

**ADMINISTRATIVE AND SOCIO-ECONOMIC FACTORS AFFECTING
PERFORMANCE IN MATHEMATICS AMONG THE PRIMARY SCHOOLS
PUPILS IN KILOSA DISTRICT**

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REQUIREMENTS OF THE DEGREE OF MASTER OF EDUCATION IN
ADMINISTRATION, PLANNING AND POLICY STUDIES OF THE OPEN
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CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance by The Open University of Tanzania, a dissertation entitled "Administrative and Socio-economic Factors affecting performance in Mathematics among the Primary Schools Pupils in Kilosa District" in partial fulfilment of the requirement for the degree of Master of Education in Administration, Planning and Policy Studies of the Open University of Tanzania.

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DECLARATION

I, Lilian Tery, do hereby declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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Signature

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Date

DEDICATION

This dissertation is dedicated to my parents and my family for their prayers, support, encouragement and advice which have been an instrument to the successful completion of this dissertation.

ACKNOWLEDGEMENT

I give my sincere thanks to the Almighty God for kept me alive since the beginning of this journey of academic. However it could not be brought to the end without the support and cooperation of many people. I give my thanks to my parents, relatives and all friends who gave their contributions in one way or another in completing this task, as it is difficult to mention everyone, I should say that all of them deserve my sincere gratitude.

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ABSTRACT

The study investigated on Administrative and Socio-economic Factors affecting performance in Mathematics among the Primary Schools Pupils in Kilosa District. Three research objectives were (1) Identify the Administrative factors that affect mathematics subject performance in primary schools (2) Determine the socio-economic factors that affect mathematics subject performance in primary schools (3) Determine the effects of teachers' attitudes on the performance of pupils in mathematics subject in primary schools. Cross-sectional research design was employed. A sample size of 56 respondents was used that included heads of school, teachers and pupils. Some of data collected were analyzed quantitatively through Statistical Package for Social Science (SPSS). Other data were analyzed qualitatively through interpretation and explanation of the responses from the respondents. The findings indicated that lack of teaching aids was associated with teachers' demoralization that resulted into failure to produce teaching aids of their own. Parents' level of education was among the socio-economic factors that affect Mathematics subject performance. It was also found that when parents possess higher education, there is a higher possibility of influencing children to perform well in Mathematics. Moreover, teachers' attitudes on the performance of pupils in Mathematics subject resulted into the use of demonstrations and discussions to illustrate concepts/phenomena something that helped pupils to like the subject with the help of parents at home. It is recommended that physical resources such as adequate classrooms need to be constructed for the purpose of teaching Mathematics well in a conducive environment.

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LIST OF ABBREVIATIONS

SES	Socio-economic Status
SPSS	Statistical Package for Social Sciences
URT	United Republic of Tanzania

CHAPTER ONE

INTRODUCTION

1.1 Background of the Problem

The development of any nation depends largely on the level of its scientific and technological literacy (Zakaria *et al.*, 2010). Mathematics is believed to be the core subject in enhancing scientific and technological literacy. Lerner and Lerner (2004) in the Gale Encyclopedia of Science states that mathematics, in the very broadest sense, is the systematic study of relationships in the physical world and relationships between symbols which need not pertain to the real world. Consistent with Hemming *et al.* (2011) and the other study e.g. (Ma, 1996), mathematics is important in paving the way for future achievement.

Students who have high interest in mathematics in primary schools will mostly perform well in secondary-level mathematics. Primary school teachers have the mandate to provide quality mathematics instruction so that pupils can attain a high level of proficiency in primary and secondary schools. The results show that parental support is associated positively with students' performance in mathematics. This can be realized through payment for extra tuition, buying textbooks, encouragement to work hard, involvement in activities such as attending Parent-Teacher Association meetings, helping with homework, and counseling (Pang *et al.*, 2013).

Many students develop fear towards Mathematics due to their misunderstanding, non-understanding and failure during previous lessons. Mathematical anxiety is developed as a result of having a poor image of mathematics due to general lack of comfort in that someone might experience mathematical when required to perform.

Children with negative attitudes towards Mathematics have performance problems because they develop anxiety (Glenn, 1997). Ausubel (1973) stated that young children are capable of understanding abstract ideas if they are provided with sufficient materials and concrete experiences with the phenomenon that they are to understand when learning Mathematics. Mathematics subject performance is serious in Tanzania given that over 50 per cent of mathematics teacher and scientists in the country are greying (Komba, 2008). Education experts fear an entire generation of pupils passing through primary schools while missing opportunities to enter science - related fields in future; mathematics being among them.

The biggest threats facing these schools whose learners are mostly from poor families include a severe shortage of (mathematics) teachers, laboratories, books and the in-appropriate teachers' attitudes towards teaching mathematics subjects. Kilosa is one of the 6 districts of the Morogoro Region of Tanzania. It has a population of 438,175 as per the 2012 National Census. The district has 223 primary schools and 38 secondary schools. It is reported that Mathematics performance in Kilosa has been a challenge among pupils to the extent of achieving less in their examinations. Moreover, the results in Mathematics have been poor as reported in national examinations. It is from this background that this study aimed at assessing the Administration and Socio-economic factors affecting performance in Mathematics among Primary Schools pupils in Kilosa district.

1.2 Statement of the Problem

Mathematics is considered the mother of all learning in both arts and sciences (Yusuf and Adigun, 2010). It is essential in every field for measurement in fashion, angles in

sports, technology and economics. A growing body of research finding indicates that demographic, individual, instructional; classroom management and evaluation factors have an impact on the mathematical achievement of the pupils (Wamala *et al*, 2015). Identifying factors that affect mathematics achievement is important to effectively educate pupils.

Bull (1996) stated that the learning of mathematics was dependent on the teacher such that those who cannot do mathematics can trace their inability almost certainly to the teacher. Cailloids and Postlethwaiate (1980) emphasize that those teachers who spend time preparing lessons, marking homework and class work tend to achieve better results with their pupils than those who do not. Griffin (1996) emphasizes the importance of marking in induction of new teachers, which may well be applicable in any other school. Despite the usefulness of mathematics in daily life, administrative and socio-economic factors that affect mathematics subject performance in primary schools in Kilosa district are yet to be known.

The national examination results of 2015 and 2017 reflect the poor performance in this subject. Observation in primary schools in Kilosa show that the teachers for mathematics are rarely attending teachers' professional development to manage new ways of teaching mathematics, teachers also are observed not applying better learning resources in classroom in the teaching of mathematics. Parents inability to pay for the organized out of school tuition classes that could have assisted pupils and improved the mathematical skills to learners is also apparent in Kilosa district. There is need therefore to investigate the administrative and socio economic factors that affect performance in mathematic among the primary schools pupils in Kilosa

district.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of this study is to assess the administrative and socio-economic factors affecting Mathematics performance among pupils in primary schools in Kilosa district.

1.3.2 Specific Objectives

Specifically the study is sought to;

- i. Identify the administrative factors that affect Mathematics subject performance in primary schools
- ii. Determine the socio-economic factors that affect Mathematics subject performance in primary schools
- iii. Determine the effects of teachers' attitudes on the performance of pupils in Mathematics subject in primary schools

1.4 Research Questions

- i. What are the administrative factors that affect Mathematics subject performance in primary schools?
- ii. What are the socio-economic factors that affect Mathematics subject performance in primary schools?
- iii. What are the effects of teachers' attitudes on the performance of pupils in Mathematics subject in primary schools?

1.5 Significance of the Study

The findings of the study might create knowledge that would be useful for training of teachers in areas that need improvement regarding mathematics subject teaching. The findings might be used in formulating capacity building programs to empower teachers in terms of approaches to teaching Mathematics and the attitudes that need to be emulated to pupils. Again the findings of this study may help teachers to re-examine and appraise their own attitudes towards teaching Mathematics and hence make adjustment where necessary.

This study is useful to planners, educators, administrators and other educational stakeholders to build awareness to pupils and teachers of Tanzania on problems and barriers hindering the performance of Mathematics subject in primary schools. The study may guide towards policy formulation in setting the policy statements that can guide the schools on what hinders the mathematics performance among primary schools pupils and suggest the ways to address the challenges. The findings are likely to create new and contributing knowledge in challenges that hinder the mathematics performance in Tanzanian primary schools. This may serve as the point of enriching the available literature and thus guide the academicians accordingly.

1.6 Scope of the Study

The study was conducted in Kilosa district primary schools. It focused on identifying the administrative factors and socio-economic factors that affect Mathematics performance in primary schools. Finally, the study determined the effects of teachers' attitudes on the performance of pupils in Mathematics subject in primary schools.

1.7 Definition of Key Terms

Mathematics: Lerner and Lerner (2004) in the Gale Encyclopedia of Science states that Mathematics, in the very broadest sense, is the systematic study of relationships in the physical world and relationships between symbols which need not pertain to the real world. In relation to the world, Mathematics is the language of science. It operates within the laws and constraints of science as it examines physical phenomena (Mohammadpour, 2012).

Performance: Performance refers to the grades both per subject and overall that the pupil obtained in examination (Huang and Cheng, 2012). Performance in school is evaluated in a number of ways. For regular grading, pupils demonstrate their knowledge by taking written and oral tests, performing presentations, turning in homework and participating in class activities and discussions. Teachers evaluate in the form of letter or number grades and side notes, to describe how well a student has done (Pang *et al*, 2013). At the state level, pupils are evaluated by their performance on standardized tests geared toward specific ages and based on a set of achievements pupils in each age group are expected to meet.

Administrative Factor: The administrative factors affecting the teaching of mathematics in schools include those aspects that are under the school administration that influence or enable the teachers to teach well the mathematics, they include teachers' skills, attitude, and knowledge; teacher profession development, facilities like learning resource used by the teachers in the classrooms. The administrative factors in this study also include the learning environment and the available facilities for teaching difficult concepts in mathematics.

Socio Economic Factor: The socio economic factors affecting the pupils mathematics performance in this study they include the parent awareness of the need of their children to take extra efforts in mathematic drills, the ability of the parents to pay for tuition or extra class for learning mathematics and the ability to parents to shoulder some facilities for their kids to learn mathematics. Students' shyness and anxiety in learning mathematics also fall under the socio factor affecting mathematics learning.

1.8 Limitations of the Study

The following were the limitations of the study; the first constraint is the financial constraint, as the financial support was expected from researcher's pocket money which was insufficient. The second constraint is the time factor because the time allocated for data collection was very short compared to the importance and tedious work of collecting data. The third constraint was the response rate as it was expected that the response rate would be hindered by respondents being in a hurry, very busy with their daily activities and others would not be at their working place sometimes.

However, frequent follow-ups made the study to be accomplished. Another limitation was language barrier, since the interviews and questionnaires were prepared in English language. Therefore, the researcher was closer for translation when deemed necessary. Furthermore, the study utilized cross-sectional research design from the fact that the findings won't be generalized to other districts, but only in Kilosa.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examines some of the literatures from different studies in order to capture ideas which guide the development of the study. It focuses on theoretical, review of empirical studies, research gap and conceptual framework.

2.2 Theoretical Literature

This subsection presents the theories and ideas presented by various scholars regarding the topic. To start with is the Theory of Learning.

2.2.1 Jean Piaget's Theory of Learning

According to Piaget (1979), human intellectual development progresses chronologically through four sequential stages. The order in which the stages occur have been found to be largely invariant, however the ages at which people enter each higher order stage vary according to each person's hereditary and environmental characteristics. Piaget defined intelligence as the ability to adapt to the environment. Adaptation takes place through assimilation and through accommodation, with the two processes interacting throughout life in different ways, according to the stage of mental development.

In assimilation, the individual absorbs new information, fitting features of the environment into internal cognitive structures. In accommodation, the individual modifies those internal cognitive structures to conform to the new information and meet the demands of the environment. A balance is maintained through

equilibration, as the individual organizes the demands of the environment in terms of previously existing cognitive structures. A child moves from one stage of cognitive development to another through the process of equilibration, through understanding the underlying concept so that the understanding can be applied to new situations. Equilibration is a balance between assimilation and accommodation (Kaahwa, 2012).

The stages of cognitive development that Piaget (1968) distinguished are four: Sensorimotor (0-2 years of age) where children begin to use imitation, memory and thought. They begin to recognize that objects do not cease to exist when hidden from view. They move from reflex actions to goal-directed activity. Pre-operational (2-7 years) where children gradually develop language and the ability to think in symbolic form. They are able to think operations through logically in one direction and they have difficulty seeing another person's point of view. Concrete operational (7-11 years) where children are able to solve concrete (hands-on) problems in logical fashion. They understand the laws of conservation and are able to classify and seriate. They also understand reversibility. Formal operational (11-15 years of age) is where children are able to solve abstract problems in logical fashion. Their thinking becomes more scientific, they develop concerns about social issues and about identity.

Piaget suggested that when children do not understand or have difficulty with a certain concept, it is due to a too-rapid passage from the qualitative structure of the problem (by simple logical reasoning e.g. a ball existing physically) to the quantitative or mathematical formulation (in the sense of differences, similarity, weight, number, etc.). Conditions that can help the child in his search for

understanding according to Piaget are the use of active methods that permit the child to explore spontaneously and require that new truths be learned, rediscovered or at least reconstructed by the student not simply told to him (Piaget, 1968). He pointed out that the role of the teacher is that of facilitator and organizer who creates situations and activities that present a problem to the student.

The teacher must also provide counter examples that lead children to reflect on and reconsider hasty solutions. Piaget argued that a student who achieves certain knowledge through free investigation and spontaneous effort will later be able to retain it. He will have acquired a methodology that serves him for the rest of his life and will stimulate his curiosity without risk of exhausting it. A third type of knowledge that Piaget suggests is social or conventional knowledge. He said that it is always through the external educational action of family surroundings that the young child learns language, which Piaget (1973) called it an expression of collective values. Piaget pointed out that without external social transmission (which is also educational) the continuity of collective language remains practically impossible.

There are three types of feelings or emotional tendencies, according to Piaget, that affect the ethical life of the child, that are first found in his mental constitution. In the first place is the need for love, which plays a basic role in development in various forms from the cradle to adolescence. There is a feeling of fear of those who are bigger and stronger than himself, which plays an important role in his conduct. The third is mixed, composed of affection and fear at the same time. It is the feeling of respect that is very important in the formation or exercise of moral conscience.

Table 2.1: Critiques of Piaget's Theory

Piaget's belief of cognitive development	Criticism
1) Children start developing an understanding of the object permanence	<ul style="list-style-type: none"> • Piaget overlooked children's need for motivation • Children's memory capacity has increased
2) Children's sensory abilities and cognitive development occur in their first 6 months of birth	<ul style="list-style-type: none"> • Not all learners are the same, they might be placed in a higher or lower category based on their unique abilities
3) Every child will experience the four stages in a specific order	<ul style="list-style-type: none"> • Piaget neglected the external factors, such as heredity, culture and education
4) Piaget separated the cognitive development into definite stages	<ul style="list-style-type: none"> • The stages of cognitive development should be viewed as a gradual and continuous progress

Source: researcher, 2019

Even though Piaget's theory is widely used by teachers to monitor their students' cognitive development in the classroom nowadays, his theory is controversial. Lots of educators rely on Piaget's theory to measure students' readiness for learning mathematics. On the other hand, Hiebert and Carpenter (2010) advised that Piaget's theory is not a useful guide, as lots of researches have proved that children who fail to follow Piaget's theory are still able to learn the mathematics concepts and skills. While Piaget focused on children's internal exploration for knowledge, and believed that children start developing an understanding of object permanence (such as how to track for a hidden object) from birth to age 2.

Other researchers argue that Piaget neglected the children's need for motivation. Berger (1998) believes that external motivations and teachings play an important impact also. Kagan (2002) believes that the reason why an infant is able to reach for objects even with displacement is because their memory capacity has increased, not, as Piaget pointed out, in terms of the new cognitive structure. Piaget has also been criticized for broadly speaking of children's abilities. He deduced that children's sensory abilities and cognitive development occur in their first six months of birth.

Moreover, this can be enhanced through the facilitation of administrative issues such as sufficient teaching materials and professional development among teachers. Similarly, socio-economic factors such as positive attitudes towards mathematics subject and education status of the parent need to be enriched for the purpose of helping students attain their goals. Additionally, teachers need to understand the topics taught, apply well Mathematics concepts and use demonstrations and discussions to illustrate concepts/phenomena through the use of pupils' suggestions and ideas in teaching.

2.2.2 Methods for Teaching and Learning Mathematics

Teacher-Centered Method: Under this method, pupils simply obtain information from the teacher without building their engagement level with the subject being taught (Boud and Feletti, 1999). The approach is least practical, more theoretical and memorizing (Teo and Wong, 2000). It does not apply activity based learning to encourage pupils to learn real life problems based on applied knowledge. Since the teacher controls the transmission and sharing of knowledge, the lecturer may attempt to maximize the delivery of information while minimizing time and effort. As a result, both interest and understanding of pupils may get lost. To address such shortfalls, Zakaria *et al.*, (2010) specified that teaching should not merely focus on dispensing rules, definitions and procedures for students to memorize, but should also actively engage students as primary participants.

Learner-Centered Method: With the advent of the concept of discovery learning, many scholars today widely adopt more learner-centered methods to enhance active learning (Greitzer, 2002). Most teachers today apply the learner-centered

approach to promote interest, analytical research, critical thinking and enjoyment among students (Hesson and Shad, 2007). The teaching method is regarded more effective since it does not centralize the flow of knowledge from the teacher to the student (Lindquist, 1995). The approach also motivates goal-orientated behavior among students, hence the method is very effective in improving student achievement (Slavin, 1996).

Teacher-Student Interactive Method: This teaching method applies the strategies used by both teacher-centered and learner-centered approaches. The subject information produced by the learners is remembered better than the same information presented to the learners by the lecturer (Lindquist, 1995). The method encourages the students to search for relevant knowledge rather than the teacher monopolizing the transmission of information to the learners. As such, research evidence on teaching approaches maintains that this teaching method is effective in improving students' academic performance (Damodharan and Rengarajan, 1999).

In lieu of these methods, one would concur with Rosenthal's (1997) affect effort theory that suggests that if a change in a teacher's level of expectations of the intellectual performance of a pupil occurs, (a) a change in the affect shown by the teacher towards that student will occur, and (b) a change in the level of effort given by the teacher in teaching the students will occur. For example, if the change in the teacher's level of expectation is positive, the favorable effect shown toward the pupil will increase and the effort expended on the student's learning will increase as well. After more than 40 years of researching the subject of expectancy, Rosenthal (1997) contends that the increase in teaching effort reflects the teacher's belief and

expectation that the pupil is capable of achievement, so the effort expended is worth it because it will likely lead to more learning.

2.2.3 Teaching and Learning Practices

The concept of teaching and learning can help parents as well as pupils to share ideas that can enable the facilitation of learning in their interactions.

Teaching Practices: Teaching according to Glasser (2005) is the process of imparting knowledge, skills, attitudes and values. Teaching can be considered as a process of instilling, transmitting or constructing knowledge. Teaching can also be defined as a process of transmitting knowledge to learners; it involves several kinds of skills, classroom lesson planning, classroom management, selecting subject content, use of specific methods to transmit the content, evaluating students and discussing with students.

Teaching can be viewed from three angles:

- i. If the relation knowledge is privilege, then teaching becomes the act of transmitting knowledge through exposes in clear and concise manner. Giving privilege to the relation knowledge is giving privilege to the relation to the transmission of knowledge. This is relation is the most dominant in secondary schools: the Transmissive model of teaching. In this model what is important is the quality of what is transmitted to the learners. The major problem here is how to put knowledge at the disposition of the students to ease their work of learners. This is referred to as didactic transposition. The quality of what is taught, the way it is taught becomes the determinant for the quality of what is

received;

- ii. Teaching is a process whereby automatism is acquired. In this light teaching becomes a process during which the reactions, attitudes, professional gestures and behaviours are instilled into some one. The purpose of teaching is to train students to produce answers according to the problems encountered. Here the teaching effort is centred on the activities that could bring changes to the learner's behaviour. The behaviourist theory tends to instil behaviour and automatisms in the manner of resolving issues. If the student relation is considered, then.
- iii. Teaching becomes making someone learn, study, guide or accompanying students carry out the activities proposed. When privilege is given to the student's relation, it is also a way of giving privilege to the acquisition process and knowledge construction by the students. It also insists on the student's activities in which they put in practice the knowledge acquire through mastering of how to do. This is easily seen theories of constructivism and socio-constructivism.

i) Learning Skills

According to Encarta (2003) learning is the acquisition of knowledge or skills. It also defines learning as a relatively permanent change in, or acquisition of knowledge, understanding or behaviour. Learning is involved in acquiring new competences, changing the way of reacting. Learning should be organized in such a way that, the learner always acquire knowledge in an ascending order, that is going from the less complex situation to more complex or from the known concept to the unknown.

Learning can be considered as a stable and durable modification of knowledge, know to do and know how to be of an individual. These modifications are a result of training, apprentice or exercises carried out by the individual. According to Glasser learning supposes a changes, it has links with the acquisition of abilities, knowledge and attitudes. It brings personal and social adjustment to individuals. The concept of change is very important to learning; it implies any change in behaviour implies learning took place (Glasser, 2005) It is important to know the different phases of learning, so as to better structure learning and attain objectives envisaged in a coherent manner. Encarta suggested an approach in which he says a learner passes through eight phases when learning.

A judicious usage of these phases will facilitate the work of the instructor (Encarta, 2003). These phases are: - motivation, attention and perception, codification, memorization, recognition, transfer and generalization, performance, feed-back. When these phases are applied by the teacher; it arouses and maintains motivation of the learners; facilitates the acquisition of new concepts; facilitates information retention; promotes transfer of knowledge; enables performance; and enables feed-back of performance to be seen (Encarta, 2003). Some of the learning methods applied in education are:

Collaboration Learning: Collaboration can be as simple as a two-minute in-class exercise involving pairs of students or as elaborate as a multi-year curriculum development project involving many groups of students. Term-length projects done primarily outside the classroom are the most popular form of collaboration since they require minimal changes to the usual classroom routine. This method of

learning can be applied in different domains for example, English students can review each other's work, Computer Science students can develop or debug programs together, and soon. E-mail is one of the most important collaborative tools and it usually serves as the communication backbone for all activities.

Cooperative Learning: This method of learning involves hand on tasks in which students can develop their professional skills. The crucial point is the modelling of learning as a by-product of comprehension. This underpins the constructivist approach to education. Learning by doing works best because performing a task requires learner to think and comprehend at the most testing level associated with problem solving and action (Glasser, 2005).

2.2.4 Nature of Mathematics Classroom Practices

The goal of teaching is to assist pupils in developing intellectual resources to enable them to participate in, not merely to know about, the major domains of human thought and enquiry. These include the past and its relation to the present; the natural world, the ideas, beliefs and values of our own and other peoples; the dimensions of space and quality; aesthetics and representation and so on (Ajelabi, 2002). Even though many empirical studies have demonstrated that carefully planned, interactive instruction can be effective in promoting conceptual change and enhance performance (Wieman *et al.*, 2008). Findings from the literature show that many mathematics teachers continue to teach using an ineffective, traditional, teacher-centered instructional approach (Vosniadou, 2007).

Tobin and Gallagher (1987) state that the common instructional mode in high school science classes was whole class interactive ó when the teacher dealt with the class as

a whole, and interacted with one student at a time while the others listened; and whole class non-interactive ó comprised of lecture presentations followed by individual seatwork and small group activities. More than a decade after, Hackling *et al.*, (2001) found that the teacher-centered instructional approach was still prevalent in many of the secondary schools. In Hackling *et al.*, (2001) study, the extent of teacher-centeredness was reported by 61% of secondary students who indicated that they copied notes from the teacher nearly every lesson. As well, 59% of pupils indicated that the teacher never allowed them to choose their own topics to investigate.

It was shown that interactions affect learners' attitudes towards learning and their participation in class activities (Masika, 2011). Masika (2011) indicated that teacher interaction behaviors were an important aspect of the learning environment and were strongly related to high school pupil outcomes. Masika (2011) found that, in Kenya, mathematics teachers were autocratic and dominated their classrooms by either talking or talking with illustrations. One can infer from the above studies that teacher-centered instruction continues to be a widely used instructional strategy in secondary school mathematics classrooms.

Moreover, pupils have expressed a desire for more interactive environments. If traditional approaches to teaching mathematics, which often fail to promote adequate pupils understanding of mathematics concepts, still persist then there is a huge challenge to promote pedagogical change so that mathematics teachers teach for better student learning (Mulhall and Gunstone, 2012).

2.2.5 Effectiveness in Teaching Mathematics

According to Suja (2007) teachers who register positive performance in Mathematics should be rewarded by the parents in a manner that keeps them teaching. Sometimes good teachers are promoted to positions that reduce their ability to deliver subject specific results in the classroom. By becoming administrators, for instance, such teachers' subject knowledge is missed in class. Rewards such as promotion to higher pay grades without an alteration of the job description, for instance, would go a long way to both motivate such teachers and to also encourage their colleagues to work harder. The role of teacher however is the most important without a well-educated strong motivated, skilled, well-supported teacher the arch of excellent in teaching mathematics collapses (Masika, 2011). The teacher is the keystone of quality. Education research has continued to show that our effective teacher is the single most important factor of student learning (Marzano, 2007).

2.2.6 Students' Attitude and Performance

Financial challenge is a prevailing feature amongst many developing countries around the world with ever increasing severe effects of social and economic backdrop felt in countries within sub-Saharan Africa (Hill, 2008). It is arguably a multidimensional challenge found in different forms both in urban and rural areas only possibly differing in its intensity with the effect felt most in day primary schools depending on the school size. In a study conducted on the effects of family structure and parenthood on the academic performance of pupils. Uwaifo (2008) found significant difference between the academic performance of pupils from single parent family and those from two-parent family structure. Indeed, parental

involvement and individuals' experiences at home play tremendous roles in building the personality of the child and making the child what he is.

Parent educational status is considered one of the most stable aspects of Socio Economic Status (SES) because it is typically established at an early age and tends to remain the same over time (Sirin, 2005). To date, many studies have established the effect of parents' socioeconomic status on parental involvement. One consistent finding is that parents from the higher economic status are more involved in their child's education. In this case, the higher the parents' education level, occupation status, income and their household income, the higher would be the parents' involvement in their child's education.

2.3 Empirical Literature Review

Empirical studies have revealed the influence of methods of instruction on students' and teachers' attitude towards mathematics. Kempa and Denild (1974) worked on the influence of science instruction especially mathematics; the result was that attitudes of students become more positive after instruction. Long (1981) also concluded that diagnostic-prescriptive treatment promotes positive attitude towards Mathematics. Hough and Peter (1982) further found out that groups of learners who scored significantly high in science achievement test also scored significantly high in Mathematics and attitude test.

Gibbons *et al.*, (1997) opined that pupils' and teachers' attitudes about the value of learning mathematics may be considered as both an input and outcome variable because their attitudes towards the subject can be related to educational achievement

in ways that reinforce higher or lower performance. This means that those students who do well in a subject generally have more positive attitudes towards that subject and those who have more positive attitudes towards a subject tend to perform better in the subject (Olatunde, 2009). Akinmade (1992) confirmed that pupils' attitudes toward mathematics are the basis for higher achievement in mathematics. It was found that pupils' beliefs and attitudes have the potential to either facilitate or inhibit learning.

Burstein (1992) in a comparative study of factors influencing mathematics achievement found out that there is a direct link between students' attitudes towards mathematics and student outcomes. The study also showed that the teachers' method of teaching mathematics and personality greatly accounted for the students' positive attitude towards mathematics and that, without interest and personal effort in learning mathematics by the students, they can hardly perform well in the subject (Olatunde, 2009). Reasons for this range from: inadequate teachers, lower level of preparation, weak mathematics background, lack of skills in teaching the subject, little interest among students, lack of facilities to enable teaching and learning as well as possession of below standard pedagogical content knowledge as contended by Semela (2010).

In a study conducted in Nairobi by the Team of Mathematics Teachers (2013), indicated that variation in mathematics performance was found to be significantly influenced by socio-economic and the type of teaching method. The interactive teaching method was found to be superior to the traditional approach, especially with respect to achieving higher order cognitive skills. The study also found that there

was no significant difference in performance when the availability of textbooks was at the student/textbook ratio level 1:1 and 1:2. However, ratio levels beyond 1:3 were found to have a negative effect on performance.

Although, students' gender was found not to directly affect the performance of mathematics, the performance in mathematics in this study favored girls, albeit not significantly. Class size was found not to have a significant and direct influence on achievement in assignments. However, the amount of time that pupils spent on mathematics tasks was found to be minimum. The study indicated that a student's attitude was a major predictor of his/her performance. Bos (2002) in his study found a wide range of reading material at home was thought to foster academic interests and serve to encourage learning.

Psacharopoulos and Loxley as cited by Lauglo and Maclean (2005), opined that education should develop moral aesthetic, physical and practical capacities not just cognitive knowledge organized in academic disciplines. They added that practical subjects can have the additional justification because they allow pupils to learn from more active doing than what is typical in academic subjects. Mathematics as a subject can be made practical and enjoyable with the help of the government and parents/guardians who can financially support the schools in realizing this. Learners from low socio-economic status families tend to value domestic activities more than schooling. Such children are subjected to child labour and they have little time for studies. Financial difficulties and hence poverty in developing countries have been a major barrier to effective undertaking of the major government financed programs. He indicated that in most developing countries, there are many families whose

members despite full days hard labour do not find it possible to make two ends meet.

Much of the research published has confirmed that the perception of teachers teaching mathematics raise students performance (Ferguson, 1998 and Goldhaber, 2002). Horn and Sanders (1997) also investigated the impact of teachers on pupils learning mathematics. Their findings indicated teachers are the most important educational factor influencing pupils' mathematics outcomes. According to Ajibade (1987) attitude and interest of teachers teaching mathematics can influence the students' performance since the teacher is regarded as someone who imparts or gives instructions to students to do something. Then such teachers' attitudes and interest plays a prominent role in establishing good relationship with the students for educational development. Hence, for a teacher to be able to select appropriate educational media for the teaching of Mathematics, the idea of what he wants to teach and how he wants to teach must be top most on his mind before selecting the media that takes into consideration individual differences of pupils so as to meet their needs and the interest as some of them may learn better by simple explanation in class while others do better when learning with machines.

Wayne and Youngs (2003) conducted a review study of 21 studies including meta-analyses and individual studies and declared that pupils' learning mathematics depends on such teacher characteristics as testing skills, subject knowledge, and positive relationships with students. Survey studies designed by Duruhan *et al.*, (1990), and Ergün and Duman (1998) both implied that 'contacting students to understand the reasons for failure', 'ensuring active participation in class' and 'having a friendly attitude and demeanors' were perceived by students as effective

teacher characteristics.

Shields (1991) argued that student achievement, particularly for at-risk students, is affected by the values and beliefs of the family and community. Some families and communities, particularly in poverty stricken areas, do not value or understand formal education. This leads to students to be unprepared for the school environment. In addition, this leads to misunderstandings regarding student actions and speech by teachers due to variations in norms and values. Effective instruction will allow students to use their own life experiences as a starting point for instruction while adapting instruction to the culture of the students (Devadoss and Foltz, 1996). Teachers should encourage active participation in learning by all students in the classroom in order to encourage at-risk students.

Schools must create a partnership with parents seeking to involve parents, particularly those of at-risk students, in the school process while providing tips to parents for assisting students in becoming academically successful. Through research conducted by Bergeson (2006), the need to create stronger, better partnerships between schools, families, and communities while providing better intervention programs for students struggling with exceptional outside barriers was evident. A study conducted by Komba and Nkumbi (2008) regarding teacher professional development in Tanzania found that in most other developing countries, education means teachers. Due to lack of teacher's guides and essential texts, invariably, teachers are the key source of knowledge, skills, wisdom, appropriate orientations, inspiration and models for the students. As a consequence, the teacher is central in facilitating the processes that lead to meaningful education and pupils'

learning outcomes are affected by teacher quality.

Mosha and Mmuni (2009) reported that by 2006 there were 151,882 teachers in 14,700 schools at the ratio of 1: 52 (URT, 2006). There were 47,536 grade IIIB/C teachers (31.3%), 100,177 grade IIIA teachers (66%), 3,754 Diploma holders (2.5%), and 415 degree holders (0.3%) (URT, 2006). This means that there are about 47,536 teachers to be developed through upgrading. The upgrading of grade IIIB/C teachers involves successful completion of the Ordinary Level Certificate of Secondary education course offered through distance education or attendance of evening classes offered by the Institute of Adult Education. By the late 1990s, it failed to achieve quality education due to lack of essential inputs largely because of unqualified and un-development teaching work force (Mosha 1995; Omari, 1995).

In addressing the shortage of teachers in primary schools, the Ministry of Education and Vocational Training (MoEVT) revised the two year Grade IIIA teacher education program into a one-year program followed by one-year school based training. A similar crash program was designed to train paraprofessional teachers for the Complementary Basic Education program (COBET) to cater for primary education needs of the out of school children. Also, in the name of Teacher Professional Development, the Ministry has encouraged and supported massive upgrading of grade IIIC/B teachers. The concern about these crash programs and the upgrading activities revolves around appropriateness of perception and practices of Teacher Professional Development. In Kilosa district the teacher ÷ pupil ration went as 1: 65 in 2009 while the country average being 1:70 pupils. This tremendous ratio has negative impact on pupils' performance.

Blasé & Blasé, (1999); and Mosha (2006) in their study came out with the findings that support of the school management was crucial for promoting teacher development and high quality education. It was found that if school managers are empowered they will be able to play their social and technical roles more efficiently. School management capacity is the ability of the leadership to perform its duties including supporting teacher professional development at the school. This ability depends on the way it has been empowered by education administrators and supervisors; human and physical resources available; managerial knowledge, skills of the Head Teacher and the school culture. That being the case, the teaching of mathematics was found to be correlated with the way heads of school would motivate mathematics teachers in order to come out with good performance. Moreover, the study did not determine the socio-economic factors that affect mathematics subject performance.

The study by Uwezo (2011) asserted the evidence both from the national examinations and from independent assessments of learning outcomes. It was found that the largest ever assessment of learning outcomes in the country carried out in Tanzania in 2011 and their findings were depressing. Around 100,000 and 40,000 children were assessed in all the 133 districts in the country. Uwezo assessed children's reading ability in Kiswahili and English and their numeracy competencies. The tests used by Uwezo were based on standard two syllabi in the three subject areas of Kiswahili, English and Maths (Uwezo: 2011).

A primary school syllabus stipulates that children by end of class two should be able to read simple texts in English and Kiswahili and be able to do simple additions,

subtractions and multiplications. It was particularly worrying that 19 out of 100 children finishing their primary schooling were illiterate. These illiterate primary school graduates add to the pool of illiterate people in the country after their primary school.

Further, Uwezo assessed children for their ability in basic numeracy. The findings from the survey showed that overall 65 percent of children in standard seven were able to solve a standard two multiplication problem. The situation was not encouraging. For example, only 15 percent of children in standard two were able to solve standard two multiplication problems. As with literacy skills, urban children outperform rural children in numeracy, though there was not a large difference between girls and boys. More children seem to be acquiring more skills sooner. Pass rates for the numeracy test in 2012 were higher across all grades. For example, in 2012, about 44 per cent of students in standard three passed the numeracy test compared with 37 per cent in 2011.

Administrative and Socio Economic Factors Affecting Mathematic Performance: Isack (2015) did a study on the factors leading to poor performance in mathematics subject in Kibaha secondary schools. The study was lead by four research objectives which were to examine the influence of cultural backgrounds on studentsø performance in mathematics, to identify influence of teacher-studentsø relationship on studentø performances in mathematics, determining the nature of school environment where teaching is practiced and to examine influence of school management system on teaching and learning process in mathematics. Relevant literatures were reviewed on theories and findings that emerged from different

authors. The study involved 4 secondary schools, 8 mathematics teachers and 60 students. These were obtained through simple random sampling. Four academic masters and four head of school from four schools were purposely selected. Data collection was done by using questionnaires, interviews, focus group discussions, observations and documentary review.

The findings indicated teaching and learning of mathematics was facing challenges such as poor teaching environment, mathematics departments were not well-managed, inadequate self-practice and students' poor background in mathematics. Therefore the researcher recommends teachers to make assessment on the background of their students in to decide teaching methods that can help students perform better in mathematics. Moreover, students should put self-efforts and practice in learning mathematics. Lastly, the researcher recommends future research on individual factors that affects students' learning of mathematics.

Tata et al (2014) study investigated the causes of poor performance in mathematics among public senior secondary schools students in Azare metropolis of Bauchi state, Nigeria. The study sample was 361 in which 300 were students and 61 teachers which were selected from the population of 5,545. The descriptive survey design was used and questionnaire was used in the collection of data. Frequency and simple percentage were used in the analysis of the data. The findings of the study led to the conclusion that students' negative attitude toward mathematics, anxiety and fear of mathematics, inadequate qualified teachers, poor teaching methods, inadequate teaching materials, overcrowded classes were some of the causes of poor performance in mathematics in the study area.

The study also found out that developing positive attitude, motivation and proper guidance toward mathematics, using proper methods of teaching the subject, provision of relevant teaching materials, additional classrooms and furniture, provision of libraries and mathematical laboratories were some of the ways of improving performance in mathematics in the study area. Finally, the study recommended that frequent inter-school competition in mathematics, frequent supervision and inspection by proper authorities as well as enlightenment of parents on importance of children's education should be adopted.

2.4 Research Gap

Most of studies reviewed were done in developed countries while a few done in developing countries. Studies such as Ferguson (1998), Tata et al (2014), Isack (2015), Goldhaber (2002); Horn and Sanders (1997) etc focused on developed countries and came out with recommendations to enhance administrative, socio-economic and teachers' attitudes towards Mathematics subject. Moreover, Wayne and Youngs (2003) reviewed 21 studies including meta-analyses and individual studies and declared that pupils learning mathematics depends on such teacher characteristics as testing skills, subject knowledge, and positive relationships with students.

Yet, the factors reviewed have not been tested in depth in developing countries where we find a lot of failures in the subject. It is found that learners from low socio-economic status families tend to value domestic activities more than schooling. Such children are subjected to child labour and they have little time for studies. This is the gap the study wants to fill.

2.5 Conceptual Framework

Kothari (2004) defined conceptual framework as an abstract idea or a theory used to develop new concepts or to reinterpret existing ones. It gives the relationship between the independent [input] and dependent variables [output/outcome]. From the figure the dependent variable is mathematics subject performance in public primary schools while the independent variables result from the administrative, socio-economic factors and the effects of teachers' attitudes on the performance of pupils in mathematics.

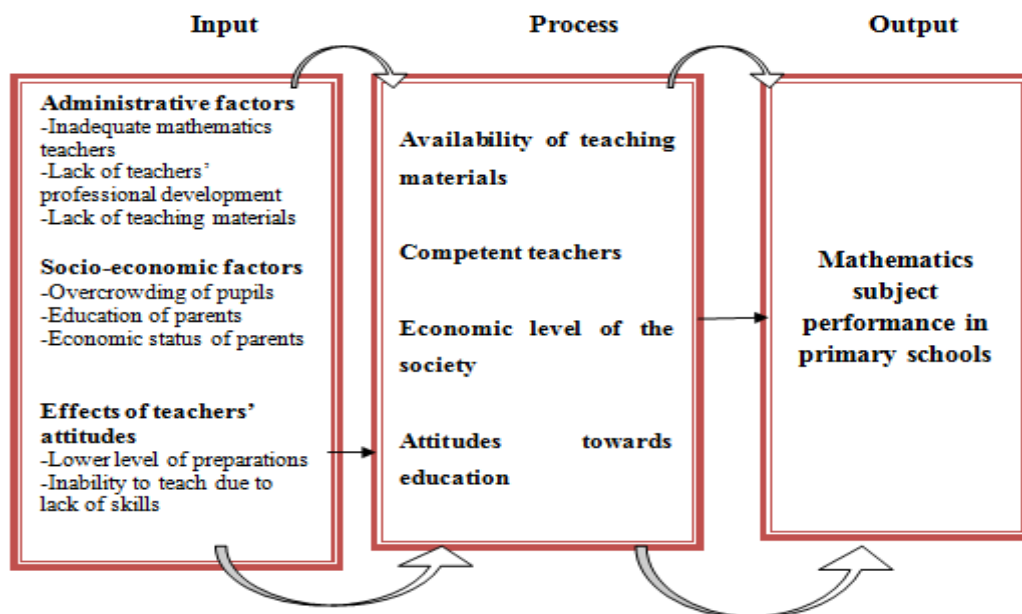


Figure 2.1: Conceptual Model

Source: Adapted from Ivatury and Mas (2008)

These include fear towards mathematics, lack of professional development, overcrowding in classroom, inadequate teaching aids and accommodation, quality of teachers, class management, instructional and evaluation factors, education of the parent, economic status of parent, perceived importance of mathematics, weak mathematics background and low level of preparations. Figure 2.1 shows that

administrative, socio-economic factors and the effects of teachers' attitudes influence the process of attaining good performance in mathematics. In order to attain that, there should be teaching materials, competent teachers; economic level of society and attitudes towards education among the population needs to be impressive. Thus, with the cooperation of teachers, management and the society at large; pupils are able to perform well and attain their goals.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section provides detailed explanation on methods and materials which were used to collect, analyze and present data. It describes the research design, study area, target population and sample techniques, data collection methods and data analysis procedures.

3.2 Research Approach

The study used survey approach where data were collected mainly through questionnaire and complemented by interviews. The survey approach was appropriately as the study intended to seek opinion on the administrative and socio economic factors affecting academic performance in Mathematics among primary school pupils in Kilosa. The approach was seen appropriate as it could allow data collection in short time with less costs (Silverman, 1997).

3.3 Research Design

Cross-sectional research design was used in the methodology because of cost and time considerations (Kothari, 2004). A cross-sectional research design was the preferred that contains a strategy regarding *õwhenõ õhowõ* or *õwhyõ* questions are being posed. The design allows data collection to be done at a single point in time and is most appropriate for sample descriptive interpretations as well as determination of relationships between and among variables. The reason for utilizing cross-sectional design which is in line with Yin (2003) who argues that cross-sectional studies allow researchers to retain the holistic and meaningful

characteristics of real life events. The most important with cross-sectional studies according to Yin (2003) is to explain the causal links in real life intervention, describe the real life context in which an intervention has occurred and evaluate the intervention itself.

3.3 Study Area

This proposed study was conducted in Kilosa district. The schools were selected out of 5 divisions from 7 wards of Dumila, Kitete, Mtumbatu, Kimamba, Mbigiri and Mikumi of Kilosa district. Seven schools included; Dumila [Dumila], Mahemu and Mtumbatu [Mtumbatu], Mfulu [Kitete], Kimamba [Kimamba], Mbigiri [Mbigiri], St. Peter Clavery [Mikumi]. The study therefore sought to assess the administrative and socio-economic factors affecting mathematics subject performance. The district is located in the East Central Tanzania at an average distance of 300 km west of Dar es Salaam and it is bounded by latitude $5^{\circ}55'$ and $7^{\circ}30'$ south and Longitude $36^{\circ}30'$ and $37^{\circ}30'$ East. Kilosa district borders to the east with Mvomero districts council; South with Kilombero district and Iringa Region, North, with Gairo district and West Gairo District and Mpwapwa District. The district is located in east central Tanzania, about 100 kilometers from Morogoro town. The selection of the area was based on easiness to collect data and being cost efficient as the researcher has been living in the area for more than fifteen years.

3.4 Target Population

The target population comprised of educational administrators, teachers and pupils in public and private primary schools in Kilosa district. The study comprised of 7 primary schools. These primary schools stem from 5 divisions of Kilosa district from

which each division was represented by one or two primary schools.

3.5 Sample Size and Sampling Techniques

3.5.1 Sample Size

The sample size of 56 respondents was selected from whom information required for the study was obtained. These are the classification, out of 56 sample size; 21 were obtained from teachers [each school 3 teachers] and 28 from pupils [each school 4 pupils] and 7 administrators [6 Ward Education Officers and 1 District Education Officer]. Sekaran (2003) argues that too large sample size could become a problem and recommends the sample size to be between 30 and 500. Similarly, Enon (2002) recommends that a minimum number of samples for research should be 39. Based on the above literatures, the sample size of 56 respondents will be selected for inclusion in this study. Table 3.1 below shows the distribution of respondents.

Table 3.1: Distribution of Respondents

S/N	Category of Respondents	Sample size
1	Administrators	7
2	Teachers	21
3	Pupils	28
	TOTAL	56

Source: Field Data, 2019

3.5.2 Sampling Techniques

The sampling techniques used in the study includes; convenience and purposive sampling.

Convenience Sampling: This is a type of non-probability sampling technique, which includes anyone in hand as a unit of inquiry. Convenience sampling (or haphazard sampling) involves selecting haphazardly those cases that are easiest to

obtain for sample, such as the person interviewed at random in a shopping Centre for a television program. The sample selection process is continued until the required sample size has been reached (Saunders, 2007). The researcher used this technique when selecting the sample from the pupils.

Although this technique of sampling is used widely, it is prone to bias and influences the researcher's control, as the cases appear in the sample only because of the ease of obtaining them. However, these problems are less important where there is little variation in the population, and such samples often serve as pilots to studies using more structured samples. This sampling technique was used as the researcher believed that there is very little variation in the population in such a way that the sample selected was a true representative (Yin, 2003).

Purposive Sampling: This method was used to select administrators and teachers teaching mathematics whereby the personal experience of each respondent regarding the assessment of administrative and socio-economic factors affecting mathematics subject performance in primary schools was sought (Saunders, 2007). Therefore, mathematics teachers as well as administrators were selected by using this method believing that they possess key information regarding the matter.

3.6 Data Collection Methods

Data collection refers to the process of gathering specific information aimed at providing or refuting some facts (Kombo and Tromp, 2006). This study utilized both primary and secondary data collection methods to get information from respondents and other sources.

3.6.1 Primary Data Collection Methods

According to Kothari (2004) primary data are those collected afresh from the field for the first time. They happen to be original in character. Therefore, primary data collection methods were used in this study to collect data from the field whereby interviews and questionnaires were employed.

Interview: The semi-structured interview was used to administrators and pupils in order to solicit information regarding the assessment of administrative and socio-economic factors affecting mathematics subject performance. The reason for using pupils is that, these are key respondents who may show the interest or not towards the subject and would be in position to provide a good feedback to teachers for rectification if any.

Questionnaires: Questionnaires with open-ended and closed-ended questions were used to obtain information from mathematics teachers. The information asked included; administrative factors, socio-economic factors and the effects of teachers' attitudes on the performance of pupils in mathematics subject in primary schools. Copies of questionnaires were prepared based on the essentials of a good questionnaire, i.e. short and simple, and organized in a logical sequence moving from relatively easy to more difficult issues. Technical terms, vague expressions and those affecting emotions of the respondents were avoided (Sirvaman, 2000).

3.6.2 Secondary Data Collection Method

Documentary Review: Documents such as personal profiles, books and journals were used in order to access accurate and reliable data.

3.7 Data Analysis Procedures

The data were summarized, coded and analyzed by Statistical Package for Social Science (SPSS). Frequency distribution and percentages were used to describe major variables. The collected data were analyzed through description, interpretation and explanation. Tabulation and classification were utilized as the major methods during data analysis. However, the analysis was generally based on descriptive framework as well as content analysis from the interview.

3.8 Reliability and Validity of Instruments

A pilot study was carried out to test the questionnaires in an area similar to the study area [Kilosa] for their reliability; afterwards corrections were done in order to obtain reliable data for the research. The data collected were verified by experts experienced in research for their reliability. This allowed the researcher to study the properties of measurement scales and the items that make them. Since the reliability of data goes with the accuracy or precision of a measuring instrument, in this research, reliability was concerned with the questionnaires' consistency of responses to the questions asked in repeated measurements (Bryman, 2004).

Moreover, validity is defined as the instrument's ability to measure exactly the concept it is supposed to measure. In order for the researcher to validate the data and instruments (questionnaires) used in the research, the researcher asked the experts to recommend on their representativeness and suitability. Besides, the researcher allowed suggestions to be made to the structure of these questionnaires. These helped in establishing content validity as argued by (Bryman, 2004).

3.9 Ethical Considerations

Research ethics refers to the type of the agreement that the researcher enters with the research respondents (Best and Khan, 2006). The research ethical issues fall into five categories which are protection from stress, harm or danger, informed consent, right to privacy, confidentiality and honesty (McMillan and Schumacher, 2006). So in doing this study all ethical considerations were adhered. This means that a researcher was ethically bound to respect the participant's human dignity, free and informed consent, privacy and confidentiality. The researcher was informed that teacher for example have their school teaching timetable. The current researcher took initiative to discuss and agree with the teachers on the suitable time for interviews, this was made to ensure the right to collection of data was not interfering the teaching timetable. Also the interview with teachers was not disclosed to senior officials, and all information which were sensitive its source were hidden to protect the individuals from harm.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Introduction

The chapter presents the results and discussion from the assessment of administrative and socio-economic factors affecting mathematics subject performance in primary schools in Kilosa district. The results and discussions are presented in three parts. The first part identifies the administrative factors that affect mathematics subject performance; the second part determines the socio-economic factors that affect mathematics subject performance and the third part determines the effects of teachers' attitudes on the performance of pupils in mathematics subject in primary schools in Kilosa district. Mathematics National examinations reviewed were 2015, 2016 and 2017 for standard seven.

4.2 Administrative Factors Affecting Mathematics Subject Performance

The first objective identified the administrative factors that affect mathematics subject performance in primary schools in Kilosa district. The respondents were asked to indicate a variety of factors according to their choice and the results were analysed as agree or disagree responses as there were no uncertain responses. Table 4.1 shows the responses.

Table 4.1: Administrative Factors Affecting Mathematics Performance N=21

Factor	Agree		Disagree	
	Frequency	Percentage %	Frequency	Percentage %
Fear towards Mathematics	18	85.7	3	14.3
Lack of professional development among teachers	20	95.2	1	4.8
Over crowdedness in class	17	80.9	4	19.1
Lack of teaching materials	16	76.2	5	23.8
Sufficient teaching aids and experience	10	47.7	11	52.3
Lack of teachers' accommodation	18	85.7	3	14.3

Source: Field Data, (2017)

4.2.1 Sufficient Teaching Aids and Experience

The results from table 4.1 indicate that 10 (47.7%) of respondents reported that there are sufficient teaching aids and experience among teachers against 52.3% who stated that there are no sufficient teaching materials and concrete experience among teachers. The reasons given were that the school lacked physical and human resources in many public primary schools except on one private primary school [St. Peter Clavery]. The absence of resources enabled mass failure in mathematics subject in comparison to private school. It was reported by respondents that inadequate teaching materials went to 1 book to 5 pupils instead of 1: 1 ratio. The findings showed that while Dumila primary school in 2015 had passed mathematics subject by 32% and failed by 68%, St. Peter Clavery primary school in the same year had passed by 100% with no failures. One of the heads of school had the following to state,

õWe have few books that do not accommodate all pupils something that result into utilizing 1 book for 5 pupils or more. This situation demoralizes pupils and the need to learn mathematics diminishes accordingly (Head of School, A)

We have teachers who teach us well but the problem comes on how to have books for our self-reading at home. Yet, the time to review lessons at home becomes difficult without reference books (Pupils from school B.

4.2.2 Lack of Teaching Materials

Further, 16 (76.2 %) of respondents reported that there were the lack of teaching materials that could enable pupils understand the abstract concepts that would have been difficult to understand. Lack of teaching aids was associated with teachers' demoralization something that made them to carelessly abide from producing teaching aids of their own. Here teachers need to be motivated for the purpose of

performing their works. One of the key informants was of the following view.

A motivated teacher learns from others and is more likely to attend various professional development activities. Motivation can be intrinsic or extrinsic which drives the teacher towards self-improvement [Head of School C].

This situation encouraged drop out in mathematics and science-related subjects where pupils would be nurtured for later innovations. The statement given by head of school above is in line with Semela (2010) who stated that reasons for this range from; inadequate teachers, lower level of preparation, weak mathematics background, lack of skills in teaching the subject, little interest among students, lack of facilities to enable teaching and learning as well as possession of below standard pedagogical content knowledge. One of the heads of school was of the following comment.

It is the responsibility of the school to provide materials to enable teachers prepare teaching aids. Lack of it has resulted into either teachers' using their resources to prepare teaching aids or teaching without aids. This in some cases has left pupils not understanding abstract ideas that emanate from mathematical concepts (Head of School C)

In case of St. Clavery Primary school, teaching aids are available as the school provides incentives for teachers who are able to put forward their innovations towards enabling pupils get taught with reliable and accurate teaching aids. The incentives provided have activated teachers to do their level best in enabling a thorough teaching and learning situation (Head of School D)

4.2.3 Over crowdedness in Class

On the other hand, 17 (80.9%) of respondents reported the overcrowded classes as the factor that affects mathematics subject performance. This situation was obvious in public primary schools than in private school. It was found that in public primary schools the lowest class comprised of 70 pupils while the highest class included 120

pupils. In private school the class had 35 pupils and the highest class with 45 pupils.

One of the head of school was of the following view.

There should be adequate classrooms equipped with facilities like furniture, books and visual aids. These help the teacher to perform her/he duties competently. Many schools in Tanzania lack sufficient books, furniture and teaching aids. Many classes are overcrowded. For the teacher to realize the best of her/his potential there should be enough teaching and learning materials and facilities at her/his disposal. Participatory methods cannot be implemented neither can discipline be sustained easily without the help of teaching and learning resources [Head of School A].

In reflecting on 2016 national examinations, Kimamba primary school with the highest number of pupils, pupils who passed were 46% and failed 54%; while the same year, St. Peter Clavery had pupils who passed by 100% without failures. The following interview with various heads of school and pupils indicate the situation as follows.

There is no effective teaching and learning at our school as the time allocated for lessons does not enable teachers to attend the pupils thoroughly due to overcrowding situation we face. With an overcrowded class of 70 to 120 pupils, a teacher becomes unable to exercise well his/her potentialities to enable pupils do exercises and get corrected at the right time. What is done is to put pupils in groups of ten and allow them to do the exercises. Teaching techniques used may include lecturing, asking questions and later providing questions for evaluation. Sometimes, after doing the corrections teachers ask pupils to exchange the exercise books and put the tick to the right answers (Head of School E)

Teachers usually utilize question and answer method in teaching because, it is impossible to divide the class in groups for discussions sometimes. This method seems to be a successful teaching as many teachers are found to utilize it (Pupil from School D)

Our classes are overcrowded. Teachers normally feel overwhelmed, discouraged and disgusted whenever they get into the class to teach. The space for class is minimal to let teachers pass and inspect what pupils do especially those sitting at the back desks. Truly, not all pupils can be attended in that situation (Head of School F).

The above findings concur with Zakaria *et al.*, (2010) and other education experts who reported to fear an entire generation of pupils passing through primary schools while missing opportunities to enter science - related fields in future; mathematics being among them. They recommend that there are biggest threats facing these schools whose learners are mostly from poor families as they face severe shortage of (mathematics) teachers, laboratories, books and the in-appropriate teachers' attitudes towards teaching mathematics subjects. Thus, do not get a thorough facilitation of teaching and learning in mathematics.

4.2.4 Fear towards Mathematics and Lack of Teachers' Accommodation

Further, 18 (85.7%) of respondents reported that fear towards Mathematics and lack of teachers' accommodation were the factors that affect mathematics subject performance in primary schools. It was found that some teachers were scared of pupils something that bring fear to pupils while lack of accommodation nearby schools render pupils who would seek for help in mathematics to fail in that view. One of the pupils stated that,

There is a tendency to intimidate pupils that mathematics is difficult by our teachers or parents something that facilitates anxiety. Also there has been no assistance among teachers who in one way or another dwell far from school campus who may be consulted in case of need after school hours (Pupils from School F)

4.2.5 Lack of Professional Development among Teachers

Furthermore, the results indicate that 20 (95.2%) of respondents reported that there is lack of professional development among teachers something that hinders new understanding of new techniques and ways of delivering lessons such as mathematics. In lieu of that there seemed to have little teacher-pupil interaction that

would necessitate effective learning. One of the key informants was of the following view.

Head teacher should be committed to develop teachers and therefore be able to design professional development activities. She/he has to be a model. Her/his work of teaching must be exemplary and has to make sure that she/he inspects teachers in order to know their teaching abilities and provide clinical supervision [Head of School C].

4.3 Socio-economic Factors that Affect Mathematics Performance

Table 4.2: Socio-Economic Factors N=21

Factor	Agree		Disagree	
	Frequency	Percentage %	Frequency	Percentage %
Positive attitudes towards mathematics subject	16	76.2	5	23.8
Perceived importance of mathematics subjects	18	85.7	3	14.3
Education of the parent	20	95.2	1	4.8
Economic status of parent	15	71.4	6	28.6

Source: Field Data, 2017

The second objective determined the socio-economic factors that affect mathematics performance in Kilosa district. The researcher asked the respondents to indicate the socio-economic factors according to their understanding and the results were processed in terms of agree or disagree as there were no uncertain responses. Table 4.2 shows the responses.

4.3.1 Economic Status of the Parent

The results in table 4.2 indicate that 15 (71.4%) of respondents argued that the economic status of parent was among the socio-economic factors that affect mathematics subject performance in primary schools. This was obvious when comparing the results from one of public primary school [Mbigiri] with the other

private school [St. Peter Clavery]. While in 2017 Mbigiri primary 11 (19%) school pupils from poor families had passed their national examinations and 47 (81%) failed. St. Peter Clavery pupils from rich families passed by 26 (90%) and failed 3 (10%). The results show that socio-economic status of parents was a factor towards performance in mathematics subject. Interview from pupils revealed the following;

It has been difficult for me to follow well during mathematics subject since I wake up early without taking breakfast. In our school there is neither provision of tea nor food. This makes me to hardly understand the subject (Pupils from School D)

It is obvious that we get breakfast and lunch at school as our parents pay for that. This makes me to follow well the lessons with a settled mind. I like mathematics subject as the teacher always encourages us to kike it. The teacher is also well equipped in teaching the subject (Pupil from St. Peter Clavery)

The findings concur with Howie (2006) who found that family socio-economic status affects pupils' performance in mathematics in South Africa. However, they contrast with Heyneman and Loxley (1983) who argued that in low-income countries, socio-economic status makes little difference in academic performance. This can be evidenced from two private primary schools of Amani and Kantui that performed well in their mathematics national examinations due to parents socio-economic status to accommodate their children as in Table 4.3 as follows.

Table 4.3: Performance in Mathematics

SCHOOL	YEAR	NUMBER	PASSED	%	FAILED	%
AMANI	2015	15	15	100	0	0
AMANI	2016	40	26	65	14	35
AMANI	2017	40	32	80	8	20
KANTUI	2015	24	24	100	0	0
KANTUI	2016	15	13	87	2	13
KANTUI	2017	26	26	100	0	0

Source: DEO KILOSA, 2018

4.3.2 Positive Attitudes towards Mathematics Subject

On the other hand, the results indicate that 16 (76.2%) of respondents reported that there have been positive attitudes towards mathematics subject among parents and pupils from both public and private primary schools. These positive attitudes emanate from the way mathematics subject cuts across all science subjects for day to day learning. It was found that pupils who cultivated a positive attitude towards the subject were able to perform well. One of the pupils was of the following view.

I have a thirst to learn mathematics from the fact that it is the subject that makes someone think deeper and come out with the realization of abstract concepts into objects that may be obvious. This has been so from the way I can apply mathematics concepts in helping my mother in shop related matters (Pupil from School A)

4.3.3 Perceived Importance of Mathematics Subjects

Further, the results indicate that 18 (85.7%) of respondents reported that there was a perceived importance of mathematics subjects among pupils and teachers from the fact that when people show the importance of something, the likelihood of developing an interest becomes higher. The results above concur with Mji and Makgato (2006), who showed that pupils with mathematics interest will improve if parents allocate time for homework and monitor it. But, illiteracy and poverty need to be overcome so as to have parents involved in children's education.

4.3.4 Education of the Parent

Similarly, 20 (95.2%) of respondents reported the education of parents is among the socio economic factors that affect mathematics subject performance. It was found that when parents possess higher education, there is a higher possibility of influencing children to emulate the same. This can be shown through parental

support that can be associated positively with pupils' assistance in order to perform well in mathematics.

The findings are in consistence with Uwaifo (2008) who stated that parents with higher education and economic status are more involved in their child's education. In this case, the higher the parent's education level, occupation status, income and their household income, the higher would be the parent's involvement in their child's education. One of the heads of school was of the following view.

It is obvious that pupils from better economic background have been eager to learn and understand mathematics. This has been associated with the education of their parents and sometimes the economic status (Head of School C)

Moreover, the findings concur with Mohammadpour (2012) who emphasizes that school resources, school size and pupils' socio-economic status (SES) are considered to be confounding factors that affect mathematics performance because parents with full-time jobs and steady income send their children to large schools with more resources.

4.4 Effects of Teacher's Attitudes on the Performance of Pupils in Mathematics

The third objective determined the effects of Teachers' attitudes on the performance of pupils in mathematics subject in primary schools. The researcher questioned the respondents to indicate the effects in lieu of their perceptive while the results being analysed in terms of agree and disagree responses as there were no uncertain responses. Table 4.4 shows the responses.

Table 4.4: Effects of Teachers' Attitudes on Mathematics Performance N=21

Effects	Agree		Disagree	
	Frequency	Percentage %	Frequency	Percentage %
Ability to understand the topics taught	14	66.6	7	33.4
Application of Mathematics concepts learnt in everyday life	18	85.7	3	14.3
Development of interest in Mathematics after the course	12	57.1	9	42.9
Show pupils how new concepts in Mathematics relate to what have already been done	17	80.9	4	19.1
Use of demonstrations and discussions to illustrate concepts/phenomena	20	95.2	1	4.8
Use of pupils' suggestions and ideas in teaching	18	85.7	3	14.3

Source: Field Data, (2017)

4.4.1 Development of Interest in Mathematics after the Course

The results indicate that 12 (57.1%) of respondents reported that one of the effects of teachers' attitudes on mathematics performance was the development of interest in mathematics after the course. This was confirmed by the teachers who in one time went for refresher course on mathematics teaching. It was found that after the course, some teacher gained some skills that enabled them to teach well the subject and enable pupils to raise their pass marks. One of the heads of school was of the following view.

In our school, mathematics results in 2015 showed that 31% passed while 69% failed. Upon efforts made by the government to render refresher course for mathematics teachers; the results in 2017 showed improvements as those who passed were 61% while those who failed were 39%. This shows the impact of teachers' refresher course undertaken (Kimamba Head of School)

The same applied to Mahemu primary school as reported by the head of school.

In 2015 our school did not perform well in mathematics. Those who passed were 33% and failures were 67%. We presented the issue to the

district education officer and when refresher courses were announced, two teachers participated. Their impact was obvious in the 2017 results were those who passed were 56% while those who failed were 34%. Thus, the role of refresher course was vivid (Mahemu Head of School)

The results above are in line with Cornelius (2000) who revealed that intelligence, attitude towards teaching and academic achievement of teacher trainee cast impression on their competence in mathematics when in-service training gets provided after sometimes.

4.4.2 Ability to Understand the Topics Taught

Similarly, 14 (66.6%) of respondents reported that the other effect was the ability to understand the topics taught. It was found that when topics were understood by the teachers, pupils were able to understand what teachers taught and vice versa. This is in line with Ma and Kishor (2017) who found that there are relationships between attitudes and performance in pupils that increase with age.

4.4.3 Show Pupils how New Concepts in Mathematics relate to what have Already been done

Additionally, 17 (80.9%) of respondents reported that the effects of teachers' attitudes on the performance of pupils in mathematics subject showed pupils how new concepts in mathematics relate to what they did from the way concepts were presented by teachers.

4.4.4 Application of Mathematics Concepts and Use of Pupils' Suggestions and Ideas in Teaching

Moreover, 18 (85.7%) of respondents reported that application of mathematics

concepts in everyday life by pupils helped teachers in utilizing pupils' suggestions and ideas in teaching that facilitated teaching and learning. As pupils asked mathematics teachers the use of concepts taught and get understood, pupils who were eager to emulate what was taught would be in position to fully apply them in their life. One of the pupils was of the following view.

After understanding the concepts taught in mathematics, I have been able to do business during holidays in order to help my parents (Pupil from School B)

4.4.5 Use of Demonstrations and Discussions to illustrate Concepts/ Phenomena

Finally, 20 (95.2%) of respondents reported that the effects of teachers' attitudes on the performance of pupils in mathematics subject resulted into the use of demonstrations and discussions to illustrate concepts/phenomena something that helped pupils to like the subject with the help of parents at home. It was found that parental involvement and individuals' experiences at home played tremendous roles in building the personality of the child and making the child what he is. Thus, concepts that were not well understood in class were elaborated by parents at home when involvement was applied.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the conclusion and recommendations from the research findings. It starts with the summary, conclusion, recommendations and finally further research is presented.

5.2 Summary

The study assessed Administrative and Socio-economic Factors affecting performance in Mathematics among the Primary Schools Pupils in Kilosa District A Cross-sectional survey design was used in the methodology because of cost and time considerations. The sample size of 56 respondents was used that included administrators, teachers and pupils. Data were collected through interview and questionnaires where the analysis was generally based on descriptive framework as well as content analysis from the interview.

The findings revealed that there were no sufficient teaching materials and concrete experience among teachers. The reasons given were that the schools lacked physical and human resources in many public primary schools except on private primary schools. Thus, the absence of resources enabled mass failure in mathematics in comparison to private schools. However, education and social status of parents were among the socio-economic factors that affect mathematics subject performance among pupils.

It was asserted that when parents possess higher education or has a good socio-economic status, influence higher possibility towards Mathematics performance

whereby children would be able to emulate the same in performance. Similarly, the performance of pupils in mathematics showed pupils how new concepts in mathematics relate to what they did from the way concepts were presented by teachers. Yet, the application of mathematics concepts in everyday life by pupils helped teachers in utilizing pupils' suggestions and ideas in teaching that facilitated teaching and learning.

5.3 Conclusion

It is concluded that administrative factors, socio-economic factors and the effects of teachers' attitudes affected mathematics performance in primary schools in Kilosa district. This emanated from the lack of teaching aids that hindered pupils understand the abstract concepts from mathematics. The lack of teaching aids was associated with teachers' demoralization something that made them to carelessly abide from producing teaching aids of their own. Moreover, overcrowding in classrooms was among the factors that affect mathematics performance found in public primary schools than in private school.

Additionally, there have been positive attitudes towards mathematics among parents and pupils from both public and private primary schools. These positive attitudes emanate from the way mathematics cuts across all science subjects for day to day learning. Thus, pupils who cultivated a positive attitude towards the subject were able to perform well. However, the effects of teachers' attitudes on the performance of pupils in mathematics subject resulted into the use of demonstrations and discussions to illustrate concepts/phenomena something that helped pupils to like the subject with the help of parents at home. Thus, concepts that were not well

understood in class were elaborated by parents at home when involvement was applied.

5.4 Recommendations

From the above findings, and conclusion the following are the recommendations.

5.4.1 Recommendations for Action

- i. Lack of teaching aids hindered pupils understand the abstract concepts from mathematics subject. It is recommended that teaching aids need to be prepared and be used in classes for the facilitation of teaching and learning.
- ii. Overcrowded in classrooms was the factor that affects mathematics subject performance. This was mostly found in public primary schools than in private school. It is recommended that physical resources such as classrooms need to be constructed for the purpose of rescuing the situation.
- iii. The effects of teachers' attitudes on the performance of pupils in mathematics subject resulted into the use of demonstrations and discussions to illustrate concepts/phenomena something that helped pupils to like the subject with the help of parents at home. It is recommended that the use of demonstrations need to be enhanced for better pupils' understanding.

5.4.2 Recommendations for Further Research

The study assessed the study assessed Administrative and Socio-economic Factors affecting performance in Mathematics among the Primary Schools Pupils in Kilosa District. The researcher recommends that further studies be done on the following issues;

- i) Determine the cultural factors that affect mathematics subject performance in Kilosa district.
- ii) To what extent has the community been able to address cultural factors that affect mathematics subject performance in Kilosa district?

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APPENDICES

APPENDIX I: Budget

Budget Items	Details	Cost (Tsh)
Research proposal preparation	-Stationary (pens, reams, pencils, drafting papers, note books, flash disks and CDs) -Questionnaire preparation	140,000/= 150,000/=
Sub-Total		290,000/=
Pilot study	-Transport -Training 3 research assistants @ 15,000/= per diem per person for three days	50,000/= 135,000/=
Sub-Total		185,000/=
Primary Data collection	-Transport to and from study area (4 people @ 5,000/= * 30 days -Subsistence allowance for principal research @ 25,000/= * 30 days -Subsistence allowance for research assistant @ 15,000/= * 30 days	600,000/= 750,000/= 1,800,000/=
Sub-Total		3,150,000/=
Data processing and report writing	-Data entry, cleaning and editing -Correction of dissertation -Printing and photocopy -Soft binding 4 copies @ 12,000/= -Hard binding 5 copies @ 50,000/=	140,000/= 80,000/= 70,000/= 48,000/= 250,000/=
Sub-Total		588,000/=
TOTAL		4,213,000/=

Appendix 2II: Interview Guide for Administrators and Students

- i) What are the administrative factors that affect mathematics subject performance in primary schools?
- ii) What are the socio-economic factors that affect mathematics subject performance in primary schools?
- iii) What are the effects of teachers' attitudes on the performance of pupils in Mathematics subject in primary schools?