

SESEMAT AND ACEDOMIC PERFORMANCE OF SCIENCE AND MATHEMATICS IN
SECONDARY SCHOOLS, A CASE STUDY OF KISINGA SUB-COUNTY, KASESE
DISTRICT, WESTERN UGANDA

BY

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DECLARATION

I Kule yofesi hereby declare that this is my original work and has never been presented to any academic institution for any award.

Signature.....

Date.....17th 09. 2018.....

APPROVAL

This is to certify that the following research has been done under my supervision and is now ready for submission to the Board of Examination of Kampala International University with my approval.

 PP

Mrs. Nakirya Margret

Date 17th September 2018

DEDICATION

To the almighty God who has enabled me to take a successful step in my journey of academics and my parents Mr. Maate Maseka Erifaza and Mrs. Maate Mbambu Pirisikira who have been funding my education.

With out any limitation I also dedicate this research to my supervisor Mrs. Nakirya Margret, Brothers Baluku Godfrey, Bwambale Geoffrey, Masesereka Timothy, Thembo Joseph, Mbusa Justus. Sisters Muhindo Peluce, Biira Joy and Mbambu faith

Not forgetting my dear friends Baluku Swizine, Muhindo Baguma edimond, Rwiha Wyclif, Kule Kighoma Enosi and Mubunga Jesca who have been there for me.

May the almighty God bless you.

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LIST OF ABBREVIATIONS AND ACRONYMS

- SESEMAT- Secondary Science and Mathematics Teachers programme
- UNESCO- United National Education Scientific and Cultural Organisation
- MOEST&S- Ministry of Education, Science, Technology and Sports
- UNEB- Uganda National Examination Board
- UCE- Uganda Certificate of Education
- JICA- Japan International Cooperation Agency
- INSET- In-service Teachers' Training
- TRCs- Teacher Resource Centers
- ICT- Information and Communication Technology
- USE- Universal Secondary Education
- STEPU- Science and Technology Equipment Production Unit
- GOU - Government Of Uganda

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ABSTRACT

The secondary science and mathematics Teachers (SESEMAT) programme has been recognised as an effective tool in enhancing the quality of science and mathematics in secondary schools.

The SESEMAT programme was introduced in Uganda in 2005 with the purpose to improve the teaching of science and mathematics teachers at secondary level and to improve the performance in these subjects.

The main objective of the study was to assess the contribution of SESEMAT on the performance of science and mathematics in Uganda, a case study of Kisinga Sub-county, Kasese District, Western Uganda. It also established how implementation of SESEMAT, follow up and teachers planning due to the SESEMAT has affected the performance in science and mathematics by both teachers and students.

However, the study focused mainly on five secondary schools in Kisinga Sub- County in the period of two and a half months starting from May 2018 to mid July 2018.

The research design was a cross section that used both qualitative and quantitative approach in analyzing the data collected from fifty six (56) respondents.

The study found out that SESEMAT programme has lead to; improved teachers' and students' attitude towards science and mathematics, improved the performance of students in national examinations and enhanced practical teaching of sciences and mathematics

CHAPTER ONE

GENERAL INTRODUCTION

This study was about SESEMAT and the performance of science and mathematics in selected secondary schools in Kisinga sub-county, Kasese district. This chapter also presents the background to SESEMAT and students performance in sciences and mathematics, statement of the problem, objectives, hypothesis or research question, the scope of the study i.e. content scope, time scope, geographical scope, and time scope, significance of the study, definition of terms and conceptual frame work.

1.0. INTRODUCTION

The field of science has become the focal point of man's interest in the contemporary world (Saunders 1956). With the increasing scientific and technological advances, many countries are strengthening and modernizing science and technology in order to produce more and better qualified candidates for higher level scientific study.

In Africa, countries have been given aids from other countries like China, Britain, Japan and many others to assist in training teachers to update their academic backgrounds in science teaching and their performance in secondary schools. Teachers are provided with professional development through attending workshops and in-service training programs especially Secondary Science and Mathematics Teachers (SESEMAT) program. The academic and professional training of teachers after the adaptation of their teaching career has been found to have a direct and positive impact on science teaching practices and learner achievement and subsequent participation and success (Burgess and Galloway 1993).

In east Africa, teachers are seen as a driving force of the education system. According to the journal of research in education and society Vol 1.2 NO 1, April 2011, teachers must be given the required tool that will equip them to make teaching/ learning to be effective. This there fore means that teachers are looked as a pre-condition to achievement of all education in both quantitative and qualitative targets. Also a meeting in December 2008 made recommendations to all East African partners and national government to clearly identify their short and medium term needs for recruitment, development, training and rotation of science teachers. UNESCO implemented and recommended us by calling upon development partners to support national effort in this area, identify and meet the needs specified and provides predictable support in science teaching through a wide range of activities and mechanisms. Continuous support needs to be provided to science teachers in terms of redesigning and upgrading current teacher's education to enhance student's performance in science and mathematics subject.

On top of that, infrastructure development and use of open and distance learning needs to be enhanced to develop professional careers of teachers to effectively teach and enhance student's performance in the field of science and technological advancement in both developing and developed countries of the world. In order to realize Universal Basic Education (UBE) and

technological advancement, teachers of science needs to be motivated to arouse their students learning of mathematics and science since teachers are role models to learners. A teacher who is not motivated does not influence learning of students and therefore learners emulate nothing from him/her which eventually demoralize students and finally bring about poor performance in the field of science and mathematics. Boundura (1977), behaviours are acquired by watching a model performing a particular task or activity. This model displays it while the learner or student observes and tries to imitate. The teacher is seen by students as a role model whose behaviors are easily copied by them. What teaches like or dislike appreciates the learners feeling about learning and can impact on the student's performance (Yara 2009). It has been noticed that most teachers teach mathematics in a way that only enable them memorize the concepts and calculations without really understanding it and applying what they were taught. This happens as a result of teacher's attitude towards the teaching and learning of sciences and mathematics. One's attitude towards any subject, job or situation, determines that person's performance in that particular field of study. If a teacher develops a positive attitude toward his or her job, it would make him or her to work harder towards the success of his/her students. When the students realize that the teacher is hard working and has concern for them, it motivates them and this result into good performance in science and mathematics. Yara (2009) stated in his findings that teacher's attitude towards mathematics is a predictor achievement in mathematics and science fields. Ouguiya (1982) cited on Yara(2009) find out that students performance could be enhanced by teacher related factors such as teacher's enthusiasm resourcefulness and helpful behaviors. The role of the teacher in the success of any educational system can not over emphasized and that is why the national policy on education (2004) stipulated that no education system can rise above the quality of its teachers, this shows the importance of teachers in school. The success of science and mathematics performance depends greatly on the science and mathematics teacher since he/she is the prime move that put all that is contained in the curriculum.

Kabeera (2003) also agree with the ascertain and states that the condition in the world today demand that every student should be trained as a scientist, and that every citizen should have adequate and sufficient knowledge of science and technology to be able to appreciate and understand the many facilities and opportunities available in the field of science. It is this effort that the government of Uganda is encouraging students to take up sciences including mathematics at UCE (Uganda Certificate of Education).

Teaching of science and mathematics in Uganda is aimed at arming all Ugandan students with appropriate skills related to the field of science and technology to meet the challenges of millennium and scientific skills for improvement of their welfare in the ever changing world of technological advancement. To achieve these objectives, the government of Uganda through the ministry of education science technology and sports (MOEST&S) passed the policy of making science subjects compulsory at 'O' level in 2005. The role aim was to make Ugandans scientifically, technologically literate by acquiring skills for creative thinking and problem solving. Sciences are key subjects for people interested in careers like doctors, agriculturalists,

engineers, veterinary officers, science teachers and other related fields. It is to this effect that strategies are put in place to enhance science and mathematics performance in secondary schools through workshops and in-service training programs like SESEMAT. However, there have been poor performance in science and mathematics especially in rural secondary schools as shown by UNEB, UCE report 2009.

For years, scholars and researchers have made attempts to find out which factors (variables) influence student's achievement in science subjects. A growing body of evidence shows that schools can make a great difference in terms of student's achievement. This attribute to teacher as a difference in teacher effectiveness produce remarkable difference in performance. (Sanders and Rivers 1996, Vito 2003 and Anderson 2004) the classroom practices especially the teaching methods influences students' achievement. (Nabasiga 2004) Effective teaching of sciences depends on the teacher's preparation, varied teaching methods which are child-centered and the way a lesson is delivered to learners do a lot in terms of student achievement.

According to constructionist theory, the student is the center of learning with teacher playing a role of instructing the long process by encouraging him/her to freely express his/her views, share experiences with others, come up with a hypothesis and illustrate their findings. Teachers are advised to construct knowledge rather than being given knowledge through instruction (Duffy and Canning Ham 1996). Darling Hammond (2000) said that teachers qualification and quality plays a significant role in student performance. Therefore these theories suggest that to promote effective delivery in science and mathematics lesson, calls for discovery teaching method that center on the learners that teachers' centered which deprives the learner to express his ability in the classroom. Enhance performance in science and mathematics largely depends on the teachers performance like varied teaching methods which are child-centered, lesson preparation like scheming, use of learning materials and delivery procedures. In this study of science and mathematics needs organizing lessons with well motivated, qualified, with positive attitudes towards teaching or learning of sciences. Teachers professional development, better ways of imparting knowledge within the lesson room and improved students performance definitely improved performance and acquisition of relevant skills needed for the changing world.

1.1. BACK GROUND OF THE STUDY

The progress report on secondary science and mathematics teachers (SESEMAT) project as per 16/07/2008, points SESEMAT a joint venture between the Ugandan government through the ministry of education, science, technology and sports and the government of Japan through Japan International Cooperation Agency (JICA) initially on pilot basis. The SESEMAT project is mainly involved in in-service (INSET) of serving teachers of science and mathematics in secondary schools. It came into being when there was consistently poor performance in science namely Biology, chemistry, physics and mathematics became a concern all over the country. Broad circular inadequate facilities, inadequate staying poor attitude of mathematics and science teachers' negative attitudes of students were always cited as the poor performance in those fields. Although dismal performance in these subjects had almost been accepted as the normal way of

passing them in almost all schools, the ministry of education, science, technology and sports (MOEST&S) and other stake holders felt, there had to be an intervention, hence the introduction of the secondary science and mathematics teachers (SESEMAT) project through Japanese government through the Japan International Agency (JICA). This is because science (biology, physics and chemistry) and mathematics plays a significant role in areas of computer, nursing (medicine), manufacturing and industry Jerry 2002.

Furthermore the ministry of education, science, technology and sports report (2008) states that over the years, the government of Uganda has made many attempts to see that the performance of science and mathematics at the secondary level through provision of laboratory equipments, building of laboratories, recruiting of more science teaching staff, renovating the already existing ones to standard, provision of chemicals, text books, giving an incentive of extra 10% to science and mathematics teachers to motivate them, establishing of teachers resource centers (TRCS) introducing of computer science and ICT skills to both teachers and students to improve the student's performance in these fields which are crucial for economic development.

The program was then piloted in the districts of Butalega, Masaka and Tororo, where significant positive impact was observed after the implementation of the program. The role aim of the project was to improve the teaching and students performance respectively.

With the government of Uganda's science policy of the USE (universal secondary education), there was need to retool teachers of science and mathematics to suitably teach and realize substantial recruits from those fields for global development' The content and activities of INSET were based on the issue and topics established by the baseline survey that was conducted by the ministry of education, science , technology and sports (MOEST&S), Kyambogo university in November 2004 and the national trainers in 2005 under Japanese government international cooperation agency (JICA).

Three cycles of INSET for the pilot phase both at national and local level have been completed according to the report of the ministry of education and sports (2008). Each of the cycles has addressed specific issues from the above said survey. These themes were; positive attitudes enhance quality teaching and learning of science and mathematics, strengthening hands-on activities to enhance teaching, learning and performance of science and mathematics , aid actualization of ALE/PIE (activity/experiment, learner-centered, encouragement, improvisation-planning, implementation, evaluation and improvement principle to enhance the teaching and learning of science and mathematics in secondary schools all over the country.

After one year of SESEMAT inception, 38 non piloted districts applied to the ministry of education, science. Technology and sports for the national extension of SESEMAT activities in which some districts like Kasese, Kabarole and those in central, eastern and northern had picked interests. The ministry of education, science, technology and sports had no objectives and the proposal was officially approved by the government of Uganda through (JICA) Japan

international cooperation and agency from Japan. The joint evaluation on the pilot SESEMAT activities that was conducted by officials from the ministry of education, science, technology and sports and JICA in February 2007 confirmed positive impact on the attitudinal change of teachers, improved pedagogy and parental support. The ministry of education, science, technology and sports (2008) observed that the SESEMAT project captured strong attention to most of secondary schools and most districts in Uganda for her unique methods of teaching and learning of science and mathematics. The successful implementation of the pilot project contributed to formulation of the expansion pilot phase that was implemented in august 2007 by the ministry of education, science, technology and sports (2008).

1.2. STATEMENT OF THE PROBLEM

There is wide spread concern about the output (outcomes) of science and mathematics education at O level (ordinary level). For example the representative industry, say that they need more high-grade scientists, technicians and engineers if the country is to complete successfully in technology-intensive global markets Ryan (2003). The secondary science (biology, physics and chemistry) and mathematics teachers (SESEMAT) program was introduced in 2005 in Uganda to address the poor performance or failure rate in these subjects at O level. A number of teachers and stakeholders have been exposed to this program through training workshops, INSET with the aim of producing better qualified teachers who can adequately and professionally impact the scientific, technological and mathematical knowledge and skills through hands-on and minds-on activities in constructive learning environment.

The government of Uganda through the ministry of education, science, technology and sports has increased funding and expenditure in ensuring that laboratories are built and renovating the existing ones, recruiting more science teachers even giving the incentive of 10% no given to art teachers, chemicals and laboratory equipments, providing textbooks, supply of computers to government aided secondary schools together with recruiting computer teachers and laboratory technicians to handle science and mathematics accurately in order to enhance students' performance in those fields.

Birgen (2004) stated that despite the explosion of more science teachers in the last ten years, the problem of poor performance has persistently been realized year after year. This finding is in agreement with the country situation where there has been public outcry over the dismal students performance in science and mathematics at secondary school level over years as reflected by Uganda national examination board (UNEB) since 1980 to date.

Nyuguna (1998) says that it had already been discovered that schools in Africa had completely failed to adequately provide the required essential scientific, technological manpower for development. The poor performance in these areas have continued being reported by the Uganda National Examination board (UNEB) in spite of the intervention by the government through the ministry of education, science, technology and sports. Thus, in this research the researcher intended to establish whether SESEMAT's implementation has lead to enhanced student's

performance in science and mathematics inception in 2018 in Kisinga sub-county, Kasese district, Uganda.

1.3.0. OBJECTIVES OF THE STUDY

1.3.1. MAJOR OBJECTIVES

The over all objective was to assess the contribution of SESEMAT in the performance of science and mathematics in Kisinga sub-county, Kasese district, Uganda.

1.3.2. SPECIFIC OBJECTIVES.

1. To establish how the implementation of SESEMAT leads to enhanced performance of science and mathematics in Kisinga sub-county, Kasese district, Uganda.
2. To find out whether follow up due to SESEMAT leads to enhanced performance of science and mathematics in Kisinga sub-county, Kasese district, Uganda.
3. To examine whether teachers planning due to SESEMAT leads to enhanced performance in science and mathematics in Kisinga sub-county, Kasese district, Uganda.

1.4. RESEARCH QUESTIONS

The study was guided by the following questions;

1. How does implementation of the SESEMAT program contributes to students' performance in science and mathematics in Kisinga sub-county?
2. What are the contributions of follow-up activates in the performance of science and mathematics in Kisinga sub-county?
3. What is the significance of planning in performance science and mathematics in Kisinga sub-county, Kasese district, Uganda?

1.5.0. SCOPE OF THE STUDY

This covers the boundaries of the study in terms of the subject, geographical location or area and the time scope.

1.5.1. CONTENT SCOPE

The study assessed the contribution of SESEMAT in the performance of science and mathematics in secondary schools in Uganda, Kasese district and Kisinga sub-county. This study examined whether teachers' planning due to SESEMAT leads to enhanced performance of science and mathematics in Kisinga sub-county. It also investigated whether teachers follow up also leads to enhanced performance in science and mathematics in kisinga Sub-County and lastly to established how the implementation due to SESEMAT lead to enhanced performance of science and mathematics in Kisinga Sub-County.

1.5.2. GEOGRAPHICAL SCOPE

This study was carried out in Kisinga sub-county, Kasese district, Western Uganda. It is located on the boarder of Demomocratic Republic of Congo in west Kabarole district in the north, Rubirizi in the south and Kamwenge in the east.

The study covered five secondary schools which include; Kisinga Vocational Secondary School, St Thereza Girls School Nsenyi, Saad Memorial Secondary School, Kiburara and Garama Secondary school.

Kisinga sub-county was chosen to be the area of study mainly because first of all this is the area or sub-county where the center of SESEMAT Kasese district is located, center at St Thereza Girls School Nsenyi, most of the schools located there are government aided and full facilitated by the government i.e. St Thereza Girls School Nsenyi, Saad Memorial School and Kisinga Vocational Secondary school except Garama and St John's Seminary which are the only private schools. Secondly most of these are all accessible with all facilities that enhance learning though most of them are rural despite being government aided; they are not compared to Kasese Secondary School, Bright Academy, Kilembe Secondary Schools which are located in the heart of Kasese municipality. Thirdly the researcher hails near the same sub-county which became easy to reach with ease during data collection.

1.5.3. TIME SCOPE

The study took two months and a half starting from May 2018 to mid July 2018.

1.6. SIGNIFICANCE OF THE STURDY

The purpose of the study was to do comparative analysis in the view of studying and analyzing the contribution of SESEMAT in student's performance in science and mathematics subjects in Uganda.

This study accomplished would help the ministry of education, science, technology and sports to evaluate the role of professional development of teachers through SESEMAT in emphasizing INSET training workshop in order to realize good performance in science and mathematics in secondary schools.

The study would also help stakeholders like inspector of schools, both local and regional, district education officers, commissioners, ministry of education, science, technology and sports increasing awareness about services offered by teachers in the performance of science and mathematics at secondary level and increasing their welfare looking at their roles in learning and teaching process.

The study would also help secondary schools to improve performance in science and mathematics, improve the education system and influence parents towards learning and teaching progress.

The study would also lead to the award of the bachelors' degree E.g. Kampala International University.

1.7. DEFINITION OF THE TERMS

Follow up.

This is the return to an existing or a situation that is under way in order to determine what the current status is and whether all intended activities are done or being done.

Planning

This is the process of thinking about organization of activities required to achieve targeted goals or aims.

Implementation

This is a specific set of activities designed to put into practice an activity or program of known dimensions.

Participation

This is an involvement of commitment towards the value of an organization or program and willingness to help each other achieve the program achievements or goals.

1.8. CONCEPTUAL FRAMEWORK

A conceptual framework done is a diagrammatic representation between research variables, translated into visible picture or diagram to illustrate the relation or inter-connection between the independent, intervening variables and their output. It is a diagrammatic illustration which shows the cause effect relationship of variables.

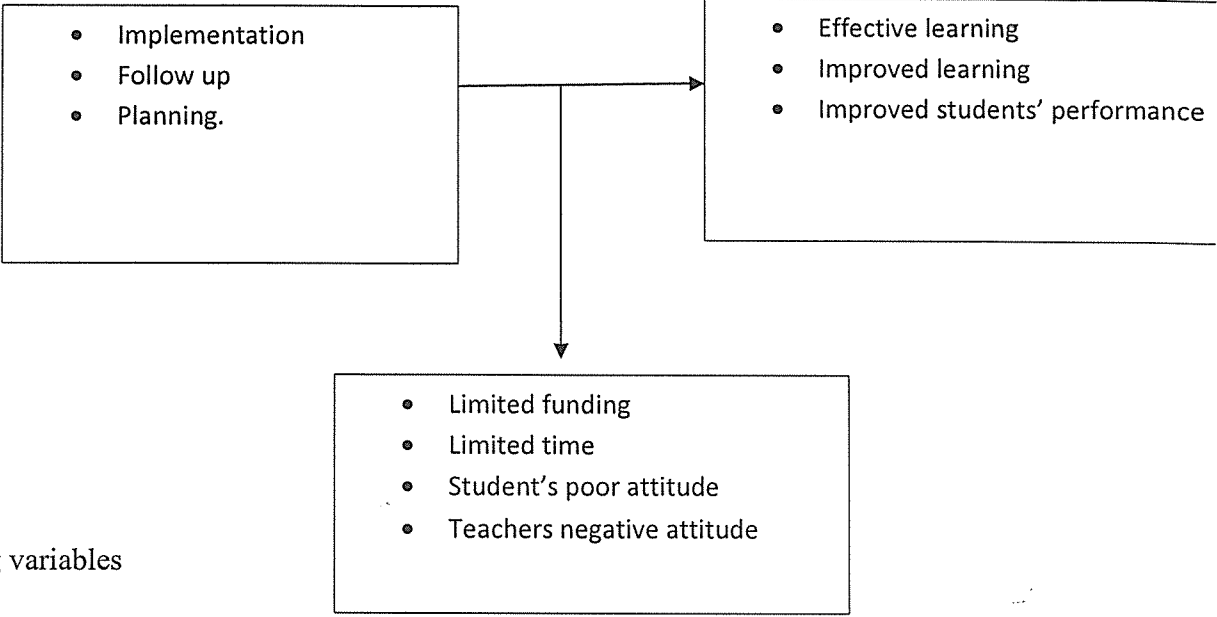
Figure 1 below shows the independent, dependent and intervening variables. On the variables there is a contribution of SESEMAT which includes making of follow ups, planning and implementation of programs while the dependent variable explains how SESEMAT influences the performance of students in science and mathematics at secondary level and professional development of teachers through effective teaching and improved students performance.

On the other hand, despite the above relationship, intervening variables that tends to interrupt the achievement of the set goals by teachers through planning, follow ups in the process of enhancing student's performance in sciences and mathematics like limited facilities, low motivation given to teachers, poor attitudes towards science and mathematics, finance being

limited and absence of learning materials in schools especially those located in hard to reach and privately owned schools with poor managerial skills.

Independent variable

dependent variable



Intervening variables

Figure

1

Source: Developed by the researcher

CHAPTER TWO

2.0. LITERATURE REVIEW

This chapter describes the literature on implementation of SESEMAT, follow up and planning as far as the performance of science and mathematics is concerned.

2.1. IMPLEMENTATION AND STUDENT'S ENHANCED PERFORMANCE IN SCIENCE AND MATHEMATICS.

Implementation of SESEMAT program requires teachers to bring out child-centered method of teaching that gives the students the free atmosphere of interacting within their class environment between themselves and their instructor (teacher). Since the implementation of SESEMAT in August 2005, 1800 teachers had undergone consistently SESEMAT training which has shown a positive altitudinal change towards their profession and improved their lesson delivery. A total of 2900 students had also been exposed to SESEMAT and also improved their participation. In a lesson as suggested in the SESEMAT progress report July (2008) through hands on and minds on.

Kuhn, (1989) states that some writing on science education has acknowledged that there tension between inducing students into a structure of agreed and essentially impersonal knowledge and the personal, social valves associated with education and schooling.

Driver et al 1994, further states that there is an existing future agenda in the developing and evaluating research evidence approaches to the teaching of other parts of science curriculum. The high demand from stakeholders towards (INSET) the compulsory science subjects at secondary school level and the national expansion of SESEMAT activities have had an impact on student's performance in science and mathematics.

Implementation commenced in August 2008 and run three years in which 2500 teachers in addition to the 2508 already trained were targeted. Furthermore 180 tutors of science and mathematics of primary teachers colleges (PRCS) and 30 lecturers of the same subjects at NTCs (National Teachers Colleges) were training as suggested by SESEMAT progress of July (2008).

A review of the research literature has shown that there is very clear evidence that formative assessment has lead to significant improvement in students test scores that is; their attainment as measured by summative assessment, Black (1998). A two year program showed that teachers measured SESEMAT program was improving their teaching and raised students test scores for the development of the program for the ministry of education in Scotland and a national program of study in science in England for key stage three and even at primary level, Hachman (2005). These developments have involved four main changes that is; the classroom dialogue, interactive feedback on written work, involving students in working in small groups to access each other work and making use of formal tests teachers regularly apply to add extra value to learning. It has also made students become active participants in their learning and more motivated to take learning so serious hence enhanced performance in science and mathematics.

Most verbal interactions involve teachers asking oral questions and allowing students to answer. However this student direct pattern occurs for less /frequently than the teacher direct pattern. Communication within the classroom involves teachers showing students what they need to know and learn. This is an agreement with Anderson (2004), assertion that showing and telling must go hand in hand if teachers are to be effective commemorators and describe the combination as demonstration or modeling. Sciences are practical subjects which entails “hands-on and minds-on” experience if effective learning is to be realized. This therefore means that teacher’s good communication skills related to demonstrating gestures, graphs, charts, specimen and visual displays improved learning and students performance as well.

In Uganda, teachers often find difficulties to use discovery method of teaching due to heavy loads, size and lack of funds to purchase the required materials (learning aids) Kabeera (2003). Teachers tend therefore to concentrate on traditional methods of teaching which are teacher - centered methods like lecture method, chalk and talk method which encourage cram work and passing on lots of notes which are not explained and integrated. Bigala (1971) describes this approach as an expository approach where the teacher presents the subject content from text books through lectures, during the lesson students are silent and do the work of listening as they take notes. Learners in this situation are not given chance to organize their learning materials for them selves in problem solving. Thus this study investigated whether the implementation of SESEMAT has lead to students’ enhanced performance in secondary schools in Kisinga Sub-County, Kasese district.

2.2. FOLLOW UP AND STUDENTS’ PERFORMANCE.

Education in Africa follow up program (SEIA), technical workshop on science and mathematics Tunis, January 29- February 6 (2009) stated that, the structure of Ugandan education system comprises of 2 year pre-primary, 3-7 years primary while 7-12 years of age, 4 years of lower secondary, 2 years of upper secondary ‘ A’ level are optional to students wishing to do them.

Following of poor performance (participation) and achievement in science and mathematics established through various studies at national assessment of performance in education, various strategies have been adopted in the teaching and learning of science and mathematics especially provision of science and mathematics education in Uganda. These strategies include construction of science laboratories, in schools , making science compulsory, targeted recruitment of science teachers, purpose full deployment of science and mathematics teachers to school in hard to reach areas especially rural areas, continued support to schools without laboratories through provision of science kits, capacity building of science and mathematics teachers through in-service training under the secondary science and mathematics teachers (SESEMAT) program (JICA/GOU) , and provision of low costs science and technical equipment production unit (STEPU) to schools.

The key reforms in the field of science and mathematics includes, support to universal secondary education USE in partnership with the world bank a program aimed at ensuring the delivery of universal secondary education in a more sustainable, cost effective and efficient manner.

According to Tunis 2009 the key reform under this initiative include infrastructure development, procurement modalities, developing effective partnership in delivery of universal secondary education, curriculum review, deployment and management, instructional materials and many others.

According to Tunis 2009 government In partnership with world bank a curriculum roadmap has been developed that will address curriculum concerns on curriculum overload, instructional time and assessment.

Government initiative from 2005 has been implementing a compulsory science policy at lower secondary and the first phase sat Uganda certificate of education in 2007. Science constitutes the core components of the education curriculum. The pass rate stood at 53 percent by the year 2012 through various intervention by providing science kits., tailor made capacity building, initiative targeting teachers continued sensitization and advocacy for science regular supervision of schools instructional materials have been done by science teachers and mathematics that shall fit phase of curriculum review. Further review and vetting of instructional materials was carried out on completion of the curriculum review process.

More use was made on science kits in all secondary schools starting with those without functional laboratories by the end of 2009. According to government policy, text books were to be supplied in large quantities to reduce student test ratio from the current 1:10 to at least 1:4 by the year 2010 especially in mathematics and sciences. The long term strategy is to put the instructional materials in the hands of the students and ensure that sciences are taught and learned particularly, infrastructural development that shall result into reduced congestion and there by enabling science teachers and performance including effective use of science kits. Effective utilization of available infrastructural facilities has been enhanced by the use of double shift teaching without loosing on the focus on learner centered teaching methodologies.

Ntambi (2003) said that, instructional materials like models may illustrate the content very well and in details into broad principles for better understanding.

According to witch and scheduled (1962) says that, instructional materials can rouse interests, stimulate, discuss and raise questions, simplify information and ideas among learners. The use of learning aids increases the quality of learning and performance respectively. They also increase the efficiency of teachers in terms of number of learners taught without reducing the quality of learning, Ellington (1998).

However, Kekuru (2003) noted that most schools especially rural schools which are located in hard to reach can hardly get any teaching/learning aids anywhere in the classroom during lessons because most schools do not have windows and doors for the safety of the learning aid. Some teachers fail to use the instructional materials in science and mathematics teaching due to lack of enough time, non-availability of materials, financial constraints of the school and poor relationship between the teachers and school administration, Bundikubi (2003). This research

specifically will found out how follow up programs of SESEMAT has lead to enhanced performance of students in sciences and mathematics in secondary schools in Kisinag Sub-County, Kasese district.

2.3. LESSON PLANNING AND SCIENCE PERFORMANCE IN SECONDARY SCHOOLS.

Every successful lesson starts with planning. Lesson planning is one of the teaching tools which is developed from the syllabus, scheme of work and other sources like textbook, internet.

A good planning of a lesson followed by effective implementation lead to its efficient delivery which can be ascertained through assessment and evaluation, This result of assessment and evaluation can be used by the teacher to improve the subsequent presentation leading to improved academic performance in science and mathematics, teachers need to come up with the guiding principles of planning, implementing, evaluation and improvement. This leads to the formation of the acronym PIEL which stands for planning, implementation, evaluation and improvement.

Graham Butt (2006) assets that, good teaching, classroom management, and sustainable learning progress lies in effective planning while poor planning is usually linked with inadequate lesson preparation. Lesson plans are systematic and logical guide to help teachers deliver their lesson well right from introduction to conclusion stage.

Essential science and mathematics lesson plans consists of four major components including lesson purpose, aims and objectives, subjects content compense and skills, implementation methodologies, strategies and evaluation (Urich and other 2010). Teachers need time to thing through these components to build logical, well linked lessons in learners' perspective. However many secondary school teachers rarely plan lessons in science and mathematics (classroom observation report) they regard lesson planning as time consuming hindrance to syllabus completion and duplication of the work which has an insufficient role in teaching process.

Planning for a lesson allows teachers to perform in the classroom environment and this suggests that teachers should apply quality of methods (Cestillo 2004). He further demonstrates that how the techniques are applied is very important because teaching methods are purely described by the teacher, the Author further asserts that the techniques can be applied to wide range of learner centered method which requires a lot of preparation, lesson plans provide a guide for managing the learning environment and essential if the teacher is to be effective and efficient. Teachers should begin by having clear mental picture of the exact change to occur among the learners and therefore plan a head regarding what, when and how they are going to teach if students are to pass. Selection of the content and how to pass depends on the planning of the teacher. Deciding when to teach a topic or subject content requires structuring a course in a logical sequence. According to Obanya (1985), the planning has to proceed from larger to small and from known to unknown events for effective teaching and learning.

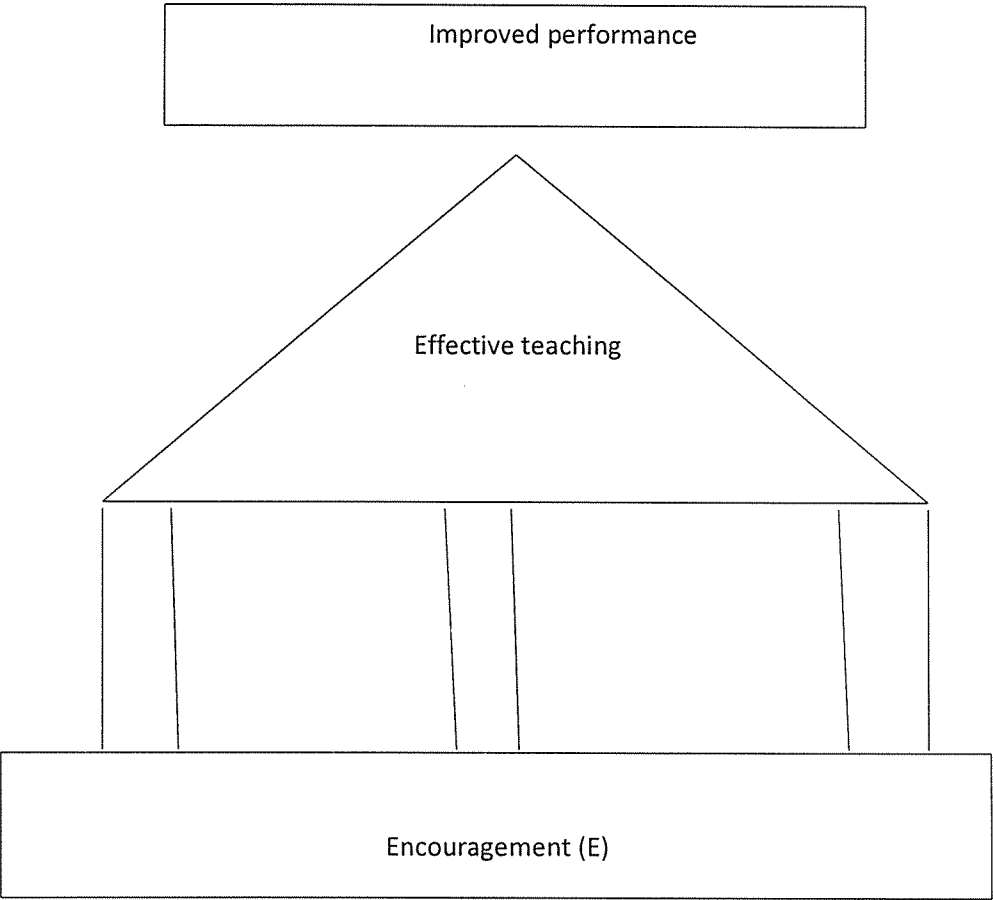
Everton and Weade (1988) points out that instructors prefer constructing detailed questions which are typed while others prefer briefest notes typed while teaching provides guide about how a lesson will be conducted. According to Jablonka (2003) a lesson plan usually specifies lesson activities (teacher and student activities). The lesson activities are divided under five phases/stages which include the following, review of previous work, presentation of content/topic and the problem of the study, development of the procedure of solving the problem, learners working individually or in group to solve the problem, discussion and summarizing main point often by the teacher like strong and weakness.

The role of the teacher is the center of learning by directing and guiding learning process of science and mathematics.

The learner natural curiosity should be an entry point that enhances learning of science and mathematics. Proper guidance and enables learners to relate their current knowledge of science and mathematics to everyday life experience. Though group discussions, learner in plan, solve problems, make decisions and apply the scientific and mathematics content to new situation. Effective teaching should include four elements, the activities/experiments by the learner, learner centered approach and encouragement from teacher to learner and employing improvising techniques. There is need for paradigm shift as follows.

- Content based –activity/experience.
- Teachers- centre- learner centre.
- Laissez faire- encouragement.
- Recipe type of experiments to appropriate experiments involving the use if improvising.

Figure 2 showing elements of teaching effectively.



ALEI Activity/Experiments, Learner centered, Encouragement, Improvisation

CHAPTER THREE

METHODOLOGY

3.0. INTRODUCTION

This chapter addresses the research design that was used in the field of study, location, population sampling procedure, sample size, data collection and methods, data management and processing, data analysis, ethical consideration, limitation of the study, time frame and executive summary of the chapter.

3.1. RESEARCH DESIGN

This research was a cross section that involved both qualitative and quantitative approach. The study described all forms of all ways in which SESEMAT contributes to enhanced performance in science and mathematics in secondary schools. A defined case was picked as the most appropriate research strategy (Saunders et al 2003) of a case study as a strategy for doing research which involved an empirical investigation of particular settings/ contemporary phenomenon within its real life context using multiple sources of evidence. This fit well the authors' intention to investigate a real life issue through a variety of data collecting methods. Quantitative design was also used by selecting key information and using non-open ended type of questions. It involved numerical data collection where as for qualitative, the study involved respondents quality suggestions, feelings, reactions and using open-ended and closed questions. The quantitative technology was used for purposes of analyzing data collected from the field and also to establish the relationship between the variables. The technology also enabled the research to meet the objectives of the study. A statement used to design variables that were not adequately measured using numbers and statistics. The quantitative technique of the research design was used in form of mathematics, numbers and statistics assigned to variables that was not directly measured using statements of the theme.

3.2. AREA OF STUDY

This study was carried out in Kisinga sub-county, Kasese district, Western Uganda. Kisinga sub-county is located six kilometers from Kasese Mbondwe Kiburara road, Bukonzo constituency, Bukonzo East County, Kasese. It is between Kyondo, Munkunyu and Lake Katwe and in the north of the Kazinga National park.

Kisinga sub-county has got the following parishes; Nsenyi, Kagando, Nyabirongo, Kejwenge.

The entire population depends on subsistence farming and business which is on a small scale as a source of their livelihood.

3.3. POPULATION OF STUDY

Kisinga sub-county has a total population of 8000 of which 3500 are males and the remaining are females. The sub-county has a total number of 3700 households. It has many secondary schools which include, St Thereza Girls Secondary School Nsenyi, Kisinga Vocation Secondary school, Garamba Secondary school, St Johns Seminary, Saad Memorial Secondary School, St Stephens Secondary

ool and Vision Secondary School Kamughobe. This study focused on few secondary schools which includes; St Thereza Girls S.S Nsenyi , Saad Memorial, St John's Seminary, Garama S.S, and Kisinga Vocation Secondary School. the study involved schools' management committee members, and teachers, students, civil servants, political leaders, households, men and women selected from the wishes. All categories of people mentioned above helped the researcher in collecting data for the research paper.

3.4. SAMPLING PROCEDURE.

The research employed the following techniques, non-probability sampling, and purposeful sampling technique and stratified random sampling. Stratified sampling technique helped in the process of selecting some samples in the way the identified sub groups in the population represented the rest of the population by providing information about the contribution of SESEMAT. These involved teachers, head teachers, students, school management committees and local leaders in their respective categories. A list of teachers, student's local leaders, civil servants was made and given to them to tick the most appropriate contribution by agree, disagree, strongly agree and strongly disagree. Old members based on the side of students on the side of female and even members on the males had a chance of being selected.

3.4.1. SAMPLE SIZE

The subject comprised of school management committee members, local leaders, students, teachers, civil servants, households men and women. This study targeted 100 respondents to represent the rest of the population. Due to the position they are holding, reliable data was collected that was resourceful to the researcher. Non probability sampling approach was employed in determining the sample size as required by the approach.

3.5. DATA COLLECTION METHODS AND INSTRUCTIONS

The study focused on both primary and secondary sources. Primary sources helped in collecting data from key informants using questionnaires, interview guides and focus on group discussions. This was quite useful in clarifying questions that was arising from the respondents. This involved open ended questions asked within the selected population, secondary documents like journals, magazines, text books, internet sources, publications and related reports. Qualitative and quantitative analysis was also used in analyzing data collected from the selected population.

3.6. QUALITY CONTROL METHOD

The data was provided by stake holders like teachers, head teachers, students, civil servants and households. Both men and women were treated with a lot of confidentiality. It was treated as primary data that were relied on by the research to compile the final report. That data did not exaggerate or omit it but instead treated as valid information concerning SESEMAT in Kasere, Kisinga sub-county.

3.7. DATA MANAGEMENT AND PROCESSING

The management of data comprised of editing the data collected from the field which was done in the field and after the field. This was done through completing and ensuring accuracy of the responses given by

ferent respondents about the study topic, question that was read through to ensure that all questions thoroughly answered and written correctly.

rocessing of data was done through coding which is the process of clarifying answers and questions to meaningful categories so as to bring out essential pattern. A coding frame was developed for only closed ended questions to aid and facilitate tallying of data.

3.8. DATA ANALYSIS

As soon as data collection from the field of study was done, it was edited, coded and analyzed to minimize errors and ensuring consistency. It involved categorizing, discussing, clarifying and summarizing of the responses to each question in the coding frame basing on the various responses that was in the questionnaire. This eased the work of tabulating the work. Answers for open-ended questions was listed and assigned numbers through corresponding value labels to each question in which the data were coded.

3.9. ETHICAL CONSIDERATION

The population comprised of head teacher, teachers, civil servants, political leaders, households, SEEMAT trainers, men and women. They were requested to fill questionnaire or answers on the interview guide willingly. Information got from them was treated with a lot of confidence and considered variable and reliable that shall help the researcher complete the research report successfully. All categories of people both key informants and other people who aided the research accomplishment were acknowledged upon the assistance theory which had accorded the researcher.

3.10. LIMITATIONS OF THE STUDY.

The limitations of the study are the hindrances or anticipated constraints or potential weaknesses of the study imposed or brought about by the methodology applied in the study. The study found limitations in finding out the contribution of SESEMAT in the teaching and students' performance of science and mathematics in Kisinga sub-county Kasese district.

Yen (2005) explains limitations as the factors or conditions that prevent the achievement of the intended goal. The anticipated limitations included the following;

- Inadequate funding to help in movement, printing and processing of the data up to completeness of the report.
- Limited time for students, teachers and head teachers who are tied up by school time tables that make them busy all the time hence failure or delayed gathering and processing of data.
- Language barrier shall be another likely danger for those households who did not have attended school and interpreting the questionnaire may be difficult hence providing inaccurate information.
- Slow and no-response from the respondents.
- Due to sensibility of the study, some respondents shall be compelled to hide the information relevant to the study or deliberately ignore the study hence limiting the completeness of the research report.

Despite the above limitations the research did not fail to come up with the required information, measures like borrowing from friends, money lenders and other responsible people to finance the research was put in place to ensure success. Time was fixed amidst several activities of different categories of people to provide the required information, language deficiency that dealt with in terms of interpreting in the local language for those people who was identified illiterate and unable to read and write and the other remedies that was seen viable.

3.11. EXECUTIVE SUMMARY OF THE CHAPTER.

The research used a descriptive cross- sectional survey, where data was collected at one point in time from cross-section of respondents. This was useful in the study because it involved collecting of data from relatively large numbers of respondents from various parishes of the sub-county including different schools of interest about SESEMAT and its contribution in student's performance in science and mathematics in secondary schools especially those located in Kisinga Sub-county. According to Amin (2005) descriptive research deals with discussing characteristics of an event or item being studied with the aim of providing systematic description that is precise as possible. In addition to that, the research also employed quantitative approach for data collection and analysis that involved tables, graphs and other charts necessary in the research.

CHAPTER FOUR

4.0. INTRODUCTION

This chapter presents the analysis and interprets the data findings on the assessment of the contribution of SESEMAT programme in the teaching of science and mathematics in secondary schools in Uganda with opening reference to Kisinga Sub County, Kasese district.

The data findings are presented and analyzed in different sub sections as a social demographic characteristics of the respondents and the objectives of the study established how implementation, follow up and teachers' planning leads to enhanced performance of science and mathematics in Ugandan schools with specific reference of Kisinga Sub County in Kasese district.

This chapter reveals to the readers the findings that the researcher investigated from the field (first hand data) as the research major aim of the research objectives.

4.1. DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

The aspects of social demographic characteristics of the respondents include; gender, level of education and age bracket. This was an essential part and aspect since personal information shows the attitudes involved in the respondent's profile that affects the data findings of the study. Therefore was based on different respondent's feelings, intelligence and attitudes.

Figure 1: shows respondents according to gender

Respondents	Frequency	Percentage (%)
Males	32	57.1
Females	24	42.9
Total	56	100.0

Source: field research findings May 2018

From the figure (figure 1) both males and females were given equal opportunities of becoming respondents in the above study. It was found out that 32 were males which accounted for 57.1% females were 24 accounting for 42.9% of the respondents, totaling to 56 respondents, which revealed that more males were involved than females.

Figure 2: shows percentage respondent according to designation in schools

Designation	Frequency	Percentage (%)
Head teacher	4	7.1
Teachers	18	32.2
Students	34	60.7
Total	56	100.0

Source: field research findings may 2018

From the table 2 above, 4 were heads of the institutions accounting for 7.1%, 18 teachers (32.2%), 34 learners accounting for 60.7% making a total of 100.0%. this means that the research findings were reliable and valid because they were got mainly from the key informants that constitute a school.

Figure 3: shows respondents according to the level of education

Education level	Frequency	Percentage (%)
'O' level	14	25
'A' level	12	21.4
Certificate	4	7.1
Diploma	16	28.6
Graduate	10	17.9
Total	56	100.0

Source: field research findings May 2018

Table 3 shows 14 respondents (25%) who attained 'O' level, 12 respondents (21.4%) with advanced level 4 respondents (7.1%) had go certificates, 16 (28.6%) had diploma level and 10(17.9%) were at degree level. This table showed that all respondents had attained formal education at different levels.

The figure 4: shows respondents according to marital status

Marital status	Frequency	Percentage (%)
Single	30	53.6
Married	19	33.9
Widowed	02	3.6
Divorced	05	8.9
Total	56	100.0

Source: research findings May 2018

From figure 4, findings showed that 30 (53.6%) were not married, 19 (33.9%) were married, 02 (3.6%) had lost their dear ones, 05 (8.9%) divorced. This means that all categories of respondents were contacted for findings because they all presented in the study.

Table 5: shows the percentage of respondents by age bracket

Age bracket	Frequency	Percentage (%)
15- 25	30	53.6
26-36	14	25.0
37-47	10	17.8
48-58	02	3.6
Total	56	100.0

Source: field research May 2018

Figure 5 above shows the age bracket of the respondents who were contacted for data collection. 30 (53.5%) were between 15- 25 years, 14 (25.0%) were between 26 – 36 years, 10 (17.8%) were between 37 – 47 years and 02 (3.6 %) were between 48 – 58 years. From the above, the respondents were ranged between 15 and 58. This meant that the data collected was got from mature and intelligent people and all school going age and working class.

Table 6: shows the percentage of respondents on how long they have known SESEMAT as an operating programme

Duration	Frequency	Percentage (%)
1 year	10	17.8
1 – 4 years	22	39.3
5 – 10 years	24	42.9
Total	56	100.0

Source: field research findings May 2016

From the figure 6 above, 10 (17.8%) of the respondents had known SESEMAT as an operating programme for less than 1 year, 22 (39.8%) for more than 2 years, 24 (42.9%) for more than 5 years and above. This statistics meant that all respondents had ever heard about SESEMAT as an operating programme in Kasese district.

Table 7: shows the percentage of respondents' opinions on whether implementation helps teachers to carefully observe learners behaviors during the lesson

Scale	Frequency	Percentage (%)
Strongly agree	26	46.4
Agree	12	21.4
Disagree	10	17.9
Not sure	08	14.3
Total	56	100.0

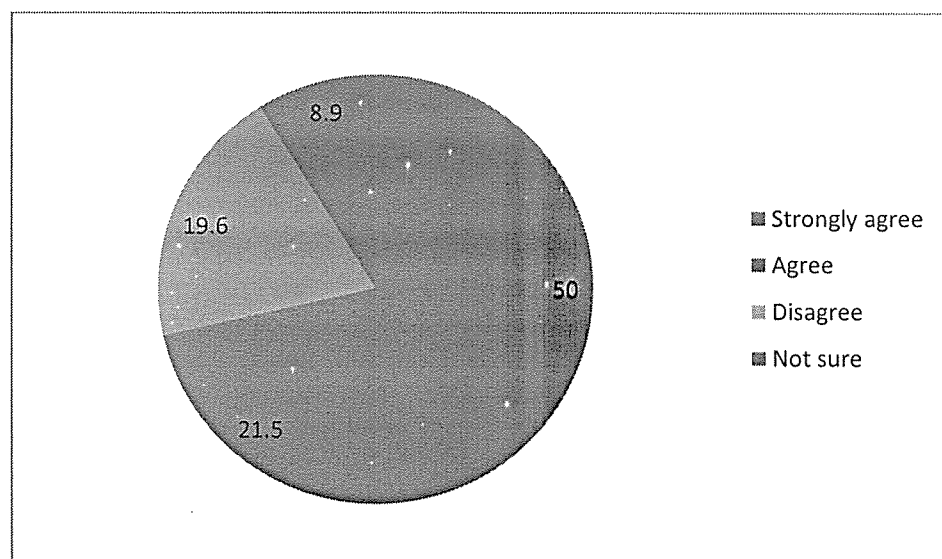
Source: field research findings May 2018

From the table above, 26 (46.4 %) strongly agreed, 12 (21.4%) agreed, 10 (17.9%) disagreed and 08 (14.3%) did not have a stand point and there fore not sure.

The above statistics showed that 46.6% strongly agreed with the above information. Its effectiveness in teaching and attendance to all lessons help teachers to carefully observe the behaviors of the students during the lesson presentation in secondary schools in Kisinga Sub county, Kasese district.

4.2. THE IMPLEMENTATION OF THE SESEMAT PROGRAMME AND TEACHER PERFORMANCE IN SCIENCE AND MATHEMATICS.

Figure 4.2.1: shows respondents' opinions on whether implementation helps teachers to conduct the lesson following the developed lesson plan



Source: field research findings May 2018

From the above figure (figure 4.1.1), the statistics shows that 28 (50.0%) strongly agreed, 12 (21.5%) disagreed and 5 (8.9%) not sure. From the above table, the study findings show that 71.5% of the respondents agreed that implementation of SESEMAT help teachers to conduct lessons following the developed lesson plan in secondary schools n Kasese district.

Table 8: shows respondents' opinion on whether implementation helps teachers in formulation of the values or the application of the lesson.

Scale	Frequency	Percentage (%)
Strongly agree	20	35.7
Agree	08	14.3
Disagree	22	39.3
Not sure	06	10.7
Total	56	100.0

Source: field resource findings May 2018

The table above indicates that 20 (35.7%) strongly agreed, 8 (14.3%) agreed, 22 (39.3%) disagreed and 6 (10.6%) were not sure. From the study findings 39.3% of the respondents disagree that implementation helps teachers in the formulation of the value or application of the lesson and there fore there are other factors that determine the value or application of the lesson by teachers in the secondary schools in Kasese district.

4.3. FOLLOW-UP PROGRAMMES DUE TO SESEMAT AND STUDENTS' PERFORMANCE IN SCIENCES AND MATHEMATICS.

Table 9: shows respondents' opinions on whether follow-up of SESEMAT programme help on the performance of learners in science and mathematics.

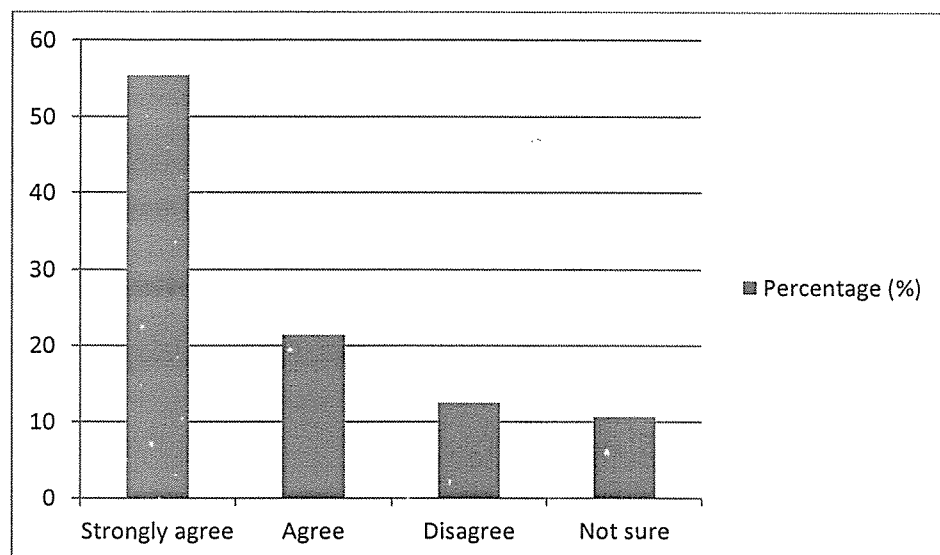
Scale	Frequency	Percentage (%)
Strongly agree	8	14.3
Agree	7	12.5
Disagree	29	51.8
Not sure	12	21.4
Total	56	100.0

Source: field research findings may 2018

From the above figure, 8(14.3%) of the respondents strongly agreed, 7 (12%) agreed that that follow-up of SESEMAT programme increase on the performance of learners, 29 (51.8%) disagreed and 12 (21.4%) were not sure.

The table shows that 51.8% of the respondents disagreed that follow-up of SESEMAT program increases on the performance of learners as far as supervision is concerned as shown by the key informants in the secondary schools in Kisinga Sub county Kasese District.

Figure 4.3.1: shows respondents' opinions on whether follow-up increases on the chances of implementation of SESEMAT programme by teachers.



Source: field research findings May 2018

The above figure indicates that 31 (55.4%) of the respondents strongly agreed, 12 (21.4%) agreed that follow-up increases the chances of implementing SESEMAT programme by the teachers in secondary schools in Kasese District. While 7 (12.5%) disagreed and 6 (10.7%) were not sure in reference to the above findings, thus follow-up increases on the chances of implementing SESEMAT programme by the teachers in the secondary schools in Kasese District.

Table 10: shows respondents' opinions on whether follow-up enhances sustainable regional activities of SESEMAT.

Scale	Frequency	Percentage (%)
Strongly agree	3	5.4
Agree	11	19.6
Disagree	24	42.9
Not sure	18	32.1
Total	56	100.0

Source: field research findings May 2018

The table above indicates that 3 (5.4%) strongly agreed, 11 (19.6%) agreed that follow-up enhances sustainable regional activities of SESEMAT, 24 (42.9%) disagreed and 18 (32.1%) were not sure.

From the table findings, many of the respondents disagreed that follow-up enhances sustainable regional activities of SESEMAT and therefore, there are other related factors like lesson

observation by the DOS, head of departments, which can also enhance sustainable regional activities of SESEMAT in secondary schools in Kisinga Sub County, Kasese District.

4.4. THE CONTRIBUTION OF THE SESEMAT PROGRAMME ON THE PERFORMANCE OF SCIENCE AND MATHEMATICS.

Table 11: shows respondents' opinions on whether SESEMAT programme has contributed to quality science and mathematics in secondary schools.

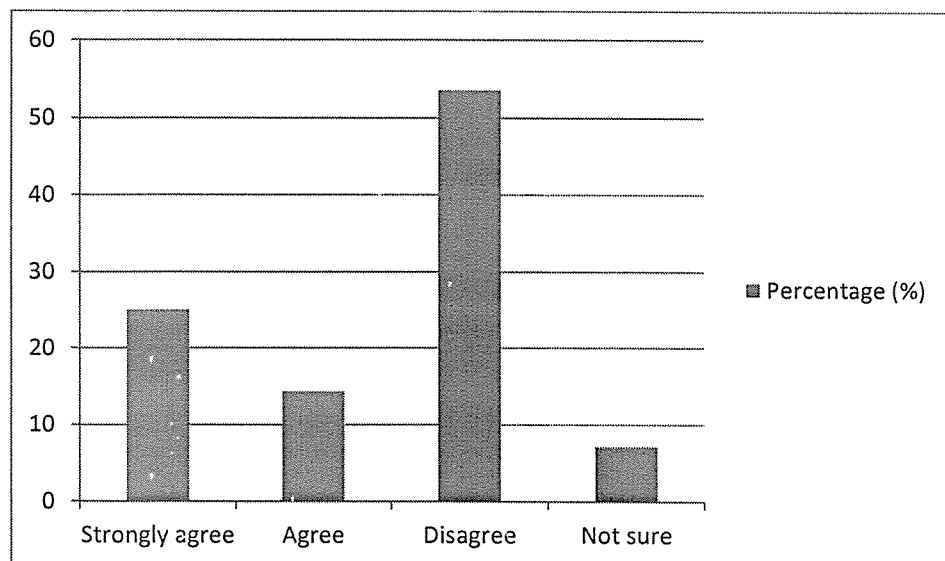
Scale	Frequency	Percentage (%)
Strongly agree	09	16.1
Agree	12	21.4
Disagree	32	57.1
Not sure	03	5.4
Total	56	100.0

Source: field research findings May 2018

The figure above indicates that 9 (16.1%) strongly agreed, 12 (21.4%) agreed that SESEMAT programme has contributed to quality science and mathematics, 32 (57.1%) disagreed and 3 (5.4%) were not sure of whether it has any impact on the quality of science and mathematics in secondary schools.

From the study findings 57.1% of the respondents disagreed that SESEMAT programme has contributed to quality science and mathematics and therefore suggested that there are other related factors like support to teachers from heads of institutions, lesson planning, motivation and many others. This was evident by the key informants in secondary schools on Kisinga Sub County Kasese District.

Figure 4.4.1; shows respondents' opinions on whether planning contribute to quality science and mathematics education in secondary schools.



Source: field research findings May 2016

From the above statistics, 14 (25.0%) strongly agreed, 8 (14.3%) agreed that lesson planning contribute to quality science and mathematics education, 30 (53.6%) disagreed and 4 (7.1%) did not have a stand point. This meant that more than 50% of the respondents disagreed that planning of lesson contribute to quality science and mathematics education in Kisinga Sub County, Kasere District.

According to the key information, even planning of the lessons contributes to quality science and mathematics teaching in secondary schools. Most head teachers do not supervise class room teachers on the lesson planning and scheming for the improvement in their teaching and students' performance.

4.5. LESSON PLANNING AND THE PERFORMANCE OF SCIENCE AND MATHEMATICS.

Table 12; shows respondents' opinions on whether lesson planning helps teachers in the teaching of science of science and mathematics in secondary schools

Scale	Frequency	Percentage (%)
Strongly agree	23	41.1
Agree	16	28.6
Disagree	11	19.6
Not sure	06	10.7
Total	56	100.0

Source: field research findings May 2018

From the above table 23 (41.1%) strongly agreed, 16 (28.6%) agreed that lesson planning helps teachers in the teaching of science and mathematics in secondary schools Kisinga Sub County, Kasere District, 11 (19.6%) disagreed while 6 (10.7%) were not sure. The data found out 69.9% of the respondents agreed that lesson planning help in the teaching of science and mathematics through lesson observation by SESEMAT programmes. Some of the science teachers in some schools had been praised as according to the key information at the end of the year 2015 for their tireless performance in science being done than even Art subjects. This was so because of well organized lesson planning, lesson observation and proper implementation of SESEMAT programme. This was evident in schools which were located in urban and pre-urban than rural which were not accessible by supervisors.

Table 13: shows respondents' opinions on whether planning contributes to quality science and mathematics education in secondary schools

Scale	Frequency	Percentage (%)
Strongly agree	28	50.0
Agree	18	32.1
Disagree	07	12.3
Not sure	03	5.4
Total	56	100.0

Source: field research findings May 2016

According to the table above, 28 (50.0%) strongly agreed, 18 (32.1%) agreed that lesson planning helps teachers in identifying teaching resources, 7 (12.5%) disagreed and 3 (5.4%) were not sure. From the above findings, 82.1% of the respondents agreed that lesson planning helps teachers to identify the teaching or learning resources. This was in agreement with the information got from the head teachers visited during data collection. These head teachers postulated that lesson planning helps teachers to carefully identify learning/ teaching aids whether physical or drawn charts for those that cannot easily be got.

Table 14: shows respondent's opinions on whether lesson planning helps teachers to think of how they can improve teaching and leaning within the classrooms

Scale	Frequency	Percentage (%)
Strongly agree	22	39.3
Agree	08	14.3
Disagree	20	36.7
Not sure	06	10.7
Total	56	100.0

Source: field research findings May 2018

From the able above (table 17); 22(39.3%) strongly agreed, 8 (14.3%) agreed that lesson planning help teachers to develop ways of improving teaching and learning in classrooms. While 20 (36.7%) disagreed and 6 (10.7%) were not sure. According to the above figure, bigger percentage (53%) showed that lesson performance in science and mathematics on the side of the teacher and enhanced performance on the side of the learners in secondary schools in Kisinga sub- County, Kasese District, Western Uganda depends on the lesson planning.

CHAPTER FIVE

DISCUSSION OF THE RESULTS, CONCLUSIONS AND RECOMMENDATIONS

5.0. INTRODUCTION

This chapter presents the discussions, conclusion and recommendations including the areas for further research.

5.1. DISCUSSION OF THE FINDINGS.

5.1.1. HOW IMPLEMENTATION OF THE SESEMAT PROGRAMME LEADS TO ENHANCED PERFORMANCE OF SCIENCE AND MATHEMATICS IN KISINGA SUB COUNTY KASESE DISTRICT.

Research findings showed that 67.8% of the contacted respondents agreed that implementation of the SESEMAT programme leads to quality of science and mathematics teaching in Kisinga Sub County Kasese District; Basing on the findings, there is low levels of implementing SESEMAT programme in the secondary schools in Kisinga Sub County Kasese District. This is evident in the very few schools that carry out and conduct lesson observation by DOS, HOD and head teachers. This failure to carry out that directly affects students' performance. Those schools whose lessons are observed, performance is good and lessons become livelier as students apply "hands on minds on" abilities.

Research showed that 2 out of 5 head teachers observed their lessons and 3 did not mind they lessons and did not even mind to know what it means by lesson observation. This was more pronounced in private secondary schools which at time refuse to send their science teachers for SESEMAT INSET trainings claiming there is no money to facilitate them.

Research findings also showed that there is some kind of lesson observation in government aided secondary schools where some grants are given, laboratory equipments given, passes trained teachers unlike the counterparts which rely on unqualified teachers who do not even know how to plan, scheme for their lessons. More to the above lessons of teachers are taught when they are not well motivated economically.

5.1.2. CONTRIBUTION OF SESEMAT PROGRAM TOWARDS ENHANCED PERFORMANCE OF SCIENCE AND MATHEMATICS IN KISINGA SUB COUNTY KASESE DISTRICT.

From the findings of the study more than 50% of the respondents disagreed that follow up due to SESEMAT program leads to enhances teaching of science and mathematics in secondary schools in Kisinga Sub County Kasese District. It is more important if monitoring was done by head teachers, DOS and HOD of the departments that lead to enhanced improved students' performance in the District of Kasese Kisinga Sub County.

More so also the findings reveals tat more than 50% of the respondents disagreed that follow up of SESEMAT program improves science teaching and students' performance respectively in

Kisinga Sub County Kasese district. It also showed that follow up of SESEMAT has been limited by inadequate finding of national and regional trainers. And it was also said that they have their teaching loads on which they are committed to in their respective schools which make it hard for them to adequately train. This limited follow ups make teachers less effective and perform poorly in their teaching which directly affect student's performance. This has probably been held responsible for the poor performance of science and mathematics as teachers continuously use teacher- centered methods which benefit teachers than students.

This showed that if SESEMAT program would be implemented and all other SESEMAT procedures followed during the teaching and learning process, it might have produced a good performance of both teachers and students.

5.1.3. HOW TEACHERS LESSON PLANNING UNDER SESEMAT PROGRAM LEADS TO ENHANCED PERFORMANCE OF SCIENCE AND MATHEMATICS IN KISINGA SUB COUNTY KASESE DISTRICT.

According to the key information, most head of institutions do less work in as far as supervision is concerned. They do much of office work, mind on accountability, organize long journeys to Kampala, District and do less work to supervise and monitor class teachers especially using the lesson plans.

Research findings was in agreement with Allan (1969) who said that the poor performance in the subjects of science in most secondary schools was due to inadequate supervision by head teachers to monitor if learning is done in accordance with the learner centered approaches.

Also the findings showed that lesson plans, schemes of work are prerequisite for effective teaching and students' performance in Kisinga Sub County Kasese District. Lesson planning and lesson scheming can only be effective if teachers are fully motivated by the school administration. Motivated teachers do not ably teach and enhance teaching by teaching by carrying out practical which is risky like in chemistry where chemists are to use pipettes. This means that teachers need to be well facilitated when attending to (INSET) programs organized by SESEMAT for continuous profession development which are organized every year provide with them the needed teaching and learning materials, in centers allowances, promotions and other incentives.

Head teachers need to be reminded to effectively monitor lesson planning and appraise their teachers if the quality of science and mathematics is to be improved in Kisinga Sub County Kasese District Western Uganda.

5.2. CONCLUSION

From the above, the contexts shows that implementation of the SESEMAT programme has lead to enhanced teaching of sciences and mathematics, this has been through use of the INSET and other workshops of this program, but however the trainers have always not been accessible since in most cases they are also teachers who have their teaching loads in their respective schools.

Thus it would be better if the trainers are compensated so that they do only training the science and mathematics teachers for the improvement of both the teaching and performance of sciences and mathematics in the secondary schools.

Also as in as far as lesson planning is concerned, it has not always done better since the heads in the offices who could do the supervisory work in their respective schools do much of the office work and also organize long journeys which make them not to get time to both supervise and correct those teachers who does not plan their lessons well. There fore in case the Head Teacher is too busy like this, he should get a representative who can supervise the teachers so that if there is mistake or mismatch in the lesson delivered and lesson plan made, clarification should be made later to ensure better and quality service delivery.

5.3. RECOMMENDATIONS

SESEMAT program has been considered as a relevant programme in terms of training and retooling of science and mathematics teachers not only in Uganda and Kasese in particular but also the continent itself and the world over its impact on student's performance and effective teaching has been felt in all secondary schools in the country.

The government of Uganda through the ministry of education, science, technology and sports should ensure that there is right balance of teaching staff in science departments in order to meet the needs of the students. This is because the most promising learners need atleast two qualified teachers in every science subject for them to understand he subject content and cover well the syllabus in order to perform well.

The curriculum of science and mathematics need to be revised in congestion with the subject teachers, Uganda National Examination (UNEb) and National Curriculum Development Center (NCDC) so that they can effectively integrate the content that can adequately meet the society

The government of Uganda through the ministry of education science, technology and sports should endeavor to reduce student- teacher ratio and decongest those classes in order to enhance effective teaching and learning. This is because the quality of science and mathematics can hardly improve in congested classes characterized by noise due to failure of teachers to control caused by big numbers which leave majority un attended to. Both students and teachers should freely enjoy the learning atmosphere and participate in the lesson teacher and find means of solving students' problems related to problem solving.

The government of Uganda through the ministry of education science, technology and sports need to report and train more teachers of mathematics and science to acquaint them with the necessary skills relevant to class control. This would make learning more meaningful where teachers use learner-centered approaches which put the leaner at the center of learning. It would

also enable teachers to effectively carry out practical in their subjects which make learning more practical hence producing more job makers than job seekers.

Provision of resources for teaching-learning process like textbooks and other teaching aids should be done to enable delivery of high quality and relevant information. This can be done by ensuring that right people with right skills are positioned in the right place.

The government of Uganda through the ministry of education, science, technology and sports should ensure that teachers are well motivated by increasing and improving their pay and general welfare. This is because well motivated teacher influences a learner's positive way towards learning especially science and mathematics in which most teachers have got negative attitude towards them. It is also important to know it that "motivation is inseparable from achievement". Therefore appropriate and good incentives like feeding, health allowances, accommodation, transport, heard to reach allowances in-service training need to be provided to teachers in order to ensure them to be gathered towards production of results.

The government of Uganda through the ministry of education, science, technology and sports needs to ensure that clear rules are set for the production of good outcomes across the country and the regions in order to identify whether there is need to strengthen the performance by increasing support, inspection and specific capacity buildings to encage the civil society organization in the debate about the direction of the SESEMAT programme. This is because civil society organizations are effective in community participation, empowerment and holding local and national government and international organizations accountable to their commitments.

The researcher recommends that students should be more active in the learning process while the teacher should be careful when guiding learners during the learning of mathematics and science In the classroom. The researcher strongly advises the teachers to interpret all the intention of SESEMAT programme and should be able to pass on the objectives of the above programme for

Through the ministry of education, science, technology and sports, the government should ensure that relevant instructional materials like textbooks, apparatus, and laboratories are put in place to effectively teach these science subjects so that good results are realized.

The government of Uganda should ensure that corruption tendencies in the education sector like bribing Uganda National Examination Board (UNEB) officials to get exam papers for students before the examination day which has increased on the high rate of examination multi practice in most schools , teachers and examination invigilators should be stopped from helping students during the examination period so as to empower students hence creating self reliance among the students and develop the spirit of heard work.

5.4. AREAS RECOMMENDED FOR FURTHER RESEARCH.

The researcher identified the following areas that need further research by those students wishing to find out why science and mathematics despite intervention by the government in teachers' salary increment in most secondary schools In Kisinga Sub County Kasese district and the whole country at large.

The researcher recommends prospective of secondary school science and mathematics (SESEMAT) in the industrial and technology development in the changing world.

Other important areas that require more and further investigation would include but not limited to examine the performance of secondary school students in science and mathematics.

SESEMAT Activity Reburial Based (SARB) programmes should be evaluated at the national level whether it has got some impact on the teaching and learning of science in Kisinga Sub County Kasese District.

REFERENCES

- Bajpai, S.P. (1984) Better Science Project (Monograph) Rivers State University of Science and Technology, Port Harcourt.
- Balozi C, Njunge J (2004). Trends in Teaching approaches and methods in Science and Mathematics Education “SMASSE project.
- Bennett, J (2003). Teaching and Learning Science. A Guide to Recent Research and its Applications Continuum, London
- Black, P and Wiliam, D (1998) Assessment and Classroom Learning, Assessment in Education 5(1), 7-73.
- Black, P, Harrison, C, Lee, C, Marshall, B & Wiliam, D (2003) Assessment for learning: putting it into practice, Open University Press,
- Buckingham Briggs L (1977). Instructional Design: Principles and Applications. New York: Englewood Cliffs.
- Burrill G (1992). The Graphing Calculator: A tool for change. In J. T. Fey & C. R. Hirsch (Eds.). Calculators in mathematics education. pp. 14 – 22
- David, P.J. and Hersh, R. (1981). The Mathematical Experience. Brighton: The Harvester Press Ltd.
- Deji, B. (2005). Mathematics and University Education. Lagos: The Punch (August 23) p 48
- Demana F, Waite RK (1990). Implementing the Standards: The Role of Technology in Teaching
- Driver, R, Asoko, H, Leach, J, Mortimer, E & Scott, P (1994), Constructing scientific knowledge in the classroom, Educational Researcher, 23(7), 5-12
- Dunham PH (1993). Does Using Calculators Work? The Jury Is Almost In. UME Trends, 5(2): 8-9
- Alexander, R (2004). Towards Dialogic Teaching: Rethinking classroom talk; Dialogos, Faculty of Education, Cambridge Press.
- Ambuko BS (2008). Media selection and use in teaching and learning Kiswahili. Unpublished Thesis M.Ed Thesis, Maseno University.
- Amin E.M.,(2005). Social Science Research Conception, Methodology & Analysis. Kampala: Makerere University Printer.

- Amos, N.G. (1998) Causes and Effects of Students' Poor Performances in Technical Training Institutions in Rivers State (Unpublished Undergraduate Research Project) Rivers State University of Science and Technology, Port Harcourt.
- Dunham PH (1995). Calculator Use and Gender Issues, Association for Women in Math. Newslett., 25(2):
- E. D. Fife, & L. Erduran, S, Simon, S, Osborne & J (2004). Taping into argumentation: developments in the International Journal of Education and Research Vol. 2 No. 6 June 2014 application of Toulmin's argument pattern for studying science discourse, Science Education, 88(6), 915-933
- Farrant JS (1980). Principles and practice of education. Singapore: Longman Publishers Limited
- Husch (Eds.) Proceedings of The Eighth Annual International Conference on Technology In Collegiate Mathematics pp. 120-124.
- Reading, MA: Addison Wesley Publishing Company. Kalejaiye, E.A.(1985). Problems of Teaching Mathematics in our Schools. Benin City: Nigerian Observer (March 18) p7.
- Kuhn, D. (1989). Children and Adults as Intuitive Scientists. Psychological Review, Vol. 96, No.4, pp674-689.
- Lefrancois, G.R. (1982). Psychology for Teaching (4th Edition) Belmont. Calif: Wadsworth Publishing Co.Inc.
- Hutchinson, C & Hayward, L (2005). The journey so far: Assessment for learning in Scotland, The Curriculum Journal 16 (2).
- Indoshi FC (1999). An Assessment of In-service Education and Training Needs of Primary
- Jarvis, T.; Pell, A. Changes in primary boys' and girls' attitudes to school and science during a two-year inservice programme.
- Millar, R., LeMarechal, J.F. & Tiberghien, A (1999) "Mapping the domain" – varieties of practical work.
- Ministry of Education & Sports, (2005): Uganda Education Statistics SCPSC:
- Malawi Science Centre Project2010 At <http://afrisciheroes.wordpress.com/malawi-science-centreproject/> (accessed 26/04/2010)
- Mortimer, E F & Scott, P H (2003) Meaning making in secondary science classrooms, Open University Press,

- Buckingham Mugende, O.M & Mugende, A.G (2003). Research Methods-Quantitative & Qualitative Approaches. ACT Press: Nairobi-Kenya.
- Njuguna B.M., (1998) The findings from baseline studies by SMASSE Project SMASSE Project Bulletin, unpublished
- Norris, S & Phillips, L (2003): How literacy in its fundamental sense is central to scientific literacy. Science Education, 87(2), 224-240.
- Odaet C.F, (1988). Uganda In: T.N Postlethwait (Ed.), The Encyclopedia of Cmparative Education and National Systems of Education, Pergamon Press, Oxford, 681-687.
- Odebode, N. (2004). Students Attitude to Mathematics Worries Government, Lagos: The Punch (March22). p 12
- Ojiabor, O. (2000). Causes of Failure in Mathematics Identified. Lagos: The Punch (April 11).
- Okujagu, P. and Okujagu E. (1996): Improving Mathematical Instructions in Schools, Journal of Science and Technical Education 1 (1 and 2)
- RSUST, Port Harcourt. Olson L (1992). Use of Technology In Schools: Still Elusive. The Educ. Digest., 57(9): 20 - 22.
- Ogborn, J, Kress, G, Martins, I & McGillicuddy, K (1996). Explaining science in the classroom, Open University Press,
- Buckingham Osborne, J, Duschl, R. and Fairbrother, B (2002) Breaking the Mould? Teaching Science for Public Understanding, School of Education, King's College London
- Osuji, L. I. (2007) The Role of Mathematics in Technical Training. (A term paper presented to
- Buckingham. Shulman, L S (1986) those who understand: Knowledge growth in teaching. Educational Researcher 15, 4-14
- Sturman, L.; Rudduck, G. Messages from TIMSS 2007, Association for Science Education AnnualConference, Reading, U.K. 2009.
- Taylor PS (1994). Teaching and Learning with Technology at the University of West Florida. Technol. Educ. Q., 6(3): 63 - 72.
- Wild M (1996). Technology Refusal: Rationalizing the Failure of Student and Beginning Teachers to use Computers. British J. Educ. Technol., 27(2): 134-143.
- Osuku, E.D. (1993). Problems of Teaching Mathematics Journal of Science and Technical

Education 1(1), RSUST, Port Harcourt. Oyodele,A (2006) FG and UNESCO Partner To Revamp Science and Technology Education.

APPENDIX

Respondent's questionnaire

Dear respondent a research is being carried out on the impact of SESEMAT on the performance of Science and Mathematics in Kasese district, Kisinga Sub County. I would like you to fill in this questionnaire to enable successful investigations. Please be free to answer the items as honestly as possible. All your responses will be treated with utmost confidentiality and will be used for academic purposes only.

Thank you for your cooperation

Part 1

Please fill in the spaces or tick in the box ☐ for the answer of your choice as applicable.

1. Name (optional)
.....
.....

2. Sex: Male ☐ Female ☐

3. Designation in school.

Head teacher ☐ Teacher ☐ Student ☐

4. Current level of education.

"O" level ☐ "A" level ☐ Certificate ☐ Diploma ☐
Graduate ☐

Single ☐ Married ☐ Widowed ☐ Divorced ☐

6. Age bracket

15 - 25 ☐ 26- 36 ☐ 37 - 47 ☐ 48 - 58 ☐

7. How long have you known SESEMAT?

1 Year ☐ 1 - 4 Years ☐ 5 - 10 years ☐

Part Two

This part covers all the variables i.e. implementation of the SESEMAT programme, follow-up of SESEMAT programme and lesson planning.

In this section use the given information below to choose or tick the right alternative that fits your opinion on the asked view.

Strongly agree = 1 Agree = 2 Disagree = 3 Not sure = 4

No	View	1	2	3	4
1.	Implementation helps teachers in the formulation of the values or the application of the lesson.				
2.	Follow up of SESEMAT programme has led to improved performance of learners in sciences and mathematics.				
3.	Follow –up of the SESEMAT programme has increased the chance of implementing this programme by teachers.				
4.	Regional activities of the SESEMAT programme have been enhance by the follow-up supplementary programmes				
5.	The SESEMAT programme has lead to quality science and mathematics in Kisinga sub-county, Kasese District.				
6.	Lesson planning contributes to quality science and mathematics in secondary schools.				
7.	When teachers are teaching, they are helped or guided by the lesson plans made before teaching.				
8.	The quality of the sciences and mathematics in secondary schools In Kisinga Sub County depends on lesson planning of the teachers.				
9.	The teacher's improvement in their ways of teaching and general				

8. How does limited funding affect the operations of the SESEMAT programme?

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How should the performance and quality of sciences and mathematics be improved?

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9. From your experience how does both teacher's and student's attitude affect the performance of science and mathematics in secondary schools in Kisinga Sub county?
-
-
-
-
-
-
-
10. Explain more how follow up increases the chances of implementing the SESEMAT programme by the teachers in Kasese.
-
-
-

Thanks for Your Cooperation

APPENDIX II

Interview guide for respondents

1. (a) From your experience, tell the main factors that have affects the performance of sciences and mathematics in secondary schools (probe for variable indicators) lesson planning, follow up, hands on activities and students' attitude.
3. What are the improvements made by SESEMAT in the secondary science and mathematics?
4. In your opinion, do you believe that secondary science is important? Yes ☐ No ☐
If your answer is yes, explain why it is important.
5. In your opinion what are the major problems faced by both science teachers and students, that lead to poor performance?
6. What has been introduced by the SESEMAT programme do you thing will enhance the performance of science and mathematics?
7. Do you thing the implementation of the SESEMAT programme is affected by limited funding?
Yes..... No..... (If yes explain how)
8. How can you say about the performance in sciences and mathematics before and after the introduction of the SESEMAT programme?

Thank you.