

**FACTORS LEADING TO POOR PERFORMANCE IN MATHEMATICS
SUBJECT IN KIBAHA SECONDARY SCHOOLS**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
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ADMINISTRATION, PLANNING AND POLICY STUDIES (MED. APPS) OF
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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation entitled “**Factors Leading to Poor Performance in Mathematics Subject in Kibaha Secondary Schools**” in partial fulfillment of the requirements for the Degree of Master of Education in Administration, Planning and Policy Studies of the Open University of Tanzania.

.....

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Date

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DECLARATION

I, **Michael Isack**, 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.in any University.

.....

Signature

.....

Date

DEDICATION

I dedicate this dissertation to my parents, Mr. & Mrs. Michael Hillonga for their prayers, encouragements and moral support, without them my study would have been difficult. I also dedicate to my youngest brethren Sifael, Elihuruma, Heriel, Isaya, Fadhili and my only sister Elineema Michael.

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ABSTRACT

This study was about 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 students' performance in mathematics, to identify influence of teacher - students' relationship on student's 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.

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LIST OF ABBREVIATIONS

CSEE	Certificate of Secondary Education Examinations
DAS	District Administrative Secretary
ETP	Education and Training policy
MOEVT	Ministry of Education and Vocational Training
OUT	Open University of Tanzania
PGDE	Postgraduate Diploma in Education
PhD	Doctor of Philosophy
RAS	Regional Administrative Secretary
SEDP	Secondary Education Development Programme
SPSS	Statistical Packages for Social Sciences
TIMSS	Trends in International Mathematics and Science Study
UNESCO	United Nations Educational, Scientific and Cultural Organization
URT	United Republic of Tanzania

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

This chapter discusses the background of the problem, statement of the problem, purpose of the study, objectives of study, and research questions, delimitations and limitations in this study was put down. The researcher had read various writings at global, African and those in Tanzanian context on factors leading to poor students' performance in mathematics subject.

1.2 Background to the Problem

Mathematics is the science of reasoning and computations. It is the science or study of numbers, quantities or shapes. Kitta (2004), defined mathematics as the language that helps us to describe ideas and relationships drawn from the environment. Mathematics enables one to make the invisible to be visible, thereby solving problems that would be impossible otherwise.

According to Lambdin (2009), mathematical demands on students increases as they progress through school; take up their adult lives at home and in the workplace. In order to function in a mathematically literate way in the future, students must have a strong foundation in mathematics. A strong foundation involves much more than the rote application of procedural knowledge. Ontario Ministry of Education report in 2004 shows that, all students should be able to understand, make sense of, and apply mathematics; make connections between concepts and see patterns throughout in mathematics.

The report shows that students must be able to communicate their reasoning, the flexibility of thinking that will allow them to tackle new areas of mathematics and be willing to continue in doing mathematics.

However findings by Iheanachor (2007), indicate that, there is a significant positive relationship between students' academic achievement in mathematics and teachers' background. Teachers who have good qualifications in mathematics have their students performing better in mathematics.

Tata (2013) made his study in Nigeria and came out with findings that, students' negative attitude toward mathematics, fear of mathematics, inadequate qualified teachers and inadequate teaching materials were some of the causes of poor performance in mathematics. Developing positive attitude, motivation and proper guidance toward mathematics and provision of relevant teaching materials could make students perform better in mathematics.

In Tanzania education curriculum, mathematics is a core subject that every student is studying at both primary and ordinary secondary education (ETP, 1995). In spite of being the core and compulsory subject, student's performance in Mathematics in Tanzania had been low for number of years in Certificate of Secondary Education Examinations (CSEE) (Kita, 2004, Mlozi, Kaguo & Nyamba, 2013, URT, 2008 and SEDP, 2004). According to (URT, 2008) large number of students fail to pass mathematics exams with required grades as the report indicated that national form four examination results in 2004, 2005 and 2006 failures in Mathematics were, 70%, 77% and 76% respectively.

Report by HakiElimu (2013), identified general performance of the year 2009 that about 27.5% of the students scored division zero, in the year 2010 failure increased to 49.6%, in the year 2011 failure was 46.4% and 60.5% in the year 2012. It was not indicated in the report that students performed better in mathematics. Factors for students' failure according to (HakiElimu, 2013) was inadequate in service training, few qualified teachers to teach mathematics and poor working conditions. This was also associated with a lot of confusion caused by limited understanding of the requirements of the 2005 competence based curriculum and syllabi currently in use (HakiElimu, 2013 & Mtitu, 2014).

According to Mabula (2012), students' performance in science subjects was affected by poor quality of science classroom teaching and a decline in interest of students toward science subjects. Mabula (2012) had shown that 83.9% of students who set for CSEE failed mathematics in the 2010 national examination and only 16.1% passed mathematics. It was therefore concluded by Mabula (2012), that teacher-students relationship in classroom teaching and learning of science need to be improved. Researchers such as Bietenbeck (2011), and Clement (2013), had associated student's failure in mathematics with teachers' teaching practices. Bietenbeck (2011), defined teaching practices as what teachers do in the classroom, how teachers apply instructional methods and traditional ways of teaching. These were such as lecture style teaching, teacher centre methods and rote memorization in teaching mathematics.

However according to Mlozi, Kaguho & Nyamba, (2013), students' performance in mathematics was not good at all in Tanzania as there were no enough teaching and

learning materials, mixing of two languages of English and Kiswahili which confuse students. According to SEDP I (2004), generally there had been low quality of schooling outcomes with over 66% failing. This was associated with overloaded curriculum, weak teacher qualifications and teaching abilities of some of the mathematics teachers.

The government had lay down a strategy to improve performance in mathematics through optimum use of available mathematics teachers as per strategies set by the (URT, 2010). To optimize the available teaching the study by (Pantziara & Philipou, 2007) tells us that teaching practices such as problem solving and use of visual aid in the mathematics classroom could increase students' motivation and morale to their performance. This was also supported by (Mtitu, 2014, Kafyulilo, Innocent & Ikupa, 2012 & URT-MOEVT, 2010) that teachers have to be encouraged to apply student centered methods that require teachers to actively involve students in the teaching and learning process.

1.3 Statement of the Problem

Effective and efficient teaching methods that could help improve student's performance in mathematics are most desired. According to Gurney (2007), teaching is effective and efficient when students are taught the right content, having enough learning materials and high ratio of teachers' time on the teaching activity. This requires a teacher to have passion in sharing knowledge with students while motivated with school management system. Mtitu (2014) also identified that, for effective and efficient teaching, learner centered methods that require teachers to actively involve students in the teaching and learning process must be applied.

However enough effort was put to improve students' performance in mathematics through programmes like SEDP (SEDP I, 2004 & SEDP II, 2010), updating teaching syllabus with all the guides to teachers on the competence based teaching practice (URT, 2010). The number of mathematics teachers was increased compared to before and were provided with frequent seminars and workshops that emphasized on the application of competence based teaching methods.

Despite all the efforts (Mkumbo, 2013) the rate of students' performance was 16.09% in the year 2010, 14.55% in the year 2011, 12.14% in the year 2012 and 18% in the year 2013. Performance in the year 2013 was a bit exceptional due to the change in national examination grading systems for CSEE, but still performance was low.

Therefore the study motive was to seek to answers on the following questions on what was the influence of cultural backgrounds on students' performance in mathematics. How does school environment affects students' performance in mathematics? In which ways does school management influence teaching and learning process?

1.4 The Purpose of the Study

The main purpose of this study was to make an assessment on the factors that leads to poor performance in mathematics Kibaha district secondary schools.

1.5 Objectives of the Study

The specific objectives of this study were:

- (i) To examine the influence of cultural backgrounds on students' performance in mathematics.

- (ii) To assess the influence of teacher – student’s relationship on students performance in mathematics.
- (iii) To identify the nature of school environment where teaching is practices in relation to student’s performance in mathematics.
- (iv) To examine the influence of school management system on teaching and learning process in mathematics.

1.6 Research Questions

- (i) What is the influence of cultural backgrounds to students’ performance in mathematics?
- (ii) How does teacher- students’ relationship affect student’s performances in mathematics?
- (iii) What is the nature of school environment where teaching is practiced?
- (iv) How does school management system influence teaching and learning process in mathematics?

1.7 Significance of the Study

This study is important to other researchers as a reference on studies concerning students’ performance in mathematics. It is the sincere hope of the researcher that by going through this work, it will make mathematics teachers to help their students perform well in mathematics subject. Teachers will consider students’ cultural backgrounds before actual classroom teaching to know if the students have the basic concepts in particular unit of study in mathematics. Then teachers can be in a position to improve students’ performance in mathematics. The study will also help

future researchers to come with findings on how school environments and teachers backgrounds are connected to students' cultural backgrounds that affects performance in mathematics.

1.8 Limitations of the Study

The foreseen possible limitations in this study were characteristics of the respondents for both teachers and students. The researcher was not able to involve every member of the population but the sample of study was randomly selected from both teachers and students. The head of schools and academic masters were purposively selected while mathematics teachers and students were randomly selected. These were the representative sample for which findings was found from and generalized.

1.9 Delimitation of the Study

The study was done in ordinary level secondary schools in Kibaha district. The district was rich in nature resembling to other districts in the country as there were public and privately owned secondary schools. Some of the schools in Kibaha district were located in urban and rural areas. Mathematics teachers were in a position to be involved in the sample of study as they would provide reliable information on teaching and learning process and students' performance in mathematics as they concerned in teaching mathematics.

1.10 Definition of Terms

To set ground for assessment on the factors that leads to poor performance in mathematics Kibaha district secondary schools, the researcher presented the working definitions for some of the terms used in this study.

1.10.1 Cultural Background

The cultural background refers to tribal, religious, racial, gender, linguistic or other socioeconomic factors and values that shape an individual's upbringing. A cultural background can be shaped at the family, societal or at primary school level. In this study it refers to what do students do to help themselves excel in their academic carriers.

1.10.2 Performance

Accomplishing or achievement of specific goals, objectives set in any academic undertaking in basic mathematics.

1.10.3 Teacher Characteristics

This refers to the attributes and practices which contribute immensely to teacher success or failure. These are such as displaying fairness, having a positive outlook, being prepared, using a personal touch, possessing a sense of humor, possessing creativity, admitting mistakes, being forgiving, respecting students, maintaining high expectations, showing compassion, and developing a sense of belonging for students— center around the theme of caring.

1.10.4 School Environment

School environment encompasses physical environment such as buildings like classrooms and teachers' houses, classroom size, how dark or light it is, temperature, the arrangement of chairs, the noise which affects teachers and students' attraction.

1.10.5 Curriculum

A sequence of potential experiences, set up in the schools to discipline children and youth in ways of thinking and acting whether it is carried out in groups or individually, inside or outside the school.

1.10.6 Teaching Method

This comprises the principles and techniques used for instruction. Commonly used teaching methods may include class participation, demonstration, recitation, memorization, or combinations of these, teacher centred and student centred methods.

1.10.7 Qualified Teacher

This is the teacher who holds the following certificate such as: Diploma in Education, B.Ed., B.Sc. (Ed), B.Sc. and PGDE, Masters in Education and PhD from a recognized university or college in Tanzania and outside Tanzania.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The previous chapter put much attention on the rationale of studying mathematics and students' performance so as to provide justification for this study. This part establishes conceptual framework on variables influencing teaching and learning of mathematics as well as empirical studies on factors influencing students' performance in mathematics.

2.2 Conceptual Framework

The conceptual framework hereunder presented variables that influence teaching and learning in mathematics subject. Sitko (2013), defined conceptual framework as the system of concepts, assumptions, expectations, beliefs, and theories that support and inform about the study.

Students' performance in mathematics is influenced by the teaching and learning methods and students' cultural backgrounds. Teaching methods are such as teacher centred method, students' centred method and type of homework assignments offered to students. Learning methods are such as group discussions when solving problems and individual work as provided by the teacher or as in textbooks. The relationship between teachers and students, the way students are punished and homework assignments might influence student's performance in mathematics (Sitko, 2013). However learning environment affected students' concentration in schools.

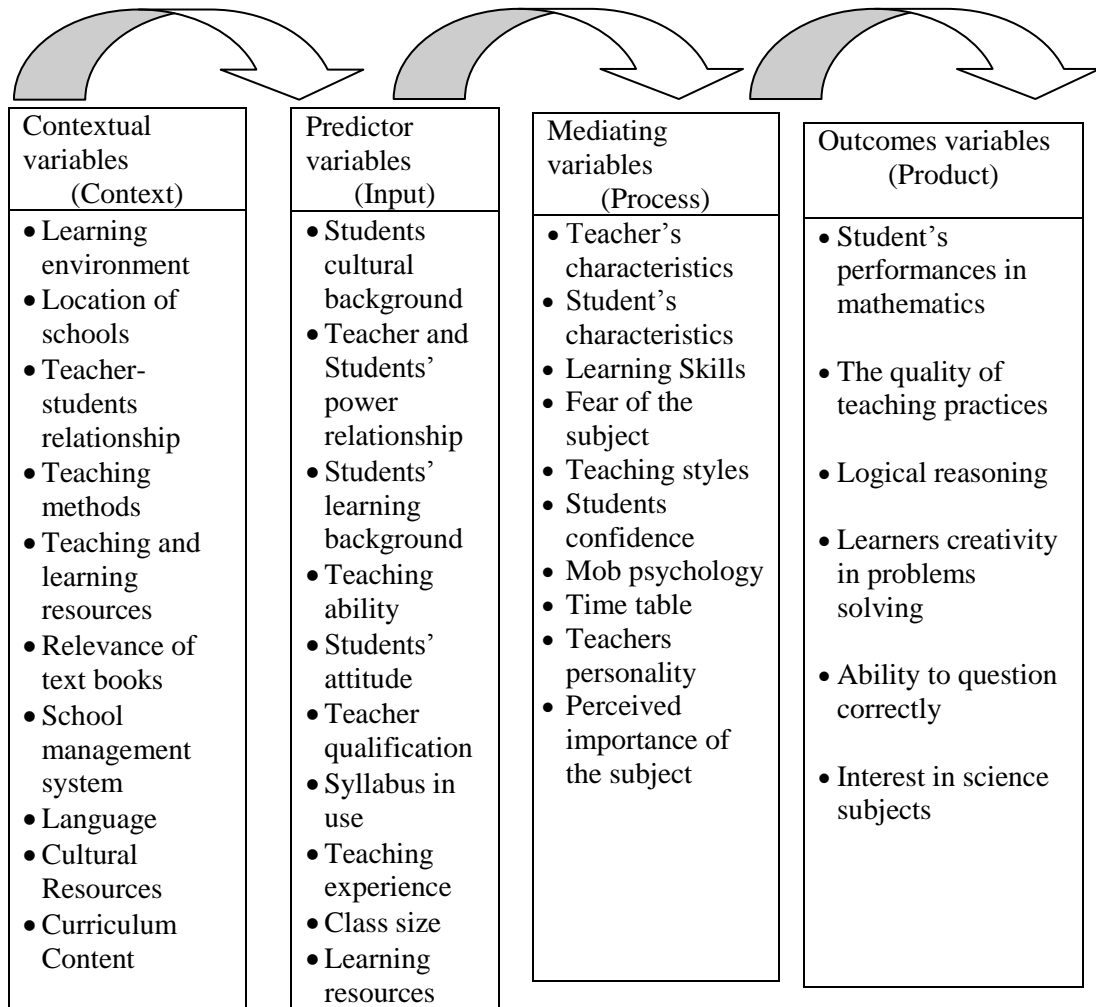


Figure 2.1: Conceptual Framework

This figure of conceptual framework was adopted and modified from Omari, (2011 p. 45). The concept behind this figure was to help researcher in developing research objectives, questions, and methodologies, analyzing and interpreting the research findings.

2.3 Theoretical Framework

Plato and Socrates' Perspectives on teaching and learning methods

Maganga (2013), as he made a study on Plato and Socrates work, he found that the knowledge of geometry have been in possession even before the birth of a child.

Thus according to Plato it is known that the ideas or general concept behind the concrete entities were experienced through senses, by means of questions set that awaken knowledge or understanding of such ideas behind concrete phenomena.

This implies that students could become good in mathematics as teachers give them more questions to awaken their knowledge and understanding on mathematics concepts. It was declared that ideas must have existed in our mind even before our birth. Such knowledge is termed a priori, that means knowledge which is their prior to and independent of any experience (Maganga, 2013). Therefore questions came on how teachers keep in mind that their learners had concepts or ideas that they should help them develop such ideas and cultivate what is in their experience as they immerse in the module or topic under study.

John Locke and Knowledge of Practice

John Lock said that empiricism is an epistemological position which contends that genuine knowledge is what comes to us through our sensory experiences. This means that the only sources of genuine knowledge are senses of sight, hearing, touching, smelling and tasting. John Locke stated that the child's mind is like a white sheet of paper on which experiences are recorded (Tarcov, 1989).

This implied that teaching methods in mathematics needs to involve five sense organs of students in the class. While teaching, students must be given tasks to attempt with the guide of a teacher; they must see clearly what is been written on the chalkboard and practically solve mathematics problems. Teachers should be able to teach students in such a way that students can practically do what they are taught,

hearing it well by minimizing number of students in overcrowded classes and use of actual environment to make students understand mathematics (Maganga, 2013). Therefore the researcher wanted to know whether in actual teaching students practically learn mathematics and how teachers help students to solve, interact with teaching materials as well as the impact of school environments to students learning.

Paul Freire and the Learning Environment

Freire (1921-1997), an influential thinker about education in the late 20th was the first philosopher to concern himself with oppressed people whose natural rights to liberty and property were violated. In his book (Freire, 1970) “Pedagogy of the Oppressed” he suggested that educational activities should be conducted under existing experiences of the participants (Maganga, 2013). Teachers should discuss with their students and help them in re-labeling or generating new ideas (Smith 2002).

This implies that mathematics teachers are supposed to teach their students in the actual living environments of their students. Students can be taken to field such as farms, pitch or football grounds to learn many forms of diagrams as examples. This will make students not to forget what they have practically learned.

According to Maganga (2013), Freire was insisting on the use of dialogue method whereby teachers should discuss with their students about their learning environments. The methods involve students discussing together or conversing, rather than using written books and syllabuses in a curriculum of study as what Paul Freire called banking education. Banking system of education the one that teachers deposit knowledge to the students.

Bartlett (2008), as he learned from Freire's work, banking education is a relationship of domination in which the teacher has knowledge that he/she deposits in the heads of the passive objects of assistance, his/her students. In contrast to banking education, Freire proposed a problem posing education that encourages students to become active in thinking. Problem posing education relies upon dialogue and critical consciousness, democratic teacher-student relationships, the concretion of knowledge through interaction, and a curriculum grounded in students' interests and experiences.

The theory by Freire raised some questions to us whether in teaching mathematics there is an element of banking as students are dominated by their teachers in classes or there is any democratic way of teaching and learning in mathematics classes. Do teachers and students have a culture of discussing mathematics concepts?

John Dewey

John Dewey (1859-1952) proposed a pragmatic philosophy of education that education was a process of reconstructing and reinstituting experience to promote individual's efficiency and good citizenship. It goes all the way from the birth of the individual to his death.

The curriculum content should not be burdened with subjects that are unrelated to the pupils' lives and every day experiences. If mathematics contents are related to learner experiences students' performance might be good. This needs to be in line with teachers' teaching methods for which their methods of delivery must be in line with such experiences.

Julius Nyerere

Julius Nyerere according to Mtitu,(2014) was the founder and the first president of Tanzania who introduced a policy of education, the education for self reliance, which was a means of inducing socialism in the country. According to Nyerere (1967), the need for curriculum change was insisted in both content and pedagogical approaches. This means that, there was a need for a curriculum to be tailored on the teachers' and students' daily life and the classroom practices need to connect students' real life what Nyerere called "praxis".

Various changes have been made in Tanzania on teachers' teaching methods. Methods such as student's centred methods were the proposed one (URT, 2010). In order to achieve this in mathematics today, teachers need to actively engage learners in their teaching and learning process to make them practically learn mathematics.

2.4 Empirical Literature Review

2.4.1 Empirical Studies in Mathematics World Wide

According to Smith (2004), family background influences student performance in mathematics, it is indentified that students' cultural backgrounds differ and can affect students' influences to study mathematics. Furthermore, students from different cultural backgrounds are influenced differently based upon parental experiences, interests in mathematics and cultural views and attitudes of mathematics education. Additionally, Smith's research indicates that students who are studying higher-level mathematics are influenced differently as compared to students who are studying lower level mathematics or chose not to study mathematics at all.

One of the most stable and consistently observed phenomena (Sirin, 2005) in the field of education is the impact of students' home background on achievement. Students whose parents have a higher level of education, a more prestigious occupation, or greater income tend to have higher achievement than students whose parents have a lower standing on such socio-economic status indicators.

According to UNESCO (1984), a necessary condition for teachers to teach mathematics was not only to know mathematics but also to be competent in understanding the basic contents, concepts and the associated skills. The teacher must know what it means to do mathematics so as to make students achieve good performance. Teachers must consider student's perceptions and the ideas the student brings into the classroom. It was therefore important that teachers should find what their students already know about the concepts or the principles that are to be introduced.

According to Limb & Fullarton (2001), there was an importance of classroom, teachers and school factors on students' performances in mathematics. Some of the school factors are gender, family cultural resources, language background and attitudes towards mathematics, which have significant negative effect on students' performance. Limb & Fullarton (2001), in the study made at US and Australia on TIMSS (Trends in International Mathematics and Science Study) they found that students with more family cultural resources such as books at home and those from two parent rather than single parent families tend to have higher achievement levels in mathematics. Students from English speaking families have good performances in

mathematics than non-english speaking families. In classes where teachers set more homework they have associated with higher levels of performance. They supported that grouping practices employed by teachers shape the classroom learning environments and improve students' performance.

2.4.2 Empirical Studies done in Africa

The study in Lesotho by Iheanachor (2007) on the influence of teachers' background, professional development and teaching practices on students' achievement in mathematics in Lesotho, have positively associated students' performance in mathematics and teaching methods in mathematics. He revealed that teaching methods, teacher qualifications, subject majors and the years of experience are predictors of students' achievement in mathematics.

The study reveals that some mathematics teachers have majored in mathematics or mathematics education and others have majored in professions other than mathematics but employed to teach mathematics. This implies that almost half of the mathematics teachers may not have enough mathematics knowledge and skills that affects their teaching methods.

In Tanzania this is evident in 2006 - 2008 where the government had introduced an induction course famous as crash program (SEDP 2010). The program, which produced ill, trained teachers as they attended the college in one month only and then posted to teach in schools. The study made by Tshabalala & Ncube (2013), revealed that student's performance in mathematics was mainly affected by teaching methods, material resources, teacher behavior, grounding in the subject at lower levels as well

as their fear of the subject. The mediating variables such as attitudes towards mathematics, perceived importance of mathematics and time spent on mathematics homework were influential predictors of student's performance in mathematics.

Ali, et al. (2010), identified in her study that many students were considered underachievers in mathematics. Students were average or above average in their intelligence but their actual performance in mathematics did not coincide to their intellectual capabilities. Several factors had been identified (Suan, 2014) which seems to be the reason for student's underachievement in mathematics.

First was teacher factor, such as teaching styles, mastery of the subject matter, instructional techniques and strategies, classroom management, communication skills, and personality. Second was student factor like study habits, time management, attitude and interests towards mathematics. Third was environmental factor such as parents' values attitudes, classroom settings and peer group.

Teachers were responsible to the learning and experiences (Iheanachor, 2007) the students might engage everyday as well as setting of educational goals and total personality development. This must be in line with professional development of teachers on content and instruction, which has remarkable effect on student achievement. Suan (2014), as she cited from Hill, Rowan & Ball (2005), and Quimbo (2003), observed that teachers who have mathematical knowledge, good attendance and participate in programs development have the students with good performances in mathematics.

This can be the case in Tanzania considering teachers' mathematical knowledge, teachers' attendance profile as well as if they attend seminars, marking for zonal or national form two or form four final examinations.

2.4.3 Similar Studies Conducted in Tanzania

The current mathematics syllabus (URT-MOEVT, 2010) has the revised process of mathematics syllabus for Tanzania schools and it have observed a change in model (paradigm shift) from content based to a competence-based curriculum. The teaching method with respect to this new syllabus is student centred and activity oriented methods.

The expectation in competence-based curriculum is students to be engaged by teachers in a variety of problem solving activities, which end up in learning. This revision had taken into consideration the requirements of SEDP program (SEDP, 2004 and SEDP 2010) whereby some basic contents have been integrated in mathematics syllabus. The general competencies are; by the end of four years course, the student should have the ability to: Think critically and logically in interpreting and solving problems; to be able to use mathematical languages in explaining and identifying mathematical ideas and to apply mathematical knowledge and techniques in other fields. Actually today students have not attained the expected level of above objectives identified in the revised syllabus such as to critically and logically solving mathematical problems.

Mtitu, (2014), have made an assessment on the implementation of learner centered teaching approaches as directed by the 2005 competence based curriculum. Though

his study was specifically in Geography subject, but the method was recommended to be applied in teaching all subjects including mathematics. However in this study it was observed that teachers in their teaching practices in classrooms, teachers dominated most of their instructional practices. When teachers assigned students into group activities, effective guidance and facilitation of students' group activities was notably absent.

In Tanzania the curriculum change was a long time idea. Mtitu cited that there was a need for a curriculum to be tailored on the teachers' and students' daily life (Nyerere, 1967) and that teaching methods needed to connect students' real life in actual practice. The methods require teachers to actively engage learners in their teaching and learning processes by allowing students to tell what they know about the content under study in the classroom. Thus the changed curriculum and the teaching methods have an important effect on teaching and learning process in mathematics basing on 2005 competency based curriculum.

However the study made by Ali et al. (2010), came out with findings that problem solving method could help students perform better in mathematics than those taught by traditional method. The methods exposed students to take responsibility of their own with the teacher acting as the facilitator. This resembles to what Mtitu termed as learner centred teaching. Kita (2004) explored a number of factors that consistently affect performance in mathematics among ordinary level secondary school students in Tanzania. These were such as schools being occupied by unqualified and under qualified teachers that had problems with pedagogical content knowledge and teaching skills.

According to Kita (2004), schools do not have enough and relevant materials for teaching mathematics that's why there was low students performance in mathematics. In the syllabus (URT, 2010 & Mtitu, 2014) it is emphasized that teaching methods in mathematics should be learner-centered but the materials available in schools, especially the textbooks, do not reflect this approach of teaching.

According to Kafyulilo, Innocent & Ikupa (2012), in their study done at Mbeya, they found that, teachers claimed to have high ability to implement competency-based teaching. Teachers were able to properly state the competency based objective and able to properly state the teachers' activities, students' activities and assessment plans. But their conclusion was that competency based teaching approaches were not well implemented in Tanzania schools and teachers have limited ability to demonstrate it. This showed that competency based teaching approach is superficially implemented and hypothetical rather than practical to the extent students fail examination in important subjects like basic mathematics.

2.5 Research Gap

Despite noticeable unsatisfactory performance in mathematics, a review of the related literature above indicated a significant gap in the area of study, factors leading to poor performance in mathematics subject and the type of samples involved. These areas required indepth investigation to enlighten the factors for poor performance in mathematics subject. The researcher considered the influence of school management system to the whole process of teaching/learning and students' performance in mathematics, which existed, insignificant in the reviewed literatures.

The studies conducted was not in Kibaha district, most of them was not in secondary education but primary education and rather put much attention in other factors like teachers' backgrounds, professional developments, scarcity of mathematics teachers and teaching practices. Moreover the sample suggested in this study would differ from other studies as the researcher involved mathematics teachers, students, head of schools and academic masters.

2.6 Chapter Summary

This chapter has presented the conceptual framework, theoretical framework and empirical studies that informed about the study. In conceptual framework the researcher has given out assumptions on factors that have an influence on student's performance in mathematics. These assumptions have been enlightened with theoretical and empirical literatures reviewed. It was noticed that students' performance is the function of teaching and learning methods, teachers'-students' relationship, school learning environments and school management system.

Lastly the research gap was developed whereby the researcher wanted to asses factors leading to poor performance in mathematics subject for which findings were generalised to other schools in Tanzania.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlined and described research methods and techniques that would be used in conducting this research. It started by explaining the area of study, research design and data collection instruments. Population and sample considered in this study was explained as well. The methods of data collection, which will be used to analyze, data are explained, issue of data validity and reliability as well as ethical consideration were covered.

3.2 Area of Study

This study was based on factors leading to poor performance in mathematics subject in Kibaha district. Kibaha district is one among the 6 administrative districts in Pwani Region. The district is bordered to the North by the Bagamoyo District, to the East by Kibaha Municipal council, to the South by the Kisarawe district and to the West by the Morogoro region.

Kibaha district was selected to be an area of study for this title due to that there was no study done on factors leading to poor performance in mathematics subject in this district. Also the district has a shared characteristic in the provision of secondary education as provided by other districts in the country. The district had diversity of schools where there are public, community and privately owned schools where the researcher accessed comprehensive amount of information.

3.3 Research Design and Approach

According to Omari (2011), research design refers to a distinct plan on how a research problem will be attacked. Creswell, (2003) & Kerlinger (1978) defined research design as the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and control variance.

In this study the researcher applied a survey research design where the researcher employed cross-sectional survey. Cross-sectional survey is done where a researcher uses different categories of people (Enon, 1998). Therefore the researcher surveyed secondary schools in Kibaha district whereby mathematics teachers, students, academic masters and head of schools were involved so as to systematically describe a situation of poor performance in mathematics subject.

However the study applied both quantitative and qualitative research approaches. Quantitative approach helped to quantify the problem by way of generating numerical data or data from the field and transform them into useable statistics. Qualitative approach helped to study attitudes, opinions, behaviors, and other defined variables of the population.

3.4 The Study Population

The target population of the sample is the large group of people, which has one or more characteristics in common on which the research study will be focused (Kothari 2004). The population targeted in this study was teachers, students and educational administrators.

3.5 Sample size of the Study

Kibaha district is an area with 14 secondary schools, approximately 32,400 students and approximately 14 head of schools, 28 academic masters and an average of 28 mathematics teachers. According to Best & Kahn (1993) a sample can be defined as a group or subset of the total populations selected for observation and analysis. Cohen, Manion & Morrison (2000), points out that the knowledge gained from the sample representative of the total population under the study. This study had three categories of respondents including Mathematics teachers, Administrative personnel and students in Kibaha district.

3.6 Sampling Procedures

The study used two types of sampling procedures which are purposive and simple random sampling methods. Purposive sampling means that respondents are chosen on the basis of their knowledge of the information desired (Calderon, 1993). Moreover random sampling was used in choosing sample unit from the entire population of teachers and students. Purposive sampling was also used in choosing education officials and head of schools as they were concern with monitoring of educational service in schools.

Through random sampling process 15 students were selected in each school. To avoid biasness when choosing students to be involved in a focus group discussion, pieces of paper labeled Yes or No were put in a box and after thorough shaking, a number of students were allowed to pick a piece of paper from the box. Those who picked papers written Yes were involved in a focus group discussion.

In random sampling procedure, each member of the population in the group had an equal chance of being selected (Cohen et al. 2000) which was applied for teachers and students except for head of schools who was be purposively involved.

3.7 Data Collection Instruments

The researcher applied both primary and secondary data collection instruments for this study. Primary data was collected through interview, observation, focus group discussion and questionnaire while secondary data was through documentary review. Most of the secondary data was obtained from relevant documents such as school academic files, school performance results and CSEE results. More than one instrument was used for this study because total dependence on one instrument may distort or may lead to biasness on a particular piece of information, (Kothari 2000).

3.8 Questionnaires

Questionnaire was chosen as one of the tool to be used in this study which was answered by teachers and administrators. It was chosen because of the nature of this study so as to get opinion and views of the respondents. Respondents replied them on their own free will without any influence from another person; they were easy to be administered within a short time and from the relatively larger groups of people who were scattered geographically. Moreover its results could easily be tabulated and interpreted (Calderon & Gonzales, 1993). The questionnaires used are found in the appendices in this study.

3.9 Interview

This study employed both semi- structured and structured interview.

(a) Structured Interview

Structured interviews are used in quantitative research and can be conducted face to face, online or over the telephone, sometimes with the aid of lap-top computers (Dawson, 2002). But in this study, face-to-face was applied. The researcher provided the respondents with pre-set questions and let them respond on the asked questions by the researcher.

(b) Semi - Structured Interview

This type of interview helped the researcher to know specific information, which was compared and contrasted with information gained in other interviews. To do this, the same questions needed to be asked in each interview (Dawson, 2002). However, the researcher also wanted the interview to remain flexible which helped much to explore other important information that arose on the interview session though not pre-set. The interview questions are in the appendices of this study.

3.10 Focus Group Discussion

The researcher intended to conduct focus group discussion with the students for which discussion with students on the influence of teaching methods to their performance was discussed. They were organized in groups of 15 and asked the pre-set discussion question. According to (Dawson, 2002), respondents are asked to come together in a group to discuss a certain issue. The discussion chaired by the researcher, and ensured that no member in the discussion dominated the discussion so that that each of the participants makes a contribution. The focus group guiding questions for students are found in the appendices of this work.

3.11 Observation

Participant observation is used when a researcher wants to immerse in a specific culture to gain a deeper understanding. According to Blessing & Chakrabarti (2002), observational methods involve the researcher recording what is actually taking place either by hand or using recording or measuring equipment.

In this study the researcher made an observation on the following areas: Teaching style and how do mathematics teachers teach in their classes, application of teaching methods in classrooms and different types of books used. Observation was also made on teaching aids, students' participation in learning process and students' activities and attitudes toward mathematics and classroom environments in which teaching activities took place.

3.12 Documentary Review

Documentary research is the use of outside sources, documents, to support the viewpoint or argument of an academic work (Omari, 2011). The researcher made review on the following documents: Mathematics files, mathematics bank of questions, mathematics syllabus, mathematics ledger books, students projects done in mathematics, continuous assessments, external and internal examination files, performance analysis file, text books and students' owned learning materials.

3.13 Validity and Reliability of the Study Instruments

To establish validity of the instruments applied, the researcher conducted a pilot study prior to the actual data collection. The instruments were tested by providing it to classmates who are teachers at Kibaha district. The instruments were presented to

the supervisor for further comments and improvement hence all necessary adjustments was be made for items which found unsuitable were removed. To ensure reliability of the collected information, some of the items in questionnaire, focus group discussions and interviews were asked more than one time to the respondents to see if there is consistency in responses from the respondents.

3.14 Data Analysis Procedures

According to Kothari (2004), data analysis is a process of editing, coding, classification and tabulation of collected data. The process involves operations which are performed with the purpose of summarizing and organizing the collected data from the field. Since the study involved both qualitative and quantitative data, the data analysis process was done by the two ways.

First the researcher applied Statistical Packages for Social Sciences (SPSS) for quantitative data. This is the software which is used to analyse information that is quantitative in nature. In this study, data collected using questionnaire was analysed using SPSS software. The process involved coding of data, sorting and conclusion was drawn.

Secondly, the qualitative data obtained using interview, observation, focus group discussion and documentary reviews was analysed by considering major themes to extract relevant information. This helped the researcher to make description of the data collected from the field basing on research objectives and derived conclusion on what to take regarding its usefulness.

3.15 Ethical Consideration

To obtain population of study, data collection and dissemination of the findings, the researcher was sensitive to research ethics and its values. This helps to ensure that good image of research enterprise in the world to be maintained (Omari, 2011). The researcher obtained a permission letter to pursue research activity from the supervisor and then clearance letter from The Open University of Tanzania (OUT) and submitted it to the district administrative authority.

At the district the researcher was asked by the District Administrative Secretary (DAS) to seek permission from the Regional Administrative Secretary (RAS). It took a week for the researcher to accomplish all the procedures and to be allowed to conduct research activity. These letters are found in the appendices of this work. All four letters permitting the researcher are behind this work in the appendices.

The researcher ensured the freedom of participants by adhering to the principal of informed concerned. This principal required the researcher to ensure that participants are aware of the purpose of the study so as to get their concern and participate freely. The statement of the research purpose, description of any potential risks or discomforts, description of potential benefits and the description of confidentiality were assured to the respondents. The researcher assured them not to reveal their identity of to anyone other than the researcher and his staff.

These findings are stored in such a way that it will be accessible only for the research purpose so as to maintain privacy or confidentiality and anonymity of the respondents in the researcher's personal computer with password.

3.16 Chapter Summary

The aim of this chapter was to introduce research methods focusing on teaching and learning of mathematics and its influences on student's performance in mathematics subject. The chapter has sequentially outlined the areas of study, research design, and population of study, sample size, instrumentation, data analysis procedures and consideration on ethical issues.

Kibaha district was selected as a representative of other districts in the country. Population of study was made up of students, mathematics teachers, academic masters and head of school. The research tools such as questionnaire, interviews, observations, documentary reviews and focus group discussions were used to collect information from the field.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents findings, which have been found through questionnaire, interview, observations, documentary review and focus group discussions. Questionnaires were distributed to mathematics teachers, academic masters and head of schools. They filled and returned them to the researcher. Mathematics teachers were interviewed and they heartily participated in the interview session with the researcher. Student's in-group of 15 from each was involved in a focus group discussion. The researcher also made some observation and documentary reviews in the schools he visited during data collection process.

The findings are presented using tables, pie charts and narrations with regard to the research questions, interview, focus group discussions, observations and documentary reviews. Thereafter the findings are discussed by looking at what the literature has exposed.

4.2 Demographic Profile of Teachers

This section presents the demographic profile of teacher participants. Demographic profile includes the gender, educational attainment, number of years at work and the length of teaching experience.

4.2.1 Educational Attainment

Educational attainment as presented in Table 4.01 showed that almost half (50%) of the teacher participants were bachelor degree holders while 37.5 % have masters in

education or in other professions as well. Only small percentages (12.5%) of the participants have diploma in education.

4.2.2 Length of Teaching Experience

Based on the data presented in Table 4.01, results implied that majority of the teacher participants have good teaching experienced. 50% of them have been teaching for 6 to 10 years, 43.75% were teaching for more than 11 years. 6.25% of the teachers had teaching experience of 1 to 5 years.

4.2.3 Gender

It is evident in gender category in table 4.01, which shows that out of 16 teacher participants, about five-eighth (62.5%) were female and three-eighth (37.5%) were males teachers. The findings of this study are evident that female teachers outnumbered male teachers.

Table 4.1: Demographic Profile of Teachers

Educational level	Frequency	Percent (%)	Cumulative Percent (%)
Masters in education	6	37.5	37.5
Degree in education	8	50	87.5
Diploma in education	2	12.5	100
Sub total	16	100	
Working experience	Frequency	Percent	Cumulative Percent
Below 5years	1	6.3	6.3
6-10 years	8	50	56.3
11 and above	7	43.7	100
Sub total	16	100	
Gender	Frequency	Percent	Cumulative Percent
Male	6	37.5	62.5
Female	10	62.5	100
Sub total	16	100	

Source: Field data (2015)

4.2.4 School Administrators

Among the four schools where the researcher has made data collection, it was observed that there is a little bias in terms of maintaining gender balance in leadership. Three schools were lead by the headmasters and one school lead by the headmistress.

In terms of academic and mathematics departments, in both four schools mathematics departments were held by both male and female teachers in the ratio of 1:1 that means there is 50% division of power to both men and female teachers.

4.2.5 Students

These were among the target group from which the researcher has collected information using a focus group discussion method. In each school 15 students were involved in a focus group discussion. The population was a mixture of students from forms one to form four, for which they were randomly selected. In this study instruments for data collection that was used to collect data included interview, questionnaires, focus group discussion, and observation and documentary review. Findings were presented according to themes in the instruments.

The researcher was able to supply questionnaire papers to the teachers, academic masters and head of school, conducted interviews, conduct focus group discussions with students, made observations and went through mathematics files. Therefore the part presents the findings of the facts obtained from the field, which is guided by the research objectives. The objectives were:

- (i) To examine the influence of cultural backgrounds on students' performance in mathematics.

- (ii) To assess the influence of teacher – student’s relationship on students performance in Mathematics.
- (iii) To identify the nature of school environment where teaching is practiced in relation to student’s performance in mathematics.
- (iv) To examine the influence of school management system on teaching and learning process in mathematics.

4.3 The Influence of Cultural Backgrounds on Students’ Performance in Mathematics

According to Smith (2004), it is identified that students’ cultural backgrounds differ and can affect students’ influences to study mathematics. Students from different cultural backgrounds are influenced differently based upon parental experiences, interests in mathematics and cultural views and attitudes of mathematics education. Additionally, Smith’s research indicates that students who are studying higher-level mathematics are influenced differently as compared to students who are studying lower level mathematics or chose not to study mathematics at all.

One of the most stable and consistently observed incidents in the field was the impact of students’ home background on their performance in mathematics subject. Students whose parents have a higher level of education, a more prestigious occupation, or greater income tend to have higher performance than students whose parents have a lower standing on such socio-economic status indicators.

The researcher wanted to find out how does teaching methods in mathematics influenced students’ performance in mathematics subject. To understand some of the

things that had the influence on teaching and learning methods in mathematics on students' performance the researcher distributed questionnaires. In each school in the sampled schools questionnaire were provided to the head of schools, academic masters and mathematics teachers.

Moreover, in each of the sampled school, 15 students had a focus group discussion and two teachers were interviewed on the matter at stake. From the findings made, it was revealed that mathematics teachers used a number of teaching methods. Teachers have identified to the researcher that they apply participatory teaching method and others applied students-centred teaching method. The methods which some teachers perceive to be helpless to make students do best in mathematics. When they were asked why so, they replied complaining that their schools are not provided with enough teaching and learning materials. One teacher confessed that to him teacher centred was good as his students' do not have good background in mathematics.

When teachers were asked on which teaching methods help students understand mathematics easily, they said it is through group discussions, clubs, consultations and self-practice by the students. Although some teachers claimed to apply participatory and students' centred methods but when researcher made an observation, it was proved that teachers were applying teacher centred method.

In focus group, when students were asked to say something on the way teachers teach them, they said that their teachers teach them well but not all of them. They added that a teacher teaches everything first and lastly gives them some questions as

an exercise. Concerning performance they said, it is low because they were not provided with enough exercises and do not have books of their own for self-practice. They said that some teachers attend classes very late and the lost sessions are not compensated. School libraries according to students are not furnished with the relevant reference books that students need in learning mathematics. They get supplement materials from bookshops for those who are able to buy.

From heads of school a lot of information had been found. Such information was as follows:

- (i) Concerning the availability of teaching staff and the number of teachers teaching mathematics at the schools; they said that the number of available teaching staff does not match with the demand of teaching staff. They said that teachers are overloaded as they are to teach all classes and help individual student. Some teachers have teaching periods up to 33 per week.
- (ii) The mathematics units offered. This refers to topic to be covered in each class starting from form one to form four. They said that students fail mathematics as some of the topics taught are above level for the student to understand. This has been so as teachers are not competent enough to teach some of difficult topic like Probability, Circle and Spheres as an example.
- (iii) Views on the strengths of the mathematics and teaching skills of the mathematics teachers at the school; they said that some of the teachers lack competence to deliver the content to students as required.

- (iv) The way teachers are recruited and retained especially qualified mathematics teachers. Head of schools said teachers posted to their school are not interviewed by the ministry concerned with employment of teachers, this lead to incompetent teachers to be employed in their school.

Mathematics teaching primarily takes place within a professional framework. However, teaching mathematics is a complex and very demanding. Even though being professional is a condition for success in teaching mathematics but it is not sufficient for students to perform better in mathematics. It depends on teaching and learning of the students.

Table 4.2: School Surveyed

School surveyed	Teachers responding	Academic Masters	Heads of Schools	School response rate (%)
Ruvu Secondary school	2	1	1	26
Accasia Secondary school	2	1	1	13
St.Getrude Secondary school	2	1	1	37
Kilangalanga Secondary School	2	1	1	24
Total	8	4	4	100

Source: Field data (2015)

Table 4.3: Teachers' Responses on Teaching Methodologies in Mathematics Subject

Teaching methods	N	Percent (%)	Cumulative Percent
Participatory methods	5	31.3	31.3
Teacher centered method	2	12.5	43.8
Learner centered methods	7	43.7	87.5
Others	2	12.5	100
Total	16	100.0	

Source: Field Data (2015)

4.4 Preferred Instructional Strategies

This section presents the level of preference on the different instructional strategies of the teacher participants in classrooms. Instructional strategies applied by teachers were lecture methods; demonstration, problem solving and students' centred learning method.

When teachers were interviewed, the researcher was replied that teachers were applying participatory methods in teaching activity and others students centred methods. Teachers said that the method was good and they are argued to apply it in various seminars they attended. The problem comes that students are not active as they found difficulty in deriving mathematics concepts this end up teachers applying teacher centred methods in actual teaching practice.

One teacher when interviewed on the method he apply in his teaching activity, he said that, he found teacher centred was better and was supported by students in focus group discussion that they wish to be taught first. This was contrary to theory Freire as it makes students to be just recipients of the knowledge hence banking system of teaching rather than problem solving. This does not help students to remember mathematics concepts very well as they didn't do any problem solving in classroom with the guide of the teacher.

Table 4.3 shows the level of preference on the different instructional strategies by the teacher participants. As shown in the data above, the findings revealed that participants preferred a variety of instructional strategies. It was found that 43.8% of teachers applied learners centered methods approach. Another 31.3% of teachers

preferred cooperative approach respectively and the rest of teachers applied teacher centred approach with 12.5%. The findings may be attributed to the standards set by the Ministry of Education requiring teachers to adopt a variety of instructional strategies in order to provide the diversity of learners.

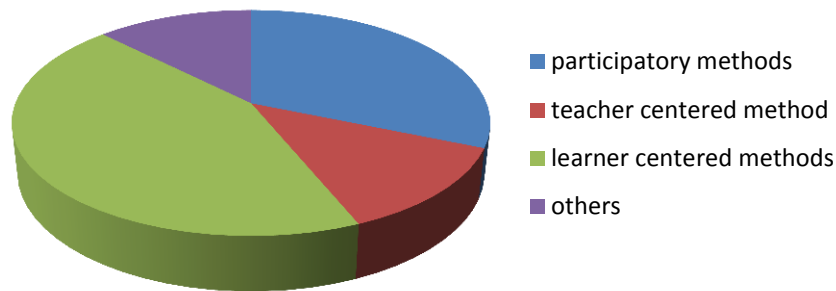


Figure 4.1: Applied Teaching Methods

Source: Field Data (2015)

Learner-centred teaching was an approach to teaching that is highly encouraged in secondary schools and higher education. Its theme does not employ a single teaching method. This approach emphasizes a variety of different types of methods that shifts the role of the teacher or instructors from givers of information to facilitating student learning. This method is suitable in teaching mathematics to increase or encourage students to participate in mathematics subject.

Table 4.4: Relationship between Teacher and Students

Teachers students relationship	N	Valid Percent	Cumulative Percent
Good	4	25.	25.0
Very good	6	37.5	62.5
Average	4	25	87.5
Poor	1	6.3	93.8
Very poor	1	6.3	100.0
Total	16	100.0	

Source: Field Data (2015)

4.5 Teacher – Students’ Relationship and Students Performance in Mathematics

In the field it was found that 37.5% of students attending mathematics subject in all sampled schools have similar favorable perceptions on their relationships with the teachers as they confirm that the relationship was good. They said that it is an individual teacher or student that has an effect on student’s perceptions of those relationships for which sometimes create negative look on the teacher by other students when they become aware. Also they said that the relationship becomes bad when a teacher make high use of corporal punishment while teaching in classrooms. Quantitative analysis revealed a greater number of significant correlations between student performance and student perceptions of the student-teacher relationship in researched schools. This result can be also presented in Figure 4.2.

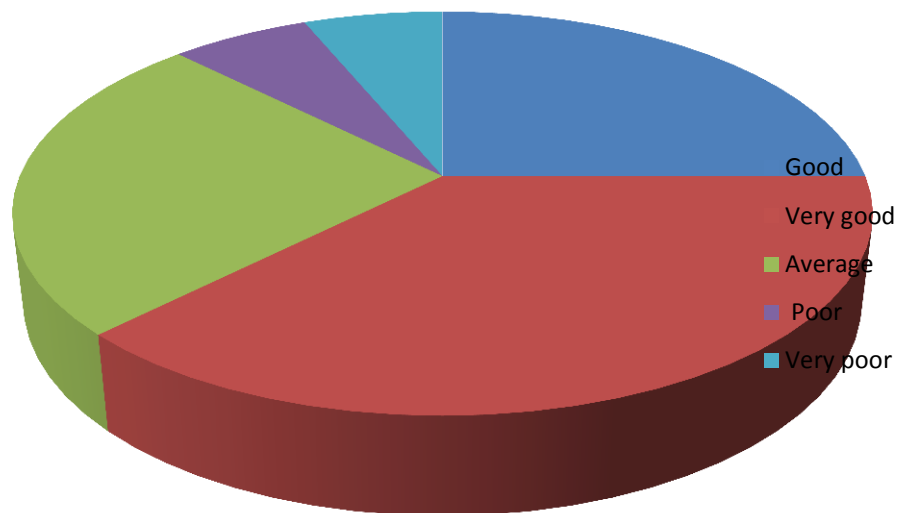


Figure 4.2: Teachers’ Relationship with Students

Source: Field Data (2015)

From the figure 4.2 shows that teachers and students in Kibaha district have good relationship. It means the students’ performance cannot be affected by such a

relationship. Based on the data presented in the above pie chart, there is no significant relationship between students' performance and the relationship between teachers and their students. The findings only indicated that it is difficult for some students to consult their teachers in case of difficulties in their learning. In focus group discussions students said that sometimes their teachers are harsh though not all the time but that discourages them.

The most important findings came from theme analysis of the student while in focus group discussion, which produced a list of teacher characteristics most valued by students in schools. These characteristics included: a sense of humor, consistent help (with high expectations), active listening, and personality value of the teacher and empathy. In other words, students appreciated when their teachers actively listened and encouraged them, as well as provided a fun and supportive, yet challenging environment where the entire class could learn.

4.6 The Nature of School Environment in Kibaha District

Teachers and school administrators were provided with questionnaires to fill in on the nature of school environment where teaching and learning was practiced. They were interviewed as well on the nature of school environment. Students were involved in a focus group discussion and they were very free to discuss how their school environments affected their learning process. Observation was also done on the nature of school environments and its quality to performance of students in mathematics subject. All four schools visited in the field had mathematics teachers. There were mathematics departments. These schools have libraries which are poorly

equipped with the books which mathematics teachers demanded in preparation for their teaching activities.

There were no enough records that students were given or borrowed mathematics books for self study and self practice. In the focus group discussion students said that some of them are boarding scholars and others day scholars. Among the students involved in a focus group discussion only two had mathematics textbook in one school and one in the group among 15 students in another school. For the other two schools, no student in the focus group discussion had mathematics textbook. On making observations the researcher noticed the shortage of teaching materials, which was parallel to no use of available teaching resources. In one of the focus group discussion students said they were taught the topic on Circle and Spheres without use of any objects with such shape, it was only through notes and drawings.

4.7 The Influence of School Management System on Student' Performance

The school management system in the researched schools was made up of head of schools, assistant head of schools, academic masters and discipline masters. It was found that in the researched schools there was a good relationship between teachers and their students. It shows how there is a firm system of leadership in Kibaha schools. Head of schools said that there is a minimum level of conflict in their schools.

The study results revealed that school cultural factors, specifically, school management style and characteristics had high influence on student's performance in mathematics. It was possible to conclude that there is a democratic style of school

management, some of evolution methods of effectiveness of teachers' work and active culture of cooperation among school community members.

In each school there was a department called mathematics department. These departments are led by mathematics teachers. But it was seen in some schools both the heads of mathematics departments and mathematics teachers are staying in the staff room. No room was specified for these leaders. Also the researcher noticed the interruption and interferences of power between academic master, head of school and head of mathematics departments. Teaching activity in mathematics was supervised by academic masters and head of schools without involvement of head of the department.

Furthermore high indicator of factors that hinder the teaching process as there was skipping classes and missing of periods during teaching hours which have really affected students' performance in mathematics. Although school management has supported mathematics teaching and learning by providing books, chalks, rehabilitation of infrastructures and other teaching aids. But when they were asked in what ratio they said that still resources are very insufficient. Mathematics teachers would like to have at least two to three students to share a book something which was not there.

In some schools there were rooms set as a library but they are poorly equipped. When students were asked if they attend libraries majority replied that they don't as in the libraries there is no kind of books they need.

4.8 Summary

In actual practice as the research found from the field, teachers are still applying teacher centred methods, they teach students from the starts of the session and leave students with an exercise to attempt. Few questions are posted on the chalkboard as students' homework. Those students' in focus group discussion complain the shortage of learning materials such as books for which they were to make self practice. Only one student in one focus group discussion confess that he managed to attempt at least 15 questions per day as he was provided books by his parents.

The researcher realized that students performance was not much affected by teacher-students' relationship but with factors other than that. Students said there is no enmity among them and their teachers. But the issue realized was that students have fear with mathematics subject to the extent they don't make practice as they think that even if they practice still they can fail. Some students said that, even some teachers other than mathematics teachers tell in their story how mathematics was difficult to them. This reduces the morality of students towards the subject mathematics.

School management has contributed enough in poor performance in mathematics in their schools as mathematics departments have not effectively supervised teaching activity in mathematics. In schools the researcher had observed and seen that practical ways of teaching mathematics had not been applied. For example mathematics clubs could include students from both levels from form one to form four.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This chapter presents the summary of findings, conclusions and recommendations based on the result of this study. The study was done focusing on factors leading to poor performance in mathematics subject. The study was done in Kibaha district involving four secondary schools as the sample of study among 14 schools in the district. Kibaha district was selected to represent other districts in Tanzania. It has schools located in rural and urban areas. The district had 14 secondary schools for which 4 schools were randomly selected. The participants of the study were the mathematics teachers; head of schools as administrators and students from form one to form four.

Specifically, the study sought to:

- (i) To examine the influence of cultural backgrounds on students' performance in mathematics.
- (ii) To identify the influence of teacher – student's relationship on students performance in mathematics.
- (iii) To determine the nature of school environment where teaching is practiced in relation to student's performance in mathematics.
- (iv) To examine the influence of school management system on teaching and learning process in mathematics.

The study was done in Kibaha district. The research involved 4 secondary schools among 14 secondary schools. The respondents of the study consisted of 8 mathematics teachers who were chosen through simple random sampling, 4 academic masters and 4 head of schools who were purposively selected. The other respondents were 60 students who were selected using simple random sampling technique as well.

Questionnaires were used in determining the teacher participants' instructional strategy preferences and extent of use on various instructional strategies as well as the students' instructional strategy preferences and perceived extent of use. Students' performance was found to be related with the teacher participants' instructional strategy preference specifically on demonstration, problem-solving, project and inquiry approach. When teaching methods does not make students understand the lesson they end up failing.

Results of the study also revealed that there was a significant difference between the teacher participants' preference of instructional strategy and the student performance in mathematics. Though teachers claimed to apply participatory and student centred methods, it was not there in actual practice. Teachers were exposed to number of workshops and attended many seminars, yet they didn't bring any changes in students' performance in mathematics.

The researcher found that if each student could have his/her own books, other supplementary learning materials and practically learning they could perform to great grades in mathematics.

5.2 Conclusions

Based on the findings of the study, it can be concluded that:

- (i) Majority of the mathematics teachers in selected secondary schools in Kibaha region mostly were female. As to educational attainment and length of teaching experience, highest educational attainments of majority of the teachers were bachelor degrees with a very good experienced in teaching mathematics.
- (ii) Student centred methods, discussion, demonstration; problem solving, project, inquiry approach; cooperative and use of audio-visual instructional strategies were highly preferred by the teacher participants. But this was hindered by the background of the students, nature of school environments, students' self effort and family economic status of the students. It end up teachers applying teacher centred method due to that students have a poor background in mathematics.
- (iii) Lecture methods, discussion, demonstration, problem-solving, project, inquiry approach, cooperative learning and use of audio-visual media instructional strategies were highly preferred by the student participants. They said that they understand when taught using such teaching methods. This means that students were missing something in their learning process depending on their background in mathematics. The researcher had observed that such methods are not practiced as teachers are few, not well paid and time pressure as they have to teach many periods as one of the teacher said in an interview.
- (iv) There was no significant relationship between the instructional strategy preference of teacher participants and their teaching performance. The

preference of teachers on particular instructional strategies does not affect the level of their teaching performance.

- (v) There was a significant relationship between the teachers' use of the different instructional strategies and their students' performance in mathematics. For example, students doing problem solving, self practice, teachers demonstrating and students contributing in the teaching session what they know about the topic under study.
- (vi) Teacher – student relationship has its motivation for both teachers and students. It motivates teachers to like attending classes as there is absence of hostility. Also it motivates students to like the subject as they don't have negative attitude toward their teacher.
- (vii) Mathematics department has a lot to help in ensuring students perform well in mathematics. But this was hindered and it was not well functioning as there was no actual practice in division of power among head of schools, academics masters and what head of mathematics departments to do.

5.3 Recommendations

Based on the results of the study, the following recommendations were made:

5.3.1 Mathematics Teachers

The researcher recommends mathematics teachers to consider students cultural and learning backgrounds in choosing instructional strategies. It is suggested that they

align teaching methods with the assessed learning needs and capabilities of students. Teachers may attempt to find a balance of teaching strategies rather than teaching student hence few understand the subject and at last many fail the subject. They may be able to realize the importance of recognizing learning styles, identify students' differences, and adjust the teaching methods accordingly. By doing that, teachers would be able to deliver content clearly, making every student understand mathematics, motivate students leading better performance in mathematics subject.

Lastly, it is also suggested for the teachers to learn to formulate their way of teaching especially if their school do not have available facilities to support their teaching activity. They may learn to develop their profession and innovativeness in teaching in order to maximize the use of available resources of the school to improve students' performance in mathematics subject.

5.3.2 Students

The study highly suggest that students take in hand their perception and feedback towards their teachers' teaching methods in order for the teachers to effectively bring into line their way of teaching to the students' way of learning. It is recommended that for students to learn effectively, they need to be flexible by using strategies outside their preferences in order to meet the demands of the challenging environment. Students must be ready to be guided in mathematics using learner centred methods, which is the very effective way of teaching. Student must not be lazy by not doing self practice daily. They are also encouraged to actively participate in classroom activities in order to have an enjoyable and satisfying learning outcome.

5.3.3 School Administrators

For school administrators, it is recommended to ensure availability of the instructional materials and facilities for the execution of different teaching methods that are aligned with the teaching methods and students' learning in classrooms. Effective teaching and learning cannot be achieved in the absence of those instructional materials.

It is also highly recommended that school leaders provide more in-service seminars, trainings and workshops for the teachers focusing more on how the teachers would enable them to align their instructional strategies they prefer and use to the learning preferences and capacities of the students. Furthermore, teachers should also be encouraged by the head of schools to pursue post graduate studies in order to upgrade their instructional competencies even if they have degrees in teaching profession. Lastly head of mathematics departments must be empowered to manage teaching and learning in mathematics. They must be provided with all guides and teaching resources.

5.3.4 Future Research

The researcher is recommending research to be done in future on identifying student individual factors that makes them fail in mathematics while performing better in other science subjects such as Physics and Chemistry. The research must also be conducted on individual teacher factors that affect their teaching practice to the extent students are poorly performing in mathematics. This is highly suggested in order to widen the scope of the current study and initiate the process of creating

evidenced based teaching strategies that will enhance the quality of instruction and learning to enhance students' performance in mathematics.

The learner centred approach need to be reinforced by all mathematics teachers and all educational stakeholders. All teachers, education inspectors and non-governmental organizations like HakiElimu to be provided on the importance of this teaching approach. Therefore research would be done on the assessment of the use of social media like facebook, twitter, instagram and whatsapp to help in teaching and learning of mathematics subject. The reason behind is that this media has corrupted the mind of many students; good enough is that they are very interactive and familiar with such social media.

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APPENDICES

Appendix I: Proposed Research Budget and Research Time Frame:

Proposed Research Budget and Source of Fund for the year 2014/2015

CORE ACTIVITIES	UNITS/ITEM	cost per unit (Tshs.)	Total cost (Tshs.)
1. Consolidation of literature, Designing and developing research instruments	(i) Library search	80,000	
	(ii) Transport cost: Mbezi to OUT Headquarter 6,000@day for 3 days per week in 6 months	432,000	
	(iii) Typing, photocopying and Binding	200,000	712,000
2. Data Collection (field Work)- Three weeks	(i) Travel and substance cost for a researcher Tshs. 40,000/= × 3 days per week x 6 weeks	720,000	720,000
3. Data processing, Analysis and Report writing	(i) Data processing and analysis cost for a researcher Tshs. 30,000/= @day × 18 days	540,000	
	(ii) Typing, Printing and Binding cost	400,000/=	940,000/=
4. Purchase and Contingence costs	(i) Purchasing voice recorder 1 Tshs. 200,000/=	200,000/=	
	(ii) Purchasing Digital camera 1 Tshs. 250,000/=	250,000/=	
	(iii) Contingence cost Tshs. 600,000/=	600,000/=	1,050,000
GRANDTOTAL			3,430,000

Appendix III: Questionnaire for Teachers and Administrators

Dear participants,

I am MICHAEL Isack, a student in the Faculty of Education at The Open University of Tanzania (OUT) Kinondoni Centre. I am taking MASTERS OF EDUCATION IN ADMINISTRATION, PLANNING AND POLICY STUDIES (MED.APPS). I am interested in the influence of teaching and learning of mathematics on students' performance.

The enclosed questionnaire was designed to obtain information about the influence of teaching and learning of mathematics on toward students' performance in mathematics, your response will be anonymous and the information gathered will help to improve the teaching of mathematics and also help our students to perform better in mathematics. I would appreciate your completion of the questionnaire.

I realize that your schedule is very busy. However, I hope that the 25 minutes it will take you will help me understand the influence of teaching and learning to improve students' performance in mathematics.

Thank you in advance for your participation

SECTION A: PERSONAL PARTICULARS**Education level;**

Masters in Education () Degree in education () Diploma in education ()

Working experience;

Below 5yrs () 6-10yrs () 11yrs and above ()

Gender; Male () Female ()

SECTION B**A. Please tick the correct one to you**

1. Which of the following teaching method is suitable in mathematics?
 - (a) Participatory methods ()
 - (b) Teacher centred method ()
 - (c) Learner centred method ()
 - (d) Others

2. What is the teacher- student relationship in mathematics classes at your school?
 - (a) Friendly ()
 - (b) Enemity ()
 - (c) Cooperative ()
 - (d) Others

3. What is the state of classroom environment/condition where teaching takes place at your school?
 - (a) Good ()

- (b) Average ()
- (c) Very good ()
- (d) Bad ()
- (e) Others

4. Mention applied teaching aids used in teaching mathematics at your school.

- (i)
- (ii)
- (iii)

5. Mention five (5) ways to improve mathematics performance in secondary school?

- (i)
- (ii)
- (iii)

6. How does school management system supported teaching and learning in mathematics?

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B. Which of the following factors do you believe have an effect to students' performance in mathematics? (Tick only one answer in the table)

1. Strongly agree 2. Agree 3. Slightly agree 3. Slightly disagree 4. Disagree 5. Strongly disagree

S/ No	Questions	1	2	3	4	5
1	A student's natural predispositions for mathematics					
2	Students' desire to be good in mathematics					
3	Teaching style					
4	Teaching aids/resources					
		1	2	3	4	5
5	Classroom conditions					
6	Distance to school					
7	Teachers self preparations before entering classes					
8	Teachers perceptions toward students learning					
9	Cooperation between teachers and students					
10	Quality of teaching					
11	Content and coverage					
12	Individual assignments provided by teachers					
13	Teaching time table					
14	Teachers personality					
15	Established mathematics clubs					
16	The content in mathematics syllabus					
17	The school's involvement in mathematics educational research projects, e.g. through collaboration with universities					
18	The student's involvement in extra-curricular activities in school					
21	The student's interest for and enjoyment of mathematics					
22	The importance attached by the school to mathematics					

C. How would you characterize each of the following in relation to teaching methods in mathematics at your school? Tick one only

(1) Very good (2) Good (3) Satisfactory (4) Poor (5) Very poor

S/No	Questionnaire Items	1	2	3	4	5
1	Teachers understanding of mathematics concepts					
2	Teachers expectations for students performance					
3	Use of teaching aids					
4	Students' regard for mathematics performance					
5	Teacher - students relationship					
6	Classrooms conditions					
7	Mathematics teachers having adequate workspace for preparation, collaboration or meeting with students					
8	Teachers do not have enough instructional materials and supplies					
10	Student pre - requisite skills in mathematics					
11	Behavior of students in class while teaching is in progress					
12	Interested of students toward mathematics subject					

7. Mention one teaching style do you apply in teaching mathematics and explain how it influences students learn and perform best in mathematics subject.

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D. For the student to be good in mathematics, how important do you think it is for teachers to insist them to consider the following: Tick one box in each row

(1) Highly important (2) Very Important (3) Important (4) Not important

(5) Meaningless

S/No	Questions	1	2	3	4	5
1	Remember formulas and procedures					
2	Think in a sequential and practical manner (from simple to complex mathematics concepts)					
3	Understand mathematical concepts, principles, and strategies					
5	Understand how mathematics is used in the real world					
6	Be able to provide reasons to support their solutions in solving problems					

(2) In your view, to what extent do the following limit teaching in mathematics?

Check one box in each row and put tick.

(1) To great extent (2) Quite a lot (3) To some extent (4) Somehow (5) Not at all

S/No	Questions	1	2	3	4	5
1	Students with different academic abilities					
2	Students coming from wide range of backgrounds, (e.g., economic, language)					
3	Students with special needs, (e.g., hearing, vision, speech impairment, physical disabilities, mental or emotional/psychological impairment)					
4	Uninterested students in mathematics					
5	Disruptive students in classrooms					
7	Shortage of instructional resources for teaching and students' use in doing individual exercises					
9	Inadequate physical facilities such as desks and chairs for students					
10	Teacher-student ratio					
11	Teachers' morale in teaching activity					
12	Students' morale in learning mathematics					

Thank you very much!

Appendix IV: Interview Questions for Teachers

A. Please help answer the interview questions below

1. What teaching methods do you apply in mathematics?
2. From your experience explain teachers-student relationship in mathematics classes?
3. To what extent school environment hinders mathematics subject delivery to students?
4. What is your opinion on how to improve students' performances in mathematics? Please briefly state.
5. Which ways of teaching (teaching style) do you think make students understand mathematics easily?
6. How often in your interactions with students did you try to develop a conversation with them about the topics being studied in a week?
7. How often was it better in mathematics for students to generate their own notes rather than copying your notes?
8. How often did you present information to students so that they would know what had to be learned in mathematics course before actual teaching?
9. In teaching mathematics course, how often did you have students solving problem in class?
10. In mathematics, how often did you concentrate on covering information that might be available from a textbook or other material from the publisher?
11. In mathematics, how often did you encourage students to restructure their existing knowledge in terms of new ways of thinking about mathematics?

12. In mathematics, how often did you encourage debate and discussion in solving mathematical problems?
13. How often did you organize your teaching in mathematics so that students get a good set of notes?
14. In mathematics, how often did you make opportunities available for students to discuss their changing understanding of mathematical ideas and experience?
15. In mathematics, how often did your teaching focus on the presentation of information to your students?
16. In mathematics, how often were your teaching activities designed to help students develop new ways of thinking about mathematical ideas and methods?
17. How often was it important for you to monitor students' developing understanding of mathematical ideas?
18. In mathematics, how often did your teaching help students question their own understanding of mathematical ideas?
19. In mathematics, how often did your teaching encourage students to figure out a concept or method on their own with some guidance from you?
20. In mathematics, how often did you present material to enable students to build up an information base in mathematics?
21. In mathematics, how often did you ask students to make a logical argument, either through individual response, in class discussions or group-work?
22. How often did you provide the students with the information they would need to pass mathematics examinations?
23. When teaching mathematics, how often did you emphasize the importance of making connections among mathematical ideas from one topic to another?

24. In teaching mathematics, how often did you ask students to learn new mathematical concepts or methods by solving problems during class time?
25. In mathematics, how often did you ask students to communicate their own mathematical thinking during class?
26. In mathematics, how often did you explain mathematical definitions, theorems and methods as part of your instructional presentation?
27. How often did your teaching in mathematics include helping students find their own learning resources?
28. What do you think you do well in terms of your teaching?
29. How highly valued among students it is to be good at mathematics?
30. Are your students interested in mathematics subject?
31. How often do they consult you?

B. Is your teaching capacity hindered by any of the following?

A) *Strongly agree* B) *Agree* C) *Slightly agree* D) *Slightly disagree* E) *Disagree* F) *Strongly disagree* (Tick the one only)

		A	B	C	D	E	F
1.	Insufficient teaching resources						
2.	A lack of other support personnel (one teacher teaching more than 5 streams)						
3.	Shortage or inadequacy of teaching equipment						
4.	Limited access to library materials						
5.	Shortage or inadequacy of computers for teaching						
6.	Limited time for professional development for mathematics						
7.	Shortage or inadequacy of textbooks						

Thank you very much!

Appendix V: Focus Group Discussion for Students

Dear students,

I am MICHAEL Isack, a graduate student at The Open University of Tanzania pursuing Master of Education in Administration, Planning and Policy Studies (MED. APPS). I am honored to welcome you to faithfully participate in this discussion. All the discussed will be used for research purpose only.

1. What teaching style do your teachers apply in teaching mathematics in your classes?
2. What teaching methods do you think influence your performance in mathematics?
3. Do you think teacher-students relationship affects students' performances in mathematics?
4. How often do you normally go to library to read some relevant mathematics materials?
5. Where do you get some additional learning materials in mathematics to learn more on what you are taught in a day?
6. What should be done to improve teaching in mathematics to increase students' performances?
7. How mathematics teachers treat students in your classes?
8. How teacher- student relationships affect teaching style?
9. How does school environment supported mathematics teaching process?
10. How does the school management system supported teaching and learning in mathematics in your school?

Thank you!

Appendix VI: Research Clearance Letters

THE OPEN UNIVERSITY OF TANZANIA

INTERNAL MEMO

To Coordinator,

Postgraduate studies.

From,

Dr. Evaristo Andreas Mtitu (PhD)

Date: 14th February, 2015

Dear Sir/Madam

Re: MICHAEL, Isack (Reg. No. PG201401504) Research Proposal Approval

I request your office to assist the above named candidate with research clearance for field work. I have guided the candidate in the development of research proposal titled **AN ASSESSMENT OF THE INFLUENCE OF TEACHING AND LEARNING OF MATHEMATICS ON STUDENTS' PERFORMANCE IN MATHEMATICS SUBJECT: A CASE OF KIBAHA DISTRICT** for the Masters' candidature, and that I am satisfied that the proposal is sufficient enough to collect data which will ultimately help to develop a dissertation that meets requirements for **Masters' Degree in Educational Administration Planning and Policy Studies (Med-APPS)**. I and the candidate have agreed to regularly communicate during field work in order to ensure the candidate remains focused to the research topic and major research questions. Take note of the candidate's latest version of the proposal for your perusal and final decision.

Please, feel free to contact me should you have anything to inquiry regarding this research proposal.

Yours sincerely,



Dr. Evaristo Andreas Mtitu (PhD),

Lecturer and supervisor for MICHAEL, Isack.

Email: evaristo.mtitu@out.ac.tz or mwalupembe@yahoo.co.uk Mobile no. 0755243097

Cc- Coordinator, Post graduate studies, Faculty of Education

THE OPEN UNIVERSITY OF TANZANIA
 DIRECTORATE OF RESEARCH, PUBLICATIONS, AND POSTGRADUATE STUDIES

P.O. Box 23409 Fax: 255-22-2668759 Dar es
 Salaam, Tanzania,
<http://www.out.ac.tz>



Tel: 255-22-2666752/2668445 ext.2101
 Fax: 255-22-2668759,
 E-mail: drpc@out.ac.tz

23/02/2015

District Executive Director,
 Kibaha District Council,
 P.O.Box
 Kibaha.

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an act of Parliament no. 17 of 1992. The act became operational on the 1st March 1993 by public notes No. 55 in the official Gazette. Act number 7 of 1992 has now been replaced by the Open University of Tanzania charter which is in line the university act of 2005. The charter became operational on 1st January 2007. One of the mission objectives of the university is to generate and apply knowledge through research. For this reason staff and students undertake research activities from time to time.

To facilitate the research function, the vice chancellor of the Open University of Tanzania was empowered to issue a research clearance to both staff and students of the university on behalf of the government of Tanzania and the Tanzania Commission of Science and Technology.

The purpose of this letter is to introduce to you **Mr Michael Issack, PG201401504** who is a Master student at the Open University of Tanzania. By this letter, Mr Michael Issack has been granted clearance to conduct research in the country. The title of his research is **"An Assessment on the influence of Teaching and Learning of mathematics subject: A case of Kibaha District"** The research will be conducted in Kibaha District.

The period in which this permission is granted is from 23/02/2015 to 30/4/2015.

In case you need any further information, please contact:

The Deputy Vice Chancellor (Academic); The Open University of Tanzania; P.O. Box 23409; Dar es Salaam. Tel: 022-2-2668820

We thank you in advance for your cooperation and facilitation of this research activity.

Yours sincerely,

Prof Shaban Mbogo

For: VICE CHANCELLOR

THE OPEN UNIVERSITY OF TANZANIA

The United Republic of Tanzania

THE PRIME MINISTER'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

REGIONAL COMMISSIONER'S OFFICE,

P.O. Box 30080,

KIBAHA.

COAST REGION:

Telegrams "**REGCOM PWANI**"

Tel. No. 023-2402066.

023-2402500

023-2402287

Fax No. 023-2402250/2402686,2402151

E-Mail: rascoast@iwayafrica.com

regcoast@iwayafrica.com

regsecrcoast@iwayafrica.com

In reply please Quote:



Ref. No.FA.221/265/01A/162

13 Machi, 2015

District Administrative Secretary,
P.O. BOX 30198,
KIBAHA.

RE: RESEARCH CLEARANCE

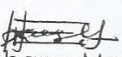
Please kindly refer to the above subject Matter.

I would like to introduce to you **Mr. Michael Isack** who is a bonafide Student of the Open University of Tanzania.

At the moment he has been given a permission to conduct a research titled "**An Assessment on the Influence of Teaching and learning of Mathematics subject: A case of Kibaha District**".

The period to which this permission has been granted is from **16th March, to 30th April, 2015.**

You are requested to provide necessary assistance which will enable him to complete the research study successfully.


Yohana Mpagama

For: **REGIONAL ADMINISTRATIVE SECRETARY**
COAST REGION

Copy to: The Open University of Tanzania,
P. O. Box 23409,
DAR ES SALAAM.

Mr. Michael Isack,
DAR ES SALAAM ✓

THE UNITED REPUBLIC OF TANZANIA
PRIME MINISTER'S OFFICE
REGIONAL ADMINISTRATIVE AND LOCAL GOVERNMENT

KIBAHA DISTRICT
Tel. No: 023-2402012
In reply please Quotes



District Commissioner's Office
P.O. Box 30175
KIBAHA

Ref. No. FA.221/265/01A/163

16th March, 2015

District Executive Director,
P. O. Box 30153,
KIBAHA.

RE: RESEARCH CLEARANCE FOR MR. MICHAEL ISACK

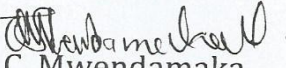
Reference is made to the above caption.

I am Introduce to you **Mr. Michael Isack** who is bonafide Student of Open University of Tanzania.

The mentioned Student has been given permission by Regional Administrative Secretary Coast Region to conduct his research on "**An Assessment on the Influence of Teaching and learning of Mathematics subject: A case of Kibaha District**".

The duration for Research is from **16th March to 30th April, 2015** and expected to cover **Kibaha District**

Please provide necessary assistance to facilitate the completion of his research.


John C. Mwendamaka

For: **District Administrative Secretary**
KIBAHA

Copy: Vice Chancellor
The Open University of Tanzania
P.O. Box 23409
DAR ES SALAAM.