

**TEACHER CHARACTERISTICS AND PRESCHOOL CHILDREN'S  
ACHIEVEMENT IN NUMBER WORK IN IMENTI NORTH  
DISTRICT, MERU COUNTY**

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## **DECLARATION**

This research project is my original work and has not been presented for an award of Degree or Diploma in any other university.

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This research project has been submitted for examination with my approval as a University Supervisor.

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## **DEDICATION**

This work of research is specifically dedicated to the Kenyan children.

## **ABSTRACT**

This study was conducted in Imenti North District of Meru County to investigate the influence of teacher factors on the achievement of preschool children in number work. The study was tailored particularly on establishing the relationship between teachers' academic and professional qualification, experience and attitude towards number work and the achievement of preschool children in number work. The target population was all preschool teachers and children from both public and private preschools in the district from which a research sample was drawn from twelve (12) public preschools and eight (8) private preschools. Two research instruments were used to collect data. They are; Preschool Teachers' Questionnaires and Documentary Analysis Form. Data was collected from all the twenty respondents within the sample population and data tabulated using Scientific Package for Social Sciences (SPSS 17.0 for windows) and analyzed using inferential statistics. The research study was guided by research questions, which conformed to the objectives of the study. Literature review of the study covered the importance of teacher characteristics, the influence of teachers' academic and professional qualification, experience, attitude towards number work and its influence on learners' achievement in number work and lastly the effects of teacher characteristics on learners' achievement. The literature review indicated that challenges exist in the area of teacher factors and their influence on learners' achievement right from the core foundation of our education system upwards. Based on the analysis of the study data, the following were the findings of the study: that there existed a significant relationship between teachers' academic qualification and preschool children achievement in number work, that teachers' professional qualification impacted positively on the achievement of preschoolers in number work, that teachers' experience did not influence preschool children achievement in number work and teachers' attitude towards number work did not seem to influence preschool children's achievement in number work. Based on the strengths of these findings, the following recommendations were critical: That there is need for the government and other educational stake holders to promote continuous teacher development through in-service and pre-service training programs. After training it is important that graduate teachers be posted direct to schools for this is the time they are more productive.

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## **ABBREVIATIONS AND ACRONYMS**

ECD	Early Childhood Education
ECDE	Early Childhood Education and Development
DICECE	District Centre for Early Childhood Education
GOK	Government of Kenya
KCPE	Kenya Certificate of Primary Education
KCSE	Kenya Certificate of Secondary Education
DEO	District Education Officer
EFA	Education for All
GOK	Government of Kenya
ZPD	Zonal Of Proximal Development
MKO	More Knowledgeable Other
SPSS	Statistical Packages for Social Sciences
SMASE	Strengthening Mathematics and Science Education

## CHAPTER ONE

### INTRODUCTION

#### **Background to the Problem**

According to Indimuli (1986), mathematics is one of the most useful subjects taught in schools and while most people, including parents teachers and children appreciate the essential role of mathematics in everyday activities, it remain one of the most disliked and poorly performed subject in the country. Statistics released by the Southern and Eastern African Consortium for Monitoring Education Quality (SACMEQ), a UNESCO backed think- tank on status of education of 15 countries in Sub-Sahara Africa in the East Africa Standard of June 2011 reported that learning achievement in Kenya's public schools has steadily dropped since introduction of free primary education. Trends in pupil achievement in mathematics also indicate in the last ten years, there had been a marginal drop in average scores among Kenya pupils. Sellinger (1994) alludes that there has been a general concern about the falling standards of numeracy raising the possibility of the need for a professional review of mathematics needed by industry at various levels. Consortium on Strengthening Mathematics and Science Education (SMASE) of (2009) labeled criticism against teachers for the declining standards in mathematic in the country and in Imenti North District in particular. This poor performance is in both Kenya certificate of Primary Education (KCPE) and Kenya Certificate of Secondary Education (KCSE).

According to Magoci (1992) the cause of this relatively poor performance has not been established. This has led to apportioning of blame at the beginning of every year on each other by different interested parties. SMASE report continues to point

out that the school administration, parents, and pupils tend to apportion blame to the teachers for the poor performance. They accuse teachers of adopting a relaxed attitude towards teaching leading to mass failure. Secondary school teachers accuse primary school teachers for producing half baked products and primary school teachers turn to preschool teachers blaming them for poor background of pupils. These accusations and counter-accusations may lead to low morale and a negative attitude towards the teaching of mathematics in particular at all levels.

Mwangi (1986) commented that there had been an outcry from the government and the general public on the way students learn and perform in mathematics. Similar sentiments were expressed by Kiragu (1986), who noted that despite national efforts made in developing a curriculum that is appropriate to the needs of this country, performances in KCSE in mathematics had been relatively poor over the last ten years. More similar sentiments were expressed by then Imenti North D.E.O Nichodemus Anyang' while addressing Baseline Survey for the development of a strategic plan for education in the district where he disclosed that only eleven KCPE candidates qualified to join national schools (Daily Nation 2012, March 02).

Commenting after releasing the 2010 KCPE results (Daily Nation, December 28) the then Minister for education, Professor Sam Ongeru hinted that Eastern province and Imenti North District in particular produced the worst performer who scored a mean of 43 out of a possible 500 marks with 25% (D-) in mathematics. The late Minister George Saitoti in the East Africa Standard 2003 February 27, noted that the overall performance in mathematics and science subjects were below average. He urged teachers to ensure that there was improvement in the subjects. He emphasized that mathematics and science subjects were a necessity as engines of

development in Kenya and that the government was committed to the issue of performance.

**TABLE 1.1: District KCSE subject mean for the year 2009-2011.**

<b>YEAR/SUBJECT</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
MATHEMATICS	2.06	2.18	2.35
KISWAHILI	4.273	4.339	4.849
ENGLISH	4.301	4.352	4.381
BIOLOGY	2.172	2.332	3.882
PHYSICS	4.859	4.554	4.382
CHEMISTRY	2.768	2.812	2.935
HISTORY	4.453	4.595	4.645
GEOGRAPHY	3.122	3.515	4.123
C.R.E	5.160	5.229	5.608
H/SCIENCE	6.428	6.603	5.508
AGRICULTURE	4.331	4.616	4.977
COMPUTER STUDIES	7.642	8.945	9.179
GERMAN	8.798	8.805	8.88
BUSINESS STUDIES	4.503	4.715	4.952

From table 1.1 mathematics registered the lowest mean among the fourteen subjects.

It was also ranked the last within the three year period.

**Table I.2: District KCPE subject performance for the year 2008-2011 in mean scores**

<b>SUBJECT</b>	<b>YEARS/MEAN SCORES</b>				<b>CUMULATIVE MEAN</b>
	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	
ENGLISH	46.68	46.20	48.28	49.45	<b>190.61</b>
KISWAHILI	46.55	43.70	51.20	50.88	<b>192.33</b>
MATHS	44.14	42.21	44.94	45.94	<b>177.23</b>
SCIENCE	44.25	42.8	45.96	46.32	<b>179.33</b>
SS/RE	44.00	43.65	45.36	45.85	<b>178.86</b>

From table 1.2 it can be concluded that, the overall district performance in KCPE for the last four years has been below average with mathematics trailing with a cumulative mean of 177.23 equal to 44.31 percent.

This indicates among other things that students may not be properly prepared in mathematics from their early years due to the quality of teachers. Education permanent secretary Professor George Godia in the Daily Nation of 10<sup>th</sup> July 2012 said that an audit conducted after perennial poor results in mathematics and science had revealed that most teachers in elementary classes and especially preschools were incompetent with most of them having had scored as low as grade D in the subjects. Sidhu (1982) stated that teachers without proper (academic) qualification and proper (professional) training fail to do “justice” to the subject. The attitude of the teachers towards mathematics is of paramount importance. Munguti (1987) found out that teachers attitude either enhanced or hindered the learning of Mathematics and hence affected performance. These findings are in agreement with Mwangi (1986) who found out that the teachers’ negative attitude was being reflected in the students’ poor performance in mathematics.

## **1.2 Statement of the Problem**

Mathematics is a useful subject taught in schools and after the introduction of information and technology in schools culminated with this era of industrialization its usefulness is compounded. It is evident that Imenti North district has been registering poor performance in mathematics for the last few years in KCPE & KCSE examinations as illustrated on table I.1 and 1.2 From the tables the subject mean throughout the years for KCPE & KCSE was very small . This trend has

multiple effects on the general development of the district, the county and the entire economy of the country. There is thus urgent need to put up mechanisms to reverse this state of affair. In an attempt to understand the primary root cause of this unsatisfactory performance at both primary and secondary level of education, the researcher sought to investigate the influence of teacher characteristics on the achievement of preschool children in number work since it is at this stage when basic number work concepts are built. The findings of the study will be of great benefit in planning for an appropriate human resource development in the instruction of number work and capacity building geared towards the attainment of the Goals of education, Millennium Development Goals and Vision 2030.

### **1.3 Purpose of the Study**

The purpose of the study was to establish the influence of teacher characteristics on the achievement of preschool children in number work.

### **1.4 Research Objectives**

This study was to:

- i). Determine the relationship between teachers' academic qualification and preschoolers' achievement in number work.
- ii). Establish the relationship between teachers' experience and the achievement of preschool children in number work.
- iii). Find out the relationship between teachers' professional qualification and the achievement of preschool children in number work.
- iv). Investigate the teachers' attitudes towards number work and its influence on learners' achievement.

## **1.5 Research Questions**

The study sought to answer the following research questions:

- i). What is the relationship between teachers' academic qualification and preschoolers' achievement in number work?
- ii). How does the teachers' experience influence the achievement of preschool children in number work?
- iii). What is the relationship between teachers' professional qualification and the achievement of preschoolers in number work?
- iv). What is the effect of teachers' attitude towards number work on the achievement of preschool children in number work?

## **1.6 Significance of the Study**

According to Kibui (1993) number work or mathematics is indispensable due to its usefulness in other fields of study like in physical sciences, economics and engineering. It is a compulsory and an examinable subject at both primary and secondary levels of education. However its poor performance in national examinations raises great concern among all the education stake holders.

It is anticipated that the research findings in this study will be instrumental to all the policy makers, planners, curriculum specialists, school administrators and other educationalists by providing an insight on how teacher characteristics influence preschool children achievement in number work in Imenti North district of Meru County. The study findings will be paramount in latter curriculum changes, innovations and early interventions geared towards cementing a strong foundation in number work.



### **1.7 Delimitation of the Study**

This study was limited to sixteen public and eight private preschools in Imenti North District of Meru County. The study only sought to establish how teacher characteristics influence preschool children's achievement in number work. The main participants in this study were preschool teachers and preschoolers within the sampled preschools in the district.

### **1.8 Limitations of the Study**

The limitation of this study was that achievement in number work may have been affected by a multiplicity of other factors. Alienating the influence of these factors was not possible. Factors such as government policies, parental participation and students' attitudes were some of the limitations encountered by the researcher in the process of conducting this study.

### **1.9 Assumptions of the Study**

The researcher assumed that the teachers' academic qualification, professional qualification, experience and their attitude towards number work influence the achievement of preschool children in number work.

### **1.10 Definition of Key Terms**

**Achievement:** Level of acquisition of knowledge and skills by children in number work.

**Attitude:** Emotional feeling towards the study of number work.

**Assessment:** Measuring the progress.

**Early Childhood Education Centre:** A formal setting for children.

**Early Childhood Education Programs:** Planned activities for under fives

**Experience:** Knowledge and skills a teacher has gained through years of teaching.

**Number work:** Knowledge in working with numbers.

**Teacher Characteristics:** Qualities of a teacher which include academic qualification, professional qualification, experience and attitude towards number work.

**Preschool:** ECD Class for age fives

### **1.11 Organization of the Study**

The research report is organized in chapters .Chapter one presents the introduction which comprises the background to the problem, statement of the problem, purpose of the study, research objectives., research questions, significance of the study, limitations and delimitations of the study, and finally definition of key terms. Chapter two reviews literature related to the study, theoretical framework and the conceptual framework. Chapter three is on research methodology under the following sub-headings; introduction, research design, target population, sample and sampling techniques, research instruments, instrument reliability and validity, data collection procedure, operation definition of variables, and data analysis and presentation. Chapter four concerns research findings and discussions and finally Chapter five presents the summary of the study, conclusions and recommendations.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This section reviews literature related to the study area. Both theoretical and empirical literature on teacher characteristics influencing preschoolers' achievement in number work is reviewed. The conceptual framework is also described.

Teacher characteristics refer to attitudes and attributes that teachers bring with them when they enter the classroom such as expectations for students, collegiality or collaborative nature, race and gender (Ballou and Podgursky, 2000). Teacher effectiveness on the other hand refer to a value added assessment of the degree to which teachers who are already in the classroom contribute to their students' learning, as indicated by higher than predicted increases in student achievement scores.

#### 2.2 Teacher Academic Qualification and its Influence on Learners Achievement

Teacher quality is of important concern to parents and policy makers (Wilson, 2001). But the definition of qualified has come under much scrutiny. For example, there is intense debate over whether alternatively certified teachers should be included under the heading of qualified teachers. The challenge in defining quality teachers illustrates a much more general concern in education. Teacher qualifications refer to credentials and knowledge that teachers bring with them when they enter classroom. These includes coursework, grades, subject matter education, degrees, test scores, certifications and evidence of participation in continued learning such as internships,

induction, supplemental training and professional development. Teacher qualifications help in the regulation of entry into classroom when there are no performance and outcome data for the case of new teachers (Ferguson and Helen, 1996). They are also used as indicators of teacher quality because of the relative ease of and cost effectiveness of data collection which can be found in public records maintained by states and districts. To some extent, teacher qualifications are effective at identifying teachers who improve the achievement of children (Ferguson, 1996). Some teacher qualifications are consistently associated with increased student achievement in particular subject areas. This is most notable in mathematics where most research studies have concentrated.

A major teacher qualification attribute that has consistently been shown to produce strong positive effects on student learning mathematics is the teachers' knowledge of mathematics matters for student learning in mathematics at all school levels (Darling-Hammond, 2001). Whether measured by mathematics course taking, certification, or degree, it appears that teachers with stronger mathematics knowledge produce better student achievement in mathematics compared with less knowledgeable teachers (Goldhaber and Brewer, 2001). Thus in this study mathematics course taking, certification, and degree of the teacher will be assessed in this study to determine its impact on the preschool children's achievement.

Other attributes that have been investigated in the past include subject matter knowledge, test scores, training institution, advanced degrees, certification, induction and mentoring, professional development, experience and content based pedagogical knowledge (Hanushek, 1997; Jacob, 2007 & Jacob, 2011). Subjected matter knowledge has been found to have varied effects on the student achievement. It is strongly related to achievement in higher grades. Studies have established that there

exist a stronger correlation between the achievement of secondary school students and their teacher's subject area expertise than exist between the success of younger students and their teacher's subject knowledge (Raymond, Fletcher & Luque 2001). In particular, several studies indicate that teacher completion of an undergraduate or graduate major in mathematics is associated with higher student achievement in high school and middle school. Given previous association of subject matter knowledge with increased achievement in higher grade classes, this study will not investigate this attribute.

The effects associated with teacher's possession of an advanced degree are strikingly counterintuitive; especially given the salary incentives offered to encourage teachers pursue graduate degrees (Rowan, 2002). Recent studies as in Woolfolk and Wayne (1990) have not established any benefits for students of teachers with advanced degrees. Moreover, these studies indicate that teachers with master's degrees and beyond may negatively influence their students' achievement. Other studies however, find marginal benefits for middle school mathematics achievement when teachers hold master's degrees, but this effect is not practically significant. Xu, Jane and Colin (2011) reported that there is no association between teachers holding master's degrees and fourth-through eighth grade student's mathematics test score gains.

Even though teacher test scores are usually used as an indicator of teacher quality, recent studies have reported mixed findings. Pecheone, Rogers and Moirs (2001) did not find any relationship between elementary and middle school teachers' certification and their student's mathematics achievements. However, other studies have shown that teachers with higher licensure test scores have a marginal positive

impact on middle school mathematics achievement. Thus the relationship between learners achievement and teacher test scores will also be investigated in this study.

Teacher certification as a signal of teacher quality has been investigated at various levels. Jacob, (2007) established that full certification is either unrelated or positively related to student achievement. On other hand, Ballou (2000) established that emergency certification is generally unrelated or negatively related to student achievement. Teachers' subject area certification or authorization is one of the teacher qualifications most consistently and strongly associated with improved student achievement. Thus in this study, teacher mathematics certification or authorization and its impact on preschool achievement will be investigated

### **2.3 Teachers' Professional Qualification and Its Influence on Learners' Achievement**

A profession is a type of a job that needs high level of education and training. Teacher trainees in colleges and universities are equipped with skills (the art or pedagogy) of teaching. This implies that after undergoing training one becomes an authority in his or her field of operation. According to Kimani (1991), inservice training in mathematics boosts the teacher's confidence in the teaching of the subject, improves his attitude towards the subject and attainment of adequate subject knowledge. Even with the highest professional qualification possible, teachers should always strive to improve their skills and knowledge. Bell (1978) asserts that one should ever remain a student which is supported by Farrant (1980) who observed that the teachers of today have greater responsibilities and therefore should have a life-long access to training at all levels and at all times appropriate to their needs. Hence, inservice training and involving preschool teachers will be investigated in this study.

Darling-Hammond, (2001) shows that certain types of professional development contribute to teacher quality and student achievement. Sustained professional development that is aligned with the curriculum and focused on instruction has shown to positively influence school level achievement in mathematics and science at both elementary and high school. However, other studies dispute this view.

Teacher's content specific pedagogical knowledge is significantly associated with students' mathematics achievement at all levels (Darling-Hammond, 2001). A study in Darling-Hammond (2001) found a strong association between the number of mathematics pedagogy courses teachers had taken with student achievement at the elementary, middle, and high school levels while another established that the teacher's mathematics pedagogical knowledge of both elementary and high school is strongly related to teacher level predictor of student achievement. Moreover, teacher's content knowledge has been found to be positively associated with elementary student achievement in reading, mathematics and language thus, refresher courses taken by teachers will be looked into.

Kathuri (1986) indicated that, a professionally trained teacher contributes more positively to effective learning than untrained one. It is for the same reason that teacher training exists as a major part of education systems throughout the world.

Eshiwani (1985), points to a general agreement that teachers' professional qualification is related to the performance of learners in mathematics. Teacher training should therefore stress on teacher quality. Kirembu (1991) found that both professional and academic qualifications of the teacher are important in ensuring good performance of learners in mathematics. This explains the importance of recruiting qualified persons for teacher training. Thus teachers' professional

qualification and its influence on the learners' achievement will be focused in this study.

Wayne (2002) argued that the training institution a teacher attends may be a useful indicator of teacher quality. However, recent studies do not support this view. In spite of this; older studies have found a marginal relationship between the selectivity of a teacher's undergraduate institution and his or her student's achievement of which will not be investigated in this study.

#### **2.4 Teachers Experience and Learner Academic Achievement**

Teaching experience can be perceived as a reliable prediction of a person's ability to handle a certain task. Sidhu (1982) attests that successful teaching experience is a valuable asset. Bell (1978) continues to say that teaching experience can be useful in teaching by ensuring that the teacher selects appropriate models of instruction. It is believed that an experienced teacher is knowledgeable and has gained a variety of skills of teaching by teaching for a long period of time. However, according to Hanushek (1971), Hanushek (1999) and Hanushek (2001) this is only applicable in the first five years of teaching mathematics. During this initial five years of teaching, teachers seem to incrementally contribute to student learning. After the initial five years of teaching, the contribution of experience to student learning appears to level off. Experience, especially during the first five years in the classroom, is positively associated with student achievement in mathematics and reading at the elementary and middle school levels. However, Barnes (1985) observed that teachers' effectiveness while it may increase through the early years of teaching, it may not directly follow the same pattern in the latter years of teaching. Thus, the attribute of teachers' experience will be investigated in this study.



According to Goe (2007), teacher experience may entail classroom practices teachers employ. They include the ways in which teachers interact with students and the teaching strategies they use to accomplish specific teaching tasks. The practices may involve aligning instruction with assessment, communicating clear learning objectives and expectations for student performance, providing intellectual challenges, allowing students to explain what they are learning, using formative assessment to understand what and the degree to which students are actually learning, offering active learning experiences and subscribing to cohesive sets of best teaching practices. Teacher practices refer to a process view of teacher quality, which could be described as instructional quality. Kimani (1991) goes ahead to point out that the practice of teaching mathematics and keeping up with new knowledge could influence the achievement in mathematics. In order to produce quality mathematics teachers for primary schools, he recommended that teaching experience should be sufficient before admission for in-service courses. Goe (2007) assert that teacher practice variables include alignment of instruction and assessments, clear learning objectives and performance expectations, intellectual challenge, explaining what they are learning, formative assessment, active learning, teacher practices as measured by expert observers, principals' subjective assessments of teacher quality. Goe (2007) goes on to report that there is a positive association between cognitively engaging on challenging instruction with elementary and middle school achievement in mathematics and reading

## **2.5 Attitude of Pre-School Teachers Towards Number Work**

Attitudes are mental superposition's that express the connections between situations. As defined by Bell (1980) it is "a mental and neural state of readiness organized through experience exerting a directive or dynamic influence upon the individual's

response to all objects and situations with which is related”. Ryan and Cooper (1984) emphasize that there are four major types of the teachers’ attitudes that affect teaching behavior. They are attitudes towards self, attitude towards children, attitudes towards peer and parents and attitude towards the subject matter.

On the attitudes of school teachers towards mathematics, Majasan (1995) reveal that attitude towards mathematics grow and is acquired gradually through the students interaction with the learning process and the curriculum. Teachers attitude are believed to be an important factor in determining the teaching and learning of mathematics. If the teachers attitude is negative towards mathematics, it may in turn affect learners learning and hence their achievement. Cockcroft (1982) noted that there’s no area of knowledge where a teacher has more influence over attitudes as well as understanding of his pupils than he does in mathematics. Cockcroft goes ahead to claim that during his professional life, a teacher of mathematics may influence for good the attitudes towards mathematics of several thousand young people and decisively affect many of their career choices. This indicates that teachers attitude towards mathematics has a great impact on mathematics’ performance than any other area of knowledge. In a study carried out by Waihenya in the year 2000, teachers’ attitude was blamed for failure in mathematics and sciences. One student is quoted as saying that teachers identify those who like the subject and concentrate their efforts on them. They never try to change the perception of students who had negative attitude towards mathematics and who eventually fail. The teachers were also accused of not marking the books of the weak students and not punishing those who missed the lessons, which was like “institutionalizing” the students’ dislike of the subject. Ryan and Cooper (1984) affirm the same when they talk of situations where teachers dislike particular students while having obvious fondness for others.

Johnson and Rising (1972) recommend that teachers be the kind of persons students accept and want to associate with. They should work with students with patience and kindness making learning mathematics a privilege and not a punishment. They should be fair in marking and discipline. Majasan (1995) talked of compassion being one of the three aspects that a teacher should have for successful teaching. A compassionate teacher takes note of every individual and circumstances which lead him/her to see what is wrong and improve on it. This way, the teacher will help the student build confidence and loyalty to mathematics culminating to successful learning. Griffiths (1988), on the development of attitudes stated that the crucial period in developing attitude in a child seems to lie in the infant, where his first formal acquaintances with arithmetic is made, thereafter, should proceed at place commensurate with his understanding so that he is not baffled on one hand or bored on the other hand. Churchill (1958) suggested that the faulty development of concepts was probably the most likely cause of the “strong dislike and even fear” which many intelligent adults were known to manifest towards arithmetic operations. This conceptualization placed the origins of the phenomenon as far back as the infant school, where critics of the current practice asserted that while children were taught perhaps to calculate, the number understanding was rarely developed. If the young child did not grasp the significance of number operations at this stage, subsequent arithmetic lessons were only meaningless and puzzling.

In (1967) Johnson noted that “it is the attitudes which are built that are highly involved in the learning and retention of our subject and it is after the attitude you (teachers) build that are basis of your rank as a successful teacher”. This indicates that if a student develops a positive attitude towards a given subject, then the chances of liking that subject and performing well in it are increased.

Aiken (1970) studied the relationship between attitude and performance and concluded that: the relationship between attitude and performance is certainly the consequence of reciprocal influence, in that, attitude affects achievement and in turn affects attitudes. Mwangi (1986) had similar findings when he found out that teachers attitude was being reflected in the students poor performance.

The teacher must like mathematics, enjoy the subject because without enthusiasm for the subject it would be easy for the students to get bored of the hard facts flatly delivered (Ryan and Cooper, 1984). Pleasure in learning and teaching is the common ground necessary to sustain great teaching. If teachers like and value their subjects, this positive attitude will show through and will have a powerful influence on the motivation of students. What the teacher values, students begin to value and on to motivation will have taken root (Eble, 1988). If the teacher therefore feels little enthusiasm or interest, this too shows through and the students slows down. Positive attitude of the teacher towards the subject plays a positive role in causing the students to learn the subject effectively and thus achieve good grades in the subject. In 1962 Dutton, investigated the changes in attitudes of prospective elementary teachers towards arithmetic since 1954. The study revealed that thirty eight (38) percent dislike arithmetic and twenty four (24) percent liked it very well. The study further showed that prospective elementary school teachers tenaciously held attitudes towards arithmetic once developed. Teachers' attitudes are believed to be an important factor in determining the teaching and learning of mathematics.

In a conference on the low achievers of mathematics (Jonson and Rising 1972), it was noted that for successful learning, the mathematics teacher should be as follows: "A teacher who accepts the fact that low achievers are teachable; a teacher who has missionary spirit and a respect for the worth of pupils with limited ability; a teacher

who is concerned and interested in individuals; a teacher who can make a pupil feel he/she is not only belongs but is important; a teacher who can instill a sense of worthiness, responsibility and desire to achieve. A teacher who cares enough to give his best to the low achiever will make the program a success”.

Gatanzamo (1977) giving his experience with prospective teachers noted that, during their first few days of classes, prospective teachers had a tendency to make one or more of the following comments: “mathematics has always been my poorest subject”, or “I will never pass this course”. Such comments indicated to some degree, the feelings and emotions of many of the prospective teachers towards mathematics. Unless these prospective teachers’ attitudes were changed, then the pupils taught by teachers with these feelings were likely to reflect the same to achieve accordingly. Looft (1971), Parker (1974), Wamani (1980) and Thuo (1984) as in Irumbi (1990) found a strong relationship between achievement in mathematics and attitude towards mathematics. Munguti (1984) in a study of factors affecting the teaching and learning of mathematics found out that teacher attitude towards mathematics was a factor that may affect the teaching of mathematics.

Mwangi (1986) had similar findings when he found out that teachers attitude was being reflected in the students’ poor performance. Alken (1970) revealed that teachers’ attitude and effectiveness were determinant of students’ attitudes and performance in mathematics. Wando (1992) studied teachers as a possible source of pupils’ attitude towards mathematics. She found no evidence to the effect that teachers’ attitudes affect pupils towards the subject. Kinyanjui (2004) argues that there is no significant relationship between the mathematics teachers attitudes students performance in the subject whereas Margaret (2003) contradicts to conclude

that a significant relationship does exist between attitudes of teachers and learners performance.

Owing to the fact that all these studies targeted the primary and the secondary teachers, it is worth to undertake the same research on the pre-school teachers to unearth the discrepancy since teachers' attitude towards mathematics is an important factor in learning mathematics.

## **2.6 Effects of Teacher Characteristics on Learners' Achievement**

Despite the importance of identifying observable characteristics that predict teacher success, researchers and educators have had difficulty identifying specific characteristics related to teacher effectiveness (Hanushek, 1986). The lack of agreement in findings has sometimes led to impassioned disagreements about interpreting research results (Krueger, 2003). Rivkin, Hanushek and Kain (2005) found that teachers in their first or second year of teaching are associated with lower student test scores in Texas, but teacher education and certification have no systematic relationship with achievement. Rockoff (2004) reported positive impacts of teacher experience and teacher license test scores on student achievement. Studies by Rockoff and Douglas (2010) and Xu (2011) got mixed results for teacher characteristics using detailed individual-level data from elementary schools in the San Diego Unified School District.

The lack of significant effects for these teacher characteristics should not be interpreted as evidence that teachers have no impact on student achievement. Teacher quality, measured by teacher fixed effects, has an important impact on student achievement in Rockoff and Douglas (2010). In addition, Hanushek (2005) found significant impact of classroom fixed effects (combined impact of

teachers and peers). Rivkin, (2005) found large effects for overall teacher effects measured at the grade level. In other words, teacher quality may be important, but it is not well captured by levels of teacher experience, certification, and education.

According to Rockoff (2004) and Rivkin (2005) there is considerable variance in the productivity of teachers. A one standard deviation increase in teacher quality is associated with a 0.1 to 0.2 standard deviation increase in student achievement. If observable characteristics that predict teacher quality can be determined, they could be used to identify the most effective candidates in the hiring process and if teacher characteristics are malleable, determining which teacher characteristics have the greatest impact on student achievement could also inform the design of teacher training programmes (Kane and Staiger, 2008). There is little evidence that academic background, certification exam scores (Boyd, Pamela, Hamilton, Susanna and James 2006; Goldhaber, 2007), or personality characteristics (Woolfolk and Hoy 1990 and Hoy and Woolfolk, 1993) can predict students' success. The lack of evidence linking observable characteristics to teacher effectiveness is due, in part, to the fact that most research on teacher effectiveness has examined a relatively small set of teacher characteristics collected by school administrators, such as graduate education and certification. Recent research using data not typically collected by school districts suggests that we may be able to predict teacher effectiveness. Kane, Rockoff and Staiger (2006) found out that students assigned to a teacher with higher cognitive or non-cognitive skills score about 0.03 standard deviations higher in math. Rockoff and Douglas (2010) (forthcoming) also find that students assigned to more highly ranked New York City teaching fellows score about 0.015 standard deviations higher in mathematics.

One type of study by Rivkin (2005) measures teacher quality and then relates teacher characteristics to it. It measures teacher quality as a teacher fixed effect in a student achievement equation using data where a teacher is matched to students in the various classes of a given grade she/he taught in a year or the cohorts she/he taught over various years. Studies by Irumbi (1990), Hanushek, (2005) and Rockoff (2004) follow this approach. They find that teacher quality measured in this way is reasonably stable over time. While students taught by ‘high quality’ teachers have significantly higher achievement, resume characteristics on which teacher compensation is based – such as teacher education, training, and experience – explain little of the variation in teacher quality.

Another type of study by Hoxby and Sonali (2010), examined the relationship between teacher characteristics and student achievement directly. Such studies have used experimental methods, mainly investigating the effect of teacher incentives. Other studies have used statistical approaches such as an instrumental variable approach (Hoxby, 2010), a value-added approach (Hanushek, 2003) or a panel data approach. The evidence from these studies is undisputed.

## **2.7 Theoretical Framework**

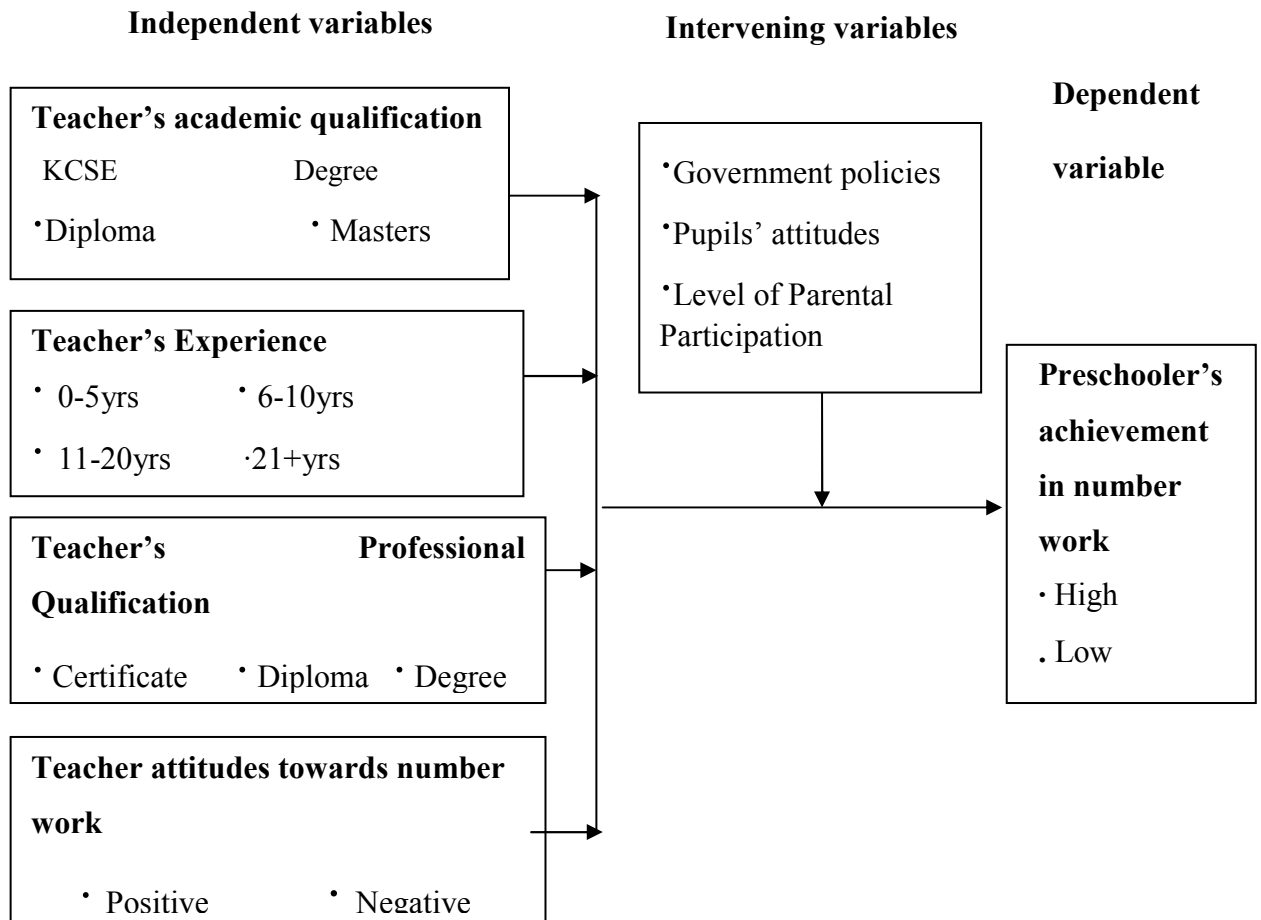
The study was anchored on the Vygotsky’s Social Constructivist theory of cognitive development. This theory focuses on social interactions that play a fundamental role in the development of cognition. Vygotsky (1978) wrote; ‘every function in the child’s cultural development appears twice: first on the social level and later, on the individual level; first between people (inter-psychological) and then inside the child (intra-psychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationship between individuals.



The potential for cognitive development depends upon two principles; the Zone of Proximal Development (ZPD) and More Knowledgeable Other (MKO). ZPD is the difference between what learners can do without help. It is the distance between the 'actual development levels as determined by independent problem solving and the level potential development determined through problem solving under adult guidance and for that matter is the preschool teacher. Full development of the ZPD depends upon social interaction in that, the range skills can be developed with social guidance or collaboration thus it often exceeds what can be attained alone. The implication is that the MKO is a teacher or an old adult. Taken together, the two form the basis of scaffolding component of the cognitive apprenticeship model of instruction. For Vygotsky, development and learning are not the same; they are dynamic processes that result to these gaps of development level that must be addressed through social cooperation and interaction with the more capable peers and adults. Preschool teachers are among the most important persons in children's inter-psychological (interpersonal) relationships. One of the most important influences on the children's psychosocial environment therefore is the preschool center teacher characteristics. Relevant strategies should therefore be geared towards improving teacher characteristics and providing a child- friendly environment. Level of teacher academic qualification, training, experience and teacher's attitude towards number work are likely to influence children's achievement in number work. This, in turn, is likely to result in teachers becoming effective in stimulating and nurturing children, responding sensitively to their needs, encouraging them and using few disciplinary actions. Consequently, teachers would achieve the ultimate psychosocial developmental goals in children: the development of high cognitive and language skills, positive emotional adjustment and social competence. The relationship between these variables is conceptualized below.

## 2.8 Conceptual Framework

The basis of the study conceptual framework is that preschool teachers' background characteristics are the core determinants of preschool children achievement in number work although other extraneous variables may influence. Figure 2.1 shows the schematic presentation of the study:



**Figure 2.1: Conceptual framework for preschool teachers' background characteristics and its influence on the achievement of preschool children in number work**

The study perceives number work achievement by learners as a function of teacher characteristics. The teacher characteristics include: Academic qualification, Professional qualification, teaching experience and the teacher's attitude towards number work.

The preschool teacher will utilize his or her academic ability to understand, internalize and construct knowledge. She/he will use his/her training and teaching experience to come up with the appropriate methodology for imparting number work concepts. His/her attitude towards the subject will affect the organization and interpretation of learning experiences. This eventually influences the whole learning process culminating to either successful learning outcome or non-successful learning outcome gauged by learners' achievement in number work. The moderating variables subject to influencing learning outcomes and are not controlled includes the government policies, pupils attitudes, level of parental involvement and availability of teaching and learning materials.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter dealt with methods and procedures used to collect data for the study. It covered the research design that was used, location of the study, population and sampling procedure and sample size, instrumentations, pilot study, data collection procedures and data analysis.

#### 3.2 Research Design

According to Orodho (2004) research design is a scheme or plan that is used to generate answers to research problems. Kothari (2004) defines it as the blue print for the collection, measurement and analysis of data. The researcher chose *ex post facto* research design. Kerlinger (1973) defines *ex post facto* research as a systematic empirical enquiry in which the scientist does not have direct control over the independent variables because their manifestations have already occurred, or because they are inherently not manipulatable. In this research the researcher established the influence of independent variables on the dependent variable retrospectively meaning after the change had taken place. Hence, the researcher dealt with (teachers' academic and professional qualification, experience and attitude towards number work) independent variables which cannot be manipulated.

#### 3.3 Target Population

According to Mugenda and Mugenda (1999), target population or universe of a study is defined as all the members of real or hypothetical set of people, events or objects to which an investigator wishes to generalize the results of the study.

The target population of the study was all the preschools in Imenti North District of Meru County .They comprised 60 public preschools with 60 teachers and 40 private ones with a number of 40 teachers. This brought together a population of 100 preschool teachers and three thousand one hundred and three preschool children.

### **3.4 Sampling Procedure and Sample Size**

The researcher used stratified random sampling technique since the population from which sample size was drawn was public and private preschools. The stratified sampling process involved necessitated the production of typical representative sample of the entire stratified population which guaranteed representativeness reducing sample error.

A sample size of twenty percent from both public and private preschools was reliable for the study. According to Kothari, a sample size of 20% is an adequate representative of the entire population. The sample for the study composed of 10% of each stratum of teachers in public and private preschools which brought the number to 12 from 60 public preschools and 8 from 40 private preschools giving a total of 20 respondents. In order to accord each of the potential respondents in the population equal chances of inclusion, the researcher assigned each a number. The number for each category was written on a small piece of paper and folded. The papers were then were then dropped into one container for private preschools and another for public preschools. The researcher picked randomly the first 12 papers from public and 8 from private schools' stratum making a total of stratified sample size of 20 preschools. Therefore, 20 preschool teachers and 620 preschool children (preschool children from the 20 preschool) constituted the sample population under investigation.

### **3.5 Data Collection Instruments**

The researcher used questionnaires and documentary analysis forms to solicit information from the sampled preschool centers regarding teacher characteristics and learners achievement.

#### **3.5.1 Questionnaires**

A single set of questionnaire was constructed guided by the formulated research objectives. It was administered by the researcher and his assistant to the sampled preschool teachers to elicit information on the independent and dependent variables under investigation. It was important to use this type of instrument to this group of people since they could read, understand and respond to the questions by writing their responses without undue influence. It was also a very useful tool for collecting data due to anonymity of the respondents thus upholding honesty and free expression of feelings. The questionnaire composed of closed -ended questions and open- ended questions. Closed-ended questions were used largely because they were easy to administer, analyze and time saving. The open-ended questions enabled the researcher to understand the respondents at depth for it gave them an opportunity to express their feelings by giving more information freely. The questionnaire had three content sub-sections : Section A which had twenty one questions. The first four questions sort teacher's background information regarding the nature of their schools and ECD centres and teachers' gender. Questions five to twenty one elicited information on teachers' level of education, training and teaching experience.

Section B had an attitude scale test intended to measure the attitude of preschool teachers' towards the teaching of number work. The test had 20 matrix questions with 5 choices each. Respondents were expected to pick one possibility from each statement. The possibilities and the corresponding scores awarded were in accordance to Revised Mathematical Attitude Scale (RMAS). It used a five rating Likert scale whereby statements portraying positive feelings were awarded as follows: strongly agree-5, agree-4, undecided-3, disagree-2 and strongly disagree-1. Whereas statements portraying negative feelings were: strongly disagree-5, disagree-4, undecided-3, agree-2 and strongly agree-1.

The highest score respondents could attain was 100 and the lowest being 20. To get the average score, the highest score was added to the lowest score then divided by two:

$$\begin{aligned} \text{Average} &= (\text{Highest Score} + \text{Lowest Score}) \div 2 \\ &= (100+20) \div 2 = 60 \end{aligned}$$

Thus, scores were categorized according to numerical rating from the smallest number to the biggest number as follows:

Negative attitude.....20-39	slightly positive.....60-79
Slightly Negative.....40-59	Positive.....80-100

According to MoE (2006) guidelines, preschool children should not be subjected to tests for rating or placement and therefore information on the dependent variable which formed section C of the questionnaire was derived from past progressive records of work. Preschool teachers were expected to use preschool children progressive records of work to respond to this section whereby they entered children

under category very good, good, fair and poor. This generated a two year data on the level of achievement of preschool children in the district.

### **3.5.2 Documentary Analysis Form**

This is a single research instrument prepared by the researcher in order to access data from teachers' professional documents such as schemes of work, lesson plans, progress records, class registers, and lesson notes. The tool was constructed following the objectives of the study in a structured manner. It was designed in a checklist format.

### **3.6 Validity of Instruments**

Validity is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study (Orodho, 2005). It is the accuracy and meaningfulness of inferences, which are based on the research results (Mugenda and Mugenda, 1999). Therefore, an instrument is said to be valid when it actually measure what it claims to measure. To establish instrument validity of the two instruments, the researcher was careful when constructing the items by ensuring they embraced all the research objectives. As recommended by Mugenda and Mugenda (1999) the researcher used experts and professionals in the field of education to establish content validity of the two instruments and their judgment was used to review the items in the questions. To further establish the validity of the two instruments a pilot test in two preschools within the district was carried out. These schools were selected from the two strata composing the study population. This is in concurrence with Mulusa (1990) who asserts that for effective pre-testing of instruments, the elements should be selected from all the categories under the study. The procedure used in pre-testing was identical to that used during the actual data



collection. After piloting the two instruments the researcher and the research assistant established how the respondents responded to different questionnaire items and did any necessary moderations. For the documentary analysis forms the researcher compared his notes with those of the research assistant. The pilot study also helped the researcher to modify or redesign some of the items in the instruments and polish the language used. This greatly assisted in controlling the problem of ambiguity and irrelevances hence improving the quality of responses from the respondents and in totality validating the instruments.

### **3.7 Reliability of Instruments**

Reliability is a measure of the degree to which research instruments yield constant results or data after repeated trials (Mugenda and Mugenda, 1999). It is the degree of consistency between two instruments or more as they address the same research problem. A test re-test technique was used to test reliability of the instruments. This involved administering the same instruments twice to the same group of subjects. The subjects (two preschools comprising two teachers and sixty eight preschool children) were picked from non participating preschools in the district. The second test was done after two weeks, same conditions withstanding. From the responses obtained from the two sets of tests, Pearson product moment formular was used to calculate the coefficient correlation at  $\pm 0.5$  level of significance in order to establish the extent to which the items in the questionnaire were consistent in eliciting the same response every time they were administered.

The formula used to analyse the instruments' reliability is given below.

$$R_{xy} = \frac{N \sum xy - (\sum x) (\sum y)}{\sqrt{[N \sum X^2 - (\sum x)^2] [N \sum Y^2 - (\sum y)^2]}}$$

Where:  $R_{xy}$  = Coefficient of reliability

$\Sigma$  = Sum of

$x$  = Deviation of  $x$  measures from assumed mean

$y$  = Deviation of  $y$  measures from assumed mean

$N$  = Number of pairs of scores

The correlation coefficient for the questionnaire was found to be  $r = 0.87$ . The Revised Mathematical Attitude Scale (RMAS) was statically evaluated for reliability. By using Spearman's correlation coefficient items were given means, variances which assisted in determining which items were to be deleted from the scale to strengthen the power of the scale. Positive questions were put in group A and negative questions in set B and the correlation coefficient between the two computed as follows using Spearman Brown Prophecy:

$$R_{xy} = \frac{2r_{oe}}{1 + r_{oe}}$$

Where:

$R_{xy}$  = The reliability of the original test

$r_{oe}$  = The reliability coefficient obtained by correlating the scores of positive statements with the scores of the negative statements.

The correlation coefficient for the RMAS was found to be  $r = 0.89$ .

Since reliability coefficient is usually interpreted like a regular correlation, the implication being that the closer the value obtained is to 1.00, the stronger the congruence of measurement, the instruments were found to be reliable for the study.

For the documentary analysis forms, data collected during piloting by the researcher and the research assistant was compared against each other and necessary adjustments effected to the statements and options.

### **3.8 Data Collection Procedure**

The first step was to obtain consent to collect data from the District Education office. The next thing concerned training the research assistant on the study objectives, ethical concerns and how to administer the two research instruments. The study preschools were divided equally among the researcher and the research assistant (ten preschools per person). Each visited selected preschools for the purpose of familiarization and delivering introductory letters to the school heads. Then, each of them visited the preschool teachers in their classes, explained the purpose of visitation and consequently forwarded the questionnaires and the letters of transmittal to the teachers. The researcher and his assistant then received teachers' professional documents and left them to fill the questionnaires independently in their rooms. As teachers filled the questionnaires the researcher and his assistant went ahead to analyze the professional documents in a separate room using documentary analysis forms. This involved searching for data relevant to the study by examining what had been put in various documents and ticking against the options under each item. Then the teachers' professional documents would be returned to teachers and questionnaires collected. For those who required more time to work on the questionnaires they were accorded and arrangements were made when to collect them.

After the two instruments were administered in two centers concurrently they proceeded to other centers. Due to the sampling procedure used to select preschool

centres to be studied, the centres were scattered across the district and the two had to cover long distances. For this reason, data collection took a period of two weeks.

### **3.9 Data Analysis**

According to Mugenda and Mugenda (1999) data obtained from the field in raw form is difficult to interpret and as such it should be cleaned, key-punched into a computer and analyzed. The process of analyzing the data was systematically carried out in the following way:

#### **3.9.1 Pre-Analysis of the Data**

The researcher chose quantitative model of data analysis. This involved assigning numerical values measured at interval or ratio scales as it applied to the responses in the questionnaires and documentary analysis forms. Since most of the items in the two instruments were structured, this exercise of assigning numerals was easily accomplished. In the event where items provided many responses the researcher formulated categories of possible responses. For the open –ended questions the researcher categorized all responses given and assigned numerals to them.

#### **3.9.2 Coding and Data Entry**

The researcher with the help of a data analyst prepared a code book that described in specific details the coding scheme to be followed. This code book described the code assignment for each response category for each item in the questionnaire and the documentary analysis form. The code book was used to enter the data into the computer using Scientific Package for Social Sciences (SPSS 17.0 for windows)

### **3.9.3 Substantiation of Statistical Analysis**

The first thing involved summarizing the data using descriptive statistics. For the data to make sense and for it to be easily interpreted the researcher presented it in a tabular form using frequency distributions. This entailed tallying the categories of responses, calculating frequencies and percentages. The researcher also calculated the mean as in the case of attitude test of the preschool teachers and the achievement level of preschool children. In order to measure relationships between independent variables and dependent variable for the purpose of generalizing the results the researcher used inferential statistics. Finally, since the analyzed data was discrete in nature the preferred correlation technique was Pearson product chi-square which helped the researcher to draw relationships between variables and make inferences.

### **3.10 Ethical Considerations**

Researching is a human activity and being so it is guided by some basic principles. To start the study the researcher sought consent from the district education office and the school head teachers of the sampled preschools. The researcher clearly outlined the purpose of the study and respondents willingly participated in the research.

The researcher was keen to carry out the research and the situations where there was a reference to other people's work the authors were acknowledged. The names of respondents and their institutions were not disclosed

## **CHAPTER FOUR**

### **FINDINGS AND DISCUSSIONS**

#### **4.1 Introduction**

This chapter presents the research findings and discussions. The findings are organized around the two study variables and anchored on the research objectives. Since the study relates the preschool teachers' back ground characteristics on the achievement of preschool children in number work, a brief analysis of the preschool children achievement in number work commences. This is followed by findings and discussions on: teachers' academic and professional qualification and preschool children achievement in number work, teachers' experience and preschool children achievement in number work and attitude of preschool teachers towards number work and its influence on the achievement of preschool children in number work. As explained in chapter three of the study twenty preschool teachers and six hundred and twenty preschool children participated in the study. Presented below were key findings of the study.

#### **4.2 Achievement Levels of Preschool Children**

Section C of the Questionnaire required the respondents to provide information about the achievement of preschool children for the last 2 years. Table 4.1 presents the summary.

**Table 4.1 Achievement level of preschool children**

<b>Levels of achievement</b>	<b>Frequency</b>	<b>Percentage</b>
High achievement	450	73.5%
Low achievement	162	26.5%
<b>Total</b>	<b>612</b>	<b>100.0%</b>

The above Table 4.1 indicated that the 20 sampled preschools had a population of about 612 preschool children. Out of these, 450 (73.5%) highly achieved in number work and 162 (26.5%) children registered a low achievement.

### **4.3 Preschool Teachers' Academic Qualification**

Respondents were asked to indicate the highest level of education they had achieved.

Table 4.2 presents the results.

**Table 4.2: Highest level of education**

<b>Level of education</b>	<b>Frequency</b>	<b>Percentage</b>
Form Four level	1	5.0
Certificate in ECDE	9	45.0
Diploma in ECDE	10	50.0
	20	100.0

Table 4.2 shows that 50.0% (n=20) being majority of preschool teachers had diploma level of education, 45.0% (n=20) attained ECDE certificate level of education while 5.0% (n=20) had form four level of education. Then if at all teacher qualifications are consistently associated with increased student achievement as indicated by Ferguson (1996) then the same was expected of this study.

#### 4.4 Preschool Teachers' Professional Qualification

Respondents were asked to indicate their highest level of professional development.

Table 4.3 presents the results.

**Table 4.3: Highest level of professional qualification**

<b>Level of education</b>	<b>Frequency</b>	<b>Percentage</b>
No formal training	1	5.0
Certificate in ECDE	9	45.0
Diploma in ECDE	10	50
<b>Total</b>	<b>20</b>	<b>100</b>

Table 4.3 shows that 50.0% (n=20) of teachers had attained diploma training in ECDE, 45.0% (n=20) attained certificate training in ECDE while 5.0% (n=20) had no formal training in ECDE. The high number of trained teachers (95.0 %) could be due to the government effort to train preschool teachers through in-service programs. Liberalization of education sector resulting to mass-rooming of training institutions could also have attracted many teachers to train. It could also be explained to be due to the government promise to employ preschool teachers under the devolved constitutional dispensation. This is a positive indication that majority of the teachers hold at least a minimum requirement for teaching at the preschool level. This places the schools in the region in a particularly good position in terms of capacity building (skills and knowledge acquisition) and creates a better basis for achievement of better results.

Preschoolers' achievement can be improved by tapping into the teachers' skills. The study established that preschool teachers in the district were well grounded in the



subject since 85.0% (n=20) had received training and attended refresher course in number work. However, the preschool teaching work force was dominated by female teachers who formed 95.0% (n=20) of the sampled population.

#### **4.5 Relationship between Preschool Teachers' (Academic and Professional) Qualification and Learners' Achievement in Number Work**

The data from table 4.2 and 4.3 portrayed similarities concerning the variables under investigation. This was demonstrated by majority of the teachers with the highest academic qualification and highest professional qualification being diploma holders at 50.0% (n=20), followed by those with certificate in ECDE at 45.0% (n=20) and finally 5.0% (n=20) had a form four certificate and without formal training in ECDE. This unique phenomenon rendered the researcher to combine the two variables when drawing their relationships with the dependent variable as in table 4.4.

**Table 4.4: Cross-tabulation of preschool teachers’ academic/ professional qualification and learners’ achievement**

Teachers’ level of education & training	Learners’ levels of achievement		High		Low	
	N	%age	N	%age	N	%age
Diploma in ECDE	10	50.0	265	58.8	0	.0
Certificate in ECDE	9	45.0	185	41.2	108	66.7
Form IV (no formal training )	1	5.0	.0	.0	54	33.3
<b>Total</b>	<b>20</b>	<b>100.0</b>	<b>450</b>	<b>100.0</b>	<b>162</b>	<b>100.0</b>

Table 4.4 shows that diploma teachers taught 58.8% (n=265) of the high achieving preschool children while 41.2% (n=185) of the highly achieving learners were instructed by teachers with ECDE certificate and the only form four certificate holder and without formal training registered high achievement of .0%. On the contrary, a whole class of 54 children (33.3%) taught by an untrained teacher lowly achieved and 108 (66.7%) of the low achievers were under the care of teachers with certificate in ECDE. This becomes an average of 12 children per class. This implies that teachers who were more qualified academically and professionally were likely to influence pre-school children to highly achieve in number work than less qualified teachers. This is further confirmed by the Chi square test shown in table 4.5.

**Table 4.5: Chi square test of teachers' qualification (academic & professional)**

<b>Chi square</b>	<b>Value</b>	<b>Df</b>	<b>Asymp. Sig. (2-sided)</b>
Pearson Chi-Square	7.800(a)	2	.020
Likelihood Ratio	7.374	2	.025
Linear-by-Linear Association	1.660	1	.198
N of Valid Cases	20		

A Chi-square test was conducted on the frequencies to establish whether a statistically significant difference existed between learners taught by teachers with high academic / professional qualification and learners taught by teachers with low academic / professional qualification. The computed Chi square value of 7.800 was significant with  $p=0.020 < 0.05$  at 5% level of significance and with 2 degrees of freedom. The study finding concurs with Jacob, (2007) who established that full certification is positively related to student achievement. Teachers' subject area certification or authorization is one of the teacher qualifications most consistently and strongly associated with improved student achievement. The effects associated with a teacher's possession of an advanced degree are strikingly counterintuitive; especially given the salary incentives offered to encourage teachers pursue graduate degrees (Rowan, 2002).

However, other studies as in Raymond (2001) have shown that teachers with higher licensure test scores have a marginal positive impact on middle school mathematics achievement. In particular, it has been indicated that teacher's completion of an

undergraduate or graduate majoring in mathematics is associated with higher student achievement in high school and middle school. Whether measured by mathematics course taking, certification, or degree, it appears that teachers with stronger mathematics knowledge produce better student achievement in mathematics compared with less knowledgeable teachers (Goldhaber and Brewer, 2001). Eshiwani (1985) went on to say that qualification of a teacher was a very important indicator of quality of education provided. According to Hus'en (1967) as in Kiragu (1996), Goldhaber & Brewer (2001) the amount of education and knowledge were positively related to students' performance. Irumbi (1990) also did a study on the teachers and pupils characteristics that affect the performance of standard eight pupils and it was found out that the academic qualifications of the mathematics teachers positively affected the pupils' performance.

On the same vein, the study depicts that professional qualification of the teacher is fundamental to the achievement of preschool children in numeracy. According to Kimani (1991), inservice training in mathematics boosts the teacher's confidence in the teaching of the subject, improves his attitude towards the subject and attainment of adequate subject knowledge. Kirembu too (1991) found that both professional and academic qualifications of the teacher are important in ensuring good performance of learners in mathematics. This is in agreement with Muhandik (1983), Riungu (1983), Kathuri (1986), and Magoci (1992) who indicated a universal belief that a professionally trained teacher contributed more positively to effective learning than untrained teacher.

Eshiwani (1985) went on to say that professional qualification of a teacher was a very important indicator of quality of education provided. According to Hus'en (1967) as in Kiragu (1996), Goldhaber & Brewer (2001) the amount of education and

knowledge were positively related to students' performance. Darling-Hammond, (2001) shows that certain types of professional development contribute to teacher quality and student achievement. Sustained professional development that is aligned with the curriculum and focused on instruction has shown to positively influence on school level achievement in mathematics and science at both elementary and high school. Teacher's content specific pedagogical knowledge is significantly associated with students' mathematics achievement at all levels (Darling-Hammond, 2001).It has been suggested that the percentage of teachers participating in mentoring or induction program is positively related to school level of achievement. However, only a few studies have reported such results and are mostly based at the school level. We therefore conclude that the teachers' academic and professional qualification have a positive influence on the achievement of pre-school children in number work.

#### **4.6 Preschool Teachers' Teaching Experience**

Respondents were required to indicate the number of years they had taught in preschools. Table 4.6 presents the results.

**Table 4.6: Number of years teachers had taught in preschools**

<b>Experience in preschools</b>	<b>Frequency</b>	<b>Percentage</b>
0-5 years	9	45.0
6-10 yrs	7	35.0
11-20 yrs	4	20.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

From table 4.6, 55.0% (n=20) teachers as the majority had taught in preschools for more than 5 years an indicator that these teachers were experienced in handling pre-school children. Even in their current stations, the teachers had stayed there long enough to handle the pre-school children as shown in table 4.7.

**Table 4.7: Number of years teachers had been in their current preschool**

<b>Experience in the current preschool</b>	<b>Frequency</b>	<b>Percentage</b>
0-5 yrs	4	20.0
6-10 yrs	15	75.0
11-20 yrs	1	5.0
<b>Total</b>	<b>N=20</b>	<b>100.0</b>

According to table 4.7, majority of the teachers which was 75% (n=20) had stayed in their current schools for a period of 6 to 10 years. Others who had been teaching in their schools for a period of less than 5 years were 20.0% (n=20) and 5.0% (n=20) of the teachers had served in current school for over 10 years. Again this shows that majority of the teachers had enough experience in handling pre-school learners.

#### **4.6.1 Relationship between Preschool Teachers' Teaching Experience and the Achievement of Preschool Children in Number Work**

The study sought to establish if teachers' experience influenced the achievement of preschool children in number work in Imenti North District. Tables 4.8 and 4.9 present the findings.

**Table 4.8: Cross-tabulation of preschool teachers' experience and learners' achievement**

Teachers' experience	level of		Learners' levels of achievement			
			High		Low	
	N	%age	N	%age	N	%age
0-5 yrs	9	45.0	238	52.9	0	.0
6-10 yrs	7	35.0	159	35.3	54	33.3
11-20 yrs	4	20.0	53	11.8	108	66.7
	<b>20</b>	<b>100.0</b>	<b>450</b>	<b>100.0</b>	<b>162</b>	<b>100</b>

Table 4.8 shows teachers with 0-5years teaching experience had 52.9% (n=450) children within the highest level of achievement. Teachers with 6-10 years of teaching experience posted 35.3% (n=450) of the kids to the highest level of achievement and those with 11-20 years of experience registered an achievement index of 11.8% n=450. On the other extreme, teachers with the longest experienced had the most of the low achievers (66.7%) n=162. They were followed by those with 6-10 years of experience at low achievement of 33.3% (n=162). Experienced teachers are believed to be instrumental in teaching especially in the area of content delivery but the study findings displayed otherwise whereby most experienced teachers were seen not to perform than their less experienced counterparts.

This is further confirmed by the Chi square test shown in table 4.8.

**Table 4.9: Chi square test (teachers experience)**

<b>Chi square</b>	<b>Value</b>	<b>Df</b>	<b>Asymp. Sig. (2-sided)</b>
Pearson Chi-Square	5.434(a)	2	.066
Likelihood Ratio	5.622	2	.060
Linear-by-Linear Association	4.796	1	.029
<b>N of Valid Cases</b>	<b>20</b>		

A Chi-square test was conducted on the frequencies to establish whether a statistically significant difference existed between learners taught by teachers who had taught for less than 5 years and teachers who had taught for more than 10 years. The computed Chi square value of 5.434 was not significant with  $p=0.066 > 0.05$  at 5% level of significance and with 2 degrees of freedom. The study findings concurs with Hanushek (1971), Hanushek (1999) and Hanushek (2001) who established that experience, especially during the first five years in the classroom is positively associated with student achievement in mathematics and reading at the elementary and middle school levels. Bennars (1994) also pointed out that teachers' effectiveness, while it increased through the early years of teaching it may not have directly followed the same pattern in the latter years of teaching. He noted that increased teaching experience at least after the early years in the classroom were associated with teachers' rejection of innovations and alterations in education practices. In the same strength, Irumbi (1990) asserts that there was no clear picture



of the effect of teaching experience on performance that seemed to emerge. Onyango (1988) too found out that the teaching experience had no effect on the performance of learners. While inexperienced teachers are less effective than more experienced teachers, the benefits of experience levels -off after a few years (Rivkin, Hanushek, & Kain, 2005). Therefore, in giving new comers an opportunity to serve allows for incorporation of new ideas and energy which might also prove handy for the ever changing technological world. It also provides an unprecedented opportunity to recruit and develop a new generation of school leaders. Such leaders have the knowledge, skills and disposition best suited to meet the current and future needs of education systems.

However, the finding contradicts with Sidhu (1982) who reported that a successful teaching experience is a valuable asset in students' performance and Hanushek (1971, 1999 & 2001) who established that teacher's experience is positively associated with students' achievement in mathematics and reading at elementary and middle school levels. This can be interpreted to imply that experience did not seem to have any influence on the achievement of the pre-school children in number work and therefore the need for continuous teacher development programs in the form of in service and pre service models, workshops and seminars all tailored towards equipping and refreshing the teacher with tools to trade. We therefore conclude that the teachers' experience did not influence the achievement of pre-school children in number work.

#### **4.7: Preschool Teachers' Attitude Towards the Teaching of Number Work**

Section B of the questionnaire had twenty questions. Teachers were required to give information about their attitudes and perceptions towards number work. The responses were in a range of 1-5 using the Likert scale.

Their response to the 20 questions were used to determine their attitude towards number work as shown in table 4.10.

<b>Attitude &amp; perceptions towards number work</b>		<b>N</b>	<b>SA</b>	<b>A</b>	<b>U</b>	<b>D</b>	<b>SD</b>	<b>Mean</b>
1.	I like Number work	20	8	10	2	0	0	4.3
2.	I am always under strain when teaching number work.	20	0	0	1	6	13	4.6
3.	I enjoy teaching number work.	20	14	6	0	0	0	4.2
4.	Number work is such an interesting activity area.	20	15	4	1	0	0	4.7
5.	Solving number work problems is boring & stressful.	20	0	0	0	8	12	4.6
6.	Number work courses & seminars are enjoyable.	20	14	6	0	0	0	4.7
7.	The Mere mention of number work irritates me.	20	0	0	2	11	7	4.3
8.	Number work makes me feel uncomfortable & impatient.	20	0	0	0	9	11	4.6
9.	The very nature of number work makes it fascinating to teach	20	8	9	3	0	0	4.3
10.	Number work gives me a feeling of security and self assurance.	20	6	13	1	0	0	4.3
11.	The end of number work lesson is always good riddance.	20	2	1	1	9	5	4.4
12.	I have a good feeling towards number work.	20	12	8	0	0	0	4.6
13.	I never choose number work, I only	20	0	1	2	11	6	4.1

	found myself in it.							
14.	Teaching number work is not a satisfying exercise.	20	0	0	2	8	10	4.4
15.	If I would go back to my childhood I would still choose number work	20	13	5	1	1	0	5.0
16.	Having to solve number work problems scares me& puts me off.	20	0	0	0	13	7	4.4
17.	Given a chance would train in another subject.	20	2	1	2	8	7	3.8
18.	Of my teaching subjects number work is my favorite	20	6	8	3	2	2	3.9
19.	Furthermore I did not do well in mathematics.	20	2	2	0	8	8	3.9
20.	I would rather teach other subjects during number work lesson	20	0	0	0	5	15	4.8

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**Table 4.10 Results to attitude test**

Table 4.10 shows that the scores were very high. All the preschool teachers had mean score above 3.8 in all the statements. In seven (35.0%) of the 20 questions, the mean score was 4.5 and above. The researcher further sought to find out whether the preschool teachers had slightly negative attitude, negative attitude, slightly positive attitude or positive attitude. As a result the responses of the 20 teachers were computed as presented in table 4.11.

**Table 4.11: Teachers attitude towards number work test results**

<b>Attitude scores</b>	<b>No of teachers</b>	<b>Percentages</b>
70	1	5.0
74	1	5.0
77	1	5.0
81	1	5.0
88	2	10.0
89	3	15.0
92	2	10
96	4	.0
97	3	20.0
99	1	15.0
100	1	5.0
		5.0
<b>Total</b>	<b>20</b>	
		<b>100.0</b>

The scores were read as a continuum. A score of 80-100 indicated positive attitude, 60-79 slightly positive, 40-59 slightly negative and 20-39 negative attitude toward number work. Table 4.12 provided the summary.

**Table 4.12: Summary of preschool teachers attitude towards number work**

<b>Attitude</b>	<b>Frequency</b>	<b>Percentages</b>
Positive	17	85.0
Slightly positive	03	15.0
<b>Total</b>	<b>n= 20</b>	<b>100.0</b>

According to table 4.12, teachers with positive attitude formed the largest portion (85.0%) of the preschool teachers. Teachers with slightly positive attitude represented 15% of the sampled population. There were no teachers within negative and slightly negative categories. This demonstrates that Imenti North District teachers teaching in preschool centers have a good and positive attitude towards number work and this could boost achievement of the pre-school learners in number work.

**4.7.1 Relationship between Preschool Teachers’ Attitude towards Number Work and the Achievement of Preschool Children**

The study sought to determine the relationship between teachers’ attitude and the achievement of preschool children in number work. Tables 4.13 and 4.14 present the findings.

**Table 4.13: Cross-tabulation of teacher attitude and learners achievement**

Teachers’ attitude towards number work	Learners’ levels of achievement					
			High		Low	
	N	%age	N	%age	N	%age
Positive	17	85.0	371	82.4	162	100.0
Slightly positive	3	15.0	79	17.6	0	.0
<b>Total</b>	<b>20</b>	<b>100.0</b>	<b>450</b>	<b>100.0</b>	<b>162</b>	<b>100.0</b>

Table 4.13 shows that 82.4% (n=450) were the majority of children with high achievement taught by teachers with positive attitude towards the teaching of number work. The same group of teachers handled the largest group of children who

had low achievement (100.0%) n=162. This brought an interesting scenario whereby the highest %age of children who had high achievement and low achievement consecutively came from teachers who had positive attitude. This implies that the achievement of preschoolers' could not be pegged on teachers' attitude alone. Interplay of other factors like teachers' experience and attitude of preschool children towards number work could be an issue of concern. This can be interpreted to mean that teachers' attitude did not seem any influence on the achievement of the pre-school learners in number work.

The study finding is further confirmed by the Chi- square test shown in table 4.14.

**Table 4.14: Chi- square test (teachers' attitude)**

<b>Chi square</b>	<b>Value</b>	<b>Df</b>	<b>Asymp. Sig. (2-sided)</b>
Pearson Chi-Square	.623(b)	1	.430
Continuity Correction(a)	.000	1	1.000
Likelihood Ratio	1.064	1	.302
Fisher's Exact Test			
Linear-by-Linear Association	.592	1	.442
<b>N of Valid Cases</b>	<b>20</b>		

A Chi-square test was conducted on the frequencies to establish whether a statistically significant difference existed between learners taught by teachers with perceived slight positive attitude and teachers perceived to have a positive attitude

towards number work. The computed Chi square value of 0.623 was not significant with  $p=0.430>0.05$  at 5% level of significance and with 1 degree of freedom. We therefore conclude that the teachers' attitude did not influence the achievement of preschool children in number work in Imenti North District. This is supported by the findings of Dutton (1962). Munguti (1987) did a similar study and found out that all the mathematics teachers had a positive attitude towards mathematics although the students' performance was poor. Kimani (1991) found out that majority of the primary school student teachers with low or average attitude scores failed in mathematics in the college examination. He however acknowledged that there were few students who failed but had high scores. Irumbi (1990) too found out that teacher attitude had no significant effect on pupils' performance in mathematics. Mwangi (1986), Wando (1992) and Kinyanjui (1980) also found out that the attitude of the teacher towards mathematics had no influence on the pupils' achievement in mathematics.

However Margret (2003), Alken (1970), Parker (1974) and Wamani (1980) hinted that a significant relationship existed between the attitude of teachers and the achievement of learners.



## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of the study, conclusions, recommendations by the researcher and areas of further research.

#### **5.2 Summary**

The purpose of the study was to investigate the influence of teacher characteristics on the preschool children's achievement in number work in Imenti North District. Specifically, the study sought to determine the relationship between teacher's academic qualification and preschool children achievement in number work, establish the relationship between teacher's experience and the achievement of preschool children in number work, find out the relationship between teacher's professional qualification and the achievement of preschool children in number work, and investigate the influence of teacher's attitude towards number work on the achievement of preschool children in number work.

The researcher used ex-post facto research design. After conducting a stratified random sampling the sample population was twenty preschools. Questionnaires for preschool teachers and documentary analysis forms were used to collect data on the independent and dependent variables. Pilot study was carried out to assess the instruments' validity and for reliability, test re-test technique was used. The

questionnaire reliability was found to be 0.87 and that of the documentary analysis form was 0.79 hence reliable for the study. The findings and discussions, conclusions and recommendations of this study were based on the data that was systematically collected, analyzed and key-punched into the computer using Statistical Package for Social Sciences (SPSS 17.0 for windows).

The study demonstrated that female teachers dominated the preschool teaching fraternity with a population of 95.0% (n=20). On teachers' qualification, teachers with diploma in ECDE registered the highest achievement of children of 58.8 % (n=450) followed by those who had certificate in ECDE with a high achievement of 41.2% (n=450). A teacher without training (with a form four certificate) posted the worst achievement of preschool children of 33.3 % (n=162). The computed chi-square value of 7.800 was significant with  $p=0.020<0.05$  at 5.0% level of significance and with 2 degrees of freedom to conclude that teachers' academic qualification and professional qualification has a positive influence on the achievement of preschool children in number work.

On teaching experience, the data showed that 52.9% (n=450) of preschool children highly achieved and were the majority taught by teachers with 0-5 years of experience. They were followed by 35.3% (n=450) taught by teachers with experience of 6-10 years and 11.8% (n=450) with 11-20 years of experience. The opposite was manifested on low achievement of learners where majority of children who had low achievement (66.7%) n=162 were taught by teachers with the longest service of 11-20 years. A Chi-square test conducted to establish whether a statistically significant difference existed between learners taught by teachers who had taught for less than 5 years and teachers who had taught for more than 10 years found out that Chi square value of 5.434 was not significant with  $p=0.066>0.05$  at

5% level of significance and with 2 degrees of freedom. Therefore it was concluded that there was no significant relationship between preschool teachers' teaching experience and the achievement of preschool children in number work.

Regarding preschool teachers' attitude towards number work, the largest group of children with high achievement of 82.4% (n=450) and low achievement of 100.0% (n=162) were taught by teachers with positive attitude. The computed Chi square value of 0.623 was not significant with  $p=0.430 > 0.05$  at 5% level of significance and with 1 degree of freedom. It was therefore concluded that the teachers' attitude did not influence the achievement of pre-school children in number work in Imenti North District.

### **5.3 Conclusion**

Meeting the needs of pre-school children requires a More Knowledgeable Other person (a preschool teacher for that matter) who has proper academic background and professionally trained in order to help children realize the optimal potential (zonal of optimal development) of their cognitive domain. This stresses the need for teachers to advance in education, attain professional development and participate in mentoring or induction programs so as to improve their quality. The above strategy will also alleviate the problems of 'more experienced teachers' who are not productive at this stage by updating them with knowledge, sharpening their pedagogical skills and energizing them to teach better leading to high achievement of learners.

### **5.4 Recommendations**

Based on the study findings the following recommendations are hereby suggested: First, academic qualification and professional qualification of a teacher has been

found to be an important ingredient towards the preschool children achievement and therefore it is important for the government and other educational stake holders to promote continuous teacher development through in service and pre service training programs. Secondly, it has been established that the initial years of teaching seem more productive than the latter years and therefore the government and the private partners should strive to employ the university and college graduates teachers soon they complete their studies for this is the period of their optimal productivity.

### **5.5 Recommendation for Further Research**

The results from this study prompted the need for further research to explore other teacher background characteristics that impact on the achievement of preschool children in number work. It would also be important to duplicate the study in other parts of the country and compare the findings. There is need for a larger sample to be used to carry out a similar study. Experimental and quasi research design could also be used to carry out similar studies and finally similar studies can be carried out at all levels of our education system.

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## **APPENDIX 1**

### **INTRODUCTORY LETTER.**

I am a student undertaking a Masters degree in Early Childhood Education at the University of Nairobi. I am conducting a research on the influence of teacher characteristics on preschool children's achievement in number work in Imenti North District of Meru County. I kindly request you to respond to the questionnaire items below as honestly as possible. Your responses shall be treated with utmost confidentiality. For the purpose of research your name and that of the school should not be included.

Your genuine responses shall go a long way to increase knowledge on the impact of teacher characteristics on preschool children's achievement in number work in Meru County.

Your cooperation is highly appreciated in advance.

Thank you.

Muthuri AndrewMutua

## APPENDIX II

### QUESTIONNAIRE FOR PRESCHOOL TEACHERS.

#### INSTRUCTIONS

The questionnaire is designed to give information on influence of preschool teachers' characteristics in promoting preschool children achievement in number work in Imenti North District, Meru County. The more honest your responses the more it will help me achieve the intended purpose.

This is not a test therefore we have no right or wrong answers but only honest answers will be useful. Your input in this study will be highly appreciated. Put a [√] mark on the right response.

#### Section A

1. Which of the following services does your center offer?

Nursery school  Pre-unit class  kindergarten  Day nursery   
Playgroup  Madrassa  home based care

2. What is the nature of your school?

Girls  Boys  Both

3. Type of the school.

Day  Private

4. Indicate your gender.

Male  Female

5. What is your highest level of education?

Certificate  Diploma  Degree  Masters  Phd   
other (specify).....

6. Do you have any formal training in ECDE?

Yes  No.

State your highest level.....

7. Have you received any training in number work course?

Yes  No.

8. When did you last attend a refresher course in the teaching of number work to preschoolers?

1 to 5 years ago  6 to 10 years ago  11 to 20 years ago

11- 20 years ago  more than 20 years ago

9. How many years have you taught in preschools?

0 – 5 years  6-10

11 – 20  21 and above.

10. How long have you been a teacher in your current preschool center?

0 – 3 years  3years – 10

11 – 20 years  21 and above years

11. What subjects do you teach?

1. ....

2. ....

3. ....

12. Who appointed you as preschool number work teacher?

Director of the center  Head teacher

13. Do you sometimes encounter slow learning children in your class?

Yes  No.

14. Briefly explain how you ensure that such pupils acquire the concept you are instructing.

.....  
.....

15. a) Do you sometimes encounter some children who dislike number work?

Yes  No

b) If yes, how do you ensure that they such pupils develop a liking for number work?

.....  
.....  
.....

16. a) Are there instances that you are forced to repeat certain number topics?

Yes  No

How many times can you repeat certain contents that children tend not to understand?

Once  Twice  Thrice

As many times as possible till the pupils capture the content

17. Are there instances when you feel like you want to give up on your tasks? State examples of such instances

Yes  No

.....  
.....  
.....

18. Do number work assessment come from what you have taught?

Yes  No

19. a) Prior to teaching do you usually have specific objectives that you intend to achieve at the end of the lesson?

Yes  No

b) If yes, are these objectives usually achieved?

Yes  No

c) If no, why do you think they are not achieved?

.....  
.....  
.....

20. When assessing preschool children, what are your expectations?

- a. Extremely high achievement
- b. High achievement
- c. Average achievement
- d. Low achievement
- e. Usual achievement
- f. Have no expectations

21. a) Is there anyone who assesses your work?

Yes  No

b) If yes, who does the assessment and how regular is it done?

.....

.....

.....

### Section B

This section seeks information about your attitude and perception towards about your attitude and perception towards mathematics .Please tick [√ ] the correct one from the ones provided .Take your time in order to pick the most appropriate

Note;

S A –Means Strongly Agree

A-Means Agree

U-Means Undecided

D- Means Disagree

SD-Means Strongly Disagree

### Attitude and perception towards number work

SA A U D SD

1. I like Number work.
2. I am always under strain when teaching number work.
3. I enjoy teaching number work.
4. Number work is such an interesting activity area.
5. Solving number work problems is boring & stressful.
6. Number work courses & seminars are enjoyable.
7. The Mere mention of number work irritates me.
8. Number work makes me feel uncomfortable & impatient.
9. The very nature of number work makes it fascinating to teach.
10. Number work gives me a feeling of security and self assurance.
11. The end of number work lesson is always good riddance.
12. I have a good feeling towards number work.
13. I never choose number work, I only found myself in it.
14. Teaching number work is not a satisfying exercise.
15. If I would go back to my childhood I would still choose math.
16. Having to solve number work problems scares me& puts me off.
17. Given a chance would train in another subject.
18. Of my teaching subjects number work is my favorite.
19. Furthermore I did not do well in mathematics.
20. I would rather teach other subjects during number work lesson

Generally, what is your attitude towards the teaching of number work in preschool?

negative

slightly negative

slightly positive

positive



## Section C

### Number work progressive Record of Work for Preschoolers

This section is intended to track the progress of preschool children in number work for the last two years. Please enter the number of children under each level of achievement.

Achievement Level	End of Term I (2011)	End of Term II (2011)	End of Term III (2011)	End of Term I (2012)	End of Term II (2012)
Very Good					
Good					
Fair					
Poor					

Thank you.

## APPENDIX III

### DOCUMENTARY ANALYSIS FORM

(To be used by the researcher only)

#### 1) Schemes of work

i) Availability

Available [ ]                      Not Available [ ]

ii) Relevance

Quite relevant [ ]              Relevant [ ]              Not relevant [ ]

iii) Suitability

Very suitable [ ]              Suitable [ ]              Not suitable [ ]

iv) Objectives

Very well written [ ]              Fairly written [ ]              Poorly written [ ]

v) Practicability

Very practical [ ]              Practical [ ]              Not practical [ ]

vi) Learning activities

Very suitable [ ]              Suitable [ ]              Not suitable [ ]

vii) Teaching activities

Very appropriate [ ]              Appropriate [ ]              Not appropriate [ ]

viii) Level of content

Very relevant [ ]              Relevant [ ]              Not relevant [ ]

ix) Resources

Varied [ ]                      Not varied [ ]

x) Period

Enough [ ]                      Not enough [ ]

xi) Teaching methods

Appropriate [ ]    Not appropriate [ ]

xii) References

Very relevant [ ]              Relevant [ ]                      Not relevant [ ]

xiii) Missing information

A lot of information [ ]              No information [ ]

xiv) Does it require improvements

Very much [ ]                      Much [ ]                      No improvement [ ]

## **2) Lesson preparations**

i) Availability

Available [ ]                      Not available [ ]

ii) Relevance

Relevant [ ]                      Not relevant [ ]

iii) Sequential of lesson steps

Well sequenced [ ]                      Not well sequenced [ ]

iv) Content

Very detailed [ ]              Detailed [ ]                      Not detailed [ ]

v) Frequency of preparation

Always [ ]                      Rarely [ ]                      Never [ ]

vi) Activities

Varied [ ]                      Not varied [ ]

vii) Time allocation

Very well allocated [ ]                      Well Allocated [ ]                      Not allocated [ ]

viii) Assessment

Frequently [ ]                      Sometimes [ ]                      Rarely [ ]

Missing information

A lot [ ]                      Little [ ]                      None [ ]

Does it require improvements?

A lot [ ]                      Little [ ]                      No improvement [ ]

### **3) Progress records**

i) Availability

Available [ ]                      Not available [ ]

ii) How often used

Always [ ]                      Rarely [ ]                      Never [ ]

iii) How it is used

.....  
.....

iv) Composition

All activity areas [ ]      Some activity areas [ ]      Very few [ ]

v) Neatness

Very neat [ ]      Neat [ ]      Poor [ ]

vi) Criteria used in coming up with it

Very appropriate [ ]      Appropriate [ ]      Not appropriate [ ]

vii) Interpretation.....

.....  
.....

viii) Progress available

All children [ ]      A few children [ ]      Very few [ ]

**4) Time table**

i) Availability

Available [ ]      Not available [ ]

ii) Time allocation

Very well allocated [ ]      Well allocated [ ]      Not well allocated [ ]

iii) Neatness.....

.....  
.....

iv) Up-to-date

Very well updated [ ]

Well updated [ ]

Not updated [ ]

v) Adherence.....

.....

**5) Class register**

i) Availability

Available [ ]

Not available [ ]

ii) Marking of register

Constantly marked [ ]

Not constantly marked [ ]

iii) Properly marked

Very well [ ]

Well [ ]

Fairly [ ]

Poorly [ ]

iv) What it reflects

True Picture [ ]

Not true picture [ ]

v) Neatness .....

.....

.....

**6) Lesson Notes**

i) Availability

Available [ ]

Not available [ ]

ii) Suitability

Very much [ ]

Fair [ ]

Poor [ ]

iii) Relevance

Very much [ ]

Much [ ]

Not relevant [ ]

iv) Nature of content

Very detailed [ ]

Detailed [ ]

Not detailed [ ]

v) Consistency in preparation

Always [ ]

Rarely [ ]

Never [ ]

## APPENDIX IV

### PRESCHOOL CENTRES VISITED IN THE DISTRICT

#### **PUBLIC PRESCHOOLS**

1. Nchaure
2. Muringombugi
3. Kathurine
4. Mwiramwanki
5. Mulathankari
6. Njukinjiru
7. DEB Kiraria
8. Kiamiriru
9. Mpuri
10. Gikumene
11. Nkabune
12. Gichunge
13. Ciothirai
14. Ntani
15. Kaaga
16. Good Shepherd
17. Mwithumwiru
18. Mbuuta
19. Meru primary
20. Nthamiri

#### **PRIVATE PRESCHOOLS**

1. ST. Paul Academy
- 2.K.A.G Academy
3. Kathumbi Academy
4. ST.Bisone Academy
5. Mary Ann academy
6. Saleem Academy
- 7.Spring Board Academy
- 8.Tumaini Academy