THE EFFECT OF SMASSE PROJECT ON PERFORMANCE OF MATHEMATICS IN SECONDARY SCHOOLS IN KITUI CENTRAL DISTRICT, KITUI COUNTY, KENYA

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A RESEARCH REPORT SUBMITTED TO THE BOARD OF POST GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI

2014

DECLARATION

This research report is my original work and has not been submitted or presented for examination in any other University.

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REG. NO. L50/62183/2013

This research report has been submitted for examination with my approval as University supervisor.

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DEDICATION

This project report is dedicated to my husband Maurice Makau, my lovely sons: Brian Makau, and Victor Mutambuki and my precious daughter Grace Muendi whose moral support and concern gave me strength to complete the study within the prescribed time

ACKNOWLEDGEMENT

I extend my gratitude to God for opening the opportunity and giving me and strength financial breakthrough to carry out this work which was a climax of long hours of study and hard work. Special thanks to my supervisor Dr. Migosi for the patience and relentless guidance in every step. To my dear family members for the sacrifices made to make this dream come true. To my spiritual father ; pastor Elijah Mbiti JMC Kitui for spiritual support throughout the journey. Thanks to my dad, Mutambuki Makau and my mom Musangi Mutambuki for inspiring me and teaching me the value of thinking big.

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LIST OF ABBREVIATIONS AND ACRONYMS

ASEI	-	Activity, Student Centered Experiment and Improvisation.
CEMASTEA	-	Center for Mathematics Science and Technology Education in Africa.
DEB	-	District Education Board
DPC	-	District Planning Committee.
DQASO	-	District Quality Assurance Officer.
INSET	-	In-service Education and Training
JCC	-	Joint Coordinating Committee.
JICA	-	Japanese International Cooperation Agency
KNEC	-	Kenya National Examination Council
KSTC	-	Kenya Science Teachers College
NEPAD	-	New Partnership for Africa's Development
NWC	-	National Working Committee
PDSI	-	Plan, Do, See and Improve.
PRESET	-	Pre-service Education and Training
SMASSE	-	Strengthening of Mathematics and Science in secondary education.
WECSA	-	Western, Eastern, Central and Southern Africa

ABSTRACT

The purpose of this study was to investigate the effect of SMASSE on performance of mathematics in Kitui Central District, Kitui County. The study sought; to establish the influence of SMASSE administrative structure on the performance of mathematics, to determine the influence of SMASSE INSET curriculum on the performance of Mathematics, to establish the influence of teachers' attitude towards SMASSE on the performance of Mathematics and to ascertain the influence of District Quality and Standards Office on SMASSE project on performance of mathematics in secondary schools in Kitui central district. The study adopted a descriptive survey research design. Census sampling was used to collect data from the 26 principals and 26 Head of mathematics department teachers in the 26 secondary schools in Kitui Central District. The questionnaires were used as the main research instruments. The questionnaires were administered to principals and head of science department teachers. Data was analyzed by both descriptive and inferential methods using the SPSS software version 20.0. The key findings for this study were; firstly, SMASSE administrative structure affected the performance of mathematics in secondary schools and that the structure needs to be changed to enhance more efficiency. This is because most of the respondents were not comfortable with the structure. Secondly, the SMASSE curriculum significantly influenced the performance of mathematics and that the curriculum needs to be amended to suit the needs of teachers. Thirdly, the study concluded that the teacher individual attitude determines the implementation of SMASSE INSET in schools since there is a strong positive correlation $r(52) = 0.82$, $p<0.05$, between teacher's attitude about SMASSE and the performance of Mathematics. Lastly, the study concluded that there is a significant relationship between role of district quality and standards office on effectiveness of SMASSE project and the performance of mathematics. The researcher recommended that the administrative structure should include subject teachers who are well endowed with classroom experiences and curriculum be revised from time to time. The INSET should also be regular and all teachers should be involved as well as ensuring some conducive school environment to as to promote mathematics.

CHAPTER ONE : INTRODUCTION

1.1 Background of the Study

In the 45th Session of International Conference on Education held in Geneva (1996), education was defined as a person's individual and social development that the person gains in the teaching and learning process in school. Such gains should lead to a person's intellectual, emotional, spiritual and physical abilities to mature, thus enabling him or her to fully participate in community affairs [United Nations International Children's Education Fund UNICEF, 1996].

In many U.S. states, educators must adhere to rigid standards or frameworks of what content is to be taught to which age groups. Unfortunately, this often leads teachers to rush to "cover" the material, without truly "teaching" it. In addition, the process of science, including such elements as the scientific method and critical thinking, is often overlooked. This emphasis can produce students who pass standardized tests without having developed complex problem solving skills. Although at the college level American science education tends to be less regulated, it is actually more rigorous, with teachers and professors fitting more content into the same time period (Adewoyin, 1991).

In 1996, the U.S. National Academy of Sciences of the U.S. National Academies produced the National Science Education Standards, its focus on inquiry-based science, based on the theory of constructivism rather than on direct instruction of facts and methods, remains controversial. Some research suggests that it is more effective as a model for teaching science (Afe, 1989). The Standards called for more than 'science as process,' in which students learn skills as observing, inferring, and experimenting. Inquiry is central to science learning. When engaging in inquiry,

students describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others. They identify their assumptions, use critical and logical thinking, and consider alternative explanations. In this way, students actively develop their understanding of science by combining scientific knowledge with reasoning and thinking skills (Okumbe, 1998)

In recent times, there has been a growing public anxiety about the teaching and learning of science in Nigerian schools. Studies showed that large numbers of students seem to learn very little science at school, learning tends to be by rote and students find learning of science to be difficult (Salau, 1996). The quality of science teaching and learning has also been questioned over time by parents, science educators, and the general public and even by the government (Adepoju, 1991)

Science teaching in Nigerian schools has been criticised because of the poor performance of Nigerian students in science subjects relative to their counterparts in other countries. This is evident from the Second International Science Study in which Nigerian students came last in primary science and second to last in secondary science among the participating countries of the world (Adeyemi, 1990). A number of factors have been identified to be responsible for these poor performances in science from the various studies conducted in Nigeria. These include the lack of motivation for most teachers, poor infrastructural facilities, inadequate textual materials, attitude of students to learning, lack of teaching skills and competence by science teachers, and lack of opportunities for professional development for science teachers (Adeyemi, (1990).

Other studies mentioned that poor classroom organization, lack of management techniques and poorly co-ordinate student activities also reduced the quality of science teaching and learning (Akale & Nwankwonta, 1996). The shortage of funds for equipment and materials for fruitful practical work; especially in view of large class size in most schools is a problem. Some other researchers also attribute the low percentage of students who pass examinations in science, to dissatisfaction with the syllabus, teachers' qualifications, workload, experience and disposition, general lack of teaching skills, and the ineffective style of delivery of subject matter (Adepoju, 1991).

Kenya made self-help efforts towards continuous development by promoting industrialization in the education sector since its independence in 1963.The Kenyan government allocated more than its current budget to the field of education. However because of lack of textbooks, teaching materials and science teachers caused by congestion of curriculum and the tight educational budget, the level of education was lowered mainly in subjects of science and mathematics. (Riak, (1996) & Eshiwani, (1993) noted that achievement in what was offered as science and mathematics was astonishingly poor.

Similarly, Birgen (2004) stated that despite the explosion of trained teachers in the last decade, the scorecard in these key subjects had persistently made depressing reading. The 'Strengthening of Mathematics and Science in Secondary Education (SMASSE) Project was launched in Kenya in 1998, was aimed at the improvement of mathematics and science education through In-Service Training (INSET) for teachers. The project focuses on lesson improvement as its key concept and established a training system using the cascade approach at the national and district levels, which

facilitated the diffusion of training effects to all participants including those who are at the lowest level of the cascade.

It has also set up mechanisms by which a part of school tuition fees is used to cover the costs for the district – level training, thus ensuring the sustainability of training management and implementation. After the launch of phase II in 2003, the Kenyan government established the national training center and INSET was extended both domestically, to cover the entire Kenyan territory, and intraregional, to conduct activities to the strengthening of mathematics and science in secondary education in 30 sub-Saharan countries. The request for assistance in the field of mathematics and science in secondary, addressed by the Kenyan government to Japan in 1996, resulted in the launch of the SMASSE project in 1998 (SMASSE, 2008).

In order to achieve sustainable social and economic development goals as outlined by Poverty Eradication Action Plan (PEAP 2004), focus must be on promoting science and mathematical education. However, performance in science and mathematics has been unsatisfactory for long as reflected by Kenya National Examinations Council (KNEC) since 1980's to date. The government has made interventions to improve the situation through building and renovating laboratories, supplying equipment, chemicals and textbooks; recruiting more science teachers, establishment of Teacher resource Centers (TRC), introducing computer science and ICT Skills to both teacher and students. The current government policy to improve science and technology for economic development, called for improvement of classroom practices in the teaching and learning of science and mathematics.

In 2005 the government of Kenya through ministry of education with technical assistance from the government of Japan through JICA, established SMASSE

(Strengthening of Mathematics and Science in Secondary Education) program to enhance the quality of teaching and learning of science and mathematics through in – service education training -(INSET) for secondary science and mathematics teachers. The program was then piloted in the municipalities of the country where the observed impacts that were tested by the KNEC, (2000) showed very positive results on the improved performance.

The government of Kenya through its policy documents has outlined several strategies to be adopted in order to enhance the field of science and technology. Key among them is the strengthening of technical capabilities through training of personnel and provision of equipment's through partnership with development partners, the government has embraced several initiatives such as the strengthening of Mathematics in secondary schools (SMASSE) project. This is a joint venture between Japanese governments through the Japanese international development agency (JICA). It was established in 1998 to improve the capacity of young Kenyans in science and mathematics through in-training (inset) centre for mathematics and technology education in Africa (CEMASTEA News letter 2008).

In Kitui County the training takes place at Mulango Girl's High school and Muthale Girl's the attendance of teacher's decreases years despite the government involvement as a matter of policy. The situation is worsened by the lack of incentives for the teachers by the lack of incentives for the teachers by the respective schools. The researcher wants to find out the effectiveness of SMASSE project on the performance of Mathematics in Kitui Central District.

1.2 Statement of the problem

The quality of an education system is a very crucial determinant of economic development and social stability of the nation (Maithya 2012). Research reveals that while both the quality and quantity of schooling is a matter for economic growth, quality is much more important.

SMASSE Project was launched in Kenya in 1998, so as to improve mathematics and science education through In-Service Training (INSET) for teachers. The project focuses on lesson improvement as its key concept and established a training system using the cascade approach at the national and district levels, which facilitated the diffusion of training effects to all participants including those who are at the lowest level of the cascade. It has also set up mechanisms by which a part of school tuition fees is used to cover the costs for the district – level training, thus ensuring the sustainability of training management and implementation. Despite the efforts and objectives of the SMASSE project aimed at improving performance of mathematics, very little has changed over the years. According to Kitui central DQASO report (2014) performance index in mathematics before SMASSE was below 2.0 and even now the performance index is still the same.

In Kitui County the training takes place at Mulango Girl's High school and Muthale Girl's High school. The attendance of teacher's decreases year by year despite the government involvement as a matter of policy (Kitui central DQASO report 2012). In Kitui central District, the performance of Mathematics in secondary schools has been dismal despite the efforts put by the Ministry of Education through SMASSE. There is therefore a need to investigate the factors influencing the effectiveness of SMASSE project on the performance of Mathematics in Kitui Central District.

1.3 Purpose of the study

The purpose of this study was to investigate the effect of SMASSE project on the performance of Mathematics in Secondary Schools in Kitui Central District.

1.4 Objectives of the study

This study was guided by the following objectives;

i. To establish the influence of SMASSE administrative structure on the performance of Mathematics in secondary schools in Kitui central district.

ii. To determine the influence of the SMASSE INSET curriculum on the performance of Mathematics in secondary schools in Kitui central district.

iii. To establish the influence of teacher's attitude about SMASSE on the performance of Mathematics in secondary schools in Kitui central district.

iv. To ascertain the influence of the district quality and standards office on the SMASSE project in the performance of Mathematics in secondary schools in Kitui central district.

1.5 Research Hypothesis

The study was guided by the following research hypothesis;

i H_0: There is no significant relationship between SMASSE administrative structure and the performance of mathematics in Kitui Central District.

H_1: There is a significant relationship between SMASSE structure and the performance of mathematics in Kitui Central District.

ii H_0: There is no significant relationship between SMASSE INSET curriculum and the performance of mathematics Kitui Central District.

H_1: There is a significant relationship between SMASSE INSET curriculum and the performance of mathematics Kitui Central District.

iii H_0: There is no significant relationship between teacher's attitude about SMASSE project and the performance of Mathematics.

H_1 : There is a significant relationship between teacher's attitude about SMASSE project and the performance of Mathematics.

iv H_0: There is no significant relationship between the role of district equality and standards office on effectiveness of SMASSE project and the performance of mathematics Kitui Central District.

H_1: There is a significant relationship between the role of district equality and standards office on effectiveness of SMASSE project and the performance of mathematics Kitui Central District.

1.6 Significance of the study

Its hoped that the study shall be significant to the government of Kenya, students and parents to understand the factors influencing the effectiveness of SMASSE project in Kitui Central District. It will help education stakeholders to find ways of making SMASSE more relevant to enhance Mathematics teaching and hence better the overall performance of Mathematics and Science subjects. It is expected that the study will be of use in creating awareness to teachers so as to be able to utilize the resources made available through the SMASSE project.

1.7 Delimitations of the study

This study was carried out in Kitui Central District, Kitui County. Kitui Central District covers the township area, boundering Nzambani district to the east, Katulani district to the south, Kitui rural to the west and Matinyani district to the north. It

involved public secondary schools of the district; this region has no unique socio-cultural practices similar to ASAL regions. The findings will be universal and so will be applied to neighbouring districts or even the entire county.

1.8 Limitations of The Study

Not all the respondents participate 100% in their responses as some may either lack interest or have no time. The researcher also had no control over the attitudes of the respondents. The researcher was limited by time and resources and therefore only reached purposely selected schools in the district.

1.9 Basic Assumptions

The researcher assumed that the Government of Kenya was in full support of the SMASSE project. It was also assumed that the staff establishment in Mathematics in the public and private secondary schools was satisfactory and more so in Kitui Central District.

1.10 Definition of Significant Terms.

Actualization A teacher preparing for a lesson and doing the actual teaching in the classroom as others in the group observe and note areas that need improvement

Actualization Centers - schools where aspects SMASSE training for example, ASEI and PDSI were put into practice. Prior arrangement had been made hence students were available.

Attitudes - Away of feeling or thinking about someone or something, especially as this influences ones behavior.

Effect - A result or condition produced by a cause.

Effectiveness –The act of producing the intended result or successful result.

In-service Training - Planned courses and activities in which a serving teacher, head teacher, school inspector or educational administrator may participate for the purpose of improving his/her instructional or professional knowledge, interest or skills.

Participant Schools - Other schools in the district used as samples for study regarding SMASSE.

Performance - Means or act of accomplishing a certain task as intended.

Pre-service - Training in a teachers' college, where a student teacher is introduced to the knowledge and skills needed to do a professional job in teaching.

SMASSE Centers - Schools selected as venues for SMASSE training. They had good facilities and were given more facilities and equipment for purposes of the training.

Training - Processes of providing employees with specific knowledge and skills, to enable them perform specific work tasks

1.11 Study organization.

The study is organized into five chapters. Chapter one is an introduction to the study. chapter two is literature review on effect of SMASSE on performance of mathematics while chapter three deals with methodology specifically on target population, sample size research instruments ,reliability and validity of the research instruments used. The fourth chapter in the research report is about data presentation, analysis, interpretation and discussion. Chapter five is about summary of the study, conclusion and recommendations of findings the study.

CHAPTER TWO : LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature of the study based on the following sub-thematic areas; the influence of the organizational structure of SMASSE, the effect of SMASSE INSET curriculum, influence of teacher's individual characteristics and the role of district quality and standards office of the SMASSE project the performance in Mathematics and Science. This chapter's main aim was to highlight the relevant information regarding the key areas the researcher shall be intending to centre his study on.

2.2 Empirical studies of SMASSE

Since the inception of 8-4-4 system of education in Kenya, the teaching of Mathematics and science subjects has become a matter of debate due to poor performance in the National examinations by many candidates (Shiundu, 1992). This is an indication that the teaching and learning of these subjects in secondary schools has not been well. It is important that teachers identify the teaching and learning problems in Mathematics and seek solutions to this perennial problem.

According to the Organization for Economic Cooperation and Development (1998), professional development signifies any activity that develops an individual's skills, expertise and other characteristics as a teacher. Development is achieved through a set of planned activities that are aimed at moving teachers to more responsible positions within the school system (Parker & Harley, 1999).

In-service education and training is any vocational training acquired during employment (Calderhead, 1992). It is meant to enhance the skills, knowledge and

understanding of teachers for effective classroom practices (Republic of Tanzania, 2010). It further provides 3 opportunities for professional development to teachers in order to raise their academic qualifications to competently address the educational challenges and compete effectively in the open labour market. From this perspective INSET of teacher is a lifelong learning process which begins with the initial preparation that a teacher receives at a teachers‟ college and continues until retirement. It is an ongoing process of education, training, learning, and support activities that takes place in either external or work-based settings (school-based) of the teacher.

Calderhead, (1992) observes, in-service education and training helps teachers to expand their current knowledge of a subject, develop new knowledge and engage with colleagues at their current school and other schools. Furthermore, it helps them to plan and develop their own work thoroughly. They may also become more conscious of strategies for change and curriculum development trends. In addition, teachers may acquire skills in research and decision making at various levels.

In-service education supports the professional development of teachers throughout their working lives (Joan, 1991). It is provided to serving teachers and may take place at any time either as a full time study or as a part time study. Full time study takes place when one seeks a study leave to pursue some training on a regular semester basis (Ibid). In Kenya, the Teachers Service Commission (TSC), the body that employs teachers, grants study leave to teachers who intend to pursue further studies on full time basis. On the other hand, part time study takes the form of single lectures, conferences, short weekend courses, short evening courses, short courses in school time or vacation courses.

In Kenya, the SMASSE INSET is undertaken on a part time basis and teachers attend the training during holidays. According to Shiundu (1992), the purposes of in-service education and training can be summarized as being: extension of knowledge; consolidation and reaffirmation of knowledge; regular acquisition of new knowledge; acquaintance with curricular developments; acquaintance with the psychological developments; acquaintance with the sociological basis of education; acquaintance with the principles of organization and administration; repetition or extension of original pre-service teacher education after intervals; acquaintance with new teaching and learning resources; introduction of new methods of teaching; understanding new relationships between teachers and learners; development of teaching and evaluation techniques; and acquaintance with and participation in educational research.

As Burges (1993) observes, in-service education and training may be taken since knowledge changes and this necessitates the need for teachers to be updated. Secondly, techniques of teaching change. If new tools are devised for teachers it is vital that they should be given really wisely planned courses on their value and their limitations. Thirdly, the society changes with time. The growth of technology produces new problems and if our citizens are to be aware of them and be prepared to cope with them, then fresh demands are inevitably placed on those who teach. Fourthly, teachers themselves change.

With experience some teachers develop new interests in special fields, for instance the teaching of handicapped children of various kinds, or counselling demand for special skills and it is one of the functions of in-service education to provide them. In addition, schools themselves change. For instance, a teacher faced with the challenges of a widely mixed ability group will require in-service training for him or her to cope.

Finally, in-service education and training can do much to bridge the gap in communication which tends to develop in our educational system. The gulf between knowledge generated through research and practice can only be bridged through in-service training (Ibid). It should be noted that INSET programmes give teachers an opportunity to reformulate their own philosophies of education and re-appraise their work in schools (www.amazon.com). In addition, the programmes enable teachers to be put in touch with current trends, literature, experiments, aids, equipment and ideas.

Shiundu (1992) argue that no teacher can claim to be fully equipped with knowledge sufficient to last him/her throughout his/her teaching career; in-service education and training is therefore a necessary part of a teacher's teaching career. However, warns that in-service training for teachers has its own problems (www.abebooks.com). The failure to relate in-service to pre-service training is one of the most significant problems. A closely related problem is that of the relationship between teacher preparation programmes and actual practice. The reason for this unfortunate condition, he argues, is that in-service and pre-service education programmes have worked separately rather than together.

In Kenya, the Ministry of Education, Science and Technology (MoEST) has a framework for INSET. This is based on the recommendations of the Master Plan on Education and Training(MPET), Kenya, 1997-2000 which states that among other things, teaching and learning transactions will be made more learner-centred through development of focused in-service courses for teachers. It is for this reason that MoEST has made the SMASSE INSET one of the investment programmes in the Kenya Education Sector Support Programme (KESSP 2005-2010).

2.3 Structure of the SMASSE Project

Studies on quality of education in Kenya indicated poor quality and performance especially in mathematics and science compared with that of social science subjects (KNEC REORT 2013). Due to resource constraints and need to improve quality of mathematics and science education, the GOK/MOE requested assistance from the development partners and the Government of Japan (GOJ) responded positively.

SMASSE INSET is delivered through a two system in which training is conducted at national and district levels. At national level, the national trainers facilitate INSET for district trainers, who in turn train all the other mathematics and science teachers in their respective districts throughout the country (SMASSE Newsletter, 2001).

The curriculum for the INSET is designed and divided into four cycles of ten days each year. This is to allow trainers and teachers to be free for two weeks during the school holidays and to ensure that lessons learnt are applied as soon as possible to benefit learners. Each of the four cycles has specific emphasis but cover a wide range of relevant aspects in teaching and learning of mathematics and sciences in the classrooms.

2.3.1 Administrative Structure

The structure of administration of SMASSE Project includes three committees. These includes; the Joint Coordinating Committee (JCC), the National Working Committee (NWC), the District Planning Committee (DPC). The JCC is chaired by the Permanent Secretary MOE. Its membership includes Education Secretary; Director of Higher Education; Director of Policy and Planning, MOE; Director of Quality Assurance and Standards (QAS); Chief Finance Officer, MOE; Director, Kenya Institute of Education (KIE); Secretary, Teachers' Service Commission (TSC);

Secretary, Kenya National Examinations Council (KNEC); Representative of Universities-from Kenyatta University (KU); Kenya Secondary Schools' Heads Association (KSSHA); Provincial Directors of Education (PDE); and Director, CEMASTEA. (SMASSE, 1998).

The National Working Committee chaired by the Director, CEMASTEA is responsible for coordination of all the day-to-day activities of SMASSE INSET programmers throughout the country. The DPC is composed of; District Education Officer (DEO) as the chairperson; District Quality Assurance and Standards Officers (DQASO); chairman of principals' association (sponsor) who is also the DPC treasurer; SMASSE district trainers' representative; and INSET Centers' principals. The DPC is responsible for selection and training of district trainers in collaboration with the national office; raising funds, budgeting and general management of District INSET, preparation of training materials in consultation with the national office. SMASSE Newsletter (2005)

The activities of the SMASSE Project are aimed at changing traditional teacher-centered teaching methods and equipping teachers with necessary skills for classroom practices that put emphasis on activity-oriented ways of teaching and learning, these includes; creating opportunity for learners to take responsibility for their own learning, employing inquiry-based approach as opposed to recipe-type experiments, encouraging improvisation not only to augment conventional equipment, apparatus/materials but also to arouse interest & curiosity among learners, encouraging teachers to draw content and examples from the learners' real life experiences in order to capture their interest and imagination, foster teachers' ability and appreciation for work planning. After being in-serviced, teachers are expected to

use student-centeredness, activity-based teaching experiment and research approaches in their teaching. SMASSE Newsletter (2005)

At the beginning of the project, the MOE/TSC recruited 8 national trainers on merit, 2 each from Mathematics, Physics, Chemistry and Biology departments who were trained in Japan and subsequently deployed as full-time staff in the project. As colleagues the 8 Kenyans worked with the Japanese personnel to develop materials, management procedure/system and activities for the INSET. Currently, the national office at the Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) is manned by 61 Kenyans and 4 Japanese.

The JICA training of Kenyan personnel in Japan and elsewhere has continued since 1999 for effective implementation of SMASSE INSET and general capacity building in education. From 2002, JICA has facilitated training of SMASSE Project officials and critical stakeholders in various universities in Japan, the Philippines and Malaysia. More opportunities for capacity development of teacher trainers, education managers and teachers have made available at the CEMASTEA (national) and 106 district training centers' through the two-tier cascade system as at September, 2006. SMASSE baseline Survey (2005)

Secondary school principals are responsible for ensuring effective and efficient implementation of curriculum at school level. The theme of Principals' Workshop has been 'Resource Mobilization, Prioritization and Utilization for Effective Teaching and Learning of Mathematics and Science'. The objectives of the workshop are to sensitize principals on: Baseline conditions that necessitated SMASSE as well as the intervention strategies adopted by the SMASSE Project. The, QASOs similarly undergo SMASSE training in order to be conversant with the principles and practices

of SMASSE INSET- the ASEI- PDSI Approach. This also reduces conflict between them and the SMASSE in-serviced teachers. In addition, the officers are in charge of organization and management of SMASSE INSET at district level. (SMASSE Newsletter 2008).

The DEOs have to oversee the management of education activities within a district. More significantly, as the chairperson of SMASSE DPC, the DEO influences effective implementation of SMASSE District INSET activities. During the workshops the role of the DEO in the implementation of the SMASSE INSET are emphasized as he/she is responsible for sensitization of stakeholders within the district on the need for INSET for mathematics and science teachers and ensuring efficient collection and remittance of SMASSE funds by principals and their management. SMASSE Newsletter (2005)

2.4 SMASSE inset Curriculum

In Service Education and Training (INSET) is defined by the (OECD) project as those education and training activities engaged by primary and secondary school teachers and principals following their initial professional certification and intended mainly or exclusively to improve their professional knowledge, skills and attitudes in order that they can educate children more effectively. Ngugi (2005) divides INSET into four categories: INSET for unqualified teachers which is done mainly for certification, INSET to upgrade teachers and INSET to prepare new roles such as principals, teachers, educators, quality assurance and standards and education officers. Curriculum related INSET linked with planned curriculum change or ad hoc refresher course.

In INSET, the trainees come with hope of being strengthened in their profession. INSET planning is based on needs of pupils, teachers and Departments within the school, the school itself, the District or even the Nation. In addition the needs assessment should consider the current situation and the aspirations of the stakeholders. Identified four factors as crucial for successful staff development these are redefining staff development as a process of learning, the role of leadership at the school development, organizing culture at the school level. The Ministry of Education (MOE) has the responsibility of maintain standards in education. The efforts of in servicing teachers are done through the institution within the Ministry and with donor supported projects and non-governmental organizations. All the in – servicing courses are accredited and certified. The in – service courses are given value by the Ministry to ensure that the providers give very high quality courses (MOEST, 2005), the sustainability of in service providers is based on the criteria that they have technical capacity to support MOE in developing the course, the provider has the financial base for sustainability.

The current SMASSE INSET is based on a curriculum, developed from the results of a Baseline Survey carried out in 1998 and findings of SMASSE Curriculum Review Committee (SCRC) which was commissioned by the Chief Inspector of Schools in September 2001 (SMASSE, 2005). This curriculum consists of general topical issues in secondary school mathematics and science education, topic areas that are of concern to both teachers and students in the four subjects that is Biology, Chemistry, Mathematics and Physics are revisited and various measures proposed on how to tackle them in classroom situations.

The guiding principle of SMASSE INSET is the ASEI/PDSI pedagogical paradigm. ASEI principle involves providing meaningful teaching Activities focused on Student learning mainly Experimental/practical work and Improvising resources where necessary. PDSI approach embraces orderly steps of executing learning activity by first Planning for the activity, then Doing it while Seeing, observing with intent to evaluate and then finally Improving on the process. The curriculum for the INSET is designed and divided into four cycles of ten days each year. This is to allow trainers and teachers to be free for two weeks during the school holidays and to ensure that lessons learnt are applied as soon as possible to benefit learners. Each of the four cycles has specific emphasis but cover a wide range of relevant aspects in teaching and learning of mathematics and sciences in the classrooms. Frequency of Seminars and INSET SMASSE (2001) report stated that the frequency of seminars and INSET were disapprovingly very low. Smylie (1992) notes that seminars and intellectual interactions among teachers can enhance developing curricula and new instructional programmes and planning professional development programmes for teachers related to the implementation of those programmes.

Gates (2001) notes that in order to prepare mathematically literate citizens, the 21st century classrooms need to be structured so that Mathematics can be learned with understanding. Teaching for understanding has to focus on ways of creating learning environments so that students learn with understanding. When students acquire knowledge with understanding they can apply that knowledge to learn new topics and solve new and unfamiliar problems.

When students do not understand concepts they perceive each topic as an isolated skill and they cannot apply their skills to solve problems not explicitly covered by instruction nor extend their learning to new topics. Furthermore when students learn skills in relation to developing understanding not only does understanding develop but mastery of skills is also facilitated. Gates (2001) further argues that understanding mathematics for instruction involves more than understanding mathematics taught in the university mathematics content courses. It entails understanding how mathematics is reflected in the goals of instruction and in different instructional practices.

Knowledge of mathematics must also be linked to knowledge of student thinking so that teachers have conception of typical trajectories of student learning and can use this knowledge to recognize landmarks of understanding in individuals. Teachers need to reflect on their practices and on ways to structure their classroom environment so that it supports student's learning with understanding they need to recognize that their own knowledge of mathematics and of student thinking as well as in student understanding is not static. Teachers must also take responsibility for their own continuing learning about mathematics and students. He further emphasizes that classrooms and instructions should be designed to further not only learning with understanding but also teachers 'knowledge and students' thinking.

According to Nyabala (2000) at every stage the teacher of mathematics is confronted with three basic problems namely; firstly, helping these students to develop understanding and mastering of concepts, principals, relationships and skills in mathematics, secondly, helping them to maintain understanding and skills already attained in their real life, thirdly, helping them to secure transfer of learning to their physical and solid environment in mathematics. Perrot, (1982) suggested that a

teacher should be prepared in the four areas of knowledge: Command of theoretical knowledge about learning and human behaviour. Display of attitudes that foster learning and genuine human relationships. Command of knowledge in the subject matter to be taught. Control of technical skills of teaching, which facilitates pupil learning.

The National Research Council (NRC; 2001) indicates that for a mathematics teacher to be "Mathematically proficient" he/she is required to acquire five types of mathematical competences. Conceptual understanding: comprehension of mathematics concepts, operations and relations. Procedural fluency: skill in carrying out procedures flexibly, accurately, efficiently and appropriately. Strategic competency: ability to formulate, represent and solve mathematics problems. Adaptive reasoning: capacity for logical thought reflection, explanation and justification. Productive disposition: habitual inclination to see mathematics as sensible, useful and worthwhile coupled with a belief in diligence and one's own efficacy (NRC 2001)

A part from having knowledge of mathematics beyond what a teacher teaches, the teachers must also have an understanding and acceptance of students. Mathematics teaching at all levels should include opportunities for exposition by the teacher, discussion between teacher and pupils and between pupils themselves, appropriate practical work, consolidation an practice of fundamental skills and routines, problem solving including application of mathematics to everyday situations and investigating work. (Orton and Frobisher 1996)

Mukasa (2001) goes further to state that management of learning deals with factor that are directly under the control of the teachers, which include teaching methodology which is employed while the student sensitivity implies that there are factors that would be attributed to the students and finally mathematical challenges dealt with the level of learning. A close examination of the SMASSE baseline findings can lead to rearranging of the challenges and identifying teacher related challenges. These are the attitude of the teachers, lack of appropriate teaching methodology engagement. Cooperative learning involves the usage of small groups to foster effective mathematical teaching where each student is expected to participate fully in discussion while it is expected that there will be no dominance by one student in a group.

The method further enhances communication, problem solving, logical reasoning and the making of mathematical connections. He continues to say that the advantages of cooperative learning include having an academic achievement, self confidence of the learners and use of social skills. By placing students in small groups the method ensures every student contributes and takes an active role in discussing mathematical concepts. Further the teacher plays a captivating role in successful development and sustainability of group dynamics in the learning process. The role of the teacher also includes ensuring that the student realizes that the success of the group depends on the impact of each student in the group and the need for positive interdependence.

Students are encouraged to listen to other's ideas, discussing over and accepting constructive comments and develop positive social skills. The teacher is also expected to monitor and intervene and should move from one group to another group, giving assistance and encouragement, should not provide readymade solutions to any call

from a student instead should ask appropriate questions and encourage such a student to rethink on the method and strategy they are using and consider alternative way of proceeding.

From the SMASSE survey findings of SMASSE (2001) young teachers seemed to find difficulties in determining the level of content to give their students explanations of concepts was sometimes not done satisfactorily due to lack of mastery of content. This was similar to what Taiwo (1994) defines as out of field teaching which is a situation where teachers lack minimum academic qualification in the subject they taught. Perrot (1982) was of the opinion that the academic mastery of the subject being taught is of utmost importance if the students are to achieve high academic standards since deep conceptual understanding leads to increased procedural fluency and confidence.

2.5 Role of the Teacher in Teaching Mathematics

Taiwo (1994) argues that for a teacher to be a specialist he must know his subjects well and be able to interpret the syllabus with a view of promoting mathematics learning at that level. He should keep in view the needs of the future mathematicians that would create more mathematics, the future engineers, biologists, chemists, physicists, agriculturalists and other scientists who need mathematics for their work, the intermediate level workers and the secondary level.

Symlie (1992) notes that today emphasis is no longer so much on teaching by the teachers as on learning, in but to make the process of education efficient. Depending on the predetermined lesson teachers also need to be sensitive to ways in which different teaching methods foster different types of mental activity and the degree to which a particular activity brings about the desired learning. Gachenga (2007) argued

that, the use of practical activities in teaching should be emphasized. Laboratory work in mathematics and science serves not only to stimulate interest but provides a most effective means of classifying many mathematical and science concepts and relations through experience of associating them directly with physical things.

2.6 The role of District quality assurance office

Quality is considered as the most important element in education. Yvonne Hill (2003) posits that quality of the teachers and the student support systems are the most influential factors in the provision of quality education. Improving quality is important as ensuring the education for all goals is obtained. The success of any community is greatly tied to the quality of education. This is beneficial to both parents and children in the long run.

Clark (cited in Hargreaves and Fullan 1992) proposes that professional development is basically a solitary journey; however almost all teachers need assistance and support during that journey from colleagues or supervisors to enhance their own development.

It is essential to note that it centers on the relationship between supervision and curriculum development by paying attention to harnessing and harmonizing of theoretical learning and work experience balancing, relating, and integrating the general education in language, literature and social sciences with diversified courses. The current nature of modern educational supervision can be defined as a democratic, strategic, resourceful and coordinating process during which supervisors and teachers come together to stimulate discussions provoke reflective thoughts and weed out deficiencies in the educational setting. Quality is one of the most controversial aspects

of education in the developing world (Musvosvi, 1998) In whichever way it is looked at whether in terms of the facilities, the inputs in terms of finances or outputs in terms of examination or test score of students, their employability and productivity once in employment, the controversy does not just fade away. The quality of education offered in most schools could at present be practically questionable.

For individuals, education has become the surest way to climb the economic ladder as well as social status (Dasgupta, 1999) for a community, education brings social stability and safety. Illiteracy and low educational attainment are core causes of crime, poverty and all ills in the society. A good curriculum provides an independent external evaluation of its effectiveness by promoting the standards, personal development and well being of the learners, the quality of its provision and how well it is led and managed. Curriculum supervision should contribute to improvement and be centered upon individual of learners. The mission of the Department of Quality Assurance and standards is to establish, maintain and improve educational standards in the country. Its vision is to provide quality assurance feedback to all educational stakeholders on all educational institutions in Kenya.

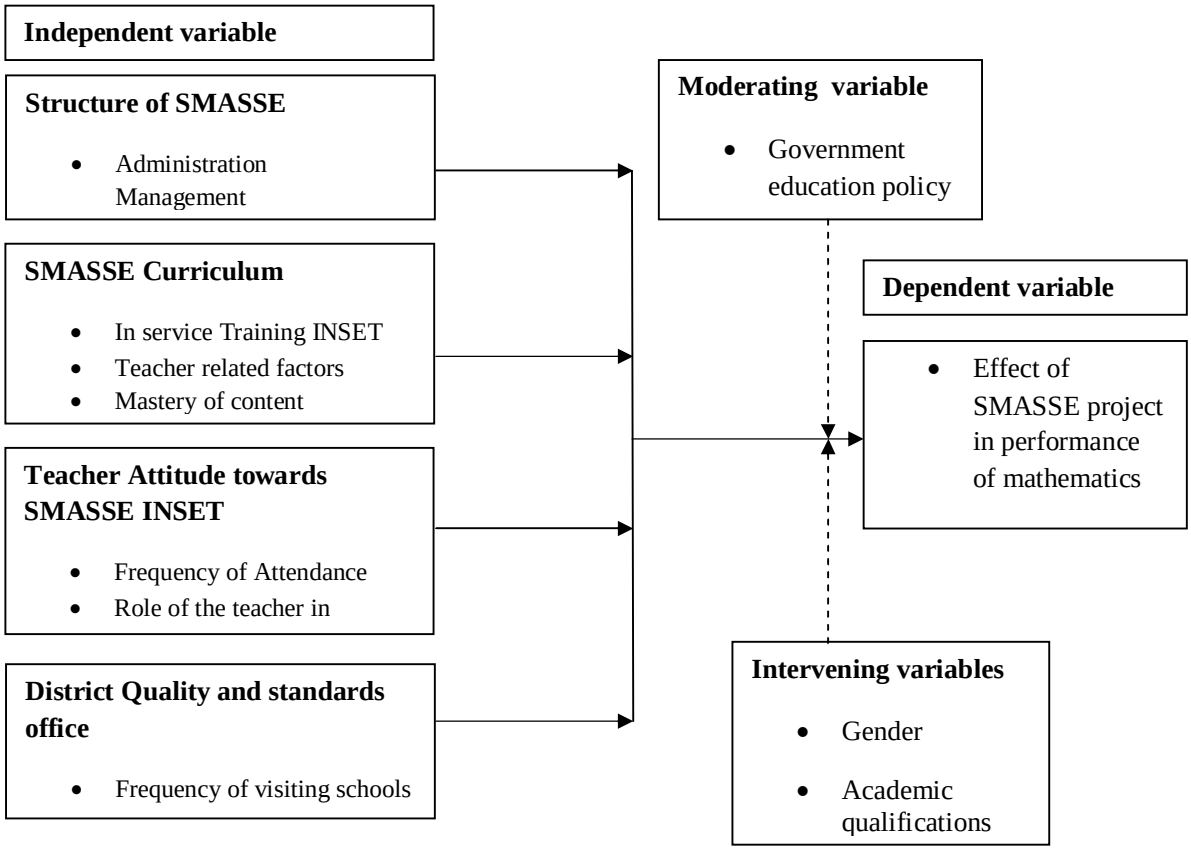
The function of assessing the standards of teaching and learning in schools is a reserve of the quality assurance directorate of the Ministry of Education. This directorate is charged with the responsibility of ensuring that there is standardization of education carrying out various types of assessment of schools and colleges. Some of the assessments done include: advisory assessment, panel, subject assessment, mass assessment, special assessment numbers – school registration, school mass indiscipline and public centre (MOEST, 2005). Quality assurance is achieved through inspection of institutions and reporting on these inspections to the institutions.

It is also achieved through assessing the curriculum through valid and reliable national examinations whose results are cited as indicators of quality of education in the country. Quality development is achieved through the work of the advisory services, the provision of staff development opportunities and the development of teaching and learning materials. Improvement on the quality of education focuses on setting of standards for the various variables and ensuring that the set standards are adhered to. The department of quality assurance and standards is mandated to co-ordinate, follow-up and advice on curriculum delivery at school level.

2.7 Theoretical Framework.

This study is based on theoretical model developed by Shavelson Mc Donwell and Oakes (1987). The model presents education system in terms of inputs, processes and outputs. The inputs in this study may include, SMASSE project which comprises of the INSET for mathematics and science teachers. Other resources include; the school infrastructure, school resources both human and physical and any other resources that schools are provided with to do their work. The school processes would be the policies and practices in the implementation of SMASSE project. The outputs also seen as outcomes in this study would mean good performance in Mathematics and science examination leading to greater achievements and positive attitudes towards schooling.

Figure 2.8 Conceptual framework



From figure 2.8, it is envisaged that any change in administrative management , in service training INSET, teacher related factors, mastery of content, frequency of attendance, role of the teacher in teaching and frequency of visiting schools by District Quality and standards office will affect either positively or negatively the extend to which SMASSE affects performance of mathematics. Government education policy in general can have an effect on how SMASSE affects performance of mathematics. Gender and academic qualifications of both principals and head of departments can influence how learners perceive mathematics.

CHAPTER THREE : RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology that shall be utilized by the researcher in the study. These include the research design, target population, sampling and sampling techniques, research instruments for data collection, Validity and reliability of instruments, data collection procedure, and data analysis techniques.

3.2 Research design

Orodho (2005) defines research design as the scheme, outline or plan that is used to generate answers to research problems. This research proposal will adopt descriptive survey design. Descriptive research design determines and reports findings the way they are. It attempts to describe possible factors such as behaviour, attitudes, values and characteristics (Mugenda & Mugenda, 1999). Survey design is conducted to collect detailed data on the existing phenomenon over a given geographical area or location with an intention of drawing possible conclusions from the facts discovered.

Descriptive survey research design was appropriate for this study for it is expected to yield new information and to generate clearer questions to maximize reliability. It takes enough protection against bias and maximizes reliability (Kothari, 2004). This is simple and widely used research design in education. It enables one to gather information on opinions, attitudes and beliefs of the sampled population. It also enables one to employ research instruments such as questionnaires, interview schedule and document analysis for effective data collection and analysis.

3.3 Target population

The study targeted 26 principals, 26 head of mathematics department in the 26 in public secondary schools in Kitui central district.

3.4 Sampling Procedure and Sample Size

Sample is as a representative part of a population as defined by Gay (2007). Therefore by studying the sample, one can be able to know more about the population without having to study the entire population. Although Kitui central district currently has 34 secondary schools, only 26 out of the 34 have actively participated in all the SMASSE cycles. In this study, census sampling shall be used where all the principals and head of Mathematics department in the 26 public secondary schools shall be included in the study. This is 100 percent of the target population. This is sufficient as proposed by Gay (2003), who argued that a census sampling yields better results.

3.5 Research Instruments

The information for the study was gathered by use of questionnaires as the main research instruments. The questionnaires shall be administered to all the principals and head of science department in the 26 public secondary schools in Kitui central district.

3.5.1 Research Instruments Piloting

According to Mugenda and Mugenda (1999) a pre-test sample of a tenth of the total sample with homogeneous characteristics is appropriate for a pilot study. A pilot study will be done in 3 secondary schools in Kitui central district. This will be a small representative sample, identical to the group that will be involved in the actual study. These respondents will not be involved in the actual research sample. The pilot study will enable the researcher to check whether the terms used will be valid and reliable. It will also enable the researcher to correct the mechanical problems, check language level and any ambiguity at the right time. The pilot study will elicit comments from the respondents which will help in the improvement of the instruments by modifying

and making sure that clear instructions are given in order to avoid misinterpretation during the actual data collection.

3.5.2 Validity of research Instrument

A research instrument is valid depending on how the data collected is related in terms of how effective the items have sampled the significant aspects of the purpose of the study (Orodho, 2005). A pilot study to establish the content validity of the instruments was conducted using three schools. Content validity of the instrument was determined by the experts from the University of Nairobi who gave advice to the researcher on the items to be corrected in the research instrument.

3.5.3 Reliability of research Instruments

Mugenda and Mugenda (1999) defines reliability as the measure or degree to which a research instrument yields consistent results or data after repeated trials. To establish the reliability of instruments, a split-half method was used by a means of a pilot study. During the pretest, the questionnaire shall be administered on a random sample of three households from the selected sample of the population. Data values was operationalized and split into two halves using the old-even item number dichotomy to get 12-12 pair of items of the questionnaire. The paired numerical data values will then correlated using Pearson Product-Moment Correlation Coefficient formula for calculations. The calculated correlation coefficient value was greater 0.82 which is greater than 0.75, the items in the questionnaire were therefore judged sufficient and the questionnaire had high pre-test reliability (Fraenkel & Wallen, 2008).

3.6 Data collection procedure

The researcher applied for authorization permit to collect data from the ministry of education. The researcher further got permission from district education officer in

Kitui central district. The questionnaires were self-administered where the researcher requested respondents to fill them after which the researcher collected the filled questionnaires. Assurance was given to the respondents on the confidentiality of their identity.

3.7 Data analysis techniques

The collected raw data was grouped according to objectives and research questions and analysed using Statistical Package for Social Scientist (SPSS) software. Statistical tally system was be used to generate frequency counts from the responses so as to prepare frequency distributions. Percentages were calculated from the responses gathered. As a measure of central tendency, the mean was used to decide the concentration side of responses. The researcher tested hypothesis using Chi-square and Spearman's Moment correlation coefficient to establish the relationship between the independent and dependent variables. Logit regression analysis was also be used to determine the key effects of SMASSE on performance of mathematics

3.8 Ethical consideration

The principles of voluntary participation were applied in this study. The research respondents were fully informed about the procedures involved in the research and were required to give their consent to participate. The researcher treated the respondents with respect and courtesy. The research procedures were reasonable, non exploitative, carefully considered and fairly administered.

3.9 Operational definition of variables

Operational definitions are specific ways in which real cases can be classified into categories of the concept researcher wants to use in his/her research. Operational definition helps one to measure the variables appropriately. There may be several given indicators for any given concept. Operational definition is a description of a

variable, term or object in terms of the specific process or set of validation tests used to determine its presence and quantity.

The table below shows how the variables were operationalised so as to have them measurable.

Table 3.1: Operationalization of study variables

Objective	Variables	Indicators	Measurement	Tools of Analysis	Types of Tools
To examine the influence of the structure on the effectiveness of the SMASSE project in the performance of Mathematics	**Independent Variable** Administrative structure. **Dependent Variable** Effectiveness of SMASSE project on the performance of mathematics and Science subjects.	Enhanced efficiency of the mathematics.	Ordinal	Measures of Central Tendency/ inferential statistics	Mean, Mode, Frequencies. Correlation analysis logit regression, anova analysis
To determine the influence of INSET curriculum on the effectiveness of SMASSE project in the performance of mathematics.	**Independent Variable** SMASSE Curriculum **Dependent Variable** Effectiveness of SMASSE project on the performance of mathematics and Science subjects.	High involvement of students in teaching learning activities	Ordinal	Measures of Central Tendency/ inferential statistics	Mean, Mode, Frequencies. Correlation analysis logit regression analysis, Anova
To ascertain the influence of teacher's attitude on the effectiveness of the SMASSE project in the performance of Mathematics and science subjects	**Independent Variable** Teachers's attitude. **Dependent Variable** Effectiveness of SMASSE project on the performance of mathematics.	High turnover for INSETS.	Ordinal	Measures of Central Tendency	Mean, Mode, Frequencies. Correlation analysis logit regression analysis, Anova
To examine the influence of the DQASO office on the efficiency of the SMASSE project on the performance of mathematics.	**Independent Variable** DQASO office **Dependent Variable** performance of mathematics.	School inspection. Organized SMASSE INSETs	Ordinal	Measures of Central Tendency/ inferential statistics	Mean, Mode, Frequencies. logit regression analysis, Anova

CHAPTER FOUR : DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents data analysis and interpretation following research objectives. The purpose of this study was to investigate the effect of SMASSE project in the performance of Mathematics in Secondary Schools in Kitui Central District. The study sought to establish the influence of SMASSE structure on the performance of Mathematics in secondary schools in Kitui central district, to determine the influence of the SMASSE INSET curriculum on the performance of Mathematics in secondary schools in Kitui central district, to examine the influence of teacher's attitude about SMASSE on the performance of Mathematics in secondary schools in Kitui central district and to ascertain the influence of the district quality and standards office on the effectiveness of SMASSE project in the performance of Mathematics in secondary schools in Kitui central district.

Data were collected using the questionnaires as the main research instruments. Census sampling of the 26 public day secondary schools in Kitui Central District was done and the 26 principals were studied. The researcher also gathered information from 26 head of departments from each studied schools. The collected data was analyzed using both descriptive and inferential statistics. For descriptive statistics, frequency distribution tables showing responses and percentages were constructed while in inferential statistics correlation and logit analysis were generated from coded data using Statistical package for social scientist (spss) to test the relationship between independent and dependent variable. This was followed by data interpretation.

4.2 Questionnaire return rate.

Questionnaire return rate is the proportion of the sample that participated in the survey and returned their questionnaires as intended by the researcher. For the purpose of data collection 26 questionnaires were issued to principals, and 26 questionnaires to head of departments. The questionnaire return rate was 100%. All the questionnaires were returned by the principals and the mathematics department heads under this study. This shows that the researcher had good rapport with the respondents and that the respondents were taking the research seriously. Also the researcher seems to have made a good follow up of the distributed questionnaires which enabled her to get back all the questionnaires.

4.3 Distribution of respondents by gender

The respondents were asked to indicate their gender with the aim of establishing whether the study was gender sensitive and to establish if gender influenced mathematics performance. The results were shown in Table 4.1.

Table 4.1 Distribution of respondents by gender

	Principals		**Head of departments**	
Categories	**Responses**	**Percentage**	**Responses**	**Percentage**
Female	8	31.0	11	43.25
Male	18	69.0	15	56.75
Total	**26**	**100**	**26**	**100**

Table 4.1 shows majority (69%) of the respondents were male principals while (31.0%) were female principals. This indicates that the number of male principals

administering secondary schools were more than the female principals. Table 4.2 also indicates that there are slightly more male head of mathematics departments (56.25%) than the female (43.75%). There seem to be gender balance in the distribution of the respondents which is likely to give balanced views concerning effect of SMASSE on performance of mathematics secondary schools in Kitui Central District.

4.4 Age Distribution of respondents

The researcher sought to establish the age distribution for the principals and mathematics department heads. This was to determine how the age of the principals was distributed among the schools and whether age was a factor in mathematics performance.

Table 4.2 Age distribution of principals

Age in years	Frequency	Percentage (%)
Less than 30	0	0.0
30 – 34	0	0.0
35 – 39	0	0.0
40 – 45	16	62.5
Above 45	10	37.5
Total	**26**	**100**

Table 4.2 revealed that majority of the school principals (62.5%) were 40 – 45 years of age while those above 45 years of age were 37.5 percent. This age indicates that the principals were relatively young and therefore assumption is made that they were in a better position to improve mathematics performance.

Table 4.3 Age distribution of mathematics department heads

Age in years	Frequency	Percentage (%)
Less than 30	0	0.0
30 – 34	0	0.0
35 – 39	6	23.0
40 – 45	16	64.5
Above 45	3	12.5
Total	**26**	**100**

Table 4.3 revealed that majority of the school mathematics department heads (64.5%) in Kitui central District are 40 – 45 years of age. This age bracket seems to be forming a pool from where teachers are promoted to become deputy principals and later principals. There seem to be many teachers who according to age should have been promoted to deputy head teachers by now but they are still mathematics departmental heads. This was followed by those in the age bracket of 35 – 39 with 23.0% percent. The table also revealed that no mathematics department head in the District was below 35 years of age. However there was 12.5 percent of mathematics department heads who were above 45 years of age. These seem to have stayed for more years before they are promoted to deputy principal and consequently school principal. The experience for this age group should be useful in assisting the administration in improving mathematics performance.

4.5 Academic qualification for the respondents

The researcher sought to investigate the academic qualification for principals and mathematics departmental heads.

Table 4.4 Principals academic qualification

Category	Frequency	Percentage (%)
PhD	0	0.0
M.Ed	5	31.25
B.Ed	10	62.5
DIP. Education	1	6.25
Total	**26**	**100**

Table 4.4 revealed that majority of the principals had a bachelor of education as their highest academic qualification. This shows that the principals had acquired academic qualification which could enable them to mobilize mathematics performance effectively. The second group was those with masters implying that the principals were interested in pursuing further education and this is an indication of a great desire for academic advancement. This is likely to influence the principals' resource mobilization strategies geared towards providing facilities needed for the student's good performance in academics. It was however revealed that some of the principals had a diploma in education. This implies a need to sensitize the head teachers on the need for higher education.

Table 4.5 Head of departments' academic qualification

Category	Frequency	Percentage (%)
PhD	0	0.0
M. Ed	3	19.75
B. Ed	10	62.5
Dip. Education	2	12.0
TOTAL	**26**	**100**

Table 4.5 revealed that majority of the head of departments interviewed had bachelor of education as their highest academic level followed by those with masters of education as the highest academic qualification. This qualification forms a good team to advise the principals on the best strategies towards mathematics performance Principals who work with consultation with these head of departments are likely to benefit more from their academic knowledge to advice on resource mobilization.

4.6 Influence of SMASSE administrative structure on the performance of Mathematics

The first objective for this study was to examine the influence of SMASSE structure on the performance of Mathematics in secondary schools in Kitui central district. To achieve this objective the researcher required the respondents to indicate the extent to which they agreed with the statements given as; SA for Strongly Agree, A for Agree, U for undecided, D for Disagree and SD for Strongly Disagree**.**

Table 4.6 Influence of SMASSE administrative structure on the performance of Mathematics

	SA	A	U	D	SD	Total
The administrative structure of the project makes it more effective.	(19.2%)	(15.4%)	(11.5%)	(53.9%)	(0%)	**(100%)**
The administrative structure enhances efficiency at all levels of the project	(11.5%)	(19.2%)	(11.5%)	(27.7%)	(11.5%)	**(100%)**
The administrative structure discriminative as one ascends the hierarchy.	(61.5%)	(15.4)	(22%)	(0%)	(0%)	**(100%)**
The administrative structure needs to be changed to enhance more efficiency.	(78%)	(22%)	(0%)	(0%)	(0%)	**(100%)**
The administrative structure is an impediment to the efficiency of the project at all levels.	(69.2%)	(22%)	(7.7%)	(0%)	(0%)	**(100%)**
Mean total	**(46%)**	**(19.2%)**	**(11.5%)**	**(19.2%)**	**(4.1%)**	**(100%)**

Table 4.6 shows that majority (46%) strongly agreed with the given statements. However there was a significant difference ($p < 0.05$) between those who strongly agreed with the statement that the administrative structure needs to be changed to enhance more efficiency leading with 78% followed by the statement that the structure is an impediment to the efficiency of the project at all levels (69.2%). It can also be noticed that 19.2 percent of the respondents disagreed with the statement with

27.7% disagreeing with the statement that the administrative structure enhances efficiency at all levels of the project.

To establish the relationship between SMASSE administrative structure and mathematics performance the researcher used the correlation coefficient by testing the hypothesis below.

H_0: There is no significant relationship between SMASSE administrative structure and the performance of mathematics in Kitui Central District.

H_1: There is a significant relationship between SMASSE administrative structure and the performance of mathematics in Kitui Central District.

Table 4.7 Relationship between SMASSE administrative structure and the performance of mathematics

		SMASSE administrative structure	Mathematics performance
SMASSE administrative structure	Pearson Correlation	1	0.70
	Sig. (2-tailed)		0.03
	N	52	52
Mathematics performance	Pearson Correlation	0.70	1
	Sig. (2-tailed)	0.03	
	N	52	52

Table 4.7 shows that there is a strong positive correlation r (52) = 0.70, $p<0.05$, between SMASSE administrative structure and mathematics performance and the relationship is significant. We therefore reject the hypothesis and conclude that there is a significant relationship between SMASSE administrative structure and mathematics performance.

Table 4.8 Chi-square test for the relationship between SMASSE administrative structure and the performance of mathematics

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	88.694[a]	51	.000
Likelihood Ratio	58.703	51	.000
N of Valid Cases	161		

The chi-square tests in Table 4.8 show that the significance χ^2 (1,51), P< 0.05, which means that there is a significant relationship between SMASSE administrative structure and the performance of mathematics in Kitui Central District.

4.7 Influence of the SMASSE INSET curriculum on the performance of Mathematics

The second objective for this study was to determine the influence of the SMASSE INSET curriculum on the performance of Mathematics in secondary schools in Kitui central district.

To achieve this objective the respondents were required first to indicate the extent to which they agreed with the statements given in Table 4.8.

Table 4.9 Influence of the SMASSE INSET curriculum on the performance of Mathematics

	SA	A	U	D	SD	Total
The curriculum needs an overhaul for better results.	(67.3%)	(17.8%)	(14.9%)	(0%)	(0%)	**52(100%)**
The curriculum needs to be amended to suit the needs of teachers.	(86.1%)	(14.9%)	(0%)	(0%)	(0%)	**52(100%)**
The curriculum should remain as it has been since it is adequate.	(0%)	(0%)	(0%)	(11.5%)	(88.5%)	**52(100%)**
Mean total	(52%)	(12%)	(3.5%)	(3.5%)	(29%)	**52(100%)**

Table 4.9, revealed that majority of the responses (52%) strongly agreed with the given statements. However there was a significant difference in the responses with majority of the respondents strongly agreeing with the statement that; the curriculum needs to be amended to suit the needs of teachers. It was also established that 88.5 percent of the respondents strongly disagreed with the statement that; the curriculum should remain as it has been since it is adequate.

Next the researcher tested the hypothesis below using Chi-square test.

H_0: There is no significant relationship between SMASSE INSET curriculum and the performance of mathematics Kitui Central District.

H_1: There is a significant relationship between SMASSE INSET curriculum and the performance of mathematics Kitui Central District.

Table 4.10 Chi-square on relationship between SMASSE inset curriculum and performance in mathematics

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.830E2[a]	51	.000
Likelihood Ratio	180.867	51	.000
N of Valid Cases	195		

a. 4 cells (25.0%) have expected count less than 5. The minimum expected count is 1.54.

The chi-square test in table 4.10 shows that the significance is .000 which is less than .005 meaning that there is a significant relationship between the SMASSE INSET curriculum and the performance of mathematics

4.8 Teacher's attitude about SMASSE and the performance of Mathematics.

The third objective for this study was to examine the influence of teacher's attitude about SMASSE on the performance of Mathematics in secondary schools in Kitui central district. To achieve this objective, the respondents were required to indicate the extent to which they are agreeable to the given statements by indicating, SA for Strongly Agree, A stands for Agree, U for undecided, D for Disagree and SD for Strongly Disagree .

Table 4.11 Teacher's attitude about SMASSE and the performance of Mathematics.

Statement	SA	A	U	D	SD	**Total**
The teacher attitude toward SMASSE affect the performance of Mathematics.	(92.3%)	(7.7%)	(0%)	(0%)	(0%)	**(100%)**
The frequency of attendance of SMASSE INSETS does not changes teacher attitude towards SMASSE.	(69%)	(19.5%)	(11.5%)	(0%)	(0%)	**(100%)**
The teacher individual attitude determines implementation of SMASSE INSET in schools.	(96%)	(4%)	(0%)	(0%)	(0%)	**(100%)**
Mean total	(85.5%)	(11.5%)	(3%)	(0%)	(0%)	**(100%)**

Table 4.11, revealed that majority (85.5%) strongly agreed with the given statements with majority (96%) strongly agreeing that the teacher individual attitude determines implementation of SMASSE INSET in schools. Next the researcher tested the hypothesis below using correlation coefficient.

Table 4.12 Correlation between Teacher's attitude about SMASSE and the performance of Mathematics.

		Attitude	Mathematics performance
Attitude	Pearson Correlation	1	0.82
	Sig. (2-tailed)		0.000
	N	52	52
Mathematics performance	Pearson Correlation	0.82	1
	Sig. (2-tailed)	0.000	
	N	52	52

Table 4.12 shows there is a strong positive correlation r(52)= 0.82 between teacher's attitude about SMASSE and the performance of Mathematics. There is also a significant relationship ($p < 0.05$) between teacher's attitude about SMASSE and the performance of Mathematics. We do therefore reject the hypothesis.

Table 4.13 Chi-square test between Teacher's attitude about SMASSE and the performance of Mathematics.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.550[a]	51	.006
Likelihood Ratio	12.520	51	.006
N of Valid Cases	161		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 1.73.

The chi-square tests in table 4.13 show that the chi-square significance is.006 which is less than the alpha of .05 meaning that there is a significant relationship between attitude about SMASSE and performance in mathematics.

4.9 District quality and standards office and the effectiveness of SMASSE project on the performance of Mathematics.

The last objective for this study was to ascertain the influence of the district quality and standards office on the effectiveness of SMASSE project on the performance of Mathematics in secondary schools in Kitui central district.

Table 4.14 District Quality and Standards Office and performance of mathematics

Response	Frequency	Percent
Strongly agree	33	62.5
Agree	6	12.5
Undecided	6	12.5
Disagree	7	12.5
Strongly disagree	0	0.0
Total	**52**	**100.0**

Most of the respondents 62.5% strongly agreed that the frequency of attendance of the DQASO visits enhances implementation of SMASSE by teachers hence improving the performance of mathematics as shown in table 4.14 above

To achieve this objective the researcher tested the hypothesis below using Chi-square test table at 5% alpha level as shown below.

H_0: There is no significant relationship between the role of district equality and standards office on effectiveness of SMASSE project and the performance of mathematics Kitui Central District.

H_1: There is a significant relationship between the role of district equality and standards office on effectiveness of SMASSE project and the performance of mathematics Kitui Central District. The results were presented in Table 4.12

Table 4.15 Chi-Square Tests for relationship between the role of district equality and standards office and effectiveness of SMASSE project and the performance of mathematics

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.911E2[a]	51	.000
Likelihood Ratio	167.463	51	.000
N of Valid Cases	161		

a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is .48.

Table 4.15 shows that the chi-square tests has the p-value .000 which is less than .05.This implies that there is a significant relationship between the role of district equality and standards office on effectiveness of SMASSE project and the performance of mathematics.

4.10 Logistic regression

The researcher used logit regression analysis to determine the key effects of SMASSE on performance of mathematics. Below, the researcher used the logit command to estimate a logistic regression model.

Table 4.16 Logistic regression

Logit admit structure, curriculum, attitude and DQASO

Iteration 0: log likelihood = -249.98826

Iteration 1: log likelihood = -229.66446

Iteration 2: log likelihood = -229.25955

Iteration 3: log likelihood = -229.25875

Logistic regression Number of obs = 52

LR chi2 (5) = 41.46

Prob > chi2 = 0.0000

Log likelihood = -229.25875 Pseudo R2 = 0.0829

Admit	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
(Constant)	-229.25875					
Structure	.0022644	.001094	2.07	0.038	.0001202	.0044086
Curriculum	.8040377	.3318193	2.42	0.015	.1536838	1.454392
Attitude	.6754429	.3164897	2.13	0.033	1.295751	.0551346
DQASO	.340204	.3453064	3.88	0.000	2.016992	

The regression model is; Performance = -229.25875 +0 .0022644(structure) + 0.8040377(curriculum) + 0.6754429 (Attitude) + 0.340204 (DQASO)

In the output above, we first see the iteration log, indicating how quickly the model converged. Also at the top of the output we see that all 52 observations in our data set were used in the analysis. In the table we see the coefficients, their standard errors, the

z-statistic, associated p-values, and the 95% confidence interval of the coefficients. All the independent variables are statistically significant.

For every one unit change in structure, the log odds of performance (versus non performance) increases by 0.002. For a one unit increase in curriculum the log odds of mathematics performance increases by 0.804. Increase in attitude and DQASO visits, performance is likely to increase by 0.675 and 0.34 respectively.

4.11 Discussion of the findings

This study established there was a significant difference ($p < 0.05$) between those who strongly agreed with the statement that the structure needs to be changed to enhance more efficiency leading. Also there is a strong positive correlation $r(52) = 0.70$) between SMASSE structure and mathematics performance and that that there is a significant relationship ($P < 0.05$) between SMASSE structure and mathematics performance. This agrees with Maithya (2012) who argued that though the SMASSE INSET curriculum has been relevant to the various subject areas, it needs to be amended from time to time in order to suit to the needs of the teachers. He further suggests that SMASSE structure seems not to addresses the needs of the teachers and might not help them to improve their classroom teaching.

It was also established most of the respondents strongly agreeing with the statement that; the curriculum needs to be amended to suit the needs of teachers. it was established that there is a significant relationship ($p < 0.05$) between SMASSE inset curriculum and mathematics performance. This disagrees with (SMASSE report, 2002) which indicated that the current SMASSE INSET is based on a curriculum, developed geared towards improving the performance in mathematics. This is because the curriculum consists of general topical issues in secondary school mathematics and

science education and that topic areas that are of concern to both teachers and students in the four subjects that is Biology, Chemistry, Mathematics and Physics are revisited and various measures proposed on how to tackle them in classroom situations.

The report further argued that the guiding principle of SMASSE INSET is the ASEI/PDSI pedagogical paradigm. ASEI principle involves providing meaningful teaching Activities focused on Student learning mainly Experimental/practical work and Improvising resources where necessary. PDSI approach embraces orderly steps of executing learning activity by first Planning for the activity, then Doing it while Seeing, observing with intent to evaluate and then finally Improving on the process. (ADEA, 2005; Republic of Kenya, 1988; World Bank, 2007; UNESCO, 1996).

Thirdly, the study established that the teacher individual attitude determines implementation of SMASSE INSET in schools. Also the tests of hypothesis indicated that there is a strong positive correlation $r(52) = 0.82$ between teacher's attitude about SMASSE and the performance of Mathematics. There is also a significant relationship ($p < 0.05$) between teacher's attitude about SMASSE and the performance of Mathematics. This agrees with Axiah (2004) who argued that the teacher related factor that have an impact in teaching / learning and eventually performance of students in mathematics in secondary school can be subdivided into six categories namely: Attitude of teachers, teaching methodology, adequate experimental skills and frequency of experiments, mastery of content, assessment of the students by teacher and interaction opportunities among teachers. John and Karaac (2004) stated that teacher's individual attitude about mathematics and science teaching / learning have a significant influence on their instructional practices. They go on to state that in some cases teachers beliefs about mathematics teaching / learning are not consistent with

classroom practices and though the teachers are aware of the conflict between them, they never try to change. The assumption is usually that awareness of difference between beliefs and practices would result in some attempt to change (Lerman 2002).

Finally, the study established that there is a significant relationship ($p<0.05$) between role of district equality and standards office on effectiveness of SMASSE project and the performance of mathematics. This agrees with Robins (1999) who argued that the role of the DQASO is to provide the teachers with support, guidance, feedback, problem solving skills and a network of colleagues who share resources, insights, practices and materials thus this work tries to assess the influence of such visits/supervision by the DQASO. A good curriculum provides an independent external evaluation of its effectiveness by promoting the standards, personal development and well being of the learners, the quality of its provision and how well it is led and managed. Curriculum supervision should contribute to improvement and be centered upon individual of learners.

The mission of the Department of Quality Assurance and standards is to establish, maintain and improve educational standards in the country. Its vision is to provide quality assurance feedback to all educational stakeholders on all educational institutions in Kenya. The function of assessing the standards of teaching and learning in schools is a reserve of the quality assurance directorate of the Ministry of Education. This directorate is charged with the responsibility of ensuring that there is standardization of education carrying out various types of assessment of schools and colleges.

CHAPTER FIVE : SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMENDATIONS

5.1 Introduction

This chapter is organized into the following subheadings: summary of the study, discussions of the study findings, conclusions of the study, recommendations of the study and suggestions for further studies.

5.2 Summary of the findings

The purpose of this study was to investigate the effect of SMASSE project in the performance of Mathematics in Secondary Schools in Kitui Central District. The study sought to establish the influence of SMASSE structure on the performance of Mathematics in secondary schools in Kitui central district, to determine the influence of the SMASSE INSET curriculum on the performance of Mathematics in secondary schools in Kitui central district, to establish the influence of teacher's attitude about SMASSE on the performance of Mathematics in secondary schools in Kitui central district and to ascertain the influence of the district quality and standards office on the effectiveness of SMASSE project in the performance of Mathematics in secondary schools in Kitui central district.

It was established that majority (46%) strongly agreed SMASSE structure affected the performance of mathematics in secondary schools. However there was a significant difference ($p\leq$) between those who strongly agreed with the statement that the structure needs to be changed to enhance more efficiency leading with 78% followed by the statement that the structure is an impediment to the efficiency of the project at all levels (69.2%). Also there is a strong positive correlation ($r = +0.70$) between

SMASSE structure and mathematics performance and that there is a significant relationship (P< 0.05) between SMASSE structure and mathematics performance.

It was also established that majority of the responses (52%) strongly agreed that the SMASSE curriculum significantly influenced the performance of mathematics. However there was a significant difference in the responses with majority (86.1%) of the respondents strongly agreeing with the statement that; the curriculum needs to be amended to suit the needs of teachers. It was also established that 88.5 percent of the respondents strongly disagreed with the statement that; the curriculum should remain as it has been since it is adequate. After testing the hypothesis it was established that there is a significant relationship (p< 0.05) between SMASSE inset curriculum and mathematics performance.

Thirdly, the study established that 85.5% strongly agreed with that teachers' attitude about SMASSE affected mathematics performance with majority (96%) strongly agreeing that the teacher individual attitude determines implementation of SMASSE INSET in schools. Also the tests of hypothesis indicated that there is a strong positive correlation (+ 0.82) between teacher's attitude about SMASSE and the performance of Mathematics. There is also a significant relationship (p < 0.05) between teacher's attitude about SMASSE and the performance of Mathematics. 0Finally, the study established that there is a significant relationship (p<0.05) between role of district equality and standards office on effectiveness of SMASSE project and the performance of mathematics.

5.3 Conclusions of the study

Based on the findings for this study, the researcher concluded SMASSE structure affected the performance of mathematics in secondary schools and that the structure

needs to be changed to enhance more efficiency. This is because most of the respondents were not comfortable with the structure. Secondly, the SMASSE curriculum significantly influenced the performance of mathematics and that the curriculum needs to be amended to suit the needs of teachers. After testing the hypothesis it was established that there is a significant relationship ($p< 0.05$) between SMASSE inset curriculum and mathematics performance.

Thirdly, the study concluded that the teacher individual attitude determines implementation of SMASSE INSET in schools since there is a strong positive correlation $r(52) = 0.82$ between teacher's attitude about SMASSE and the performance of Mathematics. Finally, the study concluded that there is a significant relationship ($p<0.05$) between role of district equality and standards office on effectiveness of SMASSE project and the performance of mathematics.

5.4 Recommendations of the study

From these research findings that the researcher made the following recommendations:

i. The structure of the SMASSE to involve classroom teachers more even at higher levels each drawn from all parts of the nation.
ii. The SMASSE curriculum needs to be reviewed from time to time.
iii. The SMASSE INSETs should be regularized and all teachers to attend new teachers also to be involved from the beginning of the project not just all teachers going to attend at will.
iv. The school environment should promote mathematics and science subjects.

5.5 Suggestions for further study

Considering the limitations and delimitations of this study, the researcher would like to make the following suggestions for further study;

i Assessment of the influence of SMASSE trainers characteristics in enhancing the performance of Mathematics and Science subjects in Kitui Central District.

ii Evaluation of the influence of school environment in implementing the SMASSE project.

iii Factors influencing the teachers' attitude towards SMASSE inset.

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APPENDICES

APPENDIX I: TRANSMITTAL LETTER

ELIZABETH KALEKYE

P.O Box……

16/1/ 2014

The Respondents

Kitui central district,

Dear Sir/Madam,

REF: TRANSMITTAL LETTER

I am a Post graduate student at the University of Nairobi pursuing a Master of Arts Degree in Project Planning and Management. As part of the requirements for the award of this degree I am conducting a study on the effects of SMASSE project on performance of mathematics in Kitui central district, Kitui County. I hereby request you to assist me in completing this questionnaire. Your information will only be used for the purpose of this study and it will be kept confidential.Do not write your name anywhere on the questionnaire.

I am very grateful for your participation and co-operation.

Thank you,

Yours faithfully,

Sign----------

Elizabeth Kalekye

APPENDIX II: QUESTIONNAIRE FOR THE PRINCIPAL

Please answer all the questions by ticking appropriately after carefully reading through them. The questions are seeking your opinion on the factors influencing the effectiveness of the SMASSE on the performance of Mathematics in Kitui Central District, Kitui County. The answers you give will be treated with confidentiality and will only be used for the purpose of this study. Do **not** write your name anywhere on this questionnaire

PART I : Personal Details

1. What is your gender? Male ( ) Female ( )

2. What is your age bracket? Below 25 years ( ) Between 25- 35 years ( )

35-45 years ( ) above 45 years ( )

3. What is your highest professional qualification. Diploma ( ) B/Ed ( )

M/Ed ( ) Any Other…….

PART II. SMASSE project organizational structure on the effectiveness of the SMASE project. Please use a tick **(√)**

4. Do you know how the SMASSE project is organized? Yes ( ) No ( )

5. Is there a level in the structure that in your opinion feel that it should be done away with?

Yes ( ) No ( )

6. If yes in the **5** above state the level……

7. (i) Does the structure make the SMASSE project more relevant? Yes ( ) No ( )

(ii) SMASSE project has led to better performance of mathematics in secondary schools in Kitui central district, Kitui county. (Tick whichever is appropriate)

Yes ( ) No ( )

The statements below describe the importance of the SMASSE project structure. Indicate the extent to which they are agreeable to you.

SA means **Strongly Agree, A** stands for **Agree, U means undecided, D** means **Disagree SD** means **Strongly Disagree.**

	SA	**A**	**U**	**D**	**SD**
The structure of the project makes it more effective.					
The structure enhances efficiency at all levels of the project					
The structure discriminative as one ascends the hierarchy.					
The structure needs to be changed to enhance more efficiency.					
The structure is an impediment to the efficiency of the project at all levels.					

PART III: SMASSE INSET curriculum

8. Do you think the curriculum of SMASSE is relevant? Yes ( ) No ( )

9. Do you think the curriculum delivered helps teachers to improve on content delivery in their respective subject areas? Yes ( ) No ( )

The statements below relate to the influence of the SMASSE INSET curriculum on the effectiveness of SMASSE project. Indicate the extent to which they are agreeable to you.

SA means **Strongly Agree, A** stands for **Agree, U stands for Undecided, D** means **Disagree SD** means **Strongly Disagree.**

	SA	A	U	D	SD
The curriculum needs an overhaul for better results.					
The curriculum needs to be amended to suit the needs of teachers.					
The curriculum should remain as it has been since it is adequate.					

PART III: The influence teacher's attitude towards SMASSE project on the performance of mathematics.

10. Indicate the subject area which your teachers have been attending INSETS.

Mathematics ( ) Physics ( ) Biology ( ) Chemistry ( )

11. Do you think the SMASSE training has enhanced the performance of your candidates in KCSE? Yes ( ) No ( ).

PART IV: This section relates to the influence of school environment on the efficiency of the SMASSE project on the performance of Mathematics and Science Subjects. Indicate the extent to which they are agreeable to you.

SA means **Strongly Agree, A** stands for **Agree, U means undecided, D** means **Disagree SD** means **Strongly Disagree.**

	SA	A	U	SD	D
The teacher individual characteristics affect the performance of Mathematics and Science subjects.					
The frequency of attendance of SMASSE INSETS changes teacher individual characteristics.					
The teacher individual characteristics determines implementation of SMASSE INSET in schools.					

PART V: This section deals with the influence of the school environment on the effectiveness of the SMASSE project on the performance of Mathematics and Science subjects.

12. i. Does your school facilitate your attendance? Yes ( ) No ( )

ii. Does your school have separate laboratories for each science subject?

Yes ( ) No ( )

iii. Does the school block timetable allow for separate times for science subject lessons?

Yes ( ) No ( )

PART VI: The statements below relate to the influence of the school environment on the effectiveness of the SMASSE project in the performance of mathematics and Science subjects. Indicate to what extent they are agreeable to you.

SA means **Strongly Agree, A** stands for **Agree, U means undecided, D** means **Disagree SD** means **Strongly Disagree.**

	SA	**A**	**U**	**D**	**SD**
The school timetable needs to be reviewed to accommodate the time required for the teaching of the science subjects.					
The laboratories are inadequate and poorly equipped to enhance better performance of Mathematics and Science Subjects.					

APPENDIX III: QUESTIONNAIRE FOR HEAD OF MATHEMATICS DEPARTMENT.

Please answer all the questions by ticking appropriately after carefully reading through them. The questions are seeking your opinion on the factors influencing the effectiveness of the SMASSE on the performance of Mathematics in Kitui Central District, Kitui County. The answers you give will be treated with confidentiality and will only be used for the purpose of this study. Do **not** write your name anywhere on this questionnaire

PART I Personal Details

1. Please indicate your gender. Male ( ) Female ( )

2. What is your age bracket? Below 25 years ( ) Between 25- 35 years ( )

35-45 years ( ) Above 45 years ( )

3. Indicate your teaching subject(s)……..

4. Please state your highest professional qualification.

Diploma ( ) B/Ed ( ) M/Ed ( ) Any Other……

PART I1.This section relates to the importance of the project organizational structure on the effectiveness of the SMASE project. Please use a tick (√) or a cross (×) where appropriate .

5. Do you know how the SMASSE project is organized? Yes ( ) No ( )

6. Is there a level in the structure that in your opinion feel that it should be done away with?

Yes ( ) No ( )

7. If yes, above state the level…….

8. Does the structure make the SMASSE project more relevant? Yes ( ) No ( )

The statements below describe the importance of the SMASSE project structure. Indicate the extent to which they are agreeable to you.

SA means **Strongly Agree, A** stands for **Agree, U means undecided, D** means **Disagree SD** means **Strongly Disagree.**

	SA	**A**	**U**	**D**	**SD**
The structure of the SMASSE project makes it more effective.					
The structure of the SMASSE project enhances efficiency at all levels of the project					
The structure of the SMASSE project is discriminative as one ascends the hierarchy.					
The structure needs to be changed to enhance more efficiency.					
The structure is an impediment to the efficiency of the project at all levels.					

PART III. This section relates to the SMASSE INSET curriculum on the effectiveness of the SMASSE project.

9. i. Do you think the curriculum of SMASSE is relevant?.

Yes ( ) No ( )

ii. Do you think the SMASSE curriculum should be reviewed from time to time?

Yes ( ) No ( ).

iii. Does the SMASSE curriculum address the needs in your subject area?

Yes ( ) No ( ).

10. i. Do you think the curriculum delivered helps teachers to improve on content delivery in their respective subject areas? Yes ( ) No ( )

ii. Indicate your teaching subject area below. Mathematics ( ) Biology ( )

Chemistry ( ) Physics ( )

11. How many SMASSE INSETS have you attended? All Four Cycles ( )

Three Cycles ( ) Two Cycles ( ) One Cycle ( ) None ( )

The statements below relate to the influence of the SMASSE INSET curriculum on the effectiveness of SMASSE project. Indicate the extent to which they are agreeable to you.

SA means Strongly **Agree, A** stands for **Agree, U meant undecided, D** means **Disagree SD** means **Strongly Disagree.**

	SA	A	D	SD
The SMASSE curriculum needs an overhaul for it to enhance better results in Mathematics and Science.				
The SMASSE curriculum needs to be amended to suit the needs of teachers.				
The SMASSE curriculum should remain as it has been since it is adequate.				

12. This section relates to the influence of the school environment on the effectiveness of SMASSE project on the performance of Mathematics and Science subjects. Indicate the extent to which they are agreeable to you.

SA means **Strongly Agree, A** stands for **Agree, U means undecided, D** means **Disagree SD** means **Strongly Disagree.**

	SA	**A**	**U**	**D**	**SD**
The school environment needs to be reviewed to accommodate the time required for the teaching of the science subjects					
The school environment is an impediment to the SMASSE effectiveness.					
More support from the school should be forthcoming so as to enhance the performance in science subjects.					