

**THE IMPACT OF THE SMASSE INSERVICE TRAINING ON THE
PERFORMANCE OF CHEMISTRY IN THE KENYA CERTIFICATE OF
SECONDARY EDUCATION (KCSE) IN SECONDARY SCHOOLS IN
KANGUNDO SUB COUNTY MACHAKOS COUNTY**

BY

MUNYAO PETER KIOKO

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DECLARATION

This research project is my original work and has never been presented for an award in any other University.

Munyao Peter Kioko

Date _____

L/40/P/8770/04

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

Date _____

Dr. Peter K. Nzuki

Lecturer, Department of Educational Studies

DEDICATION

I dedicate this work to my parents Esther S. Munyao and John Munyao Mwanzia and my siblings for upbringing and education. To my wife Judy M. Kioko and children Vicky, Mike, Patience and Heavenlight for being an encouragement.

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I wish to sincerely thank my colleague teachers, the Kangundo Sub-County SMASSE trainers and all those that gave me the inspiration to take up the challenge.

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Finally, I am grateful to all my lecturers and classmates for being there for me. May the Almighty shower them with abundant blessings.

Abstract

The study was concerned with poor performance in the subject over the years. The researcher therefore was guided by the following objectives.

- i. Identify the influence of SMASSE in-service training towards the performance of chemistry
- ii. Establish the teachers and learners attitude towards chemistry and the impact of SMASSE towards it

The study sampled secondary schools using the purposive sampling techniques. The sample population included the Head teacher, at least a Chemistry teacher and at least ten students in every institution. Data was collected using questionnaires for the teachers, students and Head Teacher from each of the sample schools. The collected data was represented using tables and graphs and analyzed using both descriptive and inferential statistics. The main technique for the analysis was casual i.e. regression analytical technique. The study found out that some of the factors influencing the performance of Chemistry in K.C.S.E were:-Availability of learning facilities, negative /neutral attitude towards the subject and poor payment of school fees. Based on the above findings that the researcher recommends that, lack of facilities/ improvisation of learning resources makes the study of the subject abstract. There was a need to sensitize the Head teachers to prioritize the provision of the basic laboratory learning resources. The subject teachers should improvise where possible. Both the Head teachers and subject teachers should be exposed to INSET fora to constantly refresh them on the methods and actions to be put in place to enable them to be more effective and sufficient towards the subject. Bursary allocations to poor students should be availed to curb time wastage and disruption of learning when these students are sent home due to lack of payment of school fees.

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CHAPETER ONE

INTRODUCTION

1.1 Background of the study

Whether learning takes place in a learner is a hidden event. The learning of sciences in general and chemistry in particular have been subjected to critical appraisal and radical change worldwide during the last twenty years. In the early 1960s, signs of change appeared in the United States, probably in response to the first Russian Sputnik. The learning in chemistry and other sciences showed departure in content, which became more factual and more a matter of principles and their derivations. Similar developments occurred in the United Kingdom and were exported to many countries in Africa, Kenya included. The teaching/learning of secondary school sciences can be characterized and described by placing it between two extremes of one or more continuum. There is the 'abstract' concrete continuum the direct-indirect influence continuum and the 'theoretical' 'practical' continuum (SMASSE Project, June 1999).

The continua imply the extend of teacher profile in the process, whether his/her profile is a dominating one (controlling the amount, pace and direction of learning) or one that sets the learner free to construct their own knowledge etc. In the continua other issues emerges, for example, the attitude of the learner, the resource mobilization and their management, the content mastery and many others.

The basis of this project was to address the impact of the SMASSE in-service training in enabling the teacher of chemistry in secondary schools in Kangundo sub-county to face the challenges posed by such factors as attitude, pedagogy, content, resource mobilization and management.

A number of educationists and other stakeholders have expressed concern over the poor performance in chemistry, which has been largely attributed to the above stated factors.

In terms of attitude, it has been observed that something needs to be done for both the learner and the teacher in that, most students, upon entry to secondary school tend to get influenced negatively by those already in the institution about chemistry as a subject (SMASSE Project June, 1999). The teacher therefore gets torn between two tasks of both teaching and winning back the learners' belief that they can do well in the subject. In many institutions, the issue of teaching methodologies as well as the availability of resources and their management has been seen to affect the performance.

Therefore, this being a burning issue affecting all the stakeholders, the Ministry of Education Science and Technology (MOEST) proposed the intervention to the problem through the initiative of the SMASSE project. The researcher has been evoked by the situation and developed curiosity and hence found it necessary to conduct a research to evaluate the impact of the project on the performance of the subject in secondary schools.

1.2 Problem statement

Poor performance in chemistry in secondary schools in Kangundo sub-County has been a continuous trend for six years. The reasons for the poor performance are not known, but attitude, pedagogy, content, resources mobilization and management are thought to influence its performance. The main aim of the study was therefore to investigate the impact of the SMASSE INSET education and training in the performance in the subject in K.C.S.E upon its implementation.

1.3 Purpose of the study

The study seeks to identify whether factors such as attitude, pedagogy, content, resource mobilization and management have had an influence in the performance of chemistry in secondary school after the implementation of SMASSE project.

1.4 Objectives

The following were the specific objectives of the study.

- i. To identify the influence of the SMASSE in óservice training towards the performance of the learners in secondary chemistry.
- ii. To identify whether SMASSE in-service training has changed the attitudes, pedagogy, content handling, resource mobilization and management in the teaching of Chemistry in Secondary Schools.

1.5 Research questions

The study attempted to answer the following questions;

- i. Have inadequate resources, poor attitude, the content and poor teaching methods led to poor performance in Secondary schools chemistry?
- ii. Are there alternatives to convectional facilities, content handling and teaching methods?
- iii. Have the recommendations of SMASSE in-service training addressed the problem of poor performance in chemistry?

1.6 Research assumptions

H1. A learner active involve in practical work increases his/her knowledge in chemistry hence good performance.

H2. Where convectional facilities are not available, improvisation can be taken as an alternative to enhance the practical approach in teaching and learning.

1.7 Significance of the study

Chemistry is an important science subject in secondary education. It forms an integral part requirement for training in careers such as medicine, pharmacy, chemical engineering, Industrial chemistry and Agriculture. The application of chemical principles and its relationship with industrial practice has wide socio-economic implications like in the fields of effluent disposal, food chemistry, petrol chemical Industry, electrochemistry, fuel and combustion chemistry and metallurgy (Halas and Hughes 1994). It is with this in mind that the researcher felt the worth of the study which will help teachers, education administrators and other stakeholders to reassess their approach to the teaching/ learning in chemistry in order to achieve the aim and objectives of education adequately. This done, the broad based objectives of education such as the acquisition of technical and industrial skill will be met and hence realization of the "Industrialization by 2030" dream. Chemistry as a subject has its own basic requirements that must be met for effective learning and teaching. The learner for example should be assisted to develop some skills such as ability to conceptualize, generation of enthusiasm and enjoyment in the subject matter. This will enable him/her to develop and embrace the positive attitude, effective skills and see the importance of chemistry even outside the school setup. The practical

application can help the learner to discover and understand the order of chemical and physical environment, be aware of the effect of scientific knowledge in everyday life through application to the management and conservation of the environment, the utilization of resources and production of food. It also enables the learners to appreciate the responsibilities of a scientist to a society.

The study was expected to come up with the information as to whether the SMASSE in-service training project could be the desperately needed cure for the perennial poor performance in the subject.

1.8 Limitations of the study

The study was narrowed to schools in Kangundo sub-district for convenience purpose and due to time limit. There was also the financial constraint hence the researcher could not cover an expansive region. On the side of the respondent some teachers may give the wrong information where teaching methodology is concerned since they feel challenged, only to cover their weaknesses. The information was collected in few schools and this may not be adequate to provide a comprehensive picture on the extend of the impact.

1.9 Delimitations

The study was carried out in Form 1, 2, 3 and 4, the reason being that the recommendations of the SMASSE were expected to be indicated in all classes and eventually translate to the K.C.S.E chemistry results. The researcher also assumed that all secondary schools use a similar syllabus which outlines the expected content and the learning experiences. All secondary schools teachers were also expected to be qualified and able to adequately implement the recommendations.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1. INTRODUCTION

This chapter presents reviews on various scholars and authors have said about academic performance and factors that affect it.

The literature review has been divided into three major categories that is;

- i. The school's environment which encompasses school administration, instructional methods, teaching and learning resources and physical facilities like a laboratory.
- ii. The human resource aspects which includes the teacher, the learner and to some extent the parent/community relationships.
- iii. The impact of SMASSE in-service training of teachers handling chemistry as a subject.

The three main categories stated above determine the following aspects in teaching /learning

- Resources
- Practical work in teaching/learning
- Pedagogical approaches

2.2 Theoretical framework

The Brunner theory of structure of discipline

Jerome Brunner (1960), focuses the teaching of subject's concepts in a related manner rather than in isolation. This brings about generalization and solving of problems.

The notion that structure could be identified in subjects of instruction (such as chemistry and biology) and that facts as well as concepts were related within the structure was given prominence. At the same time, the notion of the structure had other benefits. It gave more reassurance of transfer, enhanced comprehension of subject and facilitated recall. Little wonder there has been an accrued interest by curriculum specialists and other educationists to pursue this notion advanced by Bruner. From this theory, we find that we cannot divorce facts and concepts. This can only be enhanced through practical work with services to improve the cognitive effective psychomotor aspects of learning ; the correct attitude is also required in order to provide the intrinsic aspect of motivation to the learner, this can then provide the correct environment for learning .Various pedagogical methods need to be put at work and involvement of the learner provided so that the teaching/learning process becomes more effective.

Teaching and learning of sciences especially chemistry require that the concept thought to be concretized through suitable use of teaching aids and real life experiences that involve the learners participation and variation of stimuli. The learners should be fully engaged in õhands onõ õminds onõ, õhearts onõ, õeyes onõ and õmouth onõ activities in order to grasp the intended scientific concept and facts. (SMASSE 2001)

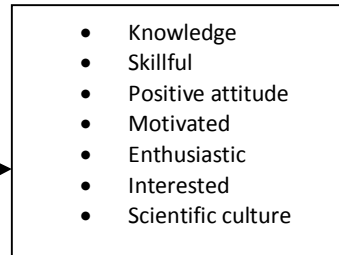
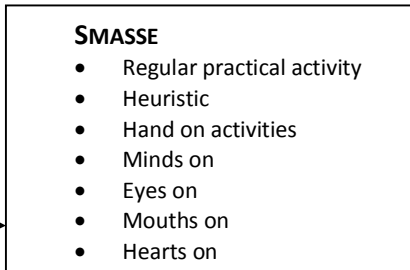
As children develop and understand more science concepts and processes, their prediction and explanation should become more sophisticated frequently reflecting a rich scientific knowledge base; evidence of logic, higher levels of analysis and greater tolerance of criticism and uncertainty (NAS 1995)

2.3 Conceptual frame work

Independent variables

Effects

With SMASSE

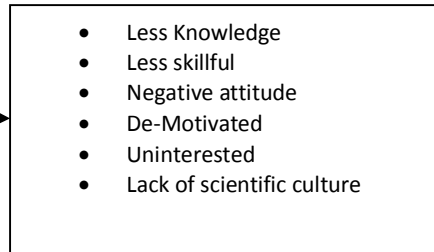
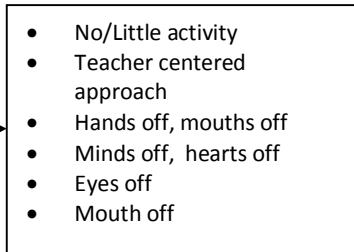


Dependent

GOOD K.C.S.E GRADES

LEARNER

No SMASSE



POOR GRADES

2.2 RESOURCES

An institution requires facilities such as building e.g. classes, laboratories and teaching /learning materials. According to the report on the presidential working party on education and manpower training for the next decade and beyond (Republic of Kenya 1988) these resources should be planned for and utilized effectively to bring about provision of quality and relevant education.

Bett, (1986), carried out a study on availability of teaching/learning materials by collecting data from head teachers, teachers and students. His findings revealed that there was poor provision,

maintenance and even lack of support from the community. The same was established by Mbuca (1986). The parents and donors/ well wishers who finance the schools in most cases are unable to adequately meet the demand for the same resources as they are wanting in institutions.

Ezewu (1982) observed that people of high socio-economic backgrounds were better placed in equipping their children's school while schools of children from poor backgrounds (economically) couldn't meet the demand for the supply. This was also shared by Tyler (1977) and Ayoo (2002) lack of resources has been linked with lack of practical work in most schools and hence that there has to be a way of bridging the difference (SMASSE 2001).

2.5 Pedagogical approaches

Teachers in secondary schools have been found to use the various pedagogical methods at their disposal. These includes:- the lecture, class experiment, demonstration, problem solving/guided discovery, group work and questioning. Different teachers use different methods depending on the availability of facilities and resources as per the status of the institution.

2.6 Practical work in teaching /learning

The use of practical work approach in teaching/ learning did not come into focus until the 19th century. There before, the teaching of science was basically theoretical; Leriuson (1994) observes that, until the late 19th century, the science concepts were rigidly formulated, dry as chalk dust, emphatically underlined on the writing board to be learnt and reproduced by rote.

In the early days of use of practical approach in science education, the objective was simply to present the learners the concept and theories, along with their proofs, as efficiently as possible.

There was very little attempt to cultivate scientism in learners since it was considered a

preserve of post- high school levels, a peculiarity of professionals and grand scientists. Leriusion observes that, thereafter attitude changed and people like Baden Powel tried to stimulate initiative and self reliance in the young through his invention of scouting movement. Currently in all systems of education, science teaching is set to improve practical work in the laboratory. This gives an insight into authentic science. It helps students to develop manual dexterity, patience, dependability and spirit of co-operation; it also enhances and strengthens student and student teacher interpersonal relations (Waddington, 1989).

Practical work approach enables learners to get more interested in the subject matter by seeing or by performing for themselves and their enthusiasm in learning of the subject is enhanced. It also enables learners to conceptualize with a lot of ease and hence to develop the scientism in them.

In most schools in our country there are science rooms, some with large demonstration tables and desks at the front and a number of experiment benches for the learners. This is a quiet evidence of our sincere acceptance of the usefulness of both demonstrations and individual experiments. On the other hand, inadequacy of equipment/apparatus is evident in other institutions and this notwithstanding; practical work forms the backbone for õgoodö science teaching. (Waddington, 1989).

In the absence of standard resources, some can be improvised according to SMASSE 2001. The dilemma of a chemistry teacher is trying to explain the properties of invisible particles like atoms, electrons, protons and molecules. An atom has certain qualities, which determine its distinguishing characteristics. These qualities cannot be reproduced but can be represented in a simple model. Such models can be readily and cheaply constructed and their use becomes indispensable once teaching methods have been adapted to take full advantage of the models as visual aids.

Much more time should be spent on the practical work to give learners the joy of doing sciences. It is common knowledge that shortage of equipment and apparatus do limit how we teach science subjects, but with a lot of innovation, we can be able to improvise in quite a number of areas and provide the learners with the desired experiences in practical work.

The conceptual aim of practical works are to enable the learner conceptualize, develop process skills, effective skills and generate enthusiasm and enjoyment of the subject matter. The conceptual aim includes making phenomena more real and concrete through firsthand experience. In absence of practical work, the learner is required to imagine and form abstract prepositions for the phenomena. Practical work enables the learner to remember facts and principles and to find facts and arrive at new principles that are organized facts and other bits of information into meaningful relationships. It enables one to carry out instructions, to elucidate theoretical work as an aid of comprehension and verify facts and principles already taught.

There are some process skills that a learner is likely to develop through self participation in carrying out experiment. This includes to enhance creativity i.e. improvement in the ability to develop new ways or approaches to old ideas to apply methods to new ideas or originate new methods from new situations. One is expected to promote logical thinking and reasoning, carry out accurate observation described in written former orally the regularities in the observations through description, classification and evaluation of data. The learner also develops the ability to communicate, isolate and control experimental variables through practical seeing of problems and seeking ways to solve them. At the end of it the learner develops specific manipulative skills for example the use of pipettes, stop watch, thermometer e.t.c.

The effective aim of practical includes the development of initiative and self reliance, arousing and maintaining interest, ability to co-operate development of suitable attitudes towards use of

cheap locally available and waste (CLAW) materials, to develop a critical attitude towards scientific phenomenon. (SMASSE, 2001)

Auxiliary aims include: to indicate/ illustrate the industrial aspect of science i.e how science and technology interrelate to give experience in standard techniques and thus it is required to prepare the learner in examination practical.

In a nut shell, practical work enhances the eight aspects of science attitudes; Viz-curiosity, open-mindedness, objectivity, intellectual honesty, willingness to suspend judgment, humility and relevant life e.c.t. These aims are achieved through use of different experiments, demonstrations, inquiry, research projects and field work.

The demonstration of teachers desk type are conducted to a group of students; standard type of experiments are supposed to be carried out by the learners themselves and the main purpose is to illustrate a concept i.e. to provide evidence in support of theory. The discovery method is where the teacher directs the approach to the experiment but learners develop the procedure. The learner is placed as far as possible, in the attitude of the discovery and the teachers role profile is more diminished (SMASSE, 2001).

Research experiments are those set by examination bodies especially to senior classes. It enables the learner to develop abilities to follow instructions, make observations and arrive at conclusions through suitable analysis. Field work involves the activities outside the confines of the classroom. It illustrates natural and or technological application of certain topics dealt with in the classroom.

Project work is a learning activity that relates the problem which is new to the learner involving some investigational work in-depth study to reach a solution and occupying the learner for

extended period of time. By allowing the learner to participate, they experience a full range of activities and come closer to understanding science and technology. Projects increase interests due to hands on experience, the students thinking skill which is a major goal of science education. It provides the learner to read widely and selectively and to be keen observers of phenomenon in their environment. (SMASSE, 2001).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the segments which outlines the procedure followed in the investigation. The study adopts an exploratory approach using descriptive survey design to investigate whether, upon the implementation of the SMASSE in-service training program; there has been an impact on the performance in chemistry in K.C.S.E and to establish the magnitude of the trend and impact.

Descriptive survey designs are used in preliminary and exploratory studies Luck and Reuben 1992) to allow researchers to gather information, summarize present and interpret the information for purpose of clarification (Orodho, 2002).

Borg and Gall (1989) notes that descriptive survey research is intended to produce statistical about aspects of education that interests policy makers and educators. The study is within the cross-sectional sub-types of descriptive survey study design.

The locale of the study was Kangundo sub-County where the situation in some selected schools was studied. The researcher chose the sub-County because of convenience and that it has been registering a poor performance notably in chemistry as a discipline.(K.C.S.E Results between 2005 - 2009). The possible cause of the poor performance has been stated as lack of adequate practical teaching approach, hence the researcher wanted to find out if upon the introduction and implementation of the SMASSE in - service training, the situation has improved, stagnated or declined.

3.2 Target population

The sub-district has a wide range of schools such as provincial, boarding, mixed day and private. This gave a wide cross section of the interviewees to provide adequate information. Head teachers, teachers and students were the main target sample population for inquiry. The Head teacher is involved in procurement and hence provision of the required resources while the teachers are required to plan to utilize the available resources and improvise such that the learners do not get disadvantaged in any way due to lack of standard materials and apparatus.

3.3. Sampling and the sample

The Head teachers, teachers and students were selected using random sampling techniques, Featuring five schools.

3.4 Instrumentation

The researcher used questionnaires for data collection. The questionnaires were developed in such a way that the research subject would respond to items independently. Most of the questions were the forced response although a few allowed individual respondents more freedom to respond. The questions were closed ended and others open-ended. The duration of the interview ranged from 10-15 minutes or more depending on materials sought and patience of the respondent.

3.5 Data collection

The researcher visited the schools and explained the purpose of his visit before handing over the questionnaire to the head teacher, teachers and students. Three questionnaires developed were therefore used and self administered. The researcher used open and semi structure questionnaires with which the respondents

3.6 Data analysis

The data collected was analyzed using descriptive statistics and presented in frequency tables and percentages.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

The data analysis in this chapter is aimed at addressing the purpose which was to investigate the impact of the SMASSE in-service training project in the performance of chemistry in K.C.S.E in secondary schools in Kangundo sub-County. The data collected was analyzed and presented in frequency tables and percentages.

The first part of the chapter describes the following:-

- Availability of learning facilities
- Chemistry teachers' teaching experience
- Attendance to the SMASSE in-service training cycle(s)
- Trend in the performance of chemistry in K.C.S.E in the recent years
- The impact of the SMASSE in-service training to the performance of chemistry in K.C.S.E
- The popular teaching /instructions methods used by the teacher.

The second part describes the aspects in the learners including:

- Learners' attitude towards chemistry as a subject
- Evidence for practical, demonstrations and field trips as an indication of learner centered approach in teaching/learning.
- Learners view about their performance in chemistry.

4.2 Response rate

The perception or views regarding the above aspects were generated through a number of questionnaires administered to 4 head teachers, 8 chemistry teachers and 160 students. The entire questionnaire administered for both the Head teachers and the chemistry teachers were returned duly filled, while 12 questionnaires administered to the students had no response. This brings to 172 expected responses in the sample matrix and 160 actual responses obtained. The data was then analyzed and presented in percentages (%) and frequencies (f). This is summarized in table 1 below.

Table 1: Response rate

Category of respondent	Expected response in sample	Actual respondents obtained	Response rate %
Head teacher	4	4	100%
Chemistry Teachers	8	8	100%
Students	160	140	92.5%
Total	172	160	93.0%

The table shows that there was a 100% response from both Head teachers and chemistry teachers while that of the students was 92.5%. This translated to 93.0% response from the initially targeted population.

4.2.1 The availability and adequacy of learning resources

The head teachers, subject teachers and students were asked to indicate the availability and adequacy of teaching/ learning facilities such as text books, laboratory equipments. The rationale was based on the assumption that the availability of learning facilities could assist in making the study of chemistry less abstract. The responses are presented in table 2 below.

Table 2: Availability and adequacy of teaching/learning resources

RESPONSE	FREQUENCY	PERCENTAGE
Well equipped	34	21.25%
Poorly equipped	87	54.37%
Not equipped	29	18.13%
No response	10	6.25%
Total	160	100%

The findings revealed that there is inadequacy of teaching /learning resources in schools in the sub-district as shown by the high percentage of the respondents 54.3%. These agree with earlier findings by Wachiye (1996) that availability of teaching /learning facilities were ranked among the most critical factors influencing performance in chemistry in secondary schools. This could have had a paramount contribution towards the poor performance.

4.2.2 Subject teachers' teaching experience

The subject teachers were asked to indicate their teaching experience. The findings are presented in table 3 below:

Table 3. Subject teachers' teaching experience

Teaching experience (years)	Frequency	Percentage (%)
Below 10	3	37.5%
Above 10	5	62.5%
Total	8	100%

From the Table above, it is reported that teachers in the district had a varied wealth of experience with a larger percentage of 62.5% with above 10 years experience hence well placed to bring about a better performance.

4.2.3 Attendance to the SMASSE in-service training

The chemistry teachers were asked to indicate whether they have attended the cycles of the in-service training held every April at the District INSET Centers.

Table 4: Attendance to the SMASSE in-service training

Cycle	No. of teachers attended	Percentage (%)
1	8	100%
2	1	12.5%
3	1	12.5%
All 4 cycles	6	75%

The findings revealed that all the 6 (75%) had at least attended 1,2,3 or all the four cycles. This indicated that they were equipped with some if not all the recommendations of the project. The teachers hence were expected to have developed a positive approach, improved on the variation of their pedagogy.

4.2.4 Impact of the SMASSE in service training to the performance of chemistry in K.C.S.E

The head teacher and teachers were asked their own view on the impact of the SMASSE In-service training to the performance of chemistry in the schools internal examination and the K.C.S.E. The study sought to determine the impact as well as the value of the INSET to the teacher. The findings are presented in tables 5 and 6.

Table 5: Impact of the SMASSE in-service training to the performance in chemistry in K.C.S.E.

Parameter	Frequency	PERCENTAGE (%)
Declining	0	0.0%
Stagnating	2	16.66%
Improving	10	83.34%
Total	12	100.0%

This shows that a greater percentage (83.34%) noted an improvement in the performance of the students in both internal and external examinations.

Table 6: Value of the SMASSE INSET programme to the teacher

Response	Frequency	Percentage (%)
Yes	6	75.0%
No	0	0.0%
Not sure	2	25.0%
Total	8	100.0%

75.0% associated the INSET as of great value to their content dissemination and pedagogical approach. From the above findings, most respondents are in concurrence that the project has had some positive impact to both the performance and in addition of value to the teacher. Some 25% of the respondents do not agree/ are not sure if it has brought any meaning full change in them. On the side of the Head teachers, their view is that the impact has not been substantially felt and hence needs a further follow up.

4.2.5 The Popular Teaching / Instructional method used by the teacher

Asked on their individual popular instructional method, the findings attained were presented in the table 6.

Table 7: Percentage of teaching time spent in each method

Instructional method	Percentage (%)
Lecture	32%
Demonstration	40%
Student experiment	28%
Total	100%

The findings revealed that 32% of teaching time was delivered through the lecture method. 40% of the teaching time was done through demonstration and 28% through class experiment.

This shows that about 68% of the delivery method would be through a practical (demonstration or class experiment) while 32% of the learning was through chalk and talk.

4.2.6 Learners attitude towards chemistry

The students were asked to indicate if they would choose or not choose chemistry if they were given a chance to decide. The findings are presented in table 8 below;

Table 8: Learners attitude towards chemistry

Response	Frequency	Percentage (%)
Would choose	140	94.59%
Would not	4	02.85%
No response	4	02.85%
Total	148	100%

From the findings, it is evident that majority of the students, 94.59% would choose the subject hence implying that they like the subject and hence had a positive attitude towards it. About 6.7% would however not choose, a further 2.8% were not decided.

4.2.7 Evidence of Demonstration, Practicals and Field Trips

Table 9: Evidence of Demonstration, Practicals and field Trips

Approach	Frequency
Demonstration	2 per week
Practicals	1 per 2 weeks
Field trips	1 per years

The above findings indicate that the most available approach in content delivery is the class demonstration while the practical are less frequent. The field trips are still rare.

4.2.8 Learners view about their performance in Chemistry

The students were asked to state their individual performance in chemistry. The findings are presented in table 9 below.

Table 10: Learners view about their performance

Response	Frequency	Percentage (%)
Very good	5	0.0375%
Good	63	42.2670%
Fair	58	39.189%
Very poor	22	14.865%

These findings show that the average performance is about 42.3% ranging between fair and very good.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of findings

The findings of the study are summarized as follows:

- In terms of availability of teaching/learning resources in the schools and their effects on Chemistry performance, the study found out that about 73.505 of the schools had inadequate facilities.
- On attendance to the SMASSE in service training program cycles, a higher percentage (98%) of the chemistry teachers in the district have had an opportunity to attend the INSET.
- On the pedagogy teachers have a wide range of approaches available to them to apply. They includes: the lecture method, demonstrations, class experiment, guided discovery and project works.
- The recommendations of the SMASSE in-service training have had an input towards shaping the teachers pedagogical approaches.
- On the students attitude towards chemistry the situational findings point towards an improvement.

5.2 Conclusions.

Inadequacy of teaching/ learning facilities has over the years contributed to the dismal performance in the subject. The introduction and implementation of the SMASSE in service training and its recommendations have apparently led to a paradigm shift and change of

approach which would be associated with the slight improvement in performance and attitude change towards chemistry as a subject. However, there is need for intervention to the problem from other government centers and non- government institutions to furnish schools with facilities desperately needed. Bursaries from constituencies, county urban councils and other community revenues can also spice up the redress.

5.3 Recommendations

Though it is being done to some extent the government through the free secondary education supplement should see to it that enough facilities are availed to secondary schools to alleviate the problem.

School administration arms should be sensitized on the need to prioritize the project of equipping laboratories, some of the schools do not even have laboratory space but one finds a storey administration block and other expensive facilities that may not directly contribute towards performance.

Teachers should take up the initiative of utilizing the available resources through improvising.

5.4 Suggestion for further research

Although this study focuses on Kangundo Sub-County it has a wider perception to the whole of the Republic of Kenya. I hope this study will motivate further research on other factors and variables in the governments programmes aimed at addressing the issue of performance in other secondary schools academic disciplines.

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APPENDICES

Appendix 1

Head teachers' Questionnaire

1. Is your school private or public (tick?)

Private

Public

2. What is your estimated student population?

3. Does the school have a chemistry laboratory?

Yes

No

4. How equipped is the laboratory?

a) Well equipped

b) Poorly equipped

c) No equipment

5. i. Have the chemistry teacher attended any of the SMASSE INSET cycles?

Yes

No

ii. a). If yes, has the training they went through brought any impact in their handling of the subject?

Yes

No

b. If yes, state whether the impact is positive or negative.

a) Positive

Negative

6. What trend has the performance in chemistry in KCSE been taking in the recent years.
- a) Improving
 - b) Stagnating
 - c) Declining
7. From your own assessments, what can you say about the impact of the SMASSE INSET programme to the in KCSE?
- a) Positive
 - b) Negative
 - c) Non-at all
8. Is the SMASSE INSET programme worth as a solution in improving performance in chemistry?
- a) Worthy
 - b) Not worth

THANK YOU

APPENDIX 2

Chemistry teachers' questionnaire

Dear Sir/Madam

This questionnaire is intended to furnish the researcher with information to be used exclusively for the purpose of this research. Kindly answer all the questions as honestly and exclusively as you possibly can. The information got will be treated with a high degree of confidentiality.

Please answer the questions as requested.

1. What is your teaching experience?

- a) 1-4 years
- b) 5-9 years
- c) 10-14 years
- d) 15 and above

2. Chemistry is primarily a theoretical subject

- a) Agree
- b) Strongly agree
- c) Disagree

3. a. Have you attended any of SMASSE INSET cycles?

Yes No

b. If yes state briefly the impact it has made in your teaching career, indicating whether positive, negative or none at all.

c. Six of the main teaching/instructional methods are listed below. Tick any three which you use often.

- | | | | |
|----------------------|--------------------------|---------------------|--------------------------|
| i. Lecture | <input type="checkbox"/> | iv. Demonstration | <input type="checkbox"/> |
| ii. Class experiment | <input type="checkbox"/> | v. Small group work | <input type="checkbox"/> |
| iii. Problem solving | <input type="checkbox"/> | vi. Questionnaire | <input type="checkbox"/> |

4. Estimate the percentage of the teaching time in lecture, demonstration and student experiment methods. (Distribute the percentage so as to add up to 100%).

Instructional method	Percentage (%)	Reason
Lecture		
Demonstration		
Student experiment		

5. In the table below, state the estimated number of practical oriented lessons you have had in your teaching classes in term 1 and 2

Form	Term 1 (no. of lessons)	Term 2 (no. of lessons)
1		
2		
3		
4		

6. A). Does your school have a chemistry laboratory?

Yes No

b). If yes, how equipped is it?

Adequately equipped poorly equipped Not equipped

7. a). Briefly state the notable problems you experience in teaching or arranging for practical activities such as experiments, projects, science congress etc, in your school

Have the recommendations of the SMASSE INSET you attended proved to be of help in addressing the above stated problems?

Yes

No

i. If yes, state some of the recommendations that have assisted you.

b). i. Have you had a field trip with your students in the year 2006?

Yes

No

ii. If yes state the site visited and the purpose of the trip.

iii If no, state the reasons that limited you organizing for one.

c. Has the recommendation obtained from the SMASSE INSET assisted you in organizing and successfully attending field trip?

Yes

No

8. Indicate below, the trend that has taken course in your student's performance upon implementing the SMASSE INSET recommendations.

a) Declining

Stagnating

Improving

From your assessment is the SMASSE INSET programme of value to you as a chemistry teacher. Yes No Not sure

APPENDIX 3

Students' questionnaire

1. a. Given a chance to decide, would you choose chemistry as a subject?

Yes

No

Not sure

b. If yes, state the reason _____

2. Do you enjoy doing chemistry practical/experiments yourself?

3. How frequently do you perform experiments/practical

None

once per week

Twice per week

4. a. How many demonstration practical has your teacher performed in term 1?

b. What experiment was being demonstrated in one of the demonstrations?

5. Do students in class get a chance of performing the practical/ experiments individually?

Yes

No

6. a. Have you had a chance to go for a Chemistry trip?

Yes

No

b. If yes state the place (site) you visited.

c. State the purpose of the trip. Give choices of purpose.

7. a. Have you performed any project in the 2006 year?

Yes

No

b. If yes, state the topics of the project. Give topic choice, e.g. Gas prepared, reaction of metals with gases. _____

8. How has been your performance in Chemistry?

Very poor

Fair

Good

Very good

9. How has your performance trend been?

a) Declining

b) Stagnant

c) Improving.

THANK YOU