisted on a piece of paper. In addition, further permission was sought from headteachers to allow the researcher conduct observation schedule in their

schools. Hence, research adhered to principles of behaviours that ensured what is legally, morally and culturally acceptable by respondents and government agencies were practised during the course of the research.

### 3.10.1 Informed consent and voluntary participation

The respondents who were willing to participate in the study were given informed consent forms to fill in order to be involved in the research study. The researcher facilitated the process of filling informed consent forms after the respondents had fully understood the nature of their involvement in the research, including time commitment, type of activities, issues they would be asked to comment about or discuss and the envisaged risks for participating in the research. When seeking consent for this study, the researcher did not compel respondents to sign the informed consent form. Therefore, participation of primary headteachers, primary teachers and ECE teachers was voluntary. The researcher explained to the respondents during the filling of the consent forms that they were free to withdraw from the study at any point. The informed consent was important since it offered sufficient information to respondents about the study.

### 3.10.2 Confidentiality and anonymity

Another ethical consideration made in this study involved protecting the identities of the respondents. This entailed masking the identities and protection of confidentiality, secure storage and restricting of access to the data. The researcher undertakes to seek permission of the respondents for any

subsequent use of data. Moreover, the researcher will destroy all raw data when analysis and reporting is complete.

# CHAPTER FOUR

# DATA PRESENTATION, INTERPRETATION AND DISCUSSION

## 4.1 Introduction

In this chapter, data presented, interpreted and discussed is drawn from questionnaires, documentary analysis guide and observation schedule. The data is aimed at addressing the key purpose of the study, which is assessing how mainstreaming of pre-primary section into primary school influences internal efficiency. Specifically the following key themes were addressed: physical infrastructure; teacher professional qualifications; provision of instructional materials and pupil-teacher ratio in pre-primary section as main aspects under mainstreaming pre-primary into primary schools and how each influences participation, promotion and graduation rates as key indicators of internal efficiency in public primary schools.

## 4.2 Questionnaire return rate

There were three types of questionnaires, for the primary school headteachers, teachers, and pre-primary school teachers. All the 39 headteachers, 39 pre-primary teachers' and 156 primary teachers' questionnaires were administered. However, the questionnaire return rate was 36(92.3%) for pre-primary schools out of 39, 145(92.9%) for primary teachers out of 156 and 37(94.8%) for headteachers out of 39. The questionnaire return rate is summarized in Table 4.1

**Table 4.1: Questionnaire return rate**

| | Category | Frequency | Out of | Percentages |
|---|---|---|---|---|
| Response | Pre-primary | 36 | 39 | 92.3 |
| | Primary teachers | 145 | 156 | 92.9 |
| | Headteachers | 37 | 39 | 94.8 |
| **Total** | | **218** | **234** | **100** |

From table 4.1, demographic information entails status of schools that participated in this study, age, gender, academic qualification and experience of primary and pre-primary school headteachers and teachers.

### 4.3 The study schools

All the 39 pre-primary schools visited were distributed in the five sub-counties of Embu County as follows; Mbeere North and South 10 and 14 pre-primary schools respectively. Embu North, East and West had 4, 7 and 4 pre-primary schools respectively. The pre-primary schools are attached to public primary schools. The visited pre-primary schools had only one classroom with pre-primary 1 and 11 combined. Only a few pre-primary schools had classrooms partitioned in situations where the number of children was more. The average number of teachers in each pre-primary class was one without counting temporary employed teachers. Most of the schools had rural catchment area and a few urban from where they got their pre-primary children. A brief description of schools visited is provided in the Table 4.2

**Table 4.2: Status of schools that participated in the study**

| Sub counties | No of visited schools | Location | Teachers | Feeder Area | Mainstreaming Status |
|---|---|---|---|---|---|
| Mbeere North | 9 | Rural | 45 | Rural | Pre-primary attached to primary schools |
| | 1 | Urban | 5 | Rural and Urban | |
| Embu North | 3 | Rural | 15 | Rural | Pre-primary attached to primary schools |
| | 1 | Urban | 5 | Rural and Urban | |
| Mbeere South | 12 | Rural | 60 | Rural | Pre-primary attached to primary schools |
| | 2 | Urban | 10 | Rural and Urban | |
| Embu West | 3 | Rural | 15 | Rural | Pre-primary attached to primary schools |
| | 1 | Urban | 5 | Rural and Urban | |
| Embu East | 6 | Rural | 30 | Rural | Pre-primary attached to primary schools |
| | 1 | Urban | 5 | Rural and Urban | |

Table 4.2 shows the sub counties where the study schools were selected from, number of rural and urban schools visited number of teachers who were the main respondents (primary headteachers, primary teachers and pre-primary teachers), feeder areas and mainstreaming status. Schools in urban areas were

well staffed compared to schools in rural areas. All the primary schools visited had pre-primary section attached to them and both of them were under the same administration and management. This implies that all the study schools were already mainstreamed.

Data on age, gender, academic qualifications and teaching experience of the primary and pre-primary school teachers and headteachers in the sampled schools was collected. This was in view to establish whether the demographic information played any role on participation, promotion and graduation rates in children which are aspects of internal efficiency. Amadi and Allagoa's (2020) study findings showed that there was significance influence of age, educational qualification and years of teaching experience with teacher's delivery effectiveness in secondary schools in Rivers State in Nigeria. The findings contradicts Morayo (2015) study findings which showed none of the demographic variable of gender, qualification and years of experience had any significance relationship with the teachers' interaction patterns in their classrooms in Nigeria. A study conducted in Kenya by Avoga (2020) found that demographic factors such as age influenced parents' perception of the role of male teachers in pre-schools.

### 4.3.1 Gender of the teachers and headteachers

The gender of teachers and headteacher's was sought with the aim to establish their distribution across the sample schools. The distribution by gender is as presented in Table 4.3.

**Table 4.3: Gender of the teachers and headteachers**

| Gender | Pre-primary Teachers | | Primary teachers | | Headteachers | |
|---|---|---|---|---|---|---|
| | F | % | F | % | F | % |
| Male | 16 | 44.5 | 99 | 68.3 | 21 | 56.8 |
| Female | 20 | 55.5 | 46 | 31.7 | 16 | 43.2 |
| Total | 36 | | 145 | | 37 | |

According to the results in table 4.3, majority 20(55.5%) of pre-primary teachers were female. Majority 99(68.3%) of primary teachers were male, while 21(56.8%) of the headteachers were male. This implies that male teachers dominate in primary schools in sampled schools while in pre-primary schools female teachers dominate. The current study finding mirrors the work of Xu (2019) who argued that there is need for increased representation of male ECE teachers in ECE schools in China.

According to a study done in Kenya by Ngure (2014), ECE schools had few male teachers compared to female who were majority which does not go hand in hand with educational and development policies such as Kenya Vision 2030 social pillar which advocates for a just and cohesive society which enjoy equal social wellbeing for instance education; Constitutions of Kenya 2010 chapter 4:19 (2) which states that there is a purpose to preserve the dignity of individuals and promote the realization of the potential of all human beings; Gender policy in education 2007 3.1.2 which through National policy on gender and development provides framework for the state to reduce gender imbalance and inequality whereby the government is mandated to address

gender inequalities through establishment of institutional frameworks. According to Mukuna's (2011) study findings, culture is the main determinant of feminization of preschool teaching profession in Kenya and that men get interested in pre-school education for administrative purposes and not necessarily to teach.

### 4.3.2 Age of the teachers

The study sought to establish the age of the teachers with the aim to establish whether internal efficiency was contributed by teachers' age. The results are as presented in Table 4.4

**Table 4.4: Age Brackets of the teachers**

| | Pre-primary | | Primary teachers | | Headteachers | |
|---|---|---|---|---|---|---|
| | F | % | F | % | F | % |
| 21-30 years | 3 | 8.3 | 77 | 53.1 | 5 | 3.4 |
| 31-40 years | 18 | 50 | 45 | 31.0 | 21 | 14.5 |
| 40 years and | 15 | 41.7 | 23 | 15.8 | 11 | 7.6 |
| Total | 36 | | 145 | | 37 | |

Table 4.4 shows that majority 18(50%) of pre-primary school teachers were aged between 31-40 years. Further, majority 77(53.1%) of the primary teachers were aged between 21-31 years. Finally, majority 21(14.5%) of primary headteachers were aged between 31-40 years. This implies that pre-primary teachers in study schools were able to deliver efficiently in classes since most of them were in productive age which enhances internal efficiency in pre-primary schools. This is the age when most of the teachers are already

mothers and are able to handle small children which is likely to increase participation, promotion and graduation rates in children. These study findings agree with Yang's (2014) study findings which showed that mature age of teachers are a neccesary requirement for the normal function of a teaching-learning process that takes place in a school education system for greater efficiency. These study findings contradict findings by Ngigi's (2015) study which revealed that above two thirds of ECE teachers ranged between age 21 and 25 years which help teachers in being dynamic inpromoting internal efficiency in ECE schools in Kenya.

### 4.3.3 Academic qualification of teachers

The study also sought to establish the highest academic qualification of the teachers which aimed to establish whether internal efficiency depended on qualification of teachers. The distribution of the teachers by academic qualification is presented in Table 4.5

**Table 4.5: Teachers' academic qualifications**

| | Pre-primary | | Primary teachers | | Headteachers | |
|---|---|---|---|---|---|---|
| | F | % | F | % | F | % |
| O-level | 3 | 8.3 | 5 | 3.4 | 0 | 0 |
| Certificate | 12 | 33.3 | 34 | 23.4 | 0 | 0 |
| Diploma | 10 | 27.8 | 66 | 45.5 | 12 | 32.4 |
| Degree | 5 | 13.9 | 30 | 20.7 | 13 | 35.1 |
| Masters | 6 | 16.7 | 10 | 6.9 | 12 | 32.4 |
| Total | 36 | | 145 | | 37 | |

As presented in Table 4.5, the results show that majority 12(33.3%) of pre-primary school teachers had certificate level. Additionally, majority 66(45.5%) of primary teachers had diploma. Finally, majority 13(35.1%) of

headteachers had degree. Further, the responses of pre-primary teachers 18(50%) confirmed that they had certificates as their highest qualification level. In addition, responses of primary teachers indicated that PP1, PP11 and primary teachers were highly qualified as shown by majority 9(25%), 6(16.7% and 10(27.8%) primary teachers respectively. This implies that most of pre-primary teachers had only certificate which implied that the qualification was adequate to handle small children. Additionally, the results show that pre-primary teachers were well qualified since a good number had diploma which enabled them to teach adequately contributing to promotion of children to the next level (pre-primary to primary). These study findings concur with Innocent, Harcourt and State's (2018) study which revealed that higher educational qualification has great positive influence on internal efficiency in secondary schools in Nigeria. Findings from a study conducted in Ghana by Ntumi (2016) revealed that teachers receive inadequate training which results to low participation rates, however the current study shows that teachers were well trained with majority of them having diploma which helps in classroom teaching and learning.

### 4.3.4 Teaching experience of teachers

The length of service of the teachers was also of interest to the researcher to know the number of years the teachers had been teaching in their various stations as shown in Table 4.6.

**Table 4.6: Length of service by teachers**

| | Pre-primary Teachers | | Primary teachers | | Headteachers | |
|---|---|---|---|---|---|---|
| | F | % | F | % | F | % |
| 1-10 years | 7 | 19.4 | 65 | 44.8 | 9 | 24.3 |
| 11-20 years | 12 | 33.3 | 45 | 31 | 13 | 35.1 |
| 21-30 years | 10 | 27.8 | 20 | 13.8 | 8 | 21.6 |
| Above 30 years | 8 | 22.2 | 15 | 10.3 | 7 | 18.9 |
| Total | 36 | | 145 | | 37 | |

Findings in table 4.6 show that majority 12(33.3%) of pre-primary school teachers had worked for 11-20 years. About, 65(44.8%) of the primary teachers had worked for 1-10, while, 13(35.1%) of the headteachers had worked for 11-20 years. This implies that majority of pre-primary teachers and headteachers have taught and managed their respective schools for 11-20 years, thus they have gained good experience to enable them teach and manage their classes and schools leading to improved promotion rates in pre-primary schools. These study findings concurs with Mwaniki's (2015) study findings which revealed that preschool teachers had taught for 8-15 years which helped teachers become conversant with problems encountered by ECE children during learning which hindered schools from being efficient. Similarly, Nyarirwehi and Atuhumuze's (2019) study revealed that in Uganda majority of the ECE teachers with diploma had taught for 11-15 years but the teachers who had served long had taught for 16-20 years which improved internal efficiency in schools.

The researcher sought to determine the number of pre-primary teachers with the aim to establish their adequacy for enhancement of promotion rates of children. Table 4.7 presents the study results.

**Table 4.7: Number of pre-primary school teachers**

| | Frequency | Percentage |
|---|---|---|
| 2 Teachers | 20 | 54.1 |
| More than two teachers | 17 | 45.9 |
| Total | 37 | 100 |

As indicated in table 4.7, majority 20(54.1%) of headteachers indicated that they had two pre-primary school teachers. This implies that majority of the sampled schools had two pre-primary school teachers. Additionally, this implies that pre-primary 1 and 11 existed in primary schools to cater for different ages which enhanced promotion rates in children. This study finding contradicts Wangila's (2017) study which showed that pre-primary schools in Bungoma County in Kenya had high pupil-teacher ratio. According to a study by Ratemo (2016), staffing condition affects the quality of education and that well-staffed preschools have high internal efficiency.

### 4.4 Findings on physical infrastructure in pre-primary schools and its influence on internal efficiency

The researcher sought to determine how pre-primary teachers, primary teachers and headteacher's responses on physical infrastructures' influences internal efficiency aspect of participation rates in pre-primary schools' children.

To address this objective headteachers were asked to indicate how physical infrastructure in pre-primary schools influences participation rates in children The researcher first sought to know whether there is mainstreaming of pre-primary section into primary schools due to presence of infrastructure with the aim to establish closeness of pre-primary to primary schools for greater sharing of resources to increase participation rates in children. The study results were then presented in Table 4.8

**Table 4.8: Mainstreaming of pre-primary section into primary schools due to presence of infrastructure for participation rates in pre-primary children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 27 | 72.9 |
| No | 10 | 27.1 |
| Total | 37 | 100 |

From the results presented in table 4.8, majority 27(72.9%) of the headteachers indicated that they had mainstreamed pre-primary section into primary schools which they run. This implies that mainstreaming has helped the schools know more of content areas connections, challenges faced during participation, promotion and graduation of children hence being able to help children acquire skills which enable them have desirable enrolments which is an indicator of participation rates of children. Also it implies that mainstreaming help in providing a learning environment which support transition, dissolving boundaries among subjects and fostering stronger pupil-

teacher relationships. This study finding disagrees with the findings of the studies by Mghasse and Williams (2016) and Ntumi (2016) who revealed that mainstreaming of ECE had taken place in few schools and teachers were inadequate and that trained teachers in inservice and pre-service consisted of inadequate exposure to comprehensive theory and practice of inclusion. The researcher further sought to find out from primary teachers on adequacy of classes in pre-primary and how it enhances participation rates in children. The study results are presented in Table 4.9

**Table 4.9: Primary teachers' response on adequacy of classes in pre-primary to enhance participation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Strongly agree | 73 | 50 |
| Agree | 56 | 38.9 |
| Undecided | 8 | 5.6 |
| Disagree | 4 | 2.8 |
| Strongly disagree | 4 | 2.8 |
| Total | 145 | 100 |

Study findings in table 4.9 shows that majority 73(50%) of the primary teachers strongly agree that classes in their school are adequate for accommodating those being promoted from pre-primary school. This implies that classes for accommodating transiting pre-primary school children was adequate which enhanced participation rates in children. This study results disagree with a studies conducted by Frimpong (2019), Ngwaru and Oruga (2015), Wokadala, Ogawa, Sharma, Kizito, Mugisha, Komunda and Ssewanyana (2019) and Ngirera (2018) who found that there has been a lot of

overcrowding in ECE schools which was attributed to less and poor infrastructure.

The researcher sought to find out from primary teachers level of adequacy and inadequacy of physical infrastructure and how it enhances participation rates in children. Results are as presented in Table 4.10

**Table 4.10: Level of adequacy and inadequacy of physical infrastructure to enhance participation rates in pre-primary schools' children**

| Infrastructure | Adequate | | Inadequate | |
|---|---|---|---|---|
| | F | % | F | % |
| Latrines/Toilets | 29 | 80.5 | 7 | 19.4 |
| Classes which are well ventilated | 28 | 77.8 | 8 | 22.2 |
| Water point | 25 | 69.4 | 11 | 30.6 |
| Sports facilities | 19 | 52.8 | 17 | 47.2 |
| Electricity | 12 | 33.3 | 24 | 66.7 |
| Furniture | 20 | 55.6 | 16 | 44.4 |
| Strong tall fence | 19 | 52.7 | 17 | 47.2 |

From table 4.10 in regard to independent variable of physical infrastructure in ECE and internal efficiency, majority 29(80.5%), 28(77.8%), 25(69.4%), 19(52.8%), 20(55.6%), and 19(52.7%) of primary teachers indicated that latrines/toilets, classes which are well ventilated, water point, sports facilities, furniture and strong tall fence were adequate respectively. However, study finding showed that majority 24(66.7%) of primary teachers indicated that electricity was inadequate. This shows that most of the physical infrastructure was well provided in most of the study schools which implies that participation rates of children were relatively high. It also implies that electricity was inadequate in most of the study schools implying that inadequacy of electricity could hinder participation rates in children to some

extent. From the observation schedule of pre-primary physical infrastructure, the researcher found that majority 10(28%) of classrooms were adequately well-lit to enable children write comfortably; majority 29(80.5%) of toilets were adequate for the use by the children; majority 20(55.6%) of water points were adequate to enhance hand wash by the children; majority 10(28%) of playground was adequate to enhance use of wheels by the children; majority 12(33.3%) of furniture such as tables and chairs were adequate to enable children work with ease; majority 25(69.4%) of strong tall fence was adequate to give protection of children while being in the school compound and majority 26(72.2%) of compound was adequate to enable children move with ease. This implies that pre-primary schools had some essential facilities and lacked in others which show that participation rates of children to primary was satisfactory due to presence of facilities such as classrooms, toilets, compound and water. This study results disagree with a study conducted in Ghana by Frimpong (2019) and Åström, Björck-Åkesson, Sjöman and Granlund (2020), Ngwaru and Oruga's (2015), and Wokadala, Ogawa, Sharma, Kizito, Mugisha, Komunda and Ssewanyana (2019 who found that there has been a lot of overcrowding in ECE schools which was attributed to less and poor infrastructure. The study findings is in agreement with study conducted in Cameroon by Esongo (2017) and Chepkonga (2017) who found that availability of school resources such as infrastructure is significantly related to efficiency of the school system.

The researcher sought to find out from headteachers availability of kitchen in schools and hpow it enhances participation rates in children. The findings are presented in Table 4.11

**Table 4.11: Availability of kitchen in schools and participation rates in children**

| | Frequency | Percentage |
|---|---|---|
| No | 7 | 8.9 |
| Yes | 30 | 81.1 |
| Total | 37 | 100 |

According to the results in table 4.11, majority 30(81.1%) of the headteachers indicated that their schools had kitchen. This implies that pre-primary children were being served food from the school's kitchen which was likely to improve participation rates in pre-primary children. This study finding contradicts Chepkponga's (2017); Jemutai (2018); Ndirangu, Thinguri & Chui (2016); Githuka (2015); Oduya & Mwangi (2019); Ababa & Debele (2015); Uduku, (2011); Barret, Treves, Ambaz & Ustinova (2019); Yang, 2014); Fasasi & Ojo, 2014); Jeruto & Mutindi, 2017); Ncube (2004) and Tisdell & Glyn, 1992) which showed that majority of ECDE centre had no kitchen which negatively influenced participation rates in children. Similarly, Jemtai (2018); Ndirangu, Thinguri and Chui (2016); Githuka (2015); Oduya and Mwangi (2019); Ababa and Debele (2015); Barret, Treves, Ambaz and Ustinova (2019) and Ola Uduku's (2009) found that Ghanian pre-primary schools which were carrying out feeding programmes, had not built kitchen to serve the feeding programmes hence children were being served in the classrooms which lowered participation rates in children.

Further, the current study finding agrees with Githuku's (2015) study findings which revealed that schools were able to offer on-site meals since they have a

kitchen where food was served which greatly increased participation rates in ECE children in Kenya.

According to a study by Shaari and Ahmad (2016) and Wong, Weekes, Shaeffer, Young, Bray, Chen, and Lee's (2014) physical environment in ECE such as presence of feeding facilities for example kitchen (nutrition and health) affects children competency and development cognitively and socially.

The researcher sought to find out from headteachers number of available toilets for boys and girls and how it enhances participation rates in children. Results are as shown in Table 4.12

**Table 4.12: Number of available toilets for boys and girls and participation rates in children**

| | **Number of Toilets** |
|---|---|
| Boys | 30 |
| Girls | 33 |

Study results in table 4.12 shows that the number of toilets for Boys was 30 and for girls 33 in all the 37 study schools. This implies that most of the observed schools had toilet for boys and girls and a few of them shared toilets with primary schools which implies that to some extent toilets for both boys and girls in pre-primary schools were inadequate. This further implied that there were favorable participation rates in pre-primary schools. This study results agrees with a study by Kharemwa (2017) who found that parents had positive attitude towards pre-primary infrastructural development such as separate toilets for boys and girls in Kenya. The current study findings

contradict Amollo's (2018) study findings which revealed that sanitation were not factored in the design and budgetary allocation for ECE infrastructural facilities which hindered participation rates in ECE schools in Siaya County, Kenya. From the observation schedule, children's visit to the toilet after every twenty minutes was rated as adequate as shown in 29(80.5%) of observations which meant that toilet for boys and girls enhanced participation rates in ECE schools. Similarly, the findings agree with the findings of the study in Ethiopia by Chakacha, Ihu and Dakora (2016) who found that most pre-primary schools have inadequate toilets which hinder participation rates in ECE schools. According to a study by Rasto (2015), children in queue for a long time waiting for each other at the latrines which affect participation rates of children.

In addition the researcher sought to find out from the headteachers the availability of water for drinking and washing of hands and how it enhances participation rates in children in pre-primary schools. These findings are presented in Table 4.13

**Table 4.13: Availability of water for drinking and washing of hands in pre-primary school section and participation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 29 | 78.4 |
| No | 8 | 21.6 |
| Total | 37 | 100 |

Table 4.13 study results revealed that majority 29(78.4%) of the respondents indicated that their schools had clean water for drinking and washing hands in their pre-primary section. From the responses of pre-primary teachers in table 4.8, majority 20(55.6%) of them indicated that clean tap water for drinking and washing is available in pre-primary schools. This implies that children were able to be clean even after visiting toilets which is likely to minimize chances of contracting diseases such as worms and other contagious diseases which implies that they do not stay away from school many times hence increasing participation rates in children. From the document analysis, it is indicated that 12(33.3%) of the schools had adequate enrolment of children which implied that children were well contained in schools due to availability of infrastructural facilities such as water points. These study findings disagree with Ngwaru and Oluga's (2015) and Wokadala, Ogawa, Sharma, Kizito, Mugisha, Komunda and Ssewanyana (2019) who observed that water was scarce which poses most serious obstacle among others to the creation of effective pre-primary school classes which has really affected the internal efficiency in primary schools in Tanzania.

Similarly, Jemutai (2018), Ndirangu, Thinguri and Chui (2016), Githuka (2015), Uduku (2011), Ababa and Debele (2015), Barret, Treves, Ambaz and Ustinova (2019), and Oduya and Mwangi's (2019) study showed that the main challenges that face the feeding programme in pre-primary schools in Kenya is shortage of clean and safe drinking water which poses danger of poor health to children due to poor hygiene which impact negatively to quality education due to low participation of children in learning. From the observation schedule, the

observed activities of children washing hands at a water point after every twenty minutes was adequate as shown by majority 20(55.6%) of observed activities which meant that participation rates in ECE was greatly enhanced by availability of water in primary schools. The researcher sought to find out from the headteachers whether number of the available pre-primary classes caused low participation rates in children at any time. The findings of the study is presented in Table 4.14

**Table 4.14: Whether number of the available pre-primary classes caused low participation rates in pre-primary school children at any time to establish level of internal efficiency.**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 20 | 54.1 |
| No | 17 | 45.9 |
| **Total** | **37** | **100** |

Findings in table 4.14 study results shows that majority 20(54.1%) of the respondents indicated that infrastructure such as classes caused low participation rates in pre-primary schools due to congestion caused by combining pre-primary 1 and 11 in the same class. Responses of pre-primary teachers on the number of pre-primary classes showed that 29(80.6%) of them indicated that they had one ECE class. This implies that there were challenges facing teaching and learning which was contributed by inadequate classes. However, results in table 4.10 on responses of primary teachers that classes were adequate implies that their responses could be due to lack of knowledge on policy in regard to the recommended number of pre-primary children per class which is maximum of 25 children. The present study results concurs with

Wangila's (2017) and Brief (2016) study which revealed that the essential facilities such as classrooms are inadequate in ECE schools leading to low participation rates of children in preschools in Kenya. Similarly, Ngwaru and Oruga's (2015) Wokadala, Ogawa, Sharma, Kizito, Mugisha, Komunda and Ssewanyana (2019) who found that ECE facilities were not conducive to learning which resulted to low participation of children in preschools. Further, the study findings agrees with Amollo's (2018) study which showed that although the County government of Siaya, Kenya had constructed 201 classes in ECE centres, there was still a need to construct more classes to enhance participation rates in children. According to a study by Alimi, Ehinola and Alab (2012), Vandenbroeck and Lenaerts (2018) and Barret, Treves, Shmis, Ambasz & Ustinoiva, 2018).physical infrastructures such as classes in a school system are important since they enhance participation though most of schools have limited classes in Nigeria which resulted to low participation rates in children.

The researcher sought to know the number of children in pre-primary classes with the aim to establish whether pre-primary schools had recommended number of children in classes which could enhance desired participation rates in children. The findings of the study are presented in Table 4.15

**Table 4.15: Number of pre-primary pupils in classes to establish participation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Less than 10 pupils | 12 | 33.3 |
| 11-30 pupils | 5 | 13.9 |
| 31-60 pupils | 16 | 44.4 |

| | | |
|---|---|---|
| More than 60 pupils | 3 | 8.3 |
| **Total** | **36** | **100** |

According to table 4.15, majority 16(44.4%) of the teachers indicated that they had between 31-60 pupils. According to class registers, the enrolment in pre-primary schools was rated very adequate as shown in majority 12(33.3%) of analyzed class registers in the study schools. This implies that children in a class were more than the recommended class size of 25 children by the national pre-primary education policy standard guidelines for greater participation (Ministry of Education, 2018). The present study findings disagree with a research conducted in Kenya by Nyakina (2015) who found that there was improvement of the targeted enrolment of 60% in ECE schools which improved internal efficiency. Studies by Erudi and Edabu (2020), Koko (2016), UNESCO (2020), Ajoke (2017), Mupa and Chinooka (2015), Makorani and Muli (2017), Nyakina (2015), Rao, Sun, Wong, Weekers, Shaeffers, Young, Bray, Chen and Lee (2014) & Erukudi and Edabu (2020) showed high enrolment are associated with adequacy of provision of food in ECE schools.

The study also sought to know whether pre-primary school children have failed to participate in their classwork such as modeling which require one square meter due to lack of spacious classroom to establish whether participation rates in children was satisfactory. The study results are presented in Table 4.16

**Table 4.16: Whether pre-primary children fail to participate in classwork due to lack of spacious classrooms**

| | Frequency | Percentage |
|---|---|---|
| Strongly agree | 12 | 33.3 |
| Agree | 13 | 36.1 |
| Undecided | 5 | 13.9 |
| Disagree | 3 | 8.3 |
| Strongly disagree | 2 | 5.6 |
| **Total** | **36** | **100** |

Findings in Table 4.16 shows that majority 12(33.3%) of the pre-primary school teachers strongly agree that children have failed to participate in their classwork such as modeling which require one square meter space due to lack of spacious classroom. This implies that there was congestion of children in pre-primary schools which shows that more classes were needed to be able to avail adequate space for classwork to enhance participation rates in children. This study concurs with studies by Frimpong (2019), Åström, Björck-Åkesson, Sjöman and Granlund (2020) and Amollo (2018).

The study sought to determine relationship between physical infrastructure and participation rates in ECE using Pearson product-moment correlation. The results are as presented in Table 4.17

**Table 4.17: Pearson product-moment correlation results for physical infrastructure facilities and internal efficiency**

| | | Internal Efficiency | Physical Infrastructure |
|---|---|---|---|
| Internal Efficiency | Pearson Correlation | 1 | . 653* |
| | Sig. (2-tailed) | | .018 |
| | N | 37 | 37 |
| Physical facilities | Pearson Correlation | . 653* | 1 |
| | Sig. (2-tailed) | .018 | |
| | N | 37 | 37 |

*. Correlation is significant at the 0.05 level (2-tailed).

As presented in Table 4.17, the results indicate that there is a positive correlation between provision of physical infrastructure in ECE and internal efficiency in public primary schools (r = .653, $n$ = 37, $p$< .05). This suggests that the provision of physical facilities contributes to internal efficiency in terms of participation rates in ECE by 65.3%. Provision of physical infrastructure in the school will allow learners to utilize the infrastructure for both curriculum and co-curricular activities which enhance the participation rate of the learners. This in turn will lead to improved internal efficiencyin public primary schools.This could be attributed to adequate space and availability of physical facilities hence reducing congestion in schools. The participation rate of the learners could be attributed to adequate toilets/latrines, classes which are well ventilated, water points, sports facilities, electricity, furniture, strong tall fence, playground and space, large compound which are

aspects of physical infrastructure which enhances participation rates in pre-primary schools.

### 4.5 Findings on teacher professional qualification and its influence on internal efficiency

The researcher sought to determine how pre-primary, primary and headteachers responses on teacher professional qualifications influences internal efficiency in pre-primary schools. Data on professional qualification entails the following aspects; adequacy of teachers in terms of numbers, professional qualifications level, additional courses on special education and ability to contain children in the class.

The researcher sought to determine the adequacy in terms of number of teachers with the aim to establish whether it is related to promotion and transition rates of children from pre-primary to primary schools. Table 4.18 presents the study results.

**Table 4.18: Adequacy of pre-primary teachers in terms of number of teachers to enhance promotion rates in children**

| | Frequency | Percentage |
|---|---|---|
| Adequate | 17 | 45.9 |
| Inadequate | 20 | 54 |
| Total | 37 | 100 |

From the results presented in table 4.18, majority 20(54%) of the respondents indicated that pre-primary school teachers were inadequate in terms of numbers in Embu county. The researcher through documentary analysis guide found that majority 12(33.6%) of personnel records analyzed showed that the

staff in pre-primary schools was inadequate since the record showed that only one pre-primary teacher was permanently employed despite the high enrolment of children in pre-primary schools. This gave an implication that despite having two teachers in preschools of which one was not permanently employed, they could not adequately handle children in the classroom due to high enrolment of an average of 50 children which contributes to low promotion rates in children. These findings agree with a study in Kakamega South District by Orodho and Lindolo (2014), Ndijuye and Tandika (2019) and Onyango (2016) who found that inadequacy of teachers was due to freeze by the government. According to Achieng (2018), there is a need to find ways of retaining teachers in the profession as this will assist to reduce the expenses of recruiting new teachers and enhance promotion rates in children.

The study also sought to determine whether pre-primary teachers teach children in grade one with the aim to establish whether grade 1 experienced understaffing which could imply less qualified teachers resulting to inefficiency in primary schools. Table 4.19 presents the study results.

**Table 4.19: Pre-primary teachers and teaching lower primary children due to inadequately trained teachers and promotion rates of children**

| | **Pre-primary teachers teaching lower primary** | | **Lower primary teachers teaching pre-primary** | |
|---|---|---|---|---|
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| Yes | 21 | 56.8 | 28 | 75.7 |
| No | 16 | 43.2 | 9 | 24.3 |
| **Total** | **37** | **100** | **37** | **100** |

From table 4.19, majority 21(56.8%) of headteachers indicated that pre-primary teachers teach children in grade 1. In addition, majority 28(75.7%) of them indicated that lower primary teachers do teach pre-primary schools. This implies that in some schools there are is inadequacy of trained teachers which make headteachers request pre-primary teachers particularly those with diploma in early childhood development to teach class one. In addition, this implies that pre-primary school teachers are well trained to teach lower primary classes especially those with diploma in early childhood education. This also implies that there is integration in teaching between pre-primary school teachers and lower primary teachers in most schools which brings meaning to mainstreaming of pre-primary schools.

Additionally, this could imply inadequacy of qualification of teachers in preschools can affect promotion rates and transition rates in children. Demographic data shows that slightly less than a third (27.8%) of pre-primary teachers had diploma which implies that a good number of them could handle class one successfully. The current study findings concurs with Nyarirwehi and Atuhumuze's (2019) study which revealed that in-service teacher training enabled teachers upgrade their academic qualification to make them become better in provision of education to children of primary schools in Uganda. These study findings are in agreement with studies by Majoko (2018), Mupa and Isaac (2015), Wangila (2017) and Brief (2016)who found that there was inconsistency to exposure to comprehensive theory and practice in mainstreamed primary schools.

The researcher sought to determine whether pre-primary school children have experienced low learning participation rates in pre-primary schools due to inadequacy of qualified teachers. Table 4.20 presents the study results

**Table 4.20: Children in pre-primary have experienced low promotion rates in school due to inadequacy of teachers**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 25 | 69.4 |
| No | 11 | 30.6 |
| **Total** | **37** | **100** |

Table 4.20 shows that majority 25(69.4%) of headteachers indicated that children in pre-primary have experienced low promotion rates in school due to inadequacy of teachers. This implies that pre-primary teachers were inadequately qualified which affected promotion rates. From the document analysis, majority 15(41.6%) of staff attendance register in study schools revealed that the staff present in schools were inadequate. This implies that there were low promotion rates of children in schools since teachers were few. This study finding is in agreement with the finding of the study conducted in Kenya by Ratemo (2016) which showed that poorly staffed preschools performed poorly hence low transition rates.

Similarly, Ochanda (2015); Kithungu (2019) and Anekeya's (2015) study finding showed that understaffing was a factor hindering transition rates in primary schools in Kenya. A study by Ntumi (2016) recommended that teachers should be encouraged to participate in seminars symposia, workshops

inter-alia to gain more knowledge and skills for effective teaching to enhance promotion rates of children. This is in agreement with a study conducted in Imenti Central District, Kenya by Mwirigi and Muthaa (2015) who found that high enrolments impacted negatively on efficiency in primary schools.

The study sought to determine whether education helps to have high quality delivery due to adequate qualification of pre-primary teachers in pre-primary class which aimed to establish transition rates of children. Table 4.21 presents the study results.

**Table 4.21: Whether education helps to have high quality delivery in your pre-primary school class due to adequate qualification of pre-primary teachers which fosters promotion rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 32 | 88.9 |
| No | 4 | 11.1 |
| **Total** | **36** | **100** |

Study results in table 4.21 shows that 32(88.9%) of pre-primary teachers revealed that education helps to have high quality delivery in preschool class. This implies that a teacher with adequate qualification has substantial knowledge on content to be delivered which implies that the delivery is of high quality. This study finding agrees with a Ugandan study conducted by Nyarirwehi and Atuhumuze (2019) which revealed that in-service trained teachers who are adequately qualified are motivated to deliver content to satisfaction which yields high efficiency in preschools. This study results

differ with a study by Wangira (2017) and Brief (2018) who revealed that preschool teachers in Kenya were not able to teach efficiently in preschools due to inadequate skills which greatly affected transition rates of children.

The researcher also sought to determine whether they had done any additional course such as on special needs to establish whether they hand adequate skills to enable them teach all children including those challenged children in mainstreamed primary schools for efficient learning. Table 4.22 presents the study results.

**Table 4.22: Whether they had done any additional course on special needs for quality delivery to enhance promotion rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 9 | 25 |
| No | 27 | 75 |
| **Total** | **36** | **100** |

Findings in table 4.22 shows that majority 27(75%) indicated that they had done additional course on special needs education such as diploma in special needs education which help to have high quality delivery in pre-primary schools since special needs children such as physically challenged children in pre-primary schools are taken care of sufficiently along with other children during teaching and learning which enhances promotion rates in children. This study finding contradicts Majoko's (2018) study which revealed that teachers were incompetent in inclusive education which resulted to low internal efficiency in primary schools in Zimbabwe. According to Nazer and

Majlinda's (2020) study in Kosovo, good inclusive practices do exist where teachers have invested in their training and professional development which help in transition of children.

The study sought to know whether primary school teachers were adequately skilled in handling children transiting from pre-primary school to primary school with the aim to establish the success in promotion rates of children. The study results are presented in Table 4.23.

**Table 4.23: Whether primary teachers were adequately trained to handle children transiting from pre-primary school to primary school**

| | **Frequency** | **Percentage** |
|---|---|---|
| Strongly agree | 73 | 50 |
| Agree | 56 | 38.9 |
| Undecided | 8 | 5.6 |
| Disagree | 4 | 2.8 |
| Strongly disagree | 4 | 2.8 |
| **Total** | **145** | **100** |

According to table 4.23, majority 129(88.9%) of primary teachers agreed that they were adequately trained on handling children transiting from pre-primary school to primary school. This implies that transition rate in pre-primary children was satisfactory. This contradicts a study conducted in Kikuyu Kiambu County by Onyango (2016) who found that primary teachers were not adequately prepared to help in smooth transition of preschool to lower primary though there were some efforts being made. Hence, primary teachers suggestions for successful transition of preschool children to lower primary was that either preschools to be in the same compound with primary schools

or let the preschools be very close to primary schools. Additionally, primary teachers suggestions were that teachers and parents to encourage interaction between preschool children and lower primary pupils to enhance transition rates.

Similarly, the findings of this study contradicts findings of a study in Kenya by Mwangi (2016) who found that primary teachers used wrong strategies such as sharing information about children's performance, planning extra-curricular activities with pre-primary teachers and asking for progress records, rare inter-staff communication between pre-primary and primary school teachers, less parental involvement in their children's transition's affairs to primary section.

The study sought to determine the relationship between teacher professional qualifications by use of Pearson product-moment correlation. The results are summarised in Table 4.24.

**Table 4.24: A Pearson product-moment correlation results for teacher professional qualification and internal efficiency**

| | | **Internal Efficiency** | **Teacher professional qualification** |
|---|---|---|---|
| Internal Efficiency | Pearson Correlation | 1 | .672* |
| | Sig. (2-tailed) | | .000 |
| | N | 37 | 37 |
| Teacher professional qualification | Pearson Correlation | .672* | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 37 | 37 |

*Correlation is significant at the 0.05 (2-tailed)

Study finding in Table 4.24 revealed that there is strong positive correlation between teacher professional qualification and internal efficiency in public primary schools (r = .672, $n$ = 37, $p$< .05). This implied that teacher profession qualification influences internal efficiency in terms of promotion rates. This indicated that the more the teachers are qualified, the more the promotion rates which enables high transition rates in children. The results also imply that teacher professional qualification increased promotion rates by 67.2% which resulted to high internal efficiency.

### 4.6 Findings on provision of pre-primary instructional materials and its influence on internal efficiency

The researcher sought to determine pre-primary, primary and headteachers responses on how Instructional materials (print materials, textbooks and reference books) influence participation rates in children which is an aspect of internal efficiency.

Data on provision of instructional materials entails the following aspects; types of instructional materials available; acquaintance of teachers with pre-primary textbooks; when they lastly bought pre-primary textbooks; whether textbooks were adequate for their schools; whether lack of textbooks kept children away from participating in learning in classes; level of quality of provided textbooks in pre-primary schools; whether textbooks were being shared between pre-primary and primary grade 1 class to supplement the few they had; whether class 1 textbooks were adequate.

The researcher sought to find out the types of instructional materials available in pre-primary schools to establish whether there were participation rates in children. Table 4.25 presents the study results.

**Table 4.25: Types of instructional materials available in pre-primary schools to establish participation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Print materials | 11 | 29.73 |
| Textbooks | 7 | 18.92 |
| Reference books | 19 | 51.35 |

From the results presented in Table 4.25, majority 19(51.35%) of teachers indicated that reference books were available in the study pre-primary schools. This implies reference books were available in the study schools which imply that teachers were using them in preparation for teaching in pre-primary schools to enhance participation rates in children. This is in agreement with a study conducted in Kenya by Koech (2017) who revealed that reference books were moderately available in preschools which enhance participation rates in children. Similarly, findings of a study conducted in Zimbabwe by Mupa and Isaac (2018) showed that instructional materials in schools were limited to reference textbooks and syllabuses in schools. These findings contradict findings of studies conducted in Kenya by Jacob (2014) and Akungu (2014) respectively who revealed that there were inadequate reference books for teachers in schools.

The researcher sought to determine whether teachers were acquainted with pre-primary instructional play materials to establish whether they made use of them to enhance internal efficiency (participation rates) in pre-primary schools. Table 4.26 presents the study results.

**Table 4.26: Acquaintance of headteachers with instructional materials to enhance participation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 21 | 56.8 |
| No | 16 | 43.2 |
| **Total** | **37** | **100** |

As indicated in Table 4.26, majority 21(56.8%) of headteachers showed that teachers were well acquitted with instructional materials particularly in play instructional materials and made use of them to enhance participation rates in children. This implies that teachers made use of available play instructional materials by making children have active use of them which enhanced participation rates. From the observation schedule, majority 15(41.2%) of observed play activities (children's use of wheels on playground) was rated as adequate. This study finding is in agreement with the findings of a study conducted in Kenya by Kithungu (2019), Anekeya (2015) and Ochanda (2015) who found that teachers were acquitted with play instructional materials and that children were engaged in outdoor play though with inadequate play equipment which inhibited participation rates in children.

Similarly, Ochanda (2015), Anekeya (2015) and Kithungu's (2019) study findings showed that the available play materials encouraged participation in

outdoor play activities in ECD schools in Kenya. According to Igbo and Omeje (2014), children are comfortable and relaxed when they use teacher-made instructional materials in primary schools in Nigeria since they were familiar with locally made play instructional materials which increased their participation rates.

The researcher also sought to know when headteachers lastly bought pre-primary instructional materials (reference books) in their schools which aimed to establish whether they were available for pre-primary teachers to enable them instruct children adequately to enhance participation rates. Table 4.27 presents the study results.

**Table 4.27: When the headteachers lastly bought pre-primary instructional materials (reference books) in their schools to enable teachers instruct children adequately to enhance participation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| 1 year ago | 12 | 32.4 |
| More than a year ago | 18 | 48.6 |
| **Total** | **37** | **100** |

From the results in table 4.27, majority 18(48.6%) of the headteachers indicated that they bought their pre-primary instructional materials (reference books) in their schools more than a year ago. From the inventory record, the researcher found that instructional materials were inadequate as shown by majority 16(44.4%) of the inventory records analysed in each study school.

This implies that headteachers had stayed long without buying any extra reference book which inhibited teaching and learning in children. This differs with findings of a Kenyan study conducted by Mariga (2017) who found that preschools have no action plans for acquisition and use of teaching and learning materials due to high costs, lack of storage space, low knowledge and experience among teachers which result to low participation rates in children of pre-primary due lack of latest reference books.

The researcher sought to know whether reference books bought more than a year ago by the headteachers were adequate for schools with the aim to establish whether children participation rates was high. Table 4.28 presents the study results.

**Table 4.28: Whether the instructional materials (reference books) bought more than a year ago were adequate for enhancing participation rates in pre-primary schools' children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 31 | 83.8 |
| No | 5 | 13.5 |
| **Total** | **37** | **100** |

As indicated in table 4.28, majority 31(83.8%) of headteachers indicated that the reference books were adequate for their pre-primary schools. This implies that teachers were able to use variety of reference books to plan their lessons adequately which implies that the content delivered was quite rich which enhanced participation rates in children. However, responses of pre-primary

teachers on adequacy of reference books in pre-primary schools showed that majority 21(58.3%) of them indicated that they were inadequate. Similarly, responses from primary school teachers showed that majority 22(61.1%) of them indicated that reference books were inadequate in pre-primary schools. From the inventory record, the researcher found that the reference books were inadequate as shown in majority 16(44.4%) of inventory records analyzed in study schools which was an indication of low participation rates in children of pre-primary schools. These present study findings concurs with a study conducted in Kenya by Okongo, Ngao, Rop and Nyongesa (2015) who found that instructional materials such as reference books were inadequate in all pre-primary schools due to inadequate finance which hindered children's participation rates. Similarly, a Tanzanian study by Mwalyeyo and Shitambala (2014) revealed that inadequacy of instructional materials in pre-primary schools was acute which resulted to minimal utilization of even few available ones due to high enrolments of children which resulted to low participation rates in pre-primary schools' children which affected transition of learners to primary schools due to lack of masterly of required concepts. Further, Riungu's (2018) study findings showed that there were inadequate instructional materials which greatly affected enrolment of in ECE schools in Imenti North sub County.

The researcher finally sought to know whether lack of sufficient instructional materials keep children away from active involvement in class activities during learning with an aim to establish level of participation rates in pre-primary schools. Table 4.29 presents the study results.

**Table 4.29: Whether lack of sufficient instructional materials keeps children away from active participation in class activities to establish level of participation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 31 | 83.8 |
| No | 5 | 13.5 |
| **Total** | **37** | **100** |

Findings in table 4.29 shows that majority 31(83.8%) of respondents indicated that children often have low participation in class activities due to lack of sufficient instructional materials. This implies that when children lack sufficient instructional materials in class, they have low level of participation in class activities which implies that this may result to low participation rates leading to low retention, completion, graduation, and transition rates in children. This finding mirrors the findings of a study conducted in Zimbabwe by Mupa and Isaac (2015) who found that instructional materials in preschools were limited to textbooks and syllabuses which hindered participation rates in children.

The researcher sought to know whether Grade 1 classes had textbooks which aimed to establish whether they were conducive for teaching and learning to attract and promote retention of children of pre-primary children during transition. The study results were presented in Table 4.30

**Table 4.30: Whether grade 1 classes had textbooks for teaching to enhance participation rates in pre-primary children during transition**

| | Frequency | Percentage |
|---|---|---|
| Yes | 98 | 67.6 |
| No | 47 | 32.4 |
| **Total** | **145** | **100** |

The results in table 4.30 shows that majority 98(67.6%) of the respondents indicated that Grade 1 classes had textbooks which gave conducive teaching and learning environment to attract and promote retention of pre-primary children during transition. This implies that grade 1 classes were conducive and were attractive for transiting children of pre-primary11. This study finding is in disagreement with a study carried out in Zimbabwe by Mupa and Isaac (2015) who found that children learn in harsh and unconducive teaching and learning environments which resulted to children having low participation rates. Similarly, a study conducted in Zimbabwe by Chikwiri and Musiyiwa (2017) found that lack of textbooks in classes was a big challenge to transiting children which led to low participation rates.

The study also sought to determine the level of provision of textbooks in pre-primary classes which aimed to establish whether they contributed to participation rates in pre-primary schools' children. Table 4.31 presents the study results.

**Table 4.31: Level of provision of instructional materials to enhance participation rates in pre-primary children**

| | **Frequency** | **Percentages** |
|---|---|---|
| Very high | 3 | 8.3 |
| High | 4 | 11.1 |
| Low | 23 | 63.8 |
| Very low | 6 | 16.7 |
| **Total** | **36** | **100** |

Table 4.31 shows that majority 23(63.8%) of pre-primary teachers indicated that provision of textbooks in pre-primary classes was low. This implies that some concepts during teaching and learning could not fully be explained since provision of textbooks was low in pre-primary classes. It also implies that since provision of textbooks was low, participation rates in children were also low.

According to production function theory by Mace (1979), inputs are converted into outputs in school institutions. Inputs in this case are instructional materials which when availed to children enhance their achievement (outputs). Hence, the more the provision of instructional materials, the more the participation rates in children implying high internal efficiency in pre-primary schools. Therefore, to enhance participation rates in pre-primary schools, more instructional materials must be provided which will lead to high retention, completion, graduation and transition rates in children.

The study sought to determine whether class one teachers share textbooks with pre-primary teachers for teaching to supplement the few textbooks they have to enhance teaching and learning for greater participation rates. Table 4.32 presents the study results.

**Table 4.32: Whether class one teachers share textbooks with pre-primary teachers to supplement the few they have to enhance participation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 20 | 55.6 |
| No | 16 | 44.4 |
| **Total** | **36** | **100** |

Study results in table 4.32 shows that majority 20(55.6%) of pre-primary teachers indicated that class one teachers do share textbooks for teaching with pre-primary teachers. This implies that some textbooks used by teachers in class one contains similar concepts with that of pre-primary schools and further implies that textbooks could be shared between the two classes to enhance participation rates in children. This study finding is in agreement with a study conducted in Rachuonyo South sub-county by Were (2014) who found that teaching and learning materials when appropriately acquired increase participation rates in pre-primary schools. Moreover, a study done in Kenya by Mariga (2017) noted that preschools have no action plan for acquisition of instructional materials to enhance teaching and learning which impacts on internal efficiency.

The study finally sought to determine whether instructional materials (textbooks) in class one is adequate with the aim to establish whether participation rates are ensured even after transition from pre-primary classes. Table 4.33 presents the study results.

**Table 4.33: Whether instructional materials (textbooks) in class one is adequate to ensure participation rates in children after transition**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 81 | 55.6 |
| No | 64 | 44.4 |
| **Total** | **145** | **100** |

According to the results in table 4.33, majority 81(55.6%) of primary teachers indicated that instructional materials (textbooks) in class one are inadequate which inhibited participation rates in pupils. This implies that inadequacy of instructional materials in class one could not help in promoting participation rates in class one children. Document analysis, showed that majority 16(44.4%) of inventory records revealed that instructional materials (textbooks) were inadequate. This finding is in agreement with a study conducted in primary schools in Kenya by Mwalyego and Shitambala (2014); Tety (2016); Lyimo, Too and Kipng'etich (2017); Rasto (2015); Mwili and Tanui (2015) Riungu (2018); Zwane and Malale (2018); Onyango (2015) and Tuimur and Chemwei (2015) which revealed that instructional materials were inadequate. Similarly, Jacob's (2014) study showed that teachers' reference materials were inadequate and greatly impacted on learning process which influenced participation rates in children.

The study sought to determine the relationship between instructional materials and internal efficiency using Pearson product-moment correlation. The results are as presented in Table 4.34.

**Table 4.34: Pearson product-moment correlation results for instructional materials and internal efficiency**

| | | **Internal Efficiency** | **ECE instructional materials** |
|---|---|---|---|
| Internal Efficiency | Pearson Correlation | 1 | .703** |
| | Sig. (2-tailed) | | .000 |
| | N | 37 | 37 |
| ECE instructional materials | Pearson Correlation | .703** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 37 | 37 |

**. Correlation is significant at the 0.01 level (2-tailed).

From table 4.34 results shows that there is a positive correlation between pre-primary instructional materials and internal efficiency in public primary schools ($r$ = .703, $n$ = 37, $p$< .01). This gave an implication that pre-primary instructional materials correlate with internal efficiency in public primary schools in terms of participation rates. The availability of instructional materials positively influences participation rates. This can be attributed to the ease of children to do classwork with help of learning materials while in class as the teacher teaches hence quality education which consequently contribute to high participation rates in pre-primary schools' children.

### 4.7 Findings on pupil-teacher ratio in pre-primary education and its influence on internal efficiency

The researcher sought to determine pre-primary, primary and headteachers responses on pupil-teacher ratio and its influence on internal efficiency (graduation rates). Data on teacher-pupil ratio entails the following aspects; pupil-teacher ratio in pre-primary schools; pupil-teacher ratio in pre-primary schools and Pearson product moment correlation results for teacher pupil ratio and graduation rates.

The researcher sought to determine headteachers' responses on the pupil-teacher ratio to establish whether it impacted on children's graduation rates to ensure transition to class one. Table 4.35 presents the study results.

**Table 4.35: Headteachers' response on pupil-teacher ratio in pre-primary schools and graduation rates in children**

| | Mean |
|---|---|
| Average pupil-teacher ratio | 1 to 50 |

Table 4.35 shows that average pupil-teacher ratio is 50 to 1. This implies that every pre-primary teacher handled up to 50 children which implies that graduation rate may be strained by the big number of children in a class since a standard pre-primary class should have a maximum of 25 children Ministry of Education (2018). This implies that the big number of children in pre-primary class may be due to having pre-primary 1 and 11 combined for lack of adequate pre-primary classes. This implies that combining the two classes together poses challenge of handling the pre-primary 1 and 11 together under

one teacher which may affect graduation rates in children. Also it implies that a teacher to handle children of two different classes may be very challenging which implies that it may affect individualized teaching and syllabus coverage which further implies that it may affect graduation rates in children. This study result is in agreement with the finding of by Muthusamy (2015), who found that mainstreamed schools were under stressful situation due to overcrowding in classrooms which resulted to low graduation rates in children.

This finding is in agreement with production function theory by Mace (1979) which looks at internal efficiency as an achievement (output) and in this case graduation rates an aspect of internal efficiency which is impacted by the situation of PTR (input) in pre-primary schools. Hence, the higher the PTR the lower the graduation rates in children due to lack of individualized teaching. The lower the PTR in a class, the higher the graduation rates in pre-primary schools which imply the more the retention, completion, graduation and transition rates. Therefore, there is a need to adhere to the pre-primary policy as advocated for a PTR of 25:1(Ministry of Education, 2018). According to Mwangi (2016), pupil to child ratio should be reduced to ensure intensive and interactive class activities which results to high graduation rates. A Tanzanian study by Mwalyego and Shitambala (2014) found that high PTR affects utilization of instructional materials negatively since they become minimal compared to high enrolment of children which make schools inefficient.

The study also sought to determine whether the headteachers were comfortable with the level of PTR with the aim to establish whether there

were new measures taken to help the situation improve graduation rates in children. Table 4.36 presents the study results.

**Table 4.36: Whether the headteachers were comfortable with pupil-teacher ratio in pre-primary classes for enhancing graduation rates in children**

| | Frequency | Percentage |
|---|---|---|
| No | 20 | 54.1 |
| Yes | 17 | 45.9 |
| **Total** | **37** | **100** |

As indicated in table 4.36, majority 20(54.1%) of headteachers indicated that they were not comfortable with high PTR in pre-primary schools. This implies that the number of children per class was more than the recommended one of 25 children per class (Ministry of Education, 2018). It also implies that when children are more than the recommended number, more teachers to handle them will need to be employed which means that a school will need to have more resources to enable it meet this demand of high PTR to enable favorable graduation rates in children. Hence, it implies that when a school lacks adequate resources particularly inputs such as adequate teachers to handle big number of children, it can put headteachers to a disturbing situation since this may be a pointer to less efficient schools marked by low graduation rates in children. This study finding is similar to the study done in Kenya by Waita, Mulei and Kalai (2016) and Nyiwa, Maithya and Kathumbi (2017) who noted that as PTR increases, quality declines and vice versa. Similarly, a study conducted in Kenya by Nyiwa, Maithya and Gathumbi (2017); Waita, Mulei

and Kalai (2016) revealed that high pupil-teacher ratio in the schools affected KCPE outcome which was an indication of low internal efficiency in schools.

The researcher also sought to determine the pupil-teacher ratio in pre-primary class (es) in schools from 2014 to 2020 with the aim to establish whether graduation rates in children has been improving to enhance internal efficiency in pre-primary schools. Table 4.37 presents the study results.

**Table 4.37: Pupil-teacher ratio in pre-primary class to show progress in graduation rates in children**

| Years | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|---|---|---|
| Average pupil-teacher ratio | 1:50 | 1:50 | 1:45 | 1:47 | 1:45 | 1:47 | 1:40 |

According to table 4.37, pupil-teacher ratio from year 2014 to 2020 ranged between 40 and 50. Responses from the primary teachers showed that PTR was 50:1. From the findings it is clear that the ratio has been increasing an indication that there is no much attempt that has been made to separate pre-primary 1 and 11 to enable success in teaching and learning of children. Additionally, the high PTR implies that more pre-primary teachers need to be deployed to pre-primary schools by the county government to enhance teaching and learning which could improve graduation rates in children. Most of the teachers stated that when the PTR is high, the number of students in class becomes unmanageable while others indicated that there was a high workload. This study findings agrees with Kyambi's (2019) study findings

which revealed that there was high PTR which negatively impacted on teaching and learning resulting to low graduation rates of pupils in Kenya.

The study finally sought to determine whether when children of pre-primary are congested in my school, many of them eventually absent themselves from school due to lack of individualized attention during teaching and learning to establish success in graduation of children. Table 4.38 presents the study results.

**Table 4.38: Absenteeism of children due to congestion in class which is an indicator of high pupil-teacher ratio in class and graduation rates in children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 20 | 54.1 |
| No | 17 | 45.9 |
| **Total** | **37** | **100** |

Study findings in table 4.38 shows that majority 20(54.1%) of the pre-primary teachers indicated that when children of pre-primary are congested in my school there is absenteeism of children due to lack of individualized attention which lead to low graduation rates in children. This implies that congestion in the class causes many children to be absent due to lack of individualized attention. Therefore, children lacks motivation to come to school daily which result to many of them not being ready to complete the cycle on time which lead to low graduation rates and eventually to low retention, completion, graduation and transition rates in pre-primary schools. This study finding is in

agreement with a study conducted in Turkana County pre-primary schools by Ngirera (2019) who found that PTR were very high and impacted negatively to teaching and learning caused by few trained teachers who could hardly give individualized attention to children which resulted to low graduation rates of children.

The study also sought to determine whether pupils in schools do well in their KCPE due to favorable PTR in pre-primary schools to establish whether favorable pupil-teacher ratio laid strong foundations to enhance smooth transition rates from pre-primary to primary schools. Table 4.39 presents the study results.

**Table 4.39: Whether pupils in schools do well in their KCPE because there has been favorable pupil-teacher ratio in pre-primary schools as a foundation for smooth graduation and transition rates in primary children**

| | **Frequency** | **Percentage** |
|---|---|---|
| Strongly agree | 13 | 8.9 |
| Agree | 20 | 13.8 |
| Undecided | 35 | 24.1 |
| Disagree | 67 | 46.2 |
| Strongly disagree | 10 | 6.9 |
| **Total** | **145** | **100** |

From table 4.39 majority 67(46.2%) of primary teachers disagreed that their pupils do well in Kenya Certificate of Primary Education (KCPE) because there has been favorable PTR in pre-primary schools as a foundation for

smooth graduation and transition rates in primary schools. This implies that PTR has not been favorable in pre-primary and in other primary school classes which imply that graduation and transition rates may not have been favorable in primary schools. It also implies that teachers were not adequate in primary classes which may have affected KCPE results negatively due to poor PTR foundation in pre-primary schools. Document analysis showed that majority 13(36.1%) of examination records in study schools indicated that it was inadequate. This study finding is in agreement with a study conducted in Kenya by Orodho and Lidolo (2014) which revealed that the many gains anticipated through provision of free primary education in Kenya was eroded by the low internal efficiency being experienced in schools due to overloaded teachers who could not make it to teach effectively hence low graduation rates in pupils.

The study sought to determine relationship between pupil-teacher ratio and internal efficiency using Pearson product moment correlation. This is as presented in table 4.40.

**Table 4.40: Pearson product-moment correlation results for pupil-teacher ratio and internal efficiency**

| | | **Internal Efficiency** | **Pupil-teacher ratio** |
|---|---|---|---|
| Internal Efficiency | Pearson Correlation | 1 | . 561** |
| | Sig. (2-tailed) | | .000 |
| | N | 37 | 37 |
| Pupil-teacher ratio | Pearson Correlation | . 561** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 37 | 37 |

**. Correlation is significant at the 0.01 level (2-tailed).

Findings in table 4.40 shows that there is a positive correlation between pupil-teacher ratio and internal efficiency in public primary schools (r = .561, *n*= 37, *p*<.01) in terms of graduation rates. PTR contributes 56.1% increases changes to internal efficiency in terms of graduation rates. Correlation refers to the strength of an association between two variables. This implies that when the PTR increases, the graduation rates increases hence children transit successfully to the next class.

### 4.8. Internal efficiency indicators of completion, transition, retention and graduation rates

The respondents were also asked to indicate the number of pupils enrolled and completed pre-primary classes to establish whether the physical infrastructure, teacher professional qualifications, instructional materials and pupil-teacher

ratio influenced completion rates in pre-primary schools. Table 4.41 presents the study results.

**Table 4.41: Pupils enrolled and completed pre-primary classes**

| Years | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|---|---|---|
| Number Enrolled | 67 | 60 | 56 | 61 | 60 | 54 | 47 |
| Number Completed | 59 | 50 | 54 | 59 | 50 | 48 | 41 |

According to table 4.41, the number of children enrolled from year 2014 to year 2020 was from 54 to 67. In addition, the number of children who completed ranged from 41 to 59. This implies that the total number of children enrolled is more than the total number of children who completed in each year. Further, it implies that there were children leaving pre-primary schools each year though they were few which lead to high completion rates in children. It further implies that there was high number of children completing preschools which could be attributed to availability of physical facilities, qualified teachers, instructional materials and favorable PTR. This current study finding is in disagreement with a study conducted in Kenya by Okongo, Ngao, Rop and Nyongesa (2015) which revealed that lack of teaching and learning resources affected completion rates of children in preschools. Similarly, a study conducted in Cameroon by Esongo (2017) revealed that there is significant relationship between availability of resources and efficiency of the school system. However, the study concurs with a study conducted in Nigeria

by Ileuma (2017) which found that school related factors such as PTR among many others have effect on internal efficiency.

The respondents were also asked to indicate the retention rates of number of pupils enrolled and completed ECE classes in the following years which aimed to establish whether physical facilities, teacher professional qualification, instructional materials and PTR influenced retention rates of children in pre-primary schools. Table 4.42 presents the study results.

**Table 4.42: Retention rates of children in pre-primary schools**

| **Years** | **2020** | **2019** | **2018** | **2017** | **2016** | **2015** | **2014** |
|---|---|---|---|---|---|---|---|
| Number Enrolled | 67 | 60 | 56 | 61 | 60 | 54 | 47 |
| Number Completed | 59 | 50 | 54 | 59 | 50 | 48 | 41 |
| Retention rates | 88.1 | 83.3 | 96.4 | 96.7 | 83.3 | 88.9 | 87.2 |

Findings in table 4.42 shows that the retention rate ranged from 88.1 to 96.7 from year 2014 to 2020 which implies high internal efficiency due to big number of children completing pre-primary cycle and either a few leave or are retained in the same class. Hence, it implies that there is possibility that physical infrastructure, teacher professional qualifications, instructional materials and PTR had a role to play in children's retention in pre-primary schools which enhanced internal efficiency.

This study finding is in disagreement with a study conducted in Kenya by Njue (2015) who found that retention rates of pupils was caused by cultural

practices, parental level of education income of the family and how pupils were handled while at school. Findings also disagrees with a study conducted in Kenya by Kirimi and Muteti (2016) who found that increase in parental level of education improved learner retention in public primary schools. Further, findings disagree with a study done in public primary schools in Kenya by Makorani and Muli (2017) which revealed that family background aspects, gender of children in the family, economic background, aspiration of the family, clubs, social facilities around the school, social cultural aspects influences retention of children in schools. However, Makorani and Muli's (2017) study findings are in agreement with current study finding which showed that instructional materials in schools enhance retention rates of pupils.

# CHAPTER FIVE
# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This chapter summarizes the entire document highlighting the main findings, conclusions, recommendations and suggestion for further studies

## 5.2 Summary of the study and major findings

The purpose of this study was to assess mainstreaming early childhood education and its influence on internal efficiency in public primary schools in Embu County, Kenya.

### 5.2.1 Physical infrastructure in ECE and its influence on internal efficiency

The first objective of the study was to determine the status of physical infrastructure in ECE and how it influences internal efficiency in public primary schools. The quantitative results from the questionnaires, document analysis and observation schedule showed that there is a positive correlation between physical facilities and participation rates in pre-primary schools in public primary schools in Embu County, Kenya. The results were corroborated by quantitative results from primary headteachers, primary teachers and pre-primary teachers who concurred that there was inadequate physical infrastructure such as electricity, toilets for boys and girls, classrooms to accommodate pre-primary 1 and 11, lack of spacious classrooms to allow activities such as modeling which affected participation rates in pre-primary children. The results therefore corroborate with literature review that showed

that there was inadequacy of physical infrastructure in pre-primary schools which affected participation rates in children.

Results on inferential statistics (Pearson Product-Moment Correlation) showed that physical infrastructure in ECE and internal efficiency (participation rates) has a significant positive correlation. This implies that as physical infrastructure provision increases in primary schools, participation rates in children increases and as physical infrastructure decreases participation rates in children decreases in public primary schools. The findings indicates that providing more classes to accommodate pre-primary 1 and 11 separately would increase participation rates in children in public primary schools in Embu County.

### 5.2.2 Teacher professional qualifications in ECE and its influence on internal efficiency

The second objective of this study was to establish how teacher professional qualifications in ECE influence internal efficiency in public primary schools. The quantitative descriptive results show that pre-primary teachers were inadequate in terms of numbers. Additionally, pre-primary teachers were engaged in teaching class 1 and also class one teacher were engaged in teaching pre-primary schools due to inadequate teachers which resulted to low promotion rates in children. These results were corroborated by quantitative results in the documentary analysis which showed that the staff in pre-primary schools was inadequate since only one pre-primary teacher was permanently

employed despite the high enrolment of children in pre-primary schools which results low promotion rates in children.

Result on inferential statistics (Pearson Product-Moment Correlation) shows that teacher professional qualification and promotion rates in public primary schools have a positive correlation. This implies that the more teachers are qualified the more the promotion rates in children in primary schools and the more the teachers are less qualified, the less the promotion rates in children. The findings therefore indicate that providing opportunities for teachers to enhance their professional qualification increases promotion rates in ECE in public primary schools in Embu County. Most literature supports these results that indeed providing teachers with opportunities to develop their skills would increases promotion rates in children.

### 5.2.3 Provision of ECE instructional materials and internal efficiency

The third specific objective was to examine ways in which provision of ECE instructional materials influences internal efficiency in public primary schools. The results of quantitative descriptive results show that in most primary schools in Embu County, the only few instructional materials available in pre-primary schools are reference books and textbooks which compromised lesson planning and contribute to low participation rates in children. Additionally, results showed that class one teachers and pre-primary teachers share textbooks to make up for the few they had to increase participation rates in children during teaching and learning. This implies that provision of more reference and textbooks would increase participation rates in primary schools.

The results of quantitative results of documentary analysis guide showed that instructional materials (textbooks) were inadequate. These were corroborated by the quantitative results from headteachers, teachers and pre-primary teachers who indicated that instructional materials were inadequate in their schools which compromised teaching and learning.

The inferential statistical results (Pearson Product-Moment Correlation) also showed that provision of ECE instructional materials and participation rates in public primary schools have a strong positive correlation meaning that as provision of instructional materials increased, participation rates increased and as the provision of instructional materials decreased, participation rates decreased in public primary schools. Generally, these results agree with the literature that indeed, lack of provision of instructional materials inhibits participation rates in public primary schools.

### 5.2.4 Pupil-teacher ratio in ECE and internal efficiency

The fourth specific objective of this study was to explore how pupil-teacher ratio in ECE influences internal efficiency in public primary schools. The quantitative descriptive results from the questionnaire show majority of headteachers indicated that pre-primary classes have pupil-teacher ratio of 50:1 and that they were not comfortable with such a high ratio in their schools. Qualitative descriptive results from pre-primary teachers showed that the high pupil-teacher ratio in their classes causes absenteeism of children which results to low graduation rates in children. This is corroborated by quantitative descriptive data from documentary analysis guide which showed that the high

pupil-teacher ratio in pre-primary schools eventually affects the graduation rates in primary schools which is showed by majority of teachers disagreeing that pupils do well in KCPE due to favorable pupil-teacher ratio.

The inferential statistics results (Pearson Product-Moment) also indicate that pupil-teacher ratio in ECE and internal efficiency in public primary schools in Embu County has a significant positive correlation. This means that the lower the pupil-teacher ratio corresponds to increased graduation rates and the higher the pupil-teacher ratio corresponds to low graduation rates in public primary schools in Embu County. These results concur with literature review of this study which indicates that schools with high pupil-teacher ratio overburden teachers which then results to low graduation rates of children in schools.

### 5.2.5 Relationship between independent and dependent variables

The descriptive analysis of the independent and the dependent variables of this study showed that a low level of internal efficiency (r=.653) of internal efficiency (participation rates) of public primary schools in Embu County occasioned by the independent variables of the study. This is supported by literature review. Moreover, for this study teachers were dissatisfied with low level of provision of instructional materials (r=.703) followed by inadequacy of teacher professional qualifications in terms of numbers (r=.672), physical infrastructure (r=.653) and pupil-teacher ratio (r=.561). The results therefore conclude that the level of pupil-teacher ratio is the most important factor of all the variables of this study that influences internal efficiency in public primary schools in Embu County.

## 5.3 Conclusion

After conducting a detailed analysis, it can be concluded that all the four independent variables considered for this study (physical infrastructure, teacher professional qualification, instructional materials, and pupil-teacher ratio) have positive and negative relationship with internal efficiency (participation rates, promotion rates, participation rates and graduation rates). The results of Pearson correlation resulted to a values greater than 0.05 or 0.01. Hence, rejected the null hypothesis and concluded that there was relationship between independent and dependent variables.

Also the quantitative descriptive results from the questionnaires of headteachers, primary teachers and pre-primary teachers, document analysis guide and observation schedule corroborate these findings. The results therefore conclude that there are inadequate physical infrastructure, inadequacy of trained teachers, inadequate instructional materials and high pupil-teacher ratio which result to low internal efficiency in public primary schools.

Evidence shows that there are a lot of efficiency problems in public primary schools in Embu County. From document analysis, observation schedule and questionnaires it is evident that there are inadequate classes to accommodate PP1 and PP11, inadequate toilets for boys and girls and inadequate electricity. Additionally, there are inadequately professionally qualified teachers, inadequate instructional materials and high pupil-teacher ratios which are more than recommended ratio of 25:1 by Ministry of Education (2018).

## 5.4 Recommendations

The study established that there are inadequate physical infrastructures such as electricity and classes to handle PP1 and PP11 separately, separate toilets for boys and girls. The researcher therefore recommends that more physical facilities should be provided by the county government which is mandated to manage pre-primary schools by the Kenyan constitution 2010. This would increase participation rates in pre-primary children.

The research established that pre-primary teachers and lower primary teachers were inadequate which was shown by the fact that pre-primary teachers are asked to teach in class one and likewise class one teachers are requested to teach pre-primary classes. The county government in partnership with Teachers Service Commission should deploy more pre-primary and primary teachers.

In line with provision of textbooks for class one, the respondents found that provision was low. The study recommends the headteachers in collaboration with parents and the county government to provide more textbooks for pre-primary schools. Class one teachers do share textbooks for teaching with pre-primary teachers. The study recommends headteachers to buy adequate textbooks to avoid the incidences of sharing to curb delivery of substandard materials or teaching workbook which are above the level of children.

The study established that the pupil-teacher ratio in pre-primary schools was 50:1 which is above the recommended ratio of 25:1 pupil-teacher ratio. The research recommends County governments to deploy more teachers to pre-

primary schools to offset the high ratio. Additionally, the research found that headteachers were not comfortable with high pupil-teacher ratio in pre-primary schools. Also, the study recommends headteachers to work hand in hand with the county government and parents to get more teachers to ease the situation of high pupil-teacher ratio in pre-primary schools. Primary teachers disagreed that pupils do well in Kenya Certificate of Primary Education because there has been favorable pupil-teacher ratio in pre-primary schools as a foundation for smooth graduation and transition rates in primary schools. Further, the study recommends headteachers to ensure recommended pupil-teacher ratio of 25:1 is strongly followed in schools to lay strong foundation for primary education right from pre-primary level for smooth retention, completion, graduation and transition rates in children.

### 5.5 Suggestions for further studies

Based on the findings of the study, the research suggests the following studies to be carried out in order to compliment the findings of this study;

A similar study to be carried out in more counties and in private primary schools in order to allow generalization of the results.

The study concentrated on ECE schools attached to primary schools and used primary headteachers and teachers, and ECE teachers. Therefore, future studies could go further and increase the scope by including other stakeholders such as children, parents and education officers.

The study concentrated on physical infrastructure, teacher professional qualifications, instructional materials and pupil-teacher ratio as aspects of mainstreaming ECE. Future studies could consider other aspects related to

mainstreaming of ECE such as parental involvement, finances, teacher characteristics, child characteristics, class size among many others.

The study concentrated on participation rates, promotion rates and graduation rates hence retention, completion, graduation, and transition rates as aspects of internal efficiency. Future studies could consider other related aspects of internal efficiency such as average attendance, children's cost of education, average instruction space among many others.

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# APPENDICES

## APPENDIX I: INTRODUCTION LETTER

Kamwitha Anastasia Muthanje

University of Nairobi

Department of Educational

Management, Policy and Curriculum Studies

P.O. Box 92-00902

Kikuyu

20th May 2016.

Dear Respondents,

**RE: PARTICIPATION IN RESEARCH**

I am currently undertaking a Doctor of Education degree in the department of Educational Management, Policy and Curriculum Studies at the University of Nairobi. I am carrying out a research on **Mainstreaming Early Childhood Education and its Influence on Internal Efficiency in Public Primary Schools in Embu County, Kenya.** Your school has been selected for the study and you have been selected as a respondent. The data gathered will be for the purpose of the research and your identity will remain confidential. Please answer the questions as truthfully as possible.

Thank you.

Yours faithfully

Kamwitha Anastasia Muthanje

## APPENDIX II: INFORMED CONSENT

**UNIVERSITY OF NAIROBI**

**INFORMED CONSENT: PARTICIPANTS 18 YEARS OF AGE AND ABOVE**

Dear study participant,

My name is **Anastasia Kamwitha Muthanje** and I am a student at the University of Nairobi working on an **Education Doctorate Degree (EDD)**. I am doing a research study entitled **Mainstreaming Early Childhood Education and its Influence on Internal Efficiency in Public Primary Schools in Embu County, Kenya.** The purpose of this study is to assess the influence of mainstreaming Early Childhood Education (ECE) on internal efficiency in public primary schools in Embu County, Kenya. The populations for the research study are all headteachers and teachers, and ECE teachers in public primary schools in Embu County, Kenya. Data collection will utilize a questionnaire.

Your participation will involve completing the questionnaire which will be administered to you on arrival in your schools and be returned immediately after filling it up. For the purposes of this research, the results of this questionnaire will remains confidential as the data will be used for the purpose of the research. After the researcher completes the dissertation, she will allow you to access the results of the questionnaire.

The results of the research study may be published but your identity will remain confidential and your name will not be made known to any outside party. In this research, there are no foreseeable risks to you. The benefits to you are devising effective ways of enhancing ECE teachers' creativity in improvising instructional materials to enhance children's participation in ECE schools, help ECE teachers devise the method of promotion of ECE children to the next class since when two classes are combined; it may be difficult to make concrete promotion, help ECE teachers come up with best practices to enhance children's graduation thus be able to complete their pre-primary 1 and 11 successfully by avoiding combining the two classes. Any question and clarity will be made on face to face contact with the researcher. For questions about your rights as a study participant, or any concerns or complaints, please contact the University of Nairobi, school of education, Department of Educational Management, Policy and Curriculum Studies, P.O Box 92-00902, Kikuyu.

As a participant in this study, you should understand the following:

a) You may decide not to be part of this study or you may want to withdraw from the study at any time. If you want to withdraw, you can do so without any problems.
b) Your identity will be kept confidential.
c) Anastasia Kamwitha Muthanje the researcher will fully explain the nature of the research study and will answer all of your questions and concerns.

d) The researcher will develop a way to code the data to assure that your name is protected.

e) Data will be kept in a secure and locked area. The data will be kept for three years by the researcher and then destroyed.

f) The results of this study may be published.

"By signing this form, you agree that you understand the nature of the study, the possible risks to you as a participant, and how your identity will be kept confidential. When you sign this form, this means that you are 18 years old or older and that you give your permission to volunteer as a participant in the study that is described here."

**( ) I accept the above terms. ( ) I do not accept the above terms. (CHECK ONE)**

Signature of the participant _____ Date _____

Signature of the researcher Anastasia Kamwitha Muthanje Date: January 4th, 2018.

## APPENDIX III

## QUESTIONNAIRE FOR THE HEADTEACHERS

Dear Sir/Madam,

This questionnaire is designed to help the researcher get the information on mainstreaming of Early Childhood Education and its influence on internal efficiency in public primary schools in Embu County, Kenya. The information will be used for research purposes only. Please read the questionnaire carefully before answering the questions.

**SECTION A: Demographic Data Headteacher**

1. Indicate your gender Male [ ] Female [ ]

2. What is your appropriate age group?

21-30 Years [ ] 31-40 Years [ ] 40 and above [ ]

3. What is your highest academic qualification?

   Secondary [ ] Middle level College [ ] University [ ]

4. What is your highest professional qualification?

   O level [ ] Certificate [ ] Diploma [ ] Degree [ ] Masters [ ]

5. What is your work experience as a headteacher?1-10 years [ ] 11-20 years [ ] 21-30 years [ ] Above 30 [ ]

**SECTION B: Physical Infrastructure in ECE**

6. a) Have you integrated ECE in your school? Yes [ ] No [ ] If yes, how has it helped in giving good foundation for grade 1? If Not, what are the reasons?

   ……

   ……

7. Do you have a kitchen entirely for the ECE children? Yes [ ] No [ ]

   If not, why doesn't the school have one?

   .....

   .....

8. Are there toilets for ECE children in your institution for boys and girls?

Yes [ ] No [ ] If yes how many for boys [ ] Girls [ ]

If not, what are the reasons?

……

……

9. Do you have clean water for drinking and washing hands in your ECE section

   Yes [ ] No [ ]

   If not, what are you planning to do to have some water in the institution?

   ……

   ……

10. Has the infrastructure such as classes caused low participation of ECE children at any time? Yes [ ] No [ ]

    If yes, what steps are you taking to curb it?.....

**SECTION C: Level of teacher professional qualification in ECE**

11. a) How many qualified ECE teachers do you have in your institutions?

    .....

    Males……. Female……..

    Are they adequate for your school? Yes [ ] No [ ]

If Not, what are you planning to do so as to get adequate number?

……

b) What level of certificate do ECE teachers have in your institution?

Certificate [ ] Diploma [ ] Degree [ ]

c) Do ECE teachers teach lower primary children at any time?

Yes [ ] No [ ]

d) Do lower primary teachers teach ECE children at any time?

Yes [ ] No [ ]

If yes, how did it help in?

a) Transition in these two classes? .....

b) Retention in these two classes? .....

12. Children in ECE have experienced low participation rates in school due to inadequacy of teachers.

Yes [ ] No [ ]

Explain your answer……..……

……

**SECTION D: Provision of ECE Instructional Materials**

13. Are you fully acquitted with ECE curriculum support materials?

Yes [ ] No [ ].

If yes, how have they been useful to grade 1 pupil? If No, what plans do you have to have them in ECE

classes?……

a) When did you lastly buy ECE instructional materials in your school?

……..

b) Were they relevant and adequate for your school?

Yes [ ] No [ ]

If No, what are you planning to do so as to get relevant and adequate instructional materials in your institution?

……..

14. a) Children often are bored due to lack of sufficient instructional materials and thus keep away from school often. Yes [ ] No [ ] Explain your answer.

**SECTION E: Pupil-teacher ratio in ECE**

15. (a) What is the Pupil-teacher Ratio in your school?...……

(b) Are you satisfied with that ratio? Yes [ ] No [ ]

If No, what is your plan for the improvement?……

(c) What is the pupil-teacher ratio in ECE class (es) in your school for the following years?

| Years | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|---|---|---|
| Pupil-teacher ratio | | | | | | | |

18. When children of ECD are congested in my school, many of them eventually absent themselves from school.

Yes [ ] No [ ] Explain your answer.

**SECTION F: Internal Efficiency indicators of completion, transition, retention and graduation rates**

1. a) Indicate the number of pupils enrolled and completed ECE classes in the following years

| Years | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|---|---|---|
| Number Enrolled | | | | | | | |
| Number Completed | | | | | | | |

b) Indicate the retention rates of pupils in ECE classes for the following years

| Years | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|---|---|---|
| Number Enrolled | | | | | | | |
| Number Retained | | | | | | | |

2. Indicate the level of graduation rates in your ECE classes

| Years | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|---|---|---|
| Number enrolled | | | | | | | |
| Number graduated | | | | | | | |

## APPENDIX IV

## ECE TEACHERS' QUESTIONNAIRE

This questionnaire is designed to help the researcher get information on mainstreaming Early Childhood Education and its influence on internal efficiency in public primary schools in Embu County, Kenya. The information will be used for the purposes of the study only. Please read the questionnaire carefully before answering the questions. Please tick where necessary or fill in the blank spaces provided.

**SECTION A: Demographic Data of ECE Teachers**

1. What is your gender? Male [ ] Female [ ]

2. What is your appropriate age group? 21-30 [ ] 31-40 [ ] Above 40 [ ]

3. What is your highest academic qualification?

   Secondary [ ] Middle level college [ ] University [ ]

   Specify others…….

3. How long have you served as an ECE teacher?

   1-10 years [ ] 11-20 years [ ] 21-30 [ ] 40 and above years [ ]

**SECTION B: Physical infrastructure in ECE**

4. a) How many permanent ECE classes do you have in your school?

   …….

   b) What is the enrolment of ECE children in each class in your school?……

5. How many ECE toilets do you have for Boys and girls your class?……

6. Is there clean tap water for drinking and bathing for ECE children in your school?

   Yes [ ] No [ ]

   If Not, how do you get water for your ECE children?……

7. ECE children have failed to participate in my class due to lack of spacious classroom.

   Strongly Agree [ ] Agree [ ] Undecided [ ] Disagree [ ] Strongly Disagree [ ]

   Explain your answer……

**SECTION C: Teacher Professional Qualification in ECE**

8. a) What is your professional qualification level?

   Certificate [ ] Diploma [ ] Degree [ ]

b) Does it help you to have high quality delivery in your ECE class?

   Yes [ ] No [ ]

   Explain your choice……..

c) Have you done any additional course on special needs? Yes [ ] No [ ]

If yes, for how long and how does it help you to handle special needy children in your class/school? ……

9. Have you at any time failed to contain ECE children in your class due to inadequacy of skill?

   Yes [ ] No [ ] Explain your answer.

**SECTION C: Provision of ECE Instructional Materials.**

10. Do your ECE classes have adequate instructional materials?

    Yes [ ] No [ ]

    If No, what are your plans of acquiring more instructional materials?……

11. What is the quality of instructional materials in your ECE class?

    Very High [ ] High [ ] Low [ ] Very Low [ ]

    Explain your answer.……

12. How do you get instructional materials for ECE learning in your class?……

13. Do class one teachers borrow your instructional materials for teaching?

    Yes [ ] No [ ] Explain your answer.

    ……

    ……

14. Instructional materials are inadequate in my ECE class. Yes [ ] No [ ]

    Explain your answer.……

    ……

**SECTION D: Pupil-Teacher Ratio in ECE**

15. What is the pupil-teacher ratio in your ECE class?

Give reasons for your answer.

……

……

16. My ECE children are …… in enrolment. Therefore I am. Satisfied [ ] unsatisfied [ ] Explain your answer.

    ……

    ……

17. How does the level of pupil/ teacher ratio in your class help in promotion of your children to Grade 1?

    ……

    ……

18. Beside each of the statement presented below, please indicate whether you agree very well, agree well, agree little, or don't agree at all.

    Pupils who began their schooling right from pre-primary progress very well in primary school.

    i) Agree very well ii) Agree well iii) Agree little iv) I don't agree at all

*Thank you for your acceptance*

## APPENDIX V

## QUESTIONNAIRE FOR PRIMARY TEACHERS

This questionnaire is designed to help the researcher get information on influence of mainstreaming of Early Childhood Development and Education of learners on internal efficiency in public primary schools' education in Embu, County, Kenya. The information will be used for the purposes of the study only. Please read the questionnaire carefully before answering the questions. Please tick inside the box where necessary or fill in the blank spaces provided.

**SECTION A: Demographic Data of Primary Teachers**

**Introduction**

1. What is your gender? Male [ ] Female [ ]

2. What is your appropriate age group? 21-30 [ ] 31-40 [ ] Above 40 [ ]

3. What is your highest academic qualification?

Secondary [ ] Middle level college [ ] University [ ]

Specify others……

4. How long have you served as an ECE teacher?

1-10 years [ ] 11-20 years [ ] 21-30 [ ] 40 and above years [ ]

**SECTION B: Physical Infrastructure in ECE**

5. The physical infrastructure in my school is adequate for accommodating those being promoted from pre-primary school.

   Strongly Agree ii) Agree iii) Undecided iv) Disagree v) Strongly Disagree

6. Are Grade 1 classes attractive to retain the pre-primary children during progression? Yes [ ] No [ ]

If No, explain your answer. …….

7. Kindly tick.

   There are enough toilets, classrooms, water taps, playground, electricity, and library in my school.

   i) Strongly agree ii) Agree iii) Undecided iv) Disagree v) Strongly Disagree

8. The enrollment of my class one is……..This was greatly influenced by the size of class that came from ECE class. Yes [ ] No [ ] Explain

   ……..

**SECTION C: Teacher Professional Qualification**

9. Kindly tick.

   There are adequately trained teachers to handle children progressing from pre-primary school to primary school.

   i) Strongly agree ii) Agree iii) Undecided iv) Disagree v) Strongly Disagree

10. What is your professional qualification?

    P 1 [ ] Diploma in ECE and P1 [ ] P1 and Diploma in Special Education Degree B.Ed [ ]

11. I feel inadequate to handle ECE children who joined my standard one class this year.

    Yes [ ] No [ ]

    Explain your answer……

    ……..

**SECTION D: Instructional Materials**

12. Kindly tick where necessary.

| Text Book | P.E | Eng | Kisw | Maths | Scie | Social/s | CRE | C/Arts/ Music | H/Scie |
|---|---|---|---|---|---|---|---|---|---|
| Available | | | | | | | | | |
| Not Available | | | | | | | | | |

13. (a) What is the pupil/book ratio in your class?……

(b) How does the ratio above help learners in their progression to the next grade?

.....……

**14.** The instructional materials in my class are adequate for all the learners in my class who have proceeded from the ECE class. Yes [ ] No [ ]

Explain……

**SECTION E. pupil-teacher Ratio in ECE**

15. (a) In your school what is the pupil-teacher ratio?……..….

(b) How does the pupil-teacher ratio in your school help in smooth transition between pre-primary and Early Grades?

…….……

16. Pupils in my school do well in their KCPE because there has been adequate number of teachers in all classes. i) Strongly agree ii) Agree iii) Undecided iv) Disagree v) Strongly Disagree

17. My class size is …...The number of ECE children who joined my class on this year is……

*Thank you for your acceptance!*

## APPENDIX VI

## DOCUMENT ANALYSIS GUIDE

From the document, the researcher aimed to obtain the enrolment of ECE children and those of class one from the register to get information on PTR and the pupil book ratio and class size so as to check whether there is congestion in classes or not. Admission register availed information on entry level of ECE children that affect the primary school enrolment right from class one. Staff registers availed information on the staffing condition in the school. The inventory and store ledger availed information on adequacy level of instructional materials in the school. Personnel records showed information on staff that was present in the schools. Examination records gave information on the performance of learners in the schools and history of school performance right from class one which may be affected by ECE class profile. Log book showed the happenings in schools like how often children are sent away from schools which could affect participation and performance of children. Learner attendance register showed class size and likelihood of performance in schools.

| | Very Adequate | Adequate | Not Sure | Inadequate | Seriously Inadequate |
|---|---|---|---|---|---|
| Enrolment of children | | | | | |
| Enrolment of teachers | | | | | |
| ECE instructional materials | | | | | |
| Staff present in schools | | | | | |
| Performance | | | | | |
| Daily turn up of teachers | | | | | |
| Performance of children | | | | | |

*Thank you for your acceptance!*

## APPENDIX VII

## EVALUATION SCHEDULE FOR OBSERVED INFRASTRUCTURE

According to Orodho (2009), observation forms are utilized to record what a researcher anticipates to observe during data collection.

| **Activities observed due to presence of infrastructure** | **Adequate** | **undecided** | **Inadequate** | **Very inadequate** |
|---|---|---|---|---|
| Children visit to the toilets | | | | |
| Children washing hands on a water point | | | | |
| Use of wheels on play ground | | | | |
| Writing and reading in a well-lit classroom | | | | |
| Working with ease and comfort at tables and chairs | | | | |
| Protection due to presence of strong tall fence | | | | |
| Easy movement of children in the compound during break periods | | | | |

## APPENDIX VIII

## RESEARCH AUTHORIZATION


**NATIONAL COMMISSION FORSCIENCE, TECHNOLOGY ANDINNOVATION**

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/17/64190/18743**

Date: **23rd August, 2017**

Anastasia Muthanje Kamwitha
University of Nairobi
P.O. Box 30197-00100
**NAIROBI.**

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on ***"Assessment of impact of mainstreaming Early Childhood Development and education on internal efficiency in public primary schools in Embu County Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Embu County** for the period ending **23rd August, 2018.**

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

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY P. KALERWA MSc., MBA, MKIM**
**FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Embu County.

The County Director of Education
Embu County.

## APPENDIX IX

## RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
*MS. ANASTASIA MUTHANJE KAMWITHA*
of UNIVERSITY OF NAIROBI , 21022-505
NAIROBI ,has been permitted to conduct
research in *Embu County*

Permit No : NACOSTI/P/17/64190/18743
Date Of Issue : 23rd August,2017
Fee Recieved :Ksh 2000

on the topic: *ASSESSMENT OF IMPACT OF MAINSTREAMING EARLY CHILDHOOD DEVELOPMENT AND EDUCATION ON INTERNAL EFFICIENCY IN PUBLIC PRIMARY SCHOOLS IN EMBU COUNTY KENYA*

for the period ending:
*23rd August,2018*

.....
*Applicant's Signature*

.....
*Director General*
*National Commission for Science, Technology & Innovation*

### CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No.A 15431

CONDITIONS: see back page

## APPENDIX X

## EMBU COUNTY RESEARCH AUTHORIZATION

**MINISTRY OF EDUCATION, SCIENCE & TECHNOLOGY**
**State Department of Education**


Telegrams: "Provedu". Embu
Telephone: Embu 31711
Fax: 30956
E-mail:cde.embu@yahoo.com
When replying please quote:

OFFICE OF THE
COUNTY DIRECTOR OF EDUCATION
EMBU COUNTY
P O BOX 123-60100
EMBU


Ref. No: EBC/GA/32/1 VOL.II/35

28th August, 2017

Anastasia Muthanje Kamwitha,
University of Nairobi,
P. O. Box 30197 – 00100,
NAIROBI.

RE: RESEARCH AUTHORIZATION

Reference is made to NACOSTI letter Ref: NACOSTI/P/17/90755/18743 dated 23rd August, 2017 on the above subject.

This office acknowledges receipt of your research authorization to carry out research on **"Assessment of impact of mainstreaming Early Childhood Development and Education on internal efficiency in public primary schools in Embu County"** for the period ending 23rd August, 2018.

This office has no objection and therefore wishes you success in this undertaking and requests prospective participants/respondents in Embu County to accord you co-operation or support you may require.

Ben O. Kenyaga
For: COUNTY DIRECTOR OF EDUCATION
EMBU COUNTY

COUNTY DIRECTOR OF EDUCATION
EMBU COUNTY
P. O. Box 123 - 60100 EMBU

Cc: The Director, Quality Assurance and Standards, MoE, Nairobi;
The Secretary/CEO, NACOSTI, Nairobi;
The Sub-County Directors of Education, Embu County

# APPENDIX XI

## SUB COUNTIES RESEARCH AUTHORIZATION

**MINISTRY OF EDUCATION, SCIENCE & TECHNOLOGY**
**STATE DEPARTMENT OF EDUCATION**


Telegrams: Education
Telephone: Mbeere 21051
Fax: 21230
Email:deombeerenorth@gmail.com
When replying please quote


Republic of Kenya


Sub-County Education Office
Mbeere North Sub-County
P.O. Box 207-60104
SIAKAGO


Ref. MRE/N/EDU/GA/E.13/90

Date: 29/8/2017

ALL PRIMARY HEADTEACHERS
MBEERE NORTH

**RE: RESEARCH AUTHORIZATION FOR ANASTACIA MUTHANJE KAMWITHA ID NO. 5773011**

I hereby write to introduce the above named person. She has been authorized by the National Council for Science and Technology through their letter Ref. No. NACOSTI/P/17/90755/18743 dated 23rd August, 2017 to carryout research on "**Assessment of impact of mainstreaming Early Childhood Development and Education on internal efficiency in public primary schools in Embu County**" for period ending 23rd August, 2018.

Kindly give her necessary assistance.

**GIKONYO D.**
**For: SUB –COUNTY DIRECTOR OF EDUCATION**
**MBEERE NORTH.**

ISO 9001:2008 CERTIFIED SGS

**MINISTRY OF EDUCATION**
***STATE DEPARTMENT OF BASIC EDUCATION***

**Telegrams: Education**
**Telephone: Mbeere: 0702671967**
**Email: deombeeresouth@gmail.com**
**Fax:**
**When replying please quote**

**District Education Office**
**Mbeere South District**
**P.O. Box 227 (60113)**
**KIRITIRI.**

**REF: MBRS/EDU/GA/S/14/160** **01/09/2017**

TO WHOM IT MAY CONCERN

**RE: RESEARCH AUTHORIZATION**
**ANASTACIA MUTHANJE KAMWITHIA:**
**REF:NACOSTI/P/17/90755/18743**

The person referred above has permission to visit Primary Schools in Mbeere South Sub-County to carry out research on "**Assessment of impact of mainstreaming Early Childhood Development and Education on internal efficiency in public primary schools in Mbeere South Sub-County"** for the period ending 23rd August, 2018.

Please accord her the necessary assistance.

FOR: SUB-COUNTY DIRECTOR OF EDUCATION
MBEERE SOUTH

BANDA G. M
FOR: SUB-COUNTY DIRECTOR OF EDUCATION
**MBEERE SOUTH**

**REPUBLIC OF KENYA**

**MINISTRY OF EDUCATION**
*STATE DEPARTMENT OF BASIC EDUCATION*

Telegrams:

Telephone: EMBU 30962/30502
**E-Mail:deoembuwest@gmail.com**

When replying please quote

**Ref.NO.EDU/EBU/W/R/3/96**
**And date**

**EMBU WEST SUB-COUNTY**
**EDUCATION OFFICE**
**P. O. BOX 8-60100**
**EMBU**

**4th September, 2017**

All Head teachers
**EMBU WEST**

**RESEARCH AUTHORIZATION: ANASTASIA MUTHANJE KAMWITHA**

Authority has been granted to the above named student from University of Nairobi to conduct a research on "**Assessment of impact of mainstreaming Early Childhood Development and Education on internal efficiency in Public Primary schools in Embu West Sub-County"**

Kindly accord her all the necessary assistance and ensure that the exercise is conducted professionally. This programme should not interfere with the normal school routine.

**ANNE GITHAIGA**
**SUB-COUNTY DIRECTOR OF EDUCATION**
**EMBU WEST**

# MINISTRY OF EDUCATION

## STATE DEPARTMENT OF BASIC EDUCATION

Telephone:
Email: deoembueast@yahoo.com
When replying, please quote

SUB-COUNTY EDUCATION OFFICE
EMBU EAST
P .O. BOX 80-60103
RUNYENJES

**REF:** EBU/E/EDU/D1C37/VOL.I/59

**DATE:** 4th September, 2017

**To All Headteachers**
**Public Primary Schools**
**Embu East**

**RE: RESEARCH AUTHORIZATION**

The bearer of this note **Sr. Anastasia Muthanje Kamwitha ID No. 5773011** has been authorized to conduct a research on **"Assessment of impact of mainstreaming Early Childhood Development and Education on internal efficiency in public primary schools in Embu County"** for the period ending **23rd August, 2018.**

This is in partial fulfilment of the requirement for the award of a **Doctorate in Education Planning.**

Please give her the necessary assistance and ensure that the normal pupils' learning time is not interfered with.

Kind regards.

SUB-COUNTY DIRECTOR OF EDUCATION
04 SEP 2017
EMBU EAST

**LILIAN W. MUTUGI**
**AG. SUB-COUNTY DIRECTOR OF EDUCATION**
**EMBU EAST**

**cc.** Regional Coordinator of Education
**Eastern Region**

County Director of Education
**Embu**

**MINISTRY OF EDUCATION**

***State Department of Basic Education***

Telegrams:.....
Email:deoembunorth@yahoo.com

When replying please quote

SUB COUNTY DIRECTOR OF EDUCATION
EMBU NORTH SUB COUNTY
P.O BOX 50-60113
MANYATTA
7/9/2017.

**Ref.NO.EDU/EBU/N/MGC/8(188)**

All Head teachers
**EMBU NORTH.**

**RE: RESEARCH AUTHORIZATION FOR ANASTASIA MUTHANJE KAMWITHA.**

The person referred above has been granted permission to visit Public Primary Schools in Embu North Sub County to carry out research on "**Assessment of impact of mainstreaming Early Childhood Development and Education on internal efficiency in Public Primary Schools in Embu North Sub County**" for the period ending 23rd August,2018.

Please accord her the necessary assistance.

SUB-COUNTY DIRECTOR OF EDUCATION
EMBU NORTH SUB-COUNTY
P.O.Box 50 - 60101,MANYATTA-EMBU.

**OMOTO WYCLIFFE**
**SUB-COUNTY DIRECTOR OF EDUCATION**
**EMBU NORTH.**

## APPENDIX XII

## POOR ECE FACILITIES IN SCHOOLS IN EMBU COUNTY

## APPENDIX XIII

## POOR ECE FACILITIES IN SCHOOLS IN EMBU COUNTY

**APPENDIX XIV**

**PARTITIONED CLASS FOR ECE**

## APPENDIX XV

## EMBU COUNTY MAP