

**BARRIERS TO THE IMPLEMENTATION OF  
GENERAL SCIENCE CURRICULUM IN SECONDARY  
SCHOOLS IN KANGUNDO DISTRICT**

**MWANGI, FLORENCE WANGARI**

**E55/10280/2008**

**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL  
OF EDUCATION IN PARTIAL FULFILLMENT FOR THE  
AWARD OF DEGREE OF MASTERS OF EDUCATION  
(CURRICULUM DEVELOPMENT)**

**KENYATTA UNIVERSITY**

**DECEMBER, 2011**

## DECLARATION

This is my original work and has not been presented to any other university or award of any other degree.

*Signature*.....*date*.....

Mwangi Florence Wangari

E55/10280/2008

This research project has been approved /accepted for examination with my authority as university supervisor

*Signature*.....*date*.....

Dr. (sr) Itolondo Wilfrida

Lecturer

Department of educational management, policy and curriculum studies

Kenyatta University

*Signature*.....*date*.....

Dr.l.i.libese

Senior lecturer

Department of educational management, policy and curriculum studies

Kenyatta University

## **DEDICATION**

First and foremost my sincere and special dedication goes to the Almighty God for giving me this opportunity to go this far in my academic ladder.

Secondly, my dedication goes to my family (Husband, Johnstone Musyoki and my two children George Musyoki and Damaris Musyoki).

Thirdly my dedication goes to my loving father Stanley Mwangi.

## **ACKNOWLEDGEMENT**

First and foremost, I wish to extend my gratitude to my supervisors, Dr. Itolondo Winfred and Dr.L.Libese who devoted their time, patience and energy while guiding me through the study.

Secondly I am sincerely grateful to my entire family members who have encouraged me to continue with the assurance that the sky is the limit.

Special thank goes to my husband Johnstone Musyoki, my dear children George and Damaris.

Thirdly I would wish to acknowledge my colleagues in the MED Kenyatta University. In particular my thanks go to my friends in the Curriculum Development group who we kept encouraging one another with the assurance everything will be possible.

## **TABLE OFCONTENTS**

TITLE PAGE.....	I
DECLARATION.....	II
DEDICATION.....	III
ACKNOWLEDGEMENT.....	IV
TABLE OF CONTENTS.....	V
LIST OF TABLES.....	IX
LIST OF FIGURES.....	X
ABBREVIATIONS AND ACRONYMS .....	XI
ABSTRACT.....	XII
<b>CHAPTER ONE</b>	
<b>INTRODUCTION</b>	
1.1 Background to the study.....	1
1.1.1 Importance of science curriculum changes in Kenya since independence .....	1
1.2 Statement to the problem.....	9
1.3 Purpose of the study.....	10
1.4 Objective of the study.....	10
1.5 Research questions.....	10
1.6 Significance of the study.....	11
1.7 Assumptions.....	12
1.8 Limitations .....	12

1.9 Delimitations .....	13
1.10 Theoretical framework.....	13
1.11 Conceptual framework.....	15
1.12 Definitions of significant terms.....	16

## **CHAPTER TWO**

### **LITERATURE REVIEW**

2.1 Introduction.....	18
2.2 Student related barriers in curriculum implementation.....	19
2.2.1 Students attitude toward science subjects.....	19
2.2.2 Career aspiration.....	21
2.3 Teacher related barriers in curriculum implementation .....	23
2. 3.1Teacher’s attitude and motivation.....	23
2.3.2 Role of In-service Training Education for teachers (INSET).....	24
2.4 Administrative related barriers in curriculum implementation .....	26
2.4.1 The role of principal.....	26
2.4.2 School Policy.....	30
2.5 Home based barriers in curriculum implementation .....	34
2.5.1 Parental involvement on student Education.....	34
2.5.2 Peer influence.....	36
2.6 Summary.....	39

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY AND DESIGN**

3.1 Introduction.....	41
-----------------------	----

3.2 Design of the study.....	41
3.3 Location of the study.....	42
3.4 Target population.....	43
3.5 Sample size and sampling.....	44
3.6 Research instruments.....	46
3.6.1 Students Questionnaire.....	46
3.6.2 Teachers Questionnaire.....	47
3.6.3 Interview Schedule.....	47
3.7 Piloting.....	47
3.7.1 Reliability of the research instruments.....	48
3.7.2 Validity of the research instruments.....	49
3.8 Data collection procedure.....	49
3.9 Data analysis.....	50

**CHAPTER FOUR**

**DATA ANALYSIS, PRESENTATION AND INTERPRETATION**

4.1 Introduction.....	51
4.2 Student related barriers to the implementation of General Science Curriculum.....	51
4.3 Teacher related barriers to the implementation of General Science Curriculum.....	59
4.4 Administrative related barriers to the implementation of General Science Curriculum.....	64
4.5 Home based barriers to the implementation of General Science Curriculum.....	68

**CHAPTER FIVE**

**SUMMARY, CONCLUSION AND RECOMMENDATIONS**

5.1 Summary of study findings.....	72
5.1.1 Student related barriers to the implementation of General Science Curriculum.....	72
5.1.2 Teacher related barriers to the implementation of General Science Curriculum.....	73
5.1.3 Administrative related barriers to the implementation of General Science Curriculum.....	74
5.1.4 Home based barriers to the implementation of General Science Curriculum.....	75
5.2 Conclusion.....	75
5.3 Recommendations.....	78
5.4 Suggestion for further studies.....	79
REFERENCES.....	81
APPENDIX I.....	88
STUDENT QUESTIONNAIRE	
APPENDIX II.....	92
TEACHER QUESTIONNAIRE	
APPENDIX III.....	95
PRINCIPAL INTERVIEW SCHEDULE	
APPENDIX IV.....	98
MAP OF KANGUNDO DISTRICT	
APPENDIX V.....	99
WORK PLAN	

## LIST OF TABLES

Table 1.1 K.C.S.E performances for Biology, Chemistry and Physics in Kangundo District schools from 2006, 2007, 2008 and 2009.....	9
Table 3.1 Number of public schools and student population in Kangundo district.....	44
Table 3.2 The study sample.....	45
Table 4.1: Reasons for choice of Science subjects.....	54
Table 4.2 Students career aspiration.....	56
Table 4.3 Teacher Professional qualification.....	61
Table 4.4 In-service training of teachers .....	62
Table 4.5 Teachers awareness of the syllabus.....	62
Table 4.6 Adequacy of school facilities .....	65
Table 4.7 Parent involvement in their children choice of science subjects.....	68
Table 4.8 Parent involvement in their children choice of science subjects.....	69

## **LIST OF FIGURES**

Figure 1.1 Barriers to the implementation of general science curriculum.....	15
Map 3.1 Kangundo area in the former Machakos District.....	42
Figure 4.1 Science subjects chosen by the student for K.C.S.E Examination.....	53
Figure 4.2 Student awareness of General Science.....	57
Figure 4.3 Level of education of science teachers.....	60

## **ABBREVIATIONS AND ACRONYMS**

**K.C.P.E** -Kenya Certificate of Primary Education

**K.C.S.E** -Kenya Certificate of Secondary Education.

**K.N.E.C** -Kenya National Examination Council.

**8-4-4** -The Kenya system of education where eight years are spend in primary school, four years in secondary and four years in university.

**M.O.E** -Ministry of Education.

**P.D.E** -Provincial Director of Education.

**T.S.C** -The Teachers Service Commission.

**JICA** - Japanese International co operation Agency

**MoEST** - Ministry of Education science and Technology.

**SMASSE** - Strengthening of Mathematics and Science in Secondary Education.

**CBAM** - Concerns-Based Adoption Model.

**INSET** -In-service Training Education for Teachers.

## ABSTRACT

There are over 3000 secondary schools in Kenya. They are categorized as National, Provincial and District schools. The Secondary Education Curriculum expects all students to study at least two pure science subjects and pass regardless of the entry behavior and career interest. This has been frustrating for learners that would like to pursue art- related courses and careers and those that are in institutions with poorly equipped laboratories. There are many learners in the Non-formal education and private students who may not be able to access the science laboratories resulting to low achievement in the science subjects. A General Science Curriculum has been introduced to cater for learners in both the formal and non-formal setting. The central problem in this study is the implementation of General Science Curriculum in Kangundo District Schools which has not been impressive owing to many schools not opting for it. However, no study has been undertaken to establish barriers to the implementation of General Science Curriculum in the District. To this end, the main purpose of the study was to investigate barriers to the implementation of General Science Curriculum in Kangundo Schools hoping that the outcome will go a long way to improve the situation.

The method used in this study was that of descriptive survey design. The study was done in Kangundo District of Machakos County and involved four secondary schools. The target population was twenty five (25) secondary schools. Four (4) provincial schools, seventeen (17) District secondary schools which are all mixed and four (4) private secondary schools. The total number of students in the twenty five schools was eight thousand nine hundred twenty (8,920). The science teachers in these schools were seventy five (75). Purposive sampling was used to select four public District Secondary schools. Simple random sampling was used to select 200 (23.3%) student out of eight thousand nine hundred and twenty (8920). The sample size for the study was two hundred 200(23.3%) students, twelve (12) teachers and four (4) principal. It is from these groups the data will be analyzed.

The data for the study was collected through questionnaires that were personally administered by the researcher to the students and science teachers. The principals, teachers and students were interviewed by the researcher for further in-depth information. The findings were presented in summary form using frequency distribution tables, bar and pie-charts.

The study found that students wanted to study general science if it is offered in their school, teachers were not in-service, principals had no clear policy and K.N.E.C interfered with the implementation.

Based on these findings it is recommended that the Ministry of Education should reconsider the initial objectives of General science in secondary schools in Kenya, provide a clear policy of its implementation, in-service and pre-service courses to be provided to teachers. Further the K.N.E.C should have the interest of the student and not the school. Finally more research needs to be done by K.I.E with a view to establishing other barriers to the implementation especially in formal education system.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background to the study**

Background to the study highlights information on importance of science, curriculum changes in Kenya since independence and objectives of General Science Curriculum.

#### **1.1.1 Importance of Science and curriculum changes in Kenya since independence**

According to Mukulu (1981) Scientific and technological literacy is a major precondition for modernization, wealth generation and the development of a democratic society. He further argues that science culture is needed for innovation and problem solving as well as acquisition of transferable skills. It promotes capacity to think and act rationally in response to new technological developments as well as the ethical issues involved in active participation in modern democracies.

The common wealth secretariat report (2002) observes that our future depends on a popular understanding and application of science and that human resource development in science is crucial to build a critical mass of skilled people. The report further says that Africa needs scientifically literate citizen who can better promote development by:

- a) Better decision making about science and technology whose impacts on everyday life thus promoting an improved quality of life in a participation democracy.
- b) Providing the work force with appropriate skills for delivery of quality products for national and international markets, thereby promoting economic growth and social development.

- c) Producing scientists and technologists who generate and apply science and technology to solve local problems and create innovations that can be put into commercial use at national and international.

In this connection, African people must ensure that they get a deeper understanding of science and apply it in their everyday life. In addition, they should also ensure human resource development in science in order to come up with large group of skilled inhabitants.

Makhurare (1998) notes, that the role and responsibility of science and technology in society is a heated discussion in every country in the world. The impact of Science and Technology in spheres of life radically affects the disciplines themselves as well as their interrelationships with society. Social development is becoming ever more closely affected by science and technology especially the information technology. This is because science and technology affects social development in terms of information sharing thus increasing the way in which human beings are becoming more informed. According to Makhurare (1998) the goal of any country development is to promote improvement of the standard of living and quality of life of its people. National development must bring sustained improvement of the well being of the individual and all citizens. Science plays an important role in the development of country's economy, environment and social relation.

The Kenya Institute of Education (K.I.E) Assessment (2006), observes that science is a medium through which a child develops his natural curiosity, his power of observation and enquiry and constructive attitude to problem solving and decision making. "Science education is imperative and unavoidable .In science lies human hope

for continuous and progressive welfare. According to K.I.E Assessment there are two main reasons for teaching science to pupils in schools”:

First is to develop clear thinking. There are occasions when individuals have to make decisions based on their feelings. But there are also occasions where people need to think things out in a clear, logical fashion, weighing up the evidence before making a decision. Science education does a lot to help people think this sort of way.

Secondly, science promotes open mindedness. We are living in a society where we come in contact with new developments in science on an everyday basis. Students need to be aware of how rapidly science can progress, and should be able to argue for positive scientific development having learned a basic level of scientific literacy at school. It should be taken that every pupil has a right to have some understanding of the world around him/her and the way things work.

Since independence, there have been various curriculum changes in Kenya. According to Sifuna (1990), the range of subjects was increased at the secondary level after independence so as to include industrial training to enable the government to Africanize the civil service. Musyoka (2000) says that at independence, the secondary school subjects were grouped as follows: language- mainly, English and to a less extent Kiswahili, Mathematics, Science and Humanities. Students were fully specializing during the last two years in secondary school in which one would pursue ‘Arts’ or ‘Sciences’ depending on the ability and interest. One would expect to have both boys and girls choosing the science and arts subjects equally. This is different from the situation today, where all the three science subjects - Chemistry, Biology and physics- are optional as long as a candidate pursues at least two of them.

A major change in the educational system and the curriculum occurred in 1985 when the 8-4-4 system was introduced as a result of the recommendations of the Mackay Report (Republic of Kenya 1981). By the time MacKay commission was established there was a felt need of changing the school curriculum so as to address the needs and interest of the school leavers at all levels of the education system in the country. To achieve this goal, a different curriculum with some new subjects was developed. The new curriculum emphasized vocational and practical subjects as well as the sciences. The idea behind the emphasis on vocational and practical subjects was to equip the learners especially in primary and secondary levels of education with skills that would enable them to become productive and self reliant after school (Kagama, 2005).

The introduction of the new subjects into the existing secondary syllabus made the secondary curriculum too broad which was not easy to implement since students could not manage the whole load of all the 32 subjects (KIE, 1985). In order to facilitate the implementation process, the 32 subjects were organized into five major groups. The purpose of grouping the subjects was to put together core subjects in one group and electives of similar characteristics such as humanities or sciences in their own group.

Group one subjects, which also formed the core (compulsory) subjects, were English, Kiswahili and Mathematics. Group two combined all the science subjects thus: Chemistry, Physics, Biology, Biological sciences and physical Sciences (physics taken with chemistry). The humanities were in group three and they included such subjects as Geography, History, Religious Education and Social Education and Ethics. Group four was composed of the applied subjects such as Home science, Agriculture, Woodwork,

and Electricity among many others while group five was composed of “other subjects” that include Commerce, Economics, Accounting, etc (KIE, 1985).

In the new curriculum, a student had to take ten examinable subjects, unlike in the former system of education where students were supposed to take a minimum of six subjects and a maximum of eight examinable subjects at ordinary level or a minimum of three and maximum of four principal subjects at advanced level. From group two subjects, a student had to take three pure sciences, that is physics, chemistry and biology or take physical science and biological sciences.

A few years after the implementation of the 8-4-4 curriculum, the system came under public criticism with a general feeling that the workload was too much for students and teachers and the cost of financing ten subjects per student was too high (Kagama, 2005 ). Most of the school time was spent on formal teaching at the expense of the other dimensions of the curriculum since a broad curriculum requires more time to implement satisfactorily. Eight years after implementation, the primary and secondary curriculum was reviewed. The review mainly affected two areas of the curriculum thus: reduction of the subject matter (content) in some subjects. For example Sciences and also reduction of the number of examinable subjects a student could take for Kenya Certificate of Secondary Education(KCSE) from ten to eight or nine ( Kagama, 2005).

In order to reduce the number of examinable subjects the optional subjects were increased. Group one that comprised the core subjects was not affected while all the other groups were slightly affected. For subjects in group two, a student had the following options: either take all the three pure sciences (physics, chemistry and biology) or drop either physics or biology. The other alternative was to take physical sciences and

biological sciences. The other groups were also affected as group two, where a student could take one subject in group three and one subject in either group four or five instead of taking a representative subject in each group (Kagama, 2005).

Another curriculum review was carried out in 2000 by Ministry of Education Science and Technology (MoEST, 2000) and implemented in 2001. The review directed that physical sciences will no longer be offered in secondary schools and all schools were to offer pure sciences. The three sciences subjects were made optional as long as a candidate pursued at least two of them.

The Ministry of Education through K.I.E developed a basic General Science Curriculum in 2008 for learners in secondary schools to cater for students that would like to pursue Arts-related courses and careers, institutions with inadequate resources and poor performance in pure science subjects, its implementation has not been impressive. In Kagundo District preliminary findings shows that only two District Secondary schools out of seventeen District Schools are registered to offer the General Science Curriculum. Pure science subjects are generally poorly performed by District schools in Kangundo. The specific objectives of General Science curriculum are:

1. Demonstrate a positive attitude towards science.
2. Apply acquired scientific knowledge, skills and attitudes to promote positive environmental and health practices.
3. Develop capacity for critical thinking in solving problem in everyday life.
4. Appreciate the use of science in technological and industrial development.
5. Demonstrate a sense of honesty and high integrity in all aspects of life.
6. Demonstrate adequate scientific knowledge for further training and or education.

7. Observe general safety proportion in all aspects of life.

The K.I.E (2008) notes that, the Secondary School General Science Curriculum aims at equipping the learners with ability to understand their environment and acquire scientific knowledge, skills, competencies and attitudes relevant to the contemporary society. In preparing this course, care has been taken to ensure not only continuity but also the reinforcement and broadening of basic scientific competence already acquired through primary education.

According to K.I.E (2008), the course targets learners in formal and non-formal education systems. Learners in the formal systems who opt to take this course will be expected to study the regular science subjects i.e. Physics, Biology and Chemistry in Form one and two and then take the Secondary General Science as an option in Form three and four. Those in the non-formal systems, may take the general science option from Form one. While greater emphasis has been placed on the needs of the learners for whom secondary education is terminal, the course will also prepare learners who will pursue further studies in courses which do not require intensive use of scientific competence.

The General Science syllabus has been developed by K.I.E through restructuring of the regular syllabi for Physics, Biology and Chemistry to facilitate acquisition of scientific competence applicable in real life situations. It has emphasized participatory and interactive approaches to teaching and learning. Contemporary and pertinent issues such as environmental conservation, drug and substance abuse, HIV and AIDS awareness, Integrity, gender responsiveness, children's rights and technological advancement has been addressed adequately.

According to K.I.E (2008), Learners taking this course will not be eligible to take any of the regular science subjects (Biology, Chemistry and Physics) in Form three and four. The syllabus has three distinct sections. Section A which covers Biology while Section B covers Chemistry and section C covers Physics.

According to (MoEST, 2000), the current secondary education curriculum requires that all students study mathematics and at least two science subjects in which they are examined at the end of form four. However, the pure Sciences curriculum is designed to equip learners with knowledge, skills and attitudes that are geared towards pursuing Mathematics and Science-related courses and careers. This is notwithstanding the fact that not all students have the interest and aptitude to pursue careers and courses that require high competence in Sciences.

On the other hand there are many learners in non-formal education and private students who find it difficult to study the pure sciences curriculum because they have no access to laboratory. Indeed, many formal schools also have no Science Laboratories. These challenges contribute to low achievement in Sciences in the Kenya Certificate of Secondary Education Examination.

In response to these challenges, the Kenya Institute of Education (K.I.E) carried out a Need Assessment Survey (2006) to address this concern. The findings indicated that mathematics and science subjects pose the biggest challenge to most learners. Consequently, the institute developed Secondary General Science curriculum that would address the needs of learners in both formal and non-formal settings.

## 1.2 Statement of the problem

Whereas the Ministry of Education through K.I.E developed a basic General Science Curriculum in 2008 for learners in secondary schools to cater for students that would like to pursue Arts-related courses and careers, institutions with inadequate resources and poor performance in pure science subjects, its implementation has not been impressive. In Kagundo District preliminary findings shows that only two District Secondary schools out of seventeen District Schools are registered to offer the General Science Curriculum. Pure science subjects are generally poorly performed by District schools in Kangundo. The mean Grade of the pure science subjects (Biology, Chemistry, and Physics) has been below average in all K.C.S.E results.

**Table 1.1 K.C.S.E performance for selected sciences in Kangundo District schools 2006-2009**

Year	Subject	Mean score	Mean grade
2006	Biology	2.492	D-
	Chemistry	2.631	D
	Physics	3.833	D+
2007	Biology	3.219	D
	Chemistry	3.289	D
	Physics	2.249	D-
2008	Biology	2.857	D
	Chemistry	2.064	D-
	Physics	3.400	D
2009	Biology	2.609	D
	Chemistry	2.573	D
	Physics	3.000	D

**Sources:** Kenya National Examination Council Result Analysis (2006-2009)

Based on these Examinations results for pure science subjects it is apparent that there are barriers to the implementation of General science curriculum which made the researcher to be concerned in carrying out this study in order to establish the mode that the implementation should adopt.

### **1.3 Purpose of the study**

The main purpose of this study was to investigate barriers to the implementation of General Science curriculum hoping that the outcome will go a long way to improve the situation.

### **1.4 Objectives of the study**

The specific objectives of the study were:

- i. To determine students related barriers to the implementation of General Science Curriculum.
- ii. To establish teachers related barriers to the implementation of General Science Curriculum.
- iii. To determine administrative related barriers to the implementation of General Science Curriculum.
- iv. To establish home based barriers to the implementation of General Science Curriculum.

### **1.5 Research Questions**

- i. What attitude do student have towards the study of General Science?

- ii. What role do science teachers play in influencing students' interest in the study of General Sciences?
- iii. What extent were teachers prepared in relation to teach General Science curriculum?
- iv. What are the teachers' views in relation to the implementation of General Science curriculum?
- v. What is the role of the principal concerning the implementation of General Science curriculum in school?
- vi. What are the parents' opinions which influence students in the selection of science subjects?
- vii. What are the K.N.E.C opinions that are influencing the implementation of General Science Curriculum?

## **1.6 Significance of the study**

The findings of this study are significant in that they provide current information on which useful decision on improving the implementation of General Science Curriculum by identifying the barriers that are influencing the implementation of General Science Curriculum. The study has practical significance because it leads to improved strategies for implementation of General Science Curriculum, procedures and practices by identifying the strengths and weakness in implementation. The information generated in the study will be used in establishing a system of information gathering and organizing for the purpose of decision making and planning by the Ministry of Education during curriculum implementation or introduction of new programs in schools.

## **1.7 Assumptions**

When carrying out this study the researcher assumed the following;-

- i. All those who were given questionnaires answered them sincerely.
- ii. The selected population would cooperate in providing reliable data.
- iii. There were enough facilities and teachers in the selected schools to help in the learning of General Science.
- iv. There would be no interruptions during the collection of data for the study.

## **1.8 Limitations**

The study of barriers to the implementation of General Science Curriculum in secondary schools should be taken as a National issue to help in the implementation nationwide. In carrying out the study, various limiting factors were met:

- i. Financial constraints in travelling and processing the questionnaires.
- ii. Uncooperative people who could not provide sufficient information for the study.
- iii. Time factor whereby a lot of time was spent in data collection.
- iv. Parents were not issued with questionnaires because tracing them needed more time, resources and other logistics. Their views and opinions were given by teachers and principals response respectively.

## **1.9 Delimitations**

The study confined itself to a few schools and this might not have been representative of the entire school population. In addition, the schools involved in the study were poorly equipped and this affected their performance in sciences. Therefore the study focused on all those schools which did not implement the General Science Curriculum and yet their laboratories are poorly equipped to cater for pure sciences.

## **1.10 Theoretical Framework**

The study adopted Hord (1987) Concerns-Based Adoption Model (CBAM). The model places its emphasis on the process of change which accompanies the introduction of a new programme. Concerns-Based Adoption Model (CBAM) is based on the belief that all change originates with the individuals. Individual change and through there changed behaviors institutions change. The model addresses only the adoption (implementation) of curriculum, not the development and design. The focus is on enabling teacher to adopt the curriculum to view it as their own. This theory is helpful in the study of implementation of General Science in schools because it emphasizes on the introduction of a new program.

The researcher used the model because it is used to describe the effects of programme implementation. The model is empirically based and has been developed from detailed studies of effects of introducing new programme in a range of different contexts. It also identifies factors which seem to contribute to the success of an innovation. The Concerns-Based Adoption Model (CBAM) was developed over number of years by a team at the University of Texas at Austin in the USA. The team was

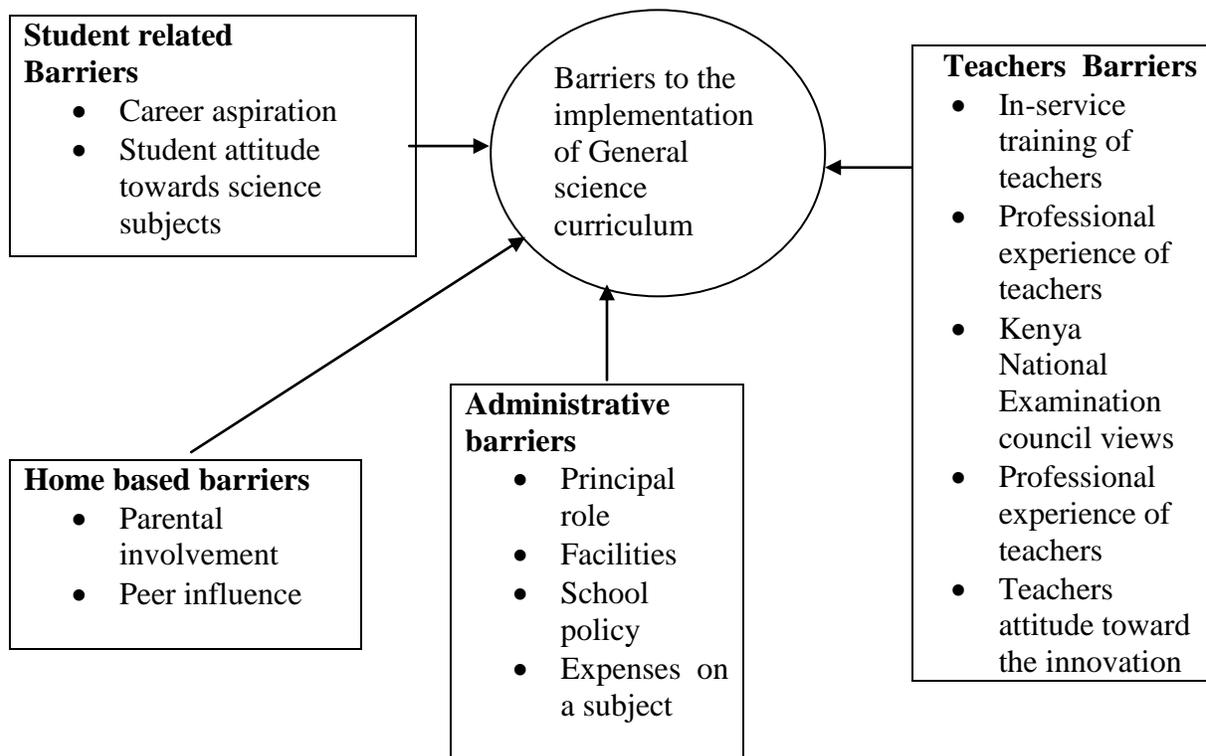
concerned that many new programmes introduced into schools appeared to meet with little success and were often discarded, a situation which is certainly not unique to the USA. This led to a detailed study of the process of change in schools and classrooms covering the introduction of a range of difference programmes. The initial work was undertaken by Hall et al, (1973), and is described in detail in Shirley Hord's books, *Evaluating Educational innovation* (Hord, 1987), a book written with classroom practitioners as its principal audience. The Concerns-Based Adoption Model is an empirically-based conceptual framework, which outlines the developmental process that individuals experience as they implement an innovation. The model is based on seven basic assumptions about change namely: Change is process, not an event; Change is made by individuals first; Change is a highly personal experience; Change entails multi-level developmental growth (i.e. it will involve shift in feelings, skills and behaviors); Change is best understood in operational terms (i.e. teachers who have to implement the change need to be able to relate it readily to what it means for their classroom practice); Change facilitation must suit individual needs (i.e. it must address the concerns and problems of those implementing the change); Change efforts should focus on individual not innovations( i.e. the innovation needs to be seen as extending beyond the materials it produces to the role of the individuals who will use the materials).

The CBAM model has four components. The first relates to how teachers feel about an innovation, the second to how they use it, the third to what the innovation means in practice as a result of it being used, and the fourth to implementing strategies to aid the change process. In this model, curriculum is not implemented until teachers concerns

have been adequately addressed. Teachers are expected to be creative with it and modify where necessary tailoring it to their students.

### 1.11 Conceptual Framework of the study

Figure 1.1 Barriers to the implementation of General Science Curriculum



**Source:** Researcher

The conceptual frame work Figure (1.1) was adopted and modified from Hyde (1995) to show barriers to the implementation of General science. The figure shows that implementation of General Science Curriculum depends on the student related barriers, home based barriers, administrative barriers and teacher barriers. This means that

implementation of science curriculum is the dependent variable while the barriers are the independent variables.

The independent variables are those variables that hinder the implementation of General science which are Teacher related barriers and Administrative related barriers. These included teachers' attitude and motivation, principal role, expenses on changing the subject and school related factors. The dependent variables are those variables that are as results of the implementation of General science curriculum. These included student related barriers such as career aspiration, teacher related barriers such as In-service Education training for teachers.

### **1.12 Definition of significant Terms**

**Attitude:** The state of being positive or negative towards science education or, having interest or lack of it in science education.

**Choice:** The opportunity for as student to select the subjects he/she will be examined in during KCSE. As students join form three they are allowed to select any two or all the three science subjects.

**Cluster:** A combination of four selected subjects required for one to pursue a given degree programme.

**Curriculum:** This is school curriculum. It refers to all that is planned to enable the students acquire and develop the desired knowledge, skills and attitudes.

**Curriculum implementation:** It means actual teaching in a classroom environment.

**Curriculum reform:** Change made to a curriculum with a view to improving and making it more sensitive to the needs of society.

**Gender:** Refers to the social roles assigned to men and women .For example, which looks after the family in our cultures who builds the house, who takes care of the family, etc

**Good performance:** Refers to attainment of grades B or A in subjects like mathematics and science.

**Job Opportunities:** Refers to chances of getting jobs in the labour market after graduation.

**Motivation:** Refers to an inner force that leads one towards an action for fulfillment of goal. It is the individual internal processes that energize, direct and sustain behavior, the personal forces that cause one to behave in a particular way.

**Parental involvement:** Refers to active participation of parents or guardians to the education of their children.

**Performance:** Refers to the outcome of the KCSE results of a school after four years.

**Poor Performance:** Refers to any students or school attaining grade D+ to E in mathematics and science subjects.

**Science education:** The science subjects offered in secondary education in Kenya. They are Physics, Chemistry and Biology.

**Science facilities:** This includes laboratories and equipment's for the teaching of science subjects.

**Science subjects:** The study of Chemistry, Physics and Biology in secondary schools.

# CHAPTER TWO

## LITERATURE REVIEW

### 2.1 Introduction

This chapter reviews literature that is considered relevant to the study. It includes literature on: Students related barriers in curriculum implementation, Teachers related barriers in curriculum implementation, Administrative related barriers in curriculum implementation, and Home based related barriers in curriculum implementation. The evidence comes from the research conducted by other people in sciences, local dailies, journals and reference books. The literature reviewed was not necessarily on Kangundo District schools but were problems of similar nature.

According to Fullan (2001), Implementation is the actual use of an innovation or what an innovation consist of in practice. He argues that there are three dimensions at stake in implementing a new program. These are the possible use of new or revised materials, the possible use of new teaching approaches and the possible alteration of belief. He suggested that change is composed of four phases, namely Initiation, Implementation, Continuation and Outcome. In educational contexts, *Initiation* involves the processes leading up to the decision to adopt a new program, *Implementation* involves the first experiences of using the new program, *Continuation* refers to the time when the program is either integrated in to the system or discarded, and *Outcome* is the degree of improvement in, for example, students' learning, and attitude, teacher satisfaction, and overall school improvement. Fullan argues that the lack of success of many innovations can be attributed to the failure of policy-maker, curriculum developers and those implementing the innovation to understand the process of change.

Joyce and Showers, (1995) focused on staff development as a key element of successful change. In their work they suggested that there are four categories of levels of impart in In-service Training (INSET): Awareness; The acquisition of concepts or organized knowledge; the learning principles and skills; the ability to apply those principles and skills in the classroom. They identified a number of key components which are necessary for effective in-service training. These include: Describing new skills to teachers through, for example, talks and lecture, demonstrating new skills and techniques to teachers, providing opportunities for teachers to develop and practice these skills and techniques in simulated and real settings giving teachers feedback on performance and coaching teachers on job.

## **2.2 Student related barriers in curriculum implementation**

### **2.2.1 Student attitude toward science**

The relationship between attitude and performance is reciprocal (Alken 1970) attitudes affects achievements and achievement affects attitudes. Neale (1969), Alken (1970), Ongoma (1987) refers to this relationship as a dynamic interaction between feeling and behavior as observed behavior .Johnson and Rising (1974) stated that attitude is fundamental to the dynamic of behavior. They largely determine what student learns. They argue that we learn in school and how well we learn in school is closely related to attitudes about school. They go ahead and say that attitudes and subject learned through simultaneously complete interaction. Thus developing an attitude toward learning a subject like sciences will improve performance in the subject.

Munguti (1984) defines attitude as “a neural or mental state of readiness organized through experience exerting a directive or dynamic influence upon the individual’s responses to all objects and situation with which it is related”.

The student’s attitude in sciences could be explained partly on the basis of their attitude and aspiration which are distorted in such a way as science subjects are hard. This has the adverse effect of making students to track themselves out of science based and to perform poorly in examinations. Kelly (1987) in support of this noted that past research on why students do not like sciences was propelled by a belief that, “there must be something wrong, with the students perception of science of the world and themselves”.

According to SMASSE Baseline Studies (1998), there is general feeling among students that Science and Mathematics are difficult subjects. This feeling is even greater in girls than boys. There are various reasons that led to this feeling. These are:

Poor performance during national examinations and hence students consider it a waste of time to concentrate on subjects they will not pass. This idea is supported by studies done by two psychologists Birch and Veroff: ‘Anticipation of negative outcomes blocks or inhibits the action’. Another reason is too much theoretical teaching of sciences which has made the subjects appear too abstract and boring. Thirdly the job market-the job market has not been promising for some years. This has discouraged students from taking up sciences that appear more challenging, especially when they see their own brothers and sisters go without job for years. Fourth reason is teachers contribute in installing the negative attitude to students. They expect some student to pass and others to fail and show it openly. This is especially so in mixed school where teachers expect boys to perform better in science and mathematics than girls. There is also the issue of Social-

cultural attitudes-traditionally, difficult task have been seen as male domain. Girls are associated with lighter household chores. This has led many girls to give up in any science subject which is viewed as more challenging at the very beginning.

Teachers are the most important agents that can influence change in students' attitude toward science. They are in contact with the students most of the time. Through such contacts they can communicate their view points and expectations to the students and the students are likely to faithfully believe them.

### **2.2.2 Career aspiration**

According to Alberts et al. (2003), choice of career is one of the major areas of concern for young people nearing the end of their schooling. The influence are complex, for, Ginzberg et al, (1951) argue, the choice of career is also influenced by the young person's conceptualization of his or her abilities and preferences, and one pursuit of a match between these and job requirement. This in turn, is influenced by the young person's gender and place in the family.

The task of choosing a career is not static but part of the developmental process. According to Ginzberg et al. (1951) the initial Fantasy stage of early to mid childhood is followed through the early teenage years by the tentative age when individual begin to think about their interest, capacities and values.

Also, career advice by parents and teacher can influence student choice of science subjects. In a related investigation Okeke (2000) revealed that parents have significant effect on student choice of career and subjects. If we want to encourage more young students into science, then students need rich opportunities to find out about the many

ways science can be used in interesting careers, most of the students have not been helped by their parents when making their study choices.

The other general source is internal influences due to personal conflicts such as students making a choice of career to pursue. Career choice is a complex exercise involving unconscious decisions that are constrained by culture and social traditions.

If a student develops a positive attitude, then chances of learning the subject and at the same time performing well are increased. Student's performance in sciences primarily can be influenced by the way they perceive science in relation to their life now and in the future, by the attitude of other students, teachers, parents and society at large.

According to Super's (1990) developmental theory of career development, high school students are at the exploration stage of career development, which involves crystallizing and specifying their occupational preferences, while also making preliminary decisions about their career choice.

Furthermore, the school has a great role to play in influencing student's choice of science subjects. The school should support science subjects and career decision making. This will go a long way to encourage students' choice of science subjects. In addition, students need information about the structure and content of the science subject they want to study. This will help influence their choice of the subject.

## **2.3 Teacher related barriers in curriculum implementation**

### **2.3.1 Teacher's attitude and motivation**

Although science teachers may have positive attitude, they are beset with problems that frustrate their effort to teach effectively and efficiently. The facts that performance in national examinations in sciences or mathematics is not as good as in humanities could frustrate a teacher who thought he had put a lot of effort. It is also possible that a number of teachers are not in the profession by choice. Although many of them adjust and accept teaching as profession, there are those who take too long while others do not accept the profession at all. Committed teacher should find time for preparation and research as seen in Birch and Veroff in their book 'Motivation. A study of action' state 'people who are not good at doing things will inevitably experience successes.

Findings during baseline studies indicate that lack of sufficient teachers is problem in many rural schools. It is possible to find one physics teacher in a school, for example. In such situations, the teacher is overworked and has no time to prepare sufficiently. When students have a negative attitude towards sciences, teachers will in doubt be discouraged. The advice to teachers is to apply 'The principle of optimum change'. This means they need to change their approach so as to create curiosity in their students. The principle goes further to say that small changes are boring while large changes are scaring. The change should be optimum. Also overloaded curriculum- in an attempt to cover the syllabus, sciences is taught theoretically and students are not given time to discover things for themselves. At the same time, there is lack of facilities in some schools which has frustrated those teachers who rely on convectional apparatus only .Finally some head teachers have contributed to the frustration of science teachers'

especially. Those who are not science-based are sometimes ignorant of the needs of sciences. They are willing to spend money on co-curricular activities or construction of halls but not on apparatus and materials.

Teachers have tremendous influence on students achievement and consequently on their aspiration and expectation. Rosenthal and Jacobson (1968) supported this and Rist (1970) who confirmed that teacher's assessment and perceptions of student's potential abilities to succeed in school work affected their interest. Students believed by the teachers to have intellectual abilities for school work turned out to do as expected by their teachers.

The attitude of teachers thus serves to reinforce student's attitude towards science and technology. Munguti (1984) in support of this noted that teacher's positive attitude has been known to attract more students in their classes and hence promote achievements in the subjects they are teaching.

### **2.3.2 Role of In-service Training Education for teachers (INSET)**

Joan (1991) says that INSET is the education intended to support and assist professional development that teachers ought to experience throughout their working lives. She further says that it is a process whereby teachers become more profession. According to her, INSET should benefit serving teachers and hence requires planning and proper management to enhance teaching and learning.

According to UNESCO (1983), INSET is the whole range of activities by which serving teachers and other categories of educationists in formal school system may

extend and develop their competence and general understanding of the role of which they and their schools are expected to play in their changing societies.

Guthrie and Reed (1991) on their part view INSET as continuing staff development programme focused on a need in a formal systematic programme designed to foster personal and professional development.

Harris (1989) describes INSET as any planned programmes of learning opportunities afforded to staff members of schools, colleges or other educational agencies for purpose of improving performance of the individual in already assigned positions.

The fact that the curriculum and instruction content is an open system that is prone to mechanism should be clear from the foregoing discourse for teachers to effectively play their roles in this dynamic self-regulating set-up. The importance of INSET to continuously update their skills and abilities cannot be overemphasized.

Factors that may disturb the education system equilibrium thereby making it necessary for teacher to undergo INSET are: One, curriculum requirements of any education system do not remain constant but are ever changing with time. This may for instance be as a result of changing education policy to respond to contemporary societal needs. INSET would provide the necessary forum where the policy maker and the implementers would deliberate on matters pertaining to new aims and objectives, content, sequencing, modalities of implementations and reach a consensus. Secondly changes in curriculum bring about a need for re-examination of pedagogical aspects. New teaching methods/approaches may be required to teach new curriculum. Also there is continuous research on effectiveness of teaching/learning methods/approaches and as such practicing teachers need to be updated on the current trends. Such INSET is provided due to the

potential benefit to the teacher's professional growth. INSET also provides a good opportunity to make a follow-up, undo the retrogressive acts attitudes and practices. Most teachers' trainers especially in the universities are out of touch with the realities of the classroom and that some courses are generally theoretical. It is more for such reasons that INSET, during which pre-service training can be harmonized with the realities of educational practices, becomes essential. Teachers can be best sensitized and exposed to suitable approaches/practices to achieve the best value of education as an investment.

Technological advancement has brought with it the Information Technology (IT) revolution. Technology has found considerable use in education and since not many teachers have the necessary IT knowledge and skills, this critical area can be achieved through INSET. Lastly the dynamism of society ensures that passage of time always brings along with it issues that need to be addressed urgently e.g. AIDS pandemic, drug abuse, deviant behaviour, unrest in schools etc. INSET becomes necessary where teachers, especially head teacher and those in charge of guidance and counseling are equipped with skills and competencies to deal with such situations.

## **2.4 Administrative related barriers in curriculum implementation**

### **2.4.1 The role of the principal**

The literature attempted to analyze studies, which suggest how the head teacher as the chief-coordinator of programs in school uses his position to facilitate learning of sciences among students despite other intervening variables. The head teacher's style of leadership in relation to teaching and learning is important. The quality of administration contributes

to the successful implementation of the school programmes and their evaluation. The support he gets from the staff, pupils and the community goes a long way in improving achievement in the various programme areas.

Administration cover the whole art of carrying into effect any policy, plan or undertaking. Campbell (1973) describes administration as one act of mobilizing the efforts of a number of people towards the achievement of a common goal.

In a school set-up, administration or the day today running of the school is the responsibility of the head teacher / principal. The functions that he/she is supposed to perform are grouped under six administrative task areas. According to Campbell there are: Student or pupil personnel, staff personnel, curriculum and instruction, physical facilities, finance and management and school community relations. The success of the school is determined by the way the principal organizes and co-ordinates these tasks.

Concerning student or pupil personnel Campbell (1973) notes, that the tasks is associated with interpreting all data available on the pupils and providing special services to help them adjust in the school situation. Knevich (1975) also notes that one task involves the recording of all administrative instruction and appraisal information necessary to keep a pre-school and post-school record of each student, to provide data for the growth and development of the learner. The principal can make use of this information to help individual student where necessary and encourage their performance in science subjects.

The staff personnel task is also important since teachers are the ones who implement educational programmes. Staff morale and motivation is crucial for effective teaching. Knerich (1975) further noted that the working relationship existing between the

administrator and his staff has much to do with staff productivity. The development of mutual respect and confidence is a necessary condition if the purpose of the school is to be fostered.

For Curriculum Development and instruction the principal should see it as a co-operative endeavor. The teachers must be involved in the decision making process as regard selection of instructional materials, and the parents from whom moral and financial support will be required if the implementation of the curriculum is to succeed. The principal should also create an environment for the constant evaluation of the curriculum to determine pupils' progress and teacher effectiveness.

Programmes of instruction and pupil services in school require physical facilities. In the learning of students in science subjects, science learning facilities are very crucial for the learning and teaching of the subject.

In recognizing the importance of school management Havighmist (1964) noted that school plant management is an area of significant responsibility in educational administration and involves all services, activities and procedures concerned with seeing that existing school facilities are kept open and in usable condition. It includes services that are used on a day to day basis and which are essential to safety, comfort and well being of those who occupy and use school facilities.

Regarding school community relationship it has been noted that the community has certain aspiration for the school. The relationship between the school and the community is important if the school is to develop and provide services to its clients. Likami (1982) noted that the attitude of the community towards the school depend on how effective the head of the school is, in running it and particularly how well the

national examinations are done. The attitude is positive when the community regards the principal to be good and the student disciplined and well behaved. The interaction between the school and the community enhances this relationship.

On finance and management, Likami (1982) further noted that shortage of money can cause rioting in schools especially when students lack basic necessities, most of the shortage become more serious due to poor planning and budgeting and this will affect learning.

The successful learning of sciences amongst students will very much depend on how principal co-ordinates, harmonises and synthesizes these activities. If any of these task is neglected effective learning cannot take place, Kaungania (1985) observed that effective schools are characterized by effective leadership through the head teachers' understanding and effective performance of his/her roles effectively. Principals also needs to put in place deliberate interventions to meet the specific and special need of his charges especially in the learning of sciences which traditionally have been referred as difficult to most students.

According to Torto (1997) the teaching and learning environment needs to be conducive to the needs of students especially if they are to learn science. The methodologies used in classrooms depend largely on availability on resources and facilities. Due to their inadequacy students rely on teachers a lot and often have no referral sources. Teachers however tend to limit themselves mainly to just a few traditional teaching methods which are teacher centered. An institution with adequate resources would give all students the opportunity to be actively involved in class and appreciate the subject of study. Kelly (1987) observes that an effective teacher is who

understand various teaching methods and is able to convert those methods into productive teacher /student interactive process to facilitate learning.

Other factors that are considered for the improvement of performance of students in sciences are those related to the availability of equipments for teaching and learning of sciences. According to Washika (1997) School system that is consistently responsive to teaching and learning needs has a positive impact on the personal and collectively, efficiency and effectiveness of the teaching staff and ultimately high academic performance of its pupil in all disciplines.

#### **2.4.2 School policy**

Mackay commission (1981) which introduced 8-4-4 system of education, recommended science subjects to all students. If the school had resources it could offer pure sciences while those schools with inadequate resources could offer Physical sciences and Biological sciences. Therefore the students doing pure sciences could do Physics, Biology and Chemistry, while those doing Physical sciences could do a combination of Chemistry and Physics as physical science paper and Biological sciences. With this a basic science course in all secondary schools was retained as recommended by the report of the National Committee on Educational Objectives and Policies in 1976 known as the Gachathi report.

According to MoEST (2002) another curriculum review was carried out in 2000 by Ministry of Education, Science and Technology and implemented in 2001. The review directed that Physical sciences will no longer be offered in secondary schools but all schools were to offer pure sciences. The three sciences (Biology, Chemistry and Physics)

were made optional as long as a candidate pursued at least two of them. This implementation has a lot of disadvantages to those students in schools without resources. This is because they do not perform experiments which they are supposed to do. They don't even have a laboratories leave alone the apparatus. The students are exposed to the apparatus for the first time during examination. This has led to student doing very poorly in pure Sciences.

In most schools laboratories serve as classrooms for demonstration and doing experiments on the part of the teacher and the students alike. Aquires (1968) says:-

*“Laboratories may serve to demonstrate theoretical ideas in sciences; they may provide a familiarity with the apparatus and may provide training in how to do experiments.*

Many schools do not even have a laboratory let alone the apparatus. In cases where laboratories are there, the apparatus are too expensive to afford. Hence the laboratories end up being rooms which can not be used for demonstration on how to do experiments.

Method of teaching sciences has also been a big problem because the teachers are trained in the field that they cannot apply their skill effectively due to shortages here and there. They thus end up using unorthodox methods in teaching sciences. John Lewes (1972) observed that: - *“Scientist and science teacher often assume that it's only the technical vocabulary which is special about the language of science. But in practice, it is the vocabulary which is the easiest part of science teaching. “ If the scientific point of an experiment is fully understood the technical terms will easily be learnt.”*

Before an experiment is carried out, the theoretical part of it should be clearly understood. It is important when one is teaching he makes use of sight and the sense of hearing. A study by “second sense of hearing “in 1966 published by Educational

resources centre (U.O.N) established that:- *We learn about 11% from hearing, 83% from sight and we retain 20% of what we hear and 50% of what we hear and see.*” It is important that visual aids are used when teaching sciences as communication is more effective when seeing and hearing i.e. teachers of sciences should use a multimedia approach.

When teaching sciences many teachers use expository strategy.i.e.they give definition, application, and examples and ask students to do problems. Martin (1972)”concept of science education” London 1972 observed: *“Psychologist has established that retention and transfer of value are greater if knowledge is acquired by the guided discovery strategy. Students learn how to inquire when taught by the guided discovery approach.”* Teachers should change their approach when teaching sciences to the guided discovery approach.

Schools have over the years taught sciences that cannot even be demonstrated in the well equipped laboratories in school. Some of this science is not even applicable by the qualified students who did well in the subject at the university level. This has raised the question of the relevance of the sciences curricula or generally the school curricula, the teaching methods and facilities for teaching the science subject on the relevance of the curricula, Eshiwani (1982) says: *“Science curricula in our schools have been based on European sciences curricula, which are neither relevant to East Africa problems nor appreciative of the social cultural background of the average East African boy or girl.”*

The science curriculum should be reviewed to make it relevant to our country. Science subjects forms the basis of almost all vocational and industrial training therefore it should have a curriculum that would be relevant to our industrial needs as Kenya is still

a country that is growing industrially. The teaching of science is influenced by ideas about the nature of science and knowledge (Harlen, 1992). Furthermore, teachers' restricted understanding of science may perpetuate the environmentally inappropriate values of modern science. Lack of understanding of the nature and history of science is problematic (Lakin & Wellington, 1994) and this can be compounded by positive ideas (Clayden et al., 1994) thus modern science within a fragmented school curriculum reflects value which are alienated from nature and can perpetuate attitudes which are environmentally damaging (Eagan & Orr, 1992; Gaskell, 1992).

A lot of interest has been generated due to poor performance of pure sciences amongst students. In spite of the facts that Communities and the government have invested heavily in science education for students and policies have been put in place to ensure the successful study of science subjects. Due to the poor performance in Mathematics and Sciences at K.C.S.E level, it led to the development of the Strengthening of Mathematics and Sciences in Secondary Education (SMASSE) project as a joint venture between the government of Kenya represented by MoEST and the government of Japan represented by JICA(1998). The core function of the project is to strengthen the teaching of Mathematics and Sciences (Chemistry, Physics and Biology) at secondary level through in-servicing of serving teachers. The aim is to upgrade the capacity of young Kenyans in Mathematics and Sciences. The Kenya government spend over 30% of its annual budget on education (Republic of Kenya 2004 ). Part of this money is channeled towards improvement of science education. Despite all this effort by the government the performance of pure sciences in the country has not improved.

However as noted in the background to the problem, the existence of institutions with no laboratories and students that would like to pursue arts-related courses and careers. The General Science course was introduced to cater for such learners in both formal and non-formal setting. The content is favorable to the learners where they can achieve better grades and their overalls mean grade will be raised, throughout the Kenyan learning institutions. The General Science and Mathematics Alternative 'B' syllabuses have been developed to provide flexibility in secondary schools Science and Mathematics curricula. The curricula are designed to prepare learners who will pursue further studies in courses that do not require intensive use of Science and Mathematics competence. General Science is designed for students who do not intend to pursue careers requiring application of advanced scientific competencies. It may be taken by students whose future career is geared towards courses such as journalism, law, political science, teacher of humanities, performing arts economics e.t.c. Students who aspire to pursue careers that require application of advanced scientific competence such as Engineering, Medicine, Pharmacy, Architecture e.t.c, will need to pursue the pure Sciences up to Form Four.

## **2.5 Home based barriers in curriculum implementation**

### **2.5.1 Parental involvement on student Education**

In respect to the role of the parents and their effect on student interest in sciences it has been postulated that the family environment impinges on curriculum and influence the quality of school practices. This is due to the fact that family is represented in school organization such as Board of Governors and Parent Teacher Associations. These

associations influence the implementation of the curriculum and school practices through ideas and financial support. It is through this association that the head teachers draw their support in managing their schools. The curriculum, the school quality and school practices influence the students' educational aspirations and expectations which is further reflected in the students' interest in the various school programmes.

It is further noted that initial experiences that mould an individual's values, aspirations, emotions and attitude are those that are offered by parents and other close members of the family. Parental values aspirations and interests are subtly and unwillingly transferred to their children. The kind of activities a parent encourage his children to take part in has a direct influence on their future development. This leads to stereotyping which begins right from home and sets the place for latter pursuits of their children. Parental influence has been cited as another factor which influences learning as it may enhance positive self esteem which imposed performance. Gakuru et al. (1982) noted that the co-operation and support from parents is important in any learning process.

Studies done, underline the importance of encouragement on the child's performance in sciences. Learners whose parents encourage them to do well in subjects show interest in their schooling and are actively involved in their school work and tend to perform better .Learners who are encouraged to excel tend to be academically motivated and likely to work harder in order to please their parents. Parents who know the importance of education and have a positive attitude towards school will always press their children to complete their home work and assist them in doing them.

Cullen (1969) stresses that those children who come from homes where parents are interested in education offer help and encouragement and stress the value of deferred

rather than immediate gratification which highly motivate children who come from family whose values and norms are not in conflict with those of the school.

Douglass (1964) carried out a study of over 5000 children drawn from every type of home in England and Wales, and found out that parental encouragement is significantly related to the achievement. This researcher saw parents' encouragement to be of considerable importance in determining the education of children, those parents who are most interested in their education encourage them to do well and score high on average than children of parents who were least interested and encouraging.

Kapila (1976) in a study of over 3000 children reputed a positive association between parents' participation in their children's academics work and academic performance. Finally parent serves as useful guides to the academic fields which their children pursue. They can build self confidence in their children to help them develop high self esteem, high degree of independence and encourage them to participate in those activities that will enable them to develop interest in the sciences. Many students still select their careers totally unaware of what chances exist in areas connected with their study.

### **2.5.2 Peer influence**

External influences such as from peers and students from other schools can make student form an attitude about science subjects. Student's performance in sciences primarily can be influenced by the way they perceives science in relation to their life now and in the future, by the attitude of other students, teachers, parents and society at large. If

a student develops a positive attitude, then chances of learning the subject and at the same time performing well are increased.

Sjoberg and Imsen (1988) suggested that students are not individually responsible for their lack of interest in science but also the environment in which they live right from home to school and the community around them. Torongey (1986) reported that for students to succeed in sciences they need to have positive self-confidence and self – determination. The development of attitudes and beliefs is influenced by ones environment, the people one is interacting with and so forth. In this case the school environment, teacher, peers groups, parent and community in general can influence student’s perception of science subjects.

Barriers to implementation of curriculum change in summary from the foregoing consideration, is clear that new programs make many demands upon those involved in the developments and management of the implementation of curriculum programs. These include policy maker, curriculum planner, administrators and teachers. Above all this call for the evolution of an organization and communication system that allows flexibility in planning at all levels measure of decentralization in development and implementation and control at the central and local levels. To undertake this kind of management requires considerable knowledge and close personal relation between central and field workers.

Indeed an important realization of a curriculum worker is that ‘the process of implementation is one of persuading people to make certain decisions. And, as such it is neither a curriculum process, not academic process (Pratt, 1980).

The launching of the first generation of major science projects particularly in the United States of America in the late fifties was accompanied by a great euphoria and

curriculum development, become a big industry. However, before long, it was clear that a “formidable gap existed between the intentions of the curriculum projects and what actually happens in classrooms”(Kelley,1968).

As similar evidence on the implementation of discovery and inquiry orientation programs began to appear in Britain, what had at first been described as resistance to change began to be seen as the cumulative effect of barriers to curriculum change.

Six sources of conflict which acts as the barriers to curriculum change can be identified. The issues that emerge from this analysis are: Value conflict where many of the curriculum innovation are a response to change in social, political and /or economical values. This often represents a particular view and not an absolute value. As these are made, in anticipation of widespread implementation; value conflict emerge which can sometimes acts as powerful barriers. Second is a power conflict which arises out of the changes in the distribution of power in the transitions from development to implementation and may positively or adversely affect the implementation. Third is a Psychological conflict which involves the inability of human being to changes from one situation which is well known. Halliwell Tersely summarized this when he said, “the difficult we all experience is seeing old familiar material from a new point of view” (Halliwell, 1964). Fourth is practical conflict with the demands of new project and the complex array of demands and pressures existing in school and classroom setting may bring about practical conflict in decision making about teaching and learning strategies to be adopted, the adequacy of resources (both human and materials) in the school, and the intellectual ability and interest of the students (Schwab, 1969). Fifth involve Examination and Selection in the limited places at the university and other institutions of higher

learning where selection has been accepted as necessary and inevitable in both short-term and long-term educational planning. The selection process emphasizes the subjects that the students must pass to be regarded as successful in the examinations. This combined with the type of examination taken at the end of the courses exerts pressure on both the teachers and the students on the subject they take and the type of knowledge considered important and therefore worth learning. Lastly are the rapid social economical and technological changes which are the other sources of resistance to changes to be found in the new social, economical and technological needs of a rapidly changing society. These make many demands on educational institutions to equip their graduates with social and scientific skills necessary to man both public and private sectors of the economy. The society also expects the schools and other educational institutions to enable graduates to acquire sufficient flexibility and sophistication to cope with change itself and all the strains that change imposes upon relationship in a national setting.

## **2.6 Summary**

The literature review highlighted some of the barriers to the implementation of General Science curriculum in secondary schools. The review covered Student's related barriers in curriculum implementation, Teacher's related barriers in curriculum implementation, Administrative barriers in curriculum implementation and Home based barriers in curriculum implementation. In students related barriers in curriculum implementation some of the issues covered are student attitudes toward science and Career aspiration. In teacher related barriers in curriculum implementation it emerged

Teacher attitude and motivation together with role of In-service Training for teachers affects the implementation of a curriculum. The literature also covered Administrative related barriers in curriculum implementation which included the role of the principal and schools policy. Lastly the literature covered Home based barriers in curriculum implementation which included Effect of parental involvement on student education and Peer influence.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY AND DESIGN**

#### **3.1 Introduction**

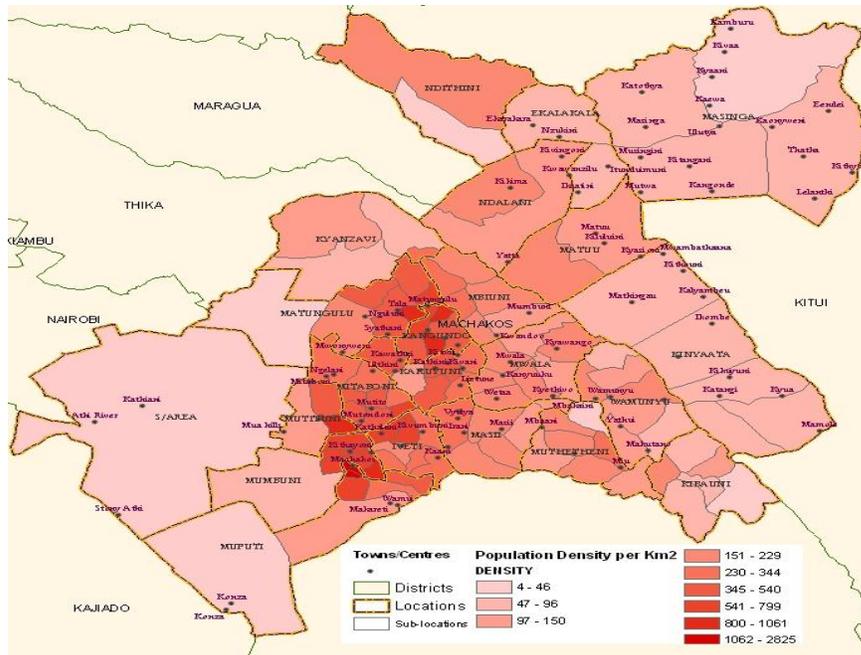
This chapter presents a discussion on the design and methodology of the study. It gives a summary of the research design, the target population, sample and sampling, description of the instrument and the data collection and analysis procedures used in the study.

#### **3.2 Design of the study**

The design used in this study was that of descriptive survey research. Descriptive research studies are designed to obtain pertinent and precise information concerning the current status of phenomena and whether possible to draw valid general conclusion from the facts discovered (Lokesh 1984). The method is non-experimental for it deals with relationships among non-manipulated variables. Descriptive survey design was used in preliminary and exploratory studies to allow researcher to gather information, summarize present and interpret for the purpose of clarification (Orodho 2004), Borg and Gall (1989) noted descriptive survey research is intended to produce statistical information about aspects of education that interest policy makers and educators.

### 3.3 Location of the study

**Map 3.1 Kangundo areas in the former Machakos District**



The study was done in Kangundo District of Machakos County and involved four secondary schools. Singleton (1993), notes that the ideal setting for any study should be easily accessible to the researcher, and should be that which permit instant rapport with the informants. Wamuhui and Karugu (1995) also point out that, being familiar with the research locale help in gaining acceptance. Kangundo District was easily accessible to the researcher because no studies to the best knowledge of the researcher have been conducted in the District. The accessibility of the Kangundo District made it economical for the study because the researcher works in the District. These also reduced the expenditure in term of transport cost.

Kangundo District is in Machakos County. Machakos County covers a total area of 6286 square kilometers (6281 km<sup>2</sup> covered by land and 5 km<sup>2</sup> covered by water). Kangundo District covers a total area of 1256 km<sup>2</sup> covered by land and 1.23 km<sup>2</sup> by water. Kangundo District is an administrative district in the former Eastern province which is approximately 69 km from Nairobi. The local climatic condition is a semi arid. The main economic activities in Kangundo district are farming where the main cash crops are maize, beans and cowpeas. The Akamba people are the dominant tribe.

### **3.4 Target population**

Borg & Gall (1989) defines population as all members of a real / hypothetical set of people or events or object to which a researcher wishes to generalize result of the study. Mugenda (1999) defines, Population as an entire group of individuals' events and objects having common observable characteristics, in other words population is the aggregate of all that conform to a given specification.

The distribution of secondary schools in the district, total number is twenty five (25), Four (4) Provincial schools, one (1) for boys and one (1) for girls and two (2) mixed, seventeen (17) District secondary schools which are all mixed and lastly four (4) Private secondary school which are all mixed. The total number of students in the twenty five schools is Eight Thousand nine hundred and twenty (8920). The Science teachers in these schools are seventy five (75).

**Table 3.1 Number of public schools and student population in Kangundo District**

Category of School	Number of School	Student population	Science Teachers
Provincial Schools	4	1670	17
District Schools	17	6030	50
Private Schools	4	1220	8
<b>Total</b>	<b>25</b>	<b>8920</b>	<b>75</b>

**Sources:** Kangundo District Education office (2010)

### **3.5 Sample size and sampling**

The purpose of sampling is securing a report of a group which will enable the researcher to get information about the target population (Kothari D, 2008). Mugenda (1999) defines sample as a small group obtained from the accessible population, each member in the sample is referred to as subject.

Sampling is the process of selecting a member of individual for the study in such a way that individual selected is representatives of a larger group on which they are selected. The purpose of sampling is securing a report of a group which will enable the researcher to get information about the target population. The study was conducted at a district with seventeen (17) public District schools. The researcher used purposive sampling for the schools. Orodho (2004) says that purposive sampling involves selecting samples using set criteria such as type of school (National, Provincial, District) boarding, day or mixed. The researcher therefore used purposive sampling and picked four public District secondary schools because majority of them did not have enough science

facilities and equipments to offer pure sciences. For this reason it was expected that District schools will embrace the implementation which was not the case.

To arrive at the number of the students' simple random sampling was used to select 200 of the students which are 23.3% of the population. The researcher used the class register for Form 3 and Form 4. A unique number was used in each school to randomly pick the students. Further a different number was used to select the students in Form 3 and Form 4. In this technique each member of the population had an equal chance of being selected as the subject. Only Form 4 and form 3 students were selected for the study because of them being in a position to understand best the dynamics of implementing General Science Curriculum because they had already chosen their science subjects and having undergone most part of the pure science syllabus currently. The sample size for the study was 200 students, 50 from each school, 12 teachers and 4 principals. The study involved 25 students in Form 3 and 25 students in Form 4 from each school. It was from these groups the data was collected and analyzed.

**Table 3.2 The study sample**

Category of school	Number of Schools	Sample size	Percentage	Student population
District schools	17	4	23.3	6030

**Sources:** Researcher

### **3.6 Research Instruments**

The main research instruments used to collect data in a survey research are questionnaires and interview Kerlinger (1973). The study therefore used questionnaires for the students and science teachers. The interview was used for the principals and also the science teachers and student. The questionnaire as Kerlinger further notes is important in that it covers a wide scope than the interview guide which serves to supplement information as a follow up to clarify gaps and add insight. The following were designed to collect data for this study.

- 1) Student's Questionnaire
- 2) Science teacher Questionnaire
- 3) Principal, science teacher and student interview schedule.

#### **3.6.1 Student's Questionnaire**

The student's questionnaires had open-ended questions. These questions were used to allow students to provide sufficient information about the implementation of a General Science Curriculum. The students were asked to state the science subjects they had chosen in their third year in secondary school. They were also told to state what influenced them to choose the science subjects. Student's questionnaires did not have any question on personal details in order to ensure that the students provided quality answers without fear.

### **3.6.2 Teacher's Questionnaire**

The teacher's questionnaires used open-ended questions in order to allow teachers to provide unlimited information. These questionnaires had questions pertaining to gender and the teacher's experience in teaching science subjects. The question on teaching experience was meant to know whether the science teachers were fully equipped with knowledge that was essential in teaching science subjects.

### **3.6.3 Interview schedule**

The interview question was concerned with the name of the school and performance of the students in the science subjects. In addition, the principals were required to state the number of science teachers in their schools and their adequacy. Open-ended questions were used to allow the provision of sufficient data.

## **3.7 Piloting**

The pilot study was conducted at Baba Dogo Secondary school in Nairobi. This was chosen because it has the same characteristics to the chosen schools for the study. The piloting was carried out using 20 students in Form 3 and 4 and three science teachers purposively selected from those teaching sciences in Form 3 and 4. The principal of the school was also included. The pilot school was not used in the final study. The purpose of the pilot was to ensure that the instruments used are reliable. It is only after satisfactorily meeting the objectives that they were dispatched and administered to the sample population.

### 3.7.1 Reliability of the research instruments

Mugenda (1999) defines reliability as a measure of the degree to which a research instrument yields consistent result /data after repeated trials. Orodho (2004), states that reliability concerns the degree to which a particular measuring procedure gives similar results over a number of repeated trials. It was essential to test the reliability of the various research instruments in order to get quality results. To ensure that the questionnaires were reliable the use of internal consistency was employed. This means that all questionnaires had similar questions in order to get quality results. This method involved splitting the statements of test into two halves (odd & even items) the odd numbered items was placed on one sub-set while the even items was placed in another test. The score of the two sub sets was computed for each individual and two test of score correlated by using the Pearson Product moment correlation efficient(r).The correlation that was obtained represented the reliability coefficient if only half of the test become reliable to the strength of the test, correlation must be affected so as to obtain the reliability of the whole test. In order to ensure reliability of the questionnaires a reliability co-efficient index of 0.7 was accepted.

Expressed as: 
$$\frac{r = 2r \text{ split half}}{1+r \text{ split half}}$$

Where r=the total number of test.

### **3.7.2 Validity of the research instruments**

Moore (1983) says that “the term validity is the degree to which an instrument measures the construct under investigation”. Mugenda (1999) defines validity as the accuracy and meaningfulness of inferences which are based on the research results. Kumar (2005) defines validity as the accuracy and meaningfulness of inferences which are based on the research results. In other words, validity is the degree to which results obtained from the analysis of the data actually represents the phenomenon under the study.

The initial step of validating the instrument was done through proposal writing. At this stage /phase the instruments was appraised by the Lecturers / Supervisors who are expert into the area of curriculum policy. The second step of instrument validity was done during the pilot study. It was intended to help the researcher in the identification of the items that were inadequate or ambiguous in eliciting relevant information. The items were discarded or modified in order to improve the quality of the instrument and hence validity. To enhance the validity of the instruments pre-testing was conducted on a population similar to the target population. The reason behind pre-testing was to access the clarity of the instrument items so that those items found to be inadequate could either be discarded or modified.

### **3.8 Data collection procedure**

The researcher visited identified school under study to seek permission from the respective Principal of the schools identified. The researcher presented letters of introduction one from the Ministry of Education Science and Technology and another

from the University. The researcher personally administered the questionnaire to each of the respondent for the purpose of collecting data. The collection of data for the study involved moving from one school to another within Kangundo district in the collection of data.

### **3.9 Data analysis**

Orodho (2004) observes that data analysis is the lifeline of a research and that the method of analysis is the backbone and conduct wire. Hence data collected was coded and entered in the computer for analysis using the Statistical Package for the Social Science (SPSS). Data collected was analyzed and tables reflecting the frequencies and percentages were drawn so as to arrive at conclusions in accordance with the purpose the study. The findings were presented on summary form using frequency distribution tables, bar and pie charts.

## **CHAPTER FOUR**

### **DATA ANALYSIS, PRESENTATION AND INTERPRETATION**

#### **4.1 Introduction**

The study sought to investigate barriers to the implementation of General science Curriculum in District Secondary schools in Kangundo District. This chapter presents data analysis and the results of the study.

The research findings are also presented on the basis of the research objectives. These are:

- 1) Students related barriers to the implementation of General Science Curriculum.
- 2) Teacher related barriers to the implementation of General science Curriculum.
- 3) Administrative related barriers to the implementation of General Science Curriculum.
- 4) Home based barriers to the implementation of General Science Curriculum.

In this chapter, each objective is addressed and dealt with fully in line with the research Questions of the study.

#### **4.2 Student related barriers to the implementation of General Science Curriculum**

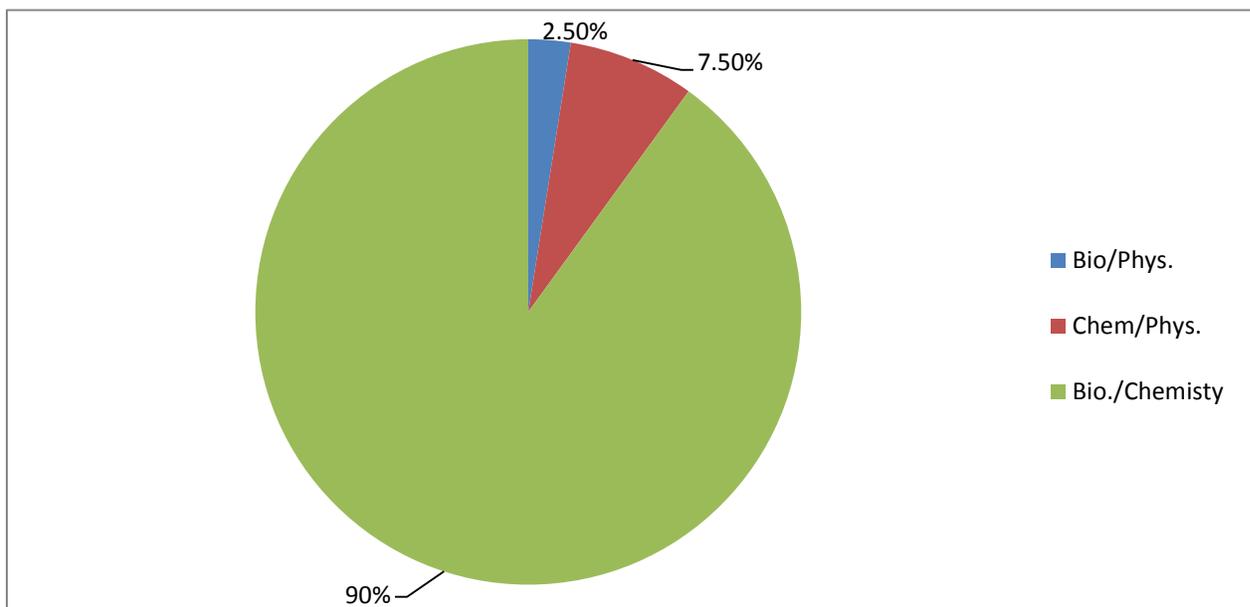
The first objective was to determine students related barriers to the implementation of General Science Curriculum, the following areas were investigated: Student's attitude toward science subjects and Students career aspiration. Students were asked questions on

reasons for choice of science subjects they were currently pursuing, career aspiration and opinion they had on introduction of General Science curriculum. It is from this questions the researcher was able to gather information about the attitude students had on science subjects. The researcher established that student's attitude toward science subjects is manifested on science subjects they chose and the reason for their choice.

### **Students attitude toward science subjects.**

From Figure 4.1 shows detail of science subjects' student chose and Table 4.1 shows detail of the reason for their choice. It can be observed that a majority of the students in sampled schools had a negative attitude toward science subjects. From figure 4.1 majority 180 (90%) of students were taking a combination of physics and chemistry while only five (2.5%) of the student were taking a combination of Physic and Biology. No student in the four schools was taking the three science subjects. When probed further the student revealed that in three (75%) schools chemistry and biology was compulsory while in one (25%) school the student reported that they had a chance to do any of the science subject

**Figure 4.1 Science subjects chosen by the student for K.C.S.E Examination N=200**



When students were further asked to give reasons as to why they opted for the science subjects they were currently pursuing. Table 4.1 below has the detail. A majority of students one hundred and sixty two (81%) did not take science out of their own choice but because it was compulsory. When propped further the students indicated that they would have been more comfortable with art-based subjects or a simpler alternative like the former Physical Science and Biological Science, only three (1.5%) opted for science subjects because of future career prospects while fifteen (7.5%) were influenced by their parents/guardians. Twelve (6%) indicated that the subjects would assist them pass examination since they were good in sciences and were confident and eight (4%) took science as it was the easiest option.

**Table 4.1: Reasons for choice of Science subjects N=200.**

Reason	Frequency	Percentage (%)
Assist me pass examination	12	6
I was encouraged by my parent/guardian	15	7.5
It was the easiest option	8	4
Best suited for my career	3	1.5
Science was compulsory	162	81
Total	200	100

From the above statistics the researcher established that students had negative attitude towards sciences. This led to lack of interest in the subjects and when science subjects are to be selected they only did it because they were compulsory. Most students preferred art-based subjects or a simpler alternative like Physical science and Biological science which was being offered when 8-4-4 system of Education was introduced. It was then abolished in 2001 (MoEST 2000) when all secondary schools were directed to offer Pure Sciences

Educational and psychological researchers support one value of choice in learning and self-regulation, proponents of positive psychology, for example argue that choice is beneficial because it increases learning, performance, and positive effect. According to Ryan & Deci, (2000) Student learns more or performs more efficiently when given choices about their learning many students report more enjoyment in learning when given choices. Teachers also endorse the use of choice in the classroom because it increases motivation effort and learning. The finding of Flowerday and Schraw (2000) reported that teachers give student choices because they believe it increase effort and learning.

As reported by Okoli (1995) most student tend to prefer non-science subjects such as Economic, secretarial studies, literature, banking and finance to science subject such as physics, mathematic, chemistry and biology. (Fraser et al. 1991) in his research findings showed that the pattern of student's interaction inside and outside the classroom has significant effect on their interest and achievement in science. He quoted in his research that student's attitudes towards science subject affect their choice of the subjects. Generally negative attitude towards a given subject leads to lack of interest and when a subject are to be selected, as in senior secondary schools, it leads to avoiding the subject or course. Furthermore a positive attitude towards science according to Simpson and Oliver (1990) leads to a positive commitment to science that influences life long interest and learning of science.

In line with research carried out by Christiana I, Drighi, P.O, Unumwaubi and L.I. A guile (2005) Choice of science and Technology subjects among secondary school students. The study showed that more student chose art and commercial subject compared to those who chose science and technology. This is in agreement with Okoli (1995) who posited that more students prefer non-science subjects to science. This subject imbalance is in direct reflection with the view of peel (1998) that attributed such development to conflicting ideas student receive from parents, teachers' friends and career adviser upon entering secondary schools.

### **Student's career aspiration**

When student were asked questions on career aspiration and the opinion they had on General Science Curriculum. Table 4.2 below shows the details of student's career aspiration.

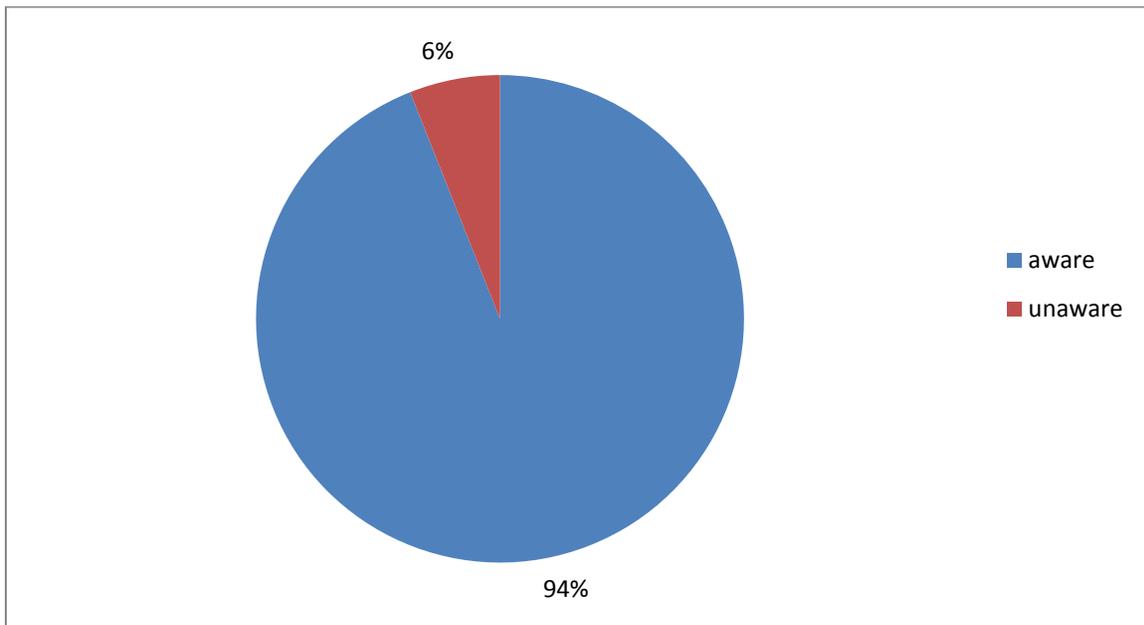
**Table 4.2 Students career aspiration N=200**

Career aspiration	Frequency	Percentage (%)
Nursing	10	5
Engineer	4	2
Law	12	6
Journalism	91	45.5
Sales and Marketing	74	37
Doctor	1	0.5
Bachelor of Commerce	8	4
Total	200	100

From the above statistic majority preferred art-related careers. This is evident as majority of student 91 (45.5%) choose journalism, 74 (37%) choose sales and marketing 12 (6%) preferred to do law. While eight (4%) preferred business oriented subject and wanted to pursue Bachelor of Commerce. Only few students preferred science oriented careers such as Doctor one (0.5%), Engineering four (2%) and Nursing ten (5%). This indicated that majority of students choice of career was not in line with science subjects. Majority preferred art- related careers. When student were interviewed to find out the reasons for study preference it emerged that career aspiration matched their subjects choice and majority wanted art – related courses while just a few preferred science related courses.

When asked whether they were aware of introduction of General Science Curriculum, majority 188 (94%) were aware. While 12 (6%) seemed not to be aware. Further questioning reviewed that those student who were aware got to know about it through the Head of Science Department teacher who informed the student when it was introduced. Others got to know about it through peers from neighboring schools which were offering General Science Curriculum. The researcher also established that if the student were given a chance majority 188 (94%) would opt for General Science Curriculum. Fig. 4.2 has the detail of students who are aware of General Science and they would wish to do it.

**Figure 4.2 Student awareness of General Science N=200**



According to super's (1990) developmental theory of career development, high school student are at the exploration stage of career development, which involves

crystallizing and specifying their occupational preferences, while also making preliminary decisions about their career choice.

According to Alberts et al. (2003), choice of career is one of the major areas of concern for young people nearing the end of their schooling. The influence are complex, for, Ginzberg et al, (1951) argue, the choice of career is also influenced by the young person's conceptualization of his or her abilities and preferences, and one pursuit of a match between these and job requirement. This in turn, is influenced by the young person's gender and place in the family. The task of choosing a career is not static but part of the developmental process. According to Ginzberg et al. (1951) the initial Fantasy stage of early to mid childhood is followed through the early teenage years by the tentative age when individual begin to think about their interest, capacities and values.

Kilonzo (1985) undertook a survey of pupils in standard 5, 6 and 7 in Machakos district. His aim was to find out whether the pupils concerned have a realistic perception of the world of work and adequate career awareness, career plans for their future and what the sources of their career preference are. Among his finding was that overall, their career awareness a feel for what it really means to have a career, is in adequate although they have a career plans for their future owing to the influence of both the home and the school environment. This further reinforces the need for efficient career guidance as raised by Gachathi (1976) and Eshiwani (1985). Many students still select their careers totally unaware of what chances exist in areas connected with their study

Also, career advice by parents and teacher can influence student choice of science subjects. In a related investigation Okeke (2000) revealed that parents have significant effect on student choice of career and subjects. If we want to encourage more young

students into science, then students need rich opportunities to find out about the many ways science can be used in interesting careers, most of the students have not been helped by their parents when making their study choices.

Furthermore, the school has a great role to play in influencing student's choice of science subjects. The school should support science subjects and career decision making. This will go a long way to encourage students' choice of science subjects. In addition, students need information about the structure and content of the science subject they want to study. This will help influence their choice of the subject.

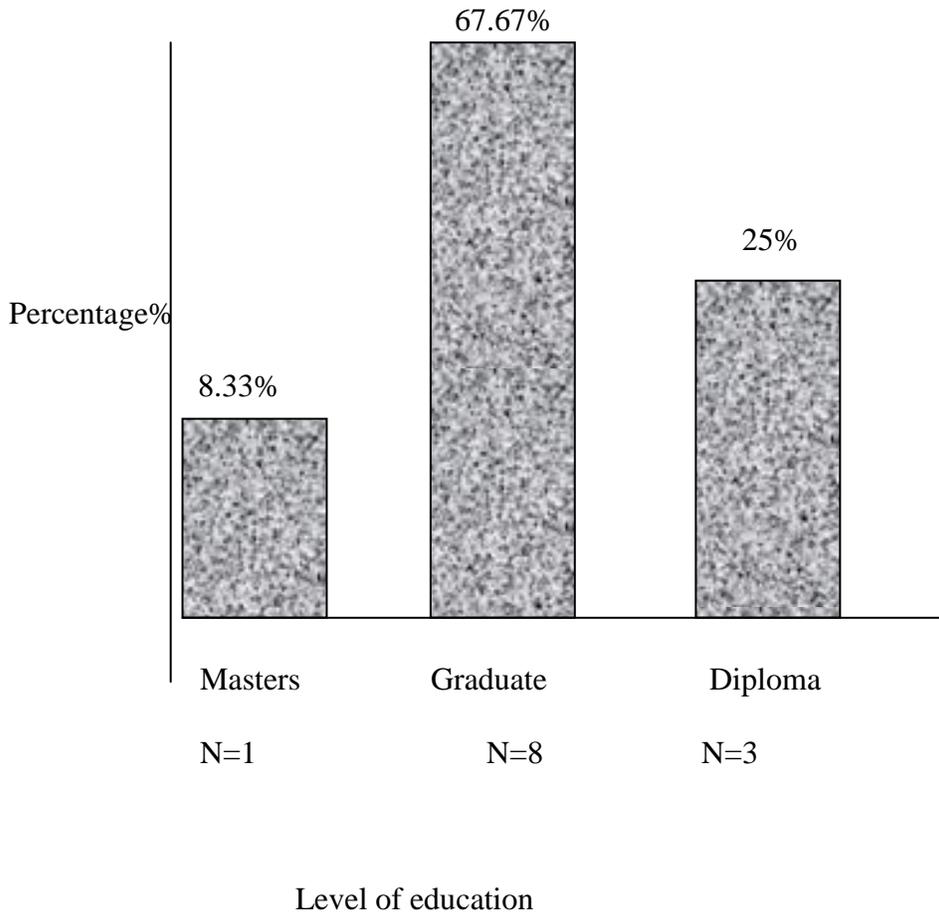
### **4.3 Teacher related barriers to the implementation of General Science Curriculum**

The second objective was to establish teacher related barriers to the implementation of General Science Curriculum the following areas were investigated: In-service training of teachers, Professional and academic experience of teachers and Teacher's attitude toward the innovation.

#### **Professional and academic experience of teachers**

Figure 4.3 below show the level of education of science teachers in the four sampled schools. One (8.33%) had master, eight (66.67%) are graduates and three (25%) are diploma holders

**Figure 4.3 Level of education of science teachers N=12.**



Analysis from the above figure indicates that the teachers had high academic qualification. Only three (25%) were of Diploma standard. While academic qualification helps a teacher in mastering the subjects matter, professional qualification helps in the delivery of the subject matter. The teachers were therefore asked to state the professional qualification. Table 4.3 contains the details.

**Table 4.3 Teacher Professional qualification N=12.**

Professional Qualification	Frequency	Percentage (%)
Master of Science	1	8.33
B.ED Science	8	66.67
Diploma Science	3	25.00
Total	12	100.00

The analysis reveals that one (8.33%) had master in science, eight (66.67%) and three (25.00%) were graduates and diploma in education science respectively. Regarding their teaching experience majority of the teachers had taught for more than 5 years with seven (58.33%) having experience of 5-10 years, three (25%) 11-15 years while only two (16.67) % had less than 5 years experience. This shows that the schools had teachers who had a wealth of experience on teaching their subject areas and had adequate qualification to carry out their teaching function effectively.

#### **Teacher's attitude toward the innovation**

The researcher established that teacher's attitude toward the innovation was manifested on the fact most teachers never attended any in-service, majority had not seen a copy of the syllabus and the Kenya National Examination Council views on how implementation should be done. When teachers were asked to indicate whether they had attended in-service courses to prepare them teach General Science Curriculum. Only two (16.63) % indicated to have attended in-service course while ten (83.33%) had not attended. Those teachers who had attended in-service reported that it was done in a hurry which was one day workshop at Machakos Boys School for all science teachers on the

former larger Machakos District. When the teachers were asked why they did not attend majority responded that the school principal sponsored only one science teacher and that is the Head of Science Department teacher. Observation made by the researcher revealed that the schools had been provided with the General Science syllabus by the Ministry of Education and each school had a copy. When the teachers were asked whether they had seen a copy of General Science syllabus, nine (75%) reported to have gone through the syllabus while three (25%) had seen it but had not gone through the content in it. Table 4.4 and Table 4.5 below have details.

**Table 4.4 In-service training of teachers N=12**

Teacher's response	Frequency	Percentage (%)
Yes	2	16.67
No	10	83.33
Total	12	100.00

**Table 4.5 Teacher's awareness of the syllabus content N=12**

Teacher' response	Frequency	Percentage (%)
Yes	9	75
NO	3	25
Total	12	100

Well educated teachers and provided with in-service courses are vital for a successful curriculum implementation. This helps the teachers to keep up to date

with the teaching methods and content matter hence it is important to in-service them. Teachers felt that with introduction of General Science Curriculum, they needed to be inducted so as to also be sensitized on how to assist the students. Much of the negative attitudes observed in the teachers during this study can therefore be attributed to the problem of teacher education programs. The fact that the teachers have never undergone an in-service course for a subject that is important to student who wishes to pursue art-related careers leaves a lot to be desired. The teacher indicated that if they were well inducted on General Science Curriculum, they would recommend it to most students since majority of the students do not perform well on pure sciences. However it should not be made compulsory to all students in schools that opt to offer General Science Curriculum as Kenya National Examination K.N.E.C had indicated in their circular sent to schools on 15<sup>th</sup> October, 2009.

The results are in line with a researches carried out by Mugiri (1981) and Gichura (1999). According to Mugiri (1981), his preliminary survey indicated that Pre-service teacher training plays a major role in preparing teacher for the implementation of programs once they graduate. Therefore, the college curriculum in teacher education must be linked to the school curriculum at every stage. It goes on to state that there has been a growing awareness of a gap that exists between classroom practice and teacher training courses especially at the university level.

Gichura (1999) undertook a survey on in-servicing of teachers and lack of organized programmes for professional growth of teacher. Her aim was to find out the impact of in- servicing courses on science teachers and the effects on improvisations of equipment, improving teaching methods and making use of teaching Aids and also

helping in preparation of practical after introduction of 8-4-4 system of education which required new approaches to the teaching of sciences. Among her findings was that due to lack of in-servicing of teacher and lack of organized programmes for professional growth of teachers, teachers are not motivated and do not understand the scope and content coverage of the subjects they are supposed to handle. This affected the teaching of sciences as most teachers felt that they were not adequately equipped to interpret the revised syllabus and deals with some of the new topics that had been introduced. Consequently teachers are not able to improvise both in terms of teaching methods and equipment mainly as a result of the fact that most pre-service teacher training institutions are poorly equipped and the equipment that exists for teaching science is obsolete and in dire need of repair, thus making teacher graduating from these institutions not able to handle practical and their approach to teaching is still theoretical.

Teachers are responsible for the implementation of program at the instructional level. In this way they act as the learning mediating agents by creating an environment in which students interact with the curriculum materials in the instruction process.

#### **4.4 Administrative related barriers to the implementation of General Science Curriculum**

The third objective was to determine administrative related barriers to the implementation of General Science Curriculum; the following areas were investigated; Principal's role, School facilities, School policy and Expense on the subject

### **Principal's role and school facilities**

When the four Principals were told to give reasons for not assisting in the implementation of General Science Curriculum in their schools, all the four (100%) indicated that they did not receive a clear guideline on how to carry out the implementation. None of them participated in any workshop, seminar or conference organized by K.I.E because it only invited science teachers. There was none organized for head teachers/principals. The principal were therefore asked about adequacy of laboratories apparatus text books and equipment in their schools. Observation made by the researcher revealed that laboratories were not enough in the four schools to offer pure science as shown in table 4.5 below.

**Table 4.6 Adequacy of school facilities N=4.**

<b>FACILITIES</b>	<b>ADEQUATE</b>		<b>NOT ADEQUATE</b>	
	F	%	F	%
Textbooks	1	25	3	75
Laboratories	1	25	3	75
Equipment	0	0	4	100

Further observation revealed that in all the four (100%) schools they did not have modern basic equipment and facilities such as computers, libraries, weighing balances, microscopes, water pipes, gas pipes, main electricity and safety gadgets among others.

This indicates that in all the four schools none was equipped to offer pure sciences and that is why according to student response they only did science subjects because they were compulsory.

### **School policy**

On further questioning all the four Principals from the four schools revealed that the school initially offered Physical Sciences and Biological Sciences on introduction of 8-4-4 system of education until 2001 when all the school were directed to offer pure sciences (MOEST 2000). This implementation had a lot of disadvantages to those schools without resources. The principals were further interviewed so as to seek their perceived opinion on the barriers which they strongly felt hindered the implementation of General Science Curriculum. All the four (100%) principals in the four school felt that:

- 1) Lack of proper guidelines from the Ministry of Education and K.I.E after developing General Science Curriculum on how to implement it.
- 2) The K.N.E.C views on how the implementation should be done. According to K.N.E.C circular (2009) each school will be expected to take only ONE of the options (either option A or B). No school will therefore be allowed to register some candidates for option A and others for option B. All candidates in centre/schools MUST opt for only ONE of the two options.
- 3) Due to acute shortage of science teachers, the selection of subject in most school is done in form one third term. On selection most school make Chemistry and Biology compulsory whereas the student don't learn Physics. With the introduction of General Science it meant student to have basic knowledge of all

science subjects i.e. since General science is a combination of the three in one paper.

For Curriculum Development and instruction the principal should see it as a co-operative endeavor. The teachers must be involved in the decision making process as regard selection of instructional materials, and the parents from whom moral and financial support will be required if the implementation of the curriculum is to succeed. The principal should also create an environment for the constant evaluation of the curriculum to determine pupils' progress and teacher effectiveness.

In line with Mugiri (1981), who carried out a survey on factors affecting the implementation of secondary school science curriculum programs in Kenya. The research findings in this study indicated that there were at least five major categories of factors affecting the implementation of secondary school science curriculum programs. These were: policy and administration, adoption and adaptation of science programs to meet institutional requirements and students need; the instructional programs themselves; and quality of science teaching resources available in schools. He further condensed those factors into three major clusters on the basis of the nature of their influence. These clusters were: policy and decision making; course content, teaching methods and science teaching resources and learning environment.

It was observed in this study that there is lack of clear and consistent policy and guidance to schools concerning the implementation from the Ministry of Education and K.I.E. During the implementations of programs it is necessary to have a clear policies, directions and decision at the National, Provincial, institutional and instructional level.

This would have helped to bring about co-ordinated curriculum implementation and sustained feedback to facilitate future curriculum improvement.

#### **4.5 Home based barriers to the implementation of General Science Curriculum**

The fourth objective was to establish home based barriers to the implementation of General Science Curriculum, the researcher gathered information in the following areas: Parental involvement and Peer influence.

Parental support has been cited as positively influencing the careers that children pursue and related subject choice. This is all in their attitude towards the teaching and learning of their children. To find out about parental involvement, the researcher sought to know from teachers and principals whether parents are involved in subjects and career choice of their children. To know more about parent involvement, the researcher asked teachers and principal to evaluate the adequacy of parental support offered to students in the area of science choices. The findings on this aspect is represented on Table 4.6

**Table 4.7 Parent involvement in their children choice of science subjects N=4**

Principal response	Frequency	Percentage (%)
Adequate	2	50
Not Adequate	2	50
Total	4	100

According to principals the adequacy of parental support offered to student in the area of science choices was two (50%) which indicated that most parent were not conversant with educational programmes being offered in schools and their relationship with the careers that the student choose. Only two (50 %) principals implied that parents were making subjects and career choices and attended open days in schools when subject choice and career choice was being discussed. This however contradicted the student views when being interviewed that parents exerted the greatest influence in their lives and were best placed to advice them as student felt free dealing with them. Parental role in sensitizing and exposing students to science related activities was cited crucial factor in the implementation of new curriculum in schools.

Teachers were also asked to state what role parents played in enhancing the selection of science subjects. Only two (16.67%) according to teachers participate in their children selection of science subjects and careers. Majority ten (83.33%) of the student parents are not aware of what is happening in schools. Table 4.7 has the detail.

**Table 4.8 Parent involvement in their children choice of science subjects N=12**

Teacher response	Frequency	Percentage (%)
Parents who participated	2	16.67
Parents who did not participate	10	83.33
Total	12	100.00

One of the major reasons cited for this is because most parents are illiterate and poor. They don't attend academic clinics and open days while invited in schools. In this

case most parents send their older sibling to attend such important occasions. When students were asked whether peer influence had any impact on the subject selection especially science, the study revealed that majority 180 (90%) were not influenced by peers while 20 (10%) indicate that they were influenced by peer.

Cullen (1969) stresses that those children who come from homes where parents are interested in education offer help and encouragement and stress the value of deferred rather than immediate gratification which highly motivate children who come from family whose values and norms are not in conflict with those of the school.

Douglass (1964) carried out a study of over 5000 children drawn for every type of home in England and Wales, and found out that parental encouragement is significantly related to the achievement. This researcher saw parents' encouragement to be of considerable importance in determining the education of children, those parents who are most interested in their education encourage them to do well and score high on average than children of parents who were least interested and encouraging.

Kapila (1976) in a study of over 3000 children reputed a positive association between parents' participation in their children's academics work and academic performance.

Sjoberg and Imsen (1988) suggested that students are not individually responsible for their lack of interest in science but also the environment in which they live right from home to school and the community around them. Torongey (1986) reported that for students to succeed in sciences they need to have positive self-confidence and self – determination.

The development of attitudes and beliefs is influenced by ones environment, the people one is interacting with and so forth. In this case the school environment, teacher, peers groups, parent and community in general can influence student's perception of science subjects. Parents and teachers play a crucial role in determining a student's future career. While some parent would want their children to pursue a certain career, probably to fulfill the parents' dream of a career they were not able to undertake, the teachers are more conversant with the ability of students. Guided by the student capability, the teacher can direct a student towards a certain career that she perceives as best suited for the student and which she can manage.

Finally parent serves as useful guides to the academic fields which their children pursue. They can build self confidence in their children to help them develop high self esteem, high degree of independence and encourage them to participate in those activities that will enable them to develop interest in the sciences.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Summary of study findings**

This section presents the summary of the findings of the study according to the following objectives: Students related barriers to the implementation of General Science Curriculum, Teacher related barriers to the implementation of General science Curriculum, Administrative related barriers to the implementation of General Science Curriculum and Home based barriers to the implementation of General Science Curriculum.

##### **5.1.1 Students related barriers to the implementation of General Science Curriculum**

Regarding this objectives majority of the student 180 (90%) had chosen a combination of Biology and chemistry and 15 (7.5%) had chosen combination of Chemistry and Physics and only five (2.5%) had chosen a combination of Biology/Physics. In the four district schools in Kangundo with 200 Form three and Form four that took part in the study, majority of the students 162 (81%) chose science because it was compulsory while 15 (7.5%) were encouraged by their parent/guardians, 12 (6%) chose sciences subjects because they thought it would assist them pass examination. Eight (4%) chose science subject as it was the easiest option and only three (1.5%)

choose science subject because it best suited their career. Most of the students 91 (45.5%) had chosen journalism as their career, 74 (37%) had chosen sales and marketing 12 (6%) preferred law, 10 (5%) nursing, eight (4%) Bachelor of Commerce and only four (2 %) and one (0.5%) preferred to be engineer and doctors respectively. This indicated that majority of students choice of career was not in line with science subjects. Majority of student preferred art-related careers. Most of the students 188 (94%) in the four schools are aware of the introduction of General Science and given a chance they would opt for it. Only 12 (6%) of the student were not aware of the alternative.

### **5.1.2 Teacher related barriers to the implementation of General science Curriculum**

In establishing this objective the study found that the level of education is one (8.33%) teacher have Master with professional qualification of Master in Science Education, three (25%) their level of education is diploma with their professional qualification of Diploma in Education science while majority eight (66.67%) were graduate with professional qualification of Bachelor of Education science. Of the twelve teachers majority seven (58.33%) had a teaching experience of 5-10 years, three (25%) 11-15 years while only two (16.67%) had teaching experience of less than 5 years. Majority of the teacher ten (83.33%) had not attended any in-service on how to teach and introduce General Science Curriculum while only two (16.67%) received some in-service on General Science. Though all the four schools had a copy of General Science syllabus

nine (75%) teachers reported to have seen and read the copy while three (25%) had not seen it.

### **5.1.3 Administrative related barriers to the implementation of General Science Curriculum**

In all the four (100%) schools the Principals did not receive a clear guideline from the Ministry of Education and K.I.E on how to carry the implementation. In all four schools (100%) equipments were not adequate while in three (75%) text books and laboratories were not adequate. In one (25%) of the school textbook and laboratories were adequate respectively. All the school lacked important school facilities and equipments such as computers, libraries, weighing balances, microscopes, water pipes, gas pipes, main electricity and safety gadgets among others. Some of the reasons the principals felt strongly hindered the implementation are: Lack of proper guidelines from the Ministry of Education and K.I.E after developing General Science Curriculum was the main barrier, Secondly the K.N.E.C views on how the implementation should be done interfered with the implementation at the schools. According to K.N.E.C circular (2009), each school was expected to take only ONE of the options (either option A or B). No school was therefore allowed to register some candidates for option A and others for option B. All candidates in centre/schools were required to opt for only ONE of the two options and lastly due to acute shortage of science teachers, the selection of subject in most school is done in form one third term. On selection most school make Chemistry and Biology compulsory whereas the student don't learn Physics. With the introduction

of General Science it meant student to have basic knowledge of all science subjects i.e. since General science is a combination of the three in one paper.

#### **5.1.4 Home based barriers to the implementation of General Science Curriculum.**

The principals and teachers reported that parental involvement on student choice of science subjects and career was minimal. About two (50%) of principal reported that parents/guardian were involved while two (50%) reported that parent/guardian were not involved. Two (16.67%) of teachers reported that parent/guardian do participate in their children subjects and career choice while majority of teachers ten (83.33%) said parent /guardian do not participate. Majority of student 180(90%) indicated that peer influence does not influence subject selection while only 20 (10%) indicated that peer influence the selection of subjects especially science subjects.

### **5.2 Conclusion**

This section presents the conclusion of the findings of the study according to the following research questions: What attitude do student have towards the study of General Science? What role do science teachers play in influencing students' interest in the study of General Sciences? , What extent were teachers prepared in relation to teach General Science curriculum? What are the teachers' views in relation to the implementation of General Science curriculum? What is the role of the principal concerning the

implementation of General Science curriculum in school? , What are the parents' opinions which influence students in the selection of science subjects? What are the K.N.E.C opinions that are influencing the implementation of General Science Curriculum? The study comes up with significant findings on barriers hindering the implementation of General Science Curriculum in district Secondary schools in Kangundo District.

Concerning the attitude student had toward the study of General Science. It was established that student wanted to study General Science if it is offered in their schools. Unfortunately when the implementation of General Science Curriculum was unclear to the teachers and school Principals, it was the student who suffered in the final analysis. In line with these findings it was observed that students considered pure science (Biology, Chemistry and Physics) difficult, and had negative attitude toward science subjects. They only studied science because they were compulsory. Most careers chosen by students were art-related.

On the role science teacher played in influencing students' interest in the study of General Science, the study found that teachers were well qualified with enough teaching experience to tackle their subject area effectively. However they lacked in-service course to introduce the new content effectively to student.

The extent to which teachers were prepared to teach General Science, it emerged that Teachers were not provided with proper in-service courses that are vital for a successful implementation of General Science curriculum. Teachers felt that with the introduction of General Science Curriculum they needed to be inducted so as to cope

better with its demands and also be sensitized on how to assist the student. Well educated teachers and provided with in-service course are vital for a successful curriculum implementation. This helps the teachers to keep up to date with the teaching methods and content matter.

The teachers' views in relation to the implementation of General Science Curriculum indicated that if teachers were well inducted on General Science Curriculum, they would recommend it to most students since majority of the students do not perform well in pure sciences. However, it should not be made compulsory to all students in school that opt to offer General Science Curriculum as K.N.E.C had indicated in their circular sent to schools. Therefore much of the negative attitudes observed in the teachers during this study can therefore be attributed to the problem of teacher education programs. Well educated teacher and provided with in-service courses are vital for a successful curriculum implementation. The facts that the teachers had never undergone any in-service course for a subject to be taken by student who wish to pursue art- related careers leave a lot to be desired.

Concerning the role of the principal towards the implementation of General Science Curriculum in school the study found that the school Principals lacked proper guidance from the Ministry of Education and K.I.E on how to carry out the implementation of General Science Curriculum. A lack of clear policy and the interference of the K.N.E.C to schools made the implementation more difficult. Secondly due to acute shortage of science teachers, the selection of subject in most school is done in form one third term. On selection most school make Chemistry and Biology compulsory whereas the student don't learn Physics. With the introduction of General

Science it meant student to have basic knowledge of all science subjects i.e. since General science is a combination of the three in one paper.

The study also found out that parental opinion which influence students in the selection of science subjects and peer influence was very minimal. This is because most parents were not conversant with educational programmes being offered in schools and their relationship with the careers that the students choose. Parents are very crucial in student's education. They are the source of financial resources, which are used to educate the student. Therefore how effectively parent play their role in education of their children depend on how readily they respond to the needs of the child and the attitude the child have towards the teaching and learning of science subjects.

Lastly the Kenya National Examination Council opinions that influenced the implementation of General Science Curriculum are the K.N.E.C views on how the implementation should be done. According to K.N.E.C each school was expected to take only ONE of the options (either option A or B). No school was therefore allowed to register some candidates for option A and others for option B. All candidates in centre/schools MUST opt for only ONE of the two options.

### **5.3 Recommendations**

Based on the findings the study recommends:

1) That all science education programs are accompanied by teacher in-service and pre-service courses not only to introduce teachers to new content but also to effectively utilize science teaching facilities.

2) The study also recommends further improvement in co-ordination and clear communication at different level in policy and decision making.

3)The Ministry of Education should also reconsider the initial objectives of implementing General Science Curriculums in secondary schools and therefore support the curriculum through provision of facilities equipments and in-servicing teachers.

4) Kenya National Examination Council should play its role as an examination body in the country. It should allow the Ministry of Education together with Kenya Institute of Education do the work of implementing school curriculum with the sole benefit of the students. Hence K.N.E.C should not interfere by placing barriers to the implementation.

5)Finally it is recommended that all future curriculums developers should make adequate plans for implementation that take into account the needs of science teacher and field officers at the initial stages as well as the progress of the implementation through co-ordinate and sustained feedbacks to facilitate improvement and development.

#### **5.4 Suggestion for further studies**

1. A similar study should be carried out on a different location to find out whether similar result would be obtained.

2. The Ministry of Education and the K.I.E used the finding of a research report titled Need Assessment survey 2006 which was carried out by K.I.E and mostly concentrated on Non-Formal Education in Kenya. Therefore I suggest K.I.E to carry out a similar study in Formal School especially District secondary Schools in Kenya which have in adequate resources.

## REFERENCES

- ACO/DSE (1982) *Review Conference and Study Tour*. Curriculum Development in Africa, Manzini/Swziland.
- Albert's, C, Mbalo, N.F. and Ackerman, C.J. (2003) *Adolescent perceptions of the relevance of domains of identify formation: South African cross – cultural study*  
Journal of youth and Adolescence.
- Ayot H.O. (1987) *Institutional Method (General methods)*, Kenyatta University, Nairobi
- Bennaars G.A., Otiende J.E. and Boisvert R (1994) *Theory and Practice of Education*. East Africa Publishers Ltd. Nairobi.
- Borg, W.R, and Gall, M.D., (1989): *Education research; Introduction* (5<sup>th</sup> Ed) New York: Longman.
- Bruner, J.S *Towards a theory of instruction* (1966). New York, Norton.
- Campbell, R.F. (1973) *Introduction to Education Administration*, Boston; Ally and Bacon incorporation.
- Campbell, R.F. (1973) *Introduction to Education Administration*, Boston; Ally and Bacon incorporation.
- Commonwealth Secretariat (1991), *Eleventh Conference of Commonwealth Ministers Report*, Marlborough House, London.
- Commonwealth secretaries (1991) *Improving the quality of basic Education*, Pall Mall, London.

Cordova, D.L & Leper, M.R. (1996) *Intuition motivation and the process of learning*.  
Journal of Educational psychology.

Eraut M. (1992) *In-service Education for innovation* .Education press  
limited, London.

Eshiwani G. (1993), *Education in Kenya since Independence*, East Africa  
Educational Publishers, Nairobi.

Flowerday; t. & Schdraw, G (2000), *Teacher beliefs about instructional choice; A*  
phenomenological study. Journal of Educational Psychology.

Fraser BJ, (1999) *Assessing and imploring school climate*. Evaluation and research in  
Education.

Gay L.R. (1992): *Education Research, Competence for Analysis and*  
*Application*, Charles Merril Publishing Co. Columbus.

Guthries, J and Reed, R.J (1991) *Educational administration in science education world*  
*wide*. The UNESCO press, Paris.

Gichura, S.W (1999) *Factor on at influence girls' performance in science subjects in*  
*Nairobi provincial public secondary school* MED thesis Kenyatta University.

Igun S.N. (2007)*Fundamental of vocational guidance and choice*. Benin – city,  
Nigeria. Otoghagua Ent

Kamii, C. (1991). *The importance of critical thinking and choice making*. School psychology reviews.

Kamunge, J.M. (1988): *Report of the Presidential Working Party oEducation and Manpower Training for the next Decade and beyond*. Government Printer Nairobi, Kenya.

KIE (2008): Regulation and Syllabuses (2008), KIE, Nairobi

Kinyanjui K; (1981) *“Educational Equality in Kenya: Some Research Experiences and issues”* working paper No. 373. Institute of Development studies, university of Nairobi.

Koech, D.K. (1985): *Commission of Inquiry into the Education System of Kenya*. .Government Printer, Nairobi Kenya .

Likami, A.A. (1982) *“Major Administrative Problems Found in Schools”* PGDE Project Kenyatta University.

Macdonald, J; 185 *“Expanding your Horizons in science and maths*. University of London career Education Conference for Secondary school young women Ages 12 – 18

Makau, B.M. (1984) *Review of significant statistic on Education of Girls and women in Kenya* “paper presented at a National Symposium on Education of Girls, Machakos years. In contribution to Third GASAT Conference.

Makhurare, J.H (1998), The role of science and Technology in development.Kenwhy:Juta

Martin, M.L (1972); *Concept of science education*. London publishers.

MacKay, C.B. (1981): *Second University in Kenya: Report of the Presidential Working Party* .Government Printer, Nairobi Kenya.

Ministry of Education (2000): *Effective Management of Secondary School Curriculum*-circular No.106.Government Printer, Nairobi

Ministry of Education (2002): *Secondary Education Syllabus*, Volume 2: Mathematics, Physics, Agriculture and Home science. Government printers Nairobi

Ministry of Education (2003). *Management of the Revised Primary and secondary Education Curriculum* 2003. Circular No. CIS 2/2003, Nairobi

MoEST (2002), *Teacher Preparation Guide for the new secondary curriculum*, Kenya Institute of Education, Nairobi.

Mugenda, O.M. and Mugenda, A.G. (1999): *Research Methods: Quantitative and Qualitative Approaches*. Africa Centre for Technology Studies, Nairobi, Kenya.

Mugiri, E.M. (1981) *Factors Affecting the implementation of secondary school, science curricula programs in Kenya*. Dissertation for Phd university of Massachusetts.

Munguti, B,K (1984) *“Survey of Factors Affecting the teaching and learning of mathematics in primary schools in Mbooni, Machakos District* ‘MED Thesis, Kenyatta University.

Obanyg P. (2007) *Fundamental guidance and counseling*. Ibadan, Nigeria, Heinemann Educational Books.

Okeke AN (2007) *The impact of school subject on choice of careers and profession*. West African Journal of Education.

Okoli JN (1995) *Effect of two interactive learning styles on students. Achievement and interest in Biology*. Phd Thesis, unpublished, Msukka university of Nigeria.

Oluoch G.P. (1982), *Essential of curriculum Development*, Elimu Bookshop ltd .Nairobi

Orodho A.J. (2005), *Elements of Education and social science Research Methods*, Masola publishers, Nairobi.

Orodho A.J. (2005), *Techniques of writing research proposals and Reports in Education and social sciences*, second Edition, kanezja publishers, Nairobi

Orodho, J.A (2004) *Techniques of writing research proposal and report*. Masola publisher, Nairobi.

The Koech report (1999) *Totality integrated quality Education and training*. Government printer, Nairobi.

*Report on the needs Assessment Survey on non-formal Education Curriculum*. K.I.E Research report series(2006).

Republic of Kenya (1964): *Education Commission Report*. Government Printers, Nairobi

Republic of Kenya (1976): *Report on the National Committee on Educational Objectives and Policies* (Gachathi Report). Nairobi: Government printer.

Republic of Kenya (1997): *Sessional Paper No. 4 of 1997 on AIDS in Kenya* Nairobi. Government Printer.

Reynolds, P.L. & Symons, S (2001) *Motivational variables and children's text search*  
Journal of Educational psychology.

Sifuna, D.N. (1990): *Development of Education in Africa, the Kenyan Experience*, Initiatives Publishers, Nairobi.

Simpson R, Oliver J, (1990) *A summary of major influences on attitude toward and achievement in science among adolescent student science Education.*

Shiundu J.S. and Omulando S.J. (1992), *curriculum: Theory and practice in Kenya*, Oxford University press, Nairobi.

SMASSE paper presented by Kithaka Njogu on “*Attitude and Motivation in sciences*” (2003).

SMASSE Project Nairobi, *Base studies* (1998).

The Kenya National Examinations Council (2008): *Regulations and Syllabuses*, Nairobi

Torongey ,P.K, (1986) “*Survey of the problems Experienced by Girls in learning physics at O Level and their implication on Girls interest in the subject in Kericho District*” MED Project Kenyatta university.

Torto, R; (1997) “*Student attitudes to the teaching/learning of sciences, maths and technology subjects in secondary schools*” FEMSA Nairobi.

Washika, RA; (1997)” *Resources and Facilities for teaching and learning of mathematics and science in school* “FEMSA Nairobi.

- \_\_\_\_\_, (2002), *monetary learning Achievement with special reference to performance in mathematics and science: The Kenya National Examination council Experience*, Kenya National Examinations council.
- \_\_\_\_\_, (1999), Records of SMASSE *sensitization workshop for pilot District*, Education stakeholders SMASSE project
- \_\_\_\_\_, (2004). *Report on Baseline studies* SMASSE project.
- \_\_\_\_\_, (2004), *Teachers' Attitude*, SMASSE project.
- \_\_\_\_\_, (2004), *Trends in Teaching Approaches and methods in science and mathematics Education*, SMASSE project. Best, J.W. (1977):

# APPENDIX I

## STUDENTS QUESTIONNAIRE

### INSTRUCTIONS.

Do not write your name.

Answer all the question provided

Where choices are provided choose the most appropriate in your own view by ticking in the spaces provided in the corresponding answer.

1. Which of the following science subject have you chosen for your K.C.S.E Examination?

1) Physics

2) Biology

3) Chemistry

1(b) .When making your subject choice in science are you influenced by your peers from other schools?

Yes.....No.....

2. Choose ONE of the following reasons that best indicate why you opted for the science subjects that you are currently taking?

- i. The subject will assist me to pass examination ( ).
- ii. My parent /guardian encouraged me to take the subject. ( )
- iii. It was the easiest option. ( )



5. When making your subject choice are you aware of the career they would lead to?

.....

6. If your answer is NO, how will you determine the career you want to pursue after Form 4?

.....

1. (a) Are you aware of the introduction of General Science Curriculum and would you like General Science to be offered in your school?

.....

.....

(b) Do you think you would do better in sciences if General Science is offered in your school...?

.....

8. What do you perceive as the role of the principal in the implementation of General Science?

.....

.....

.....

9. (a).Does your principal play his expected role?

.....

(b) Give reasons for your answer in 9(a) above

.....

.....

.....

## APPENDIX II

### TEACHER QUESTIONNAIRE

1.State the highest academic and professional qualification you have attained?

Academic.....

Professional.....

2.Give your years of teaching experience.....

What are your teaching subjects?

.....

3(a).Were you in-serviced on how to teach the General Sciences curricula?

.....

(b). If YES, why have you not initiated the innovation in the school?

.....

4.(a).Have you seen a copy of General Science syllabus?

.....

(b)If Yes would you recommend it for your students?

.....

5. To what extent have you covered the syllabus in the following subjects.

	Adequate	Very adequate	Fairly adequate	Not adequate
Physics	( )	( )	( )	( )
Biology	( )	( )	( )	( )
Chemistry	( )	( )	( )	( )

(b). Please give reasons for your answer and the possible consequences this has had on the students participation and performance in pure sciences

.....  
.....

(c)How would you compare the coverage of the syllabus if the students are taking General Science?

.....  
.....

(d)What are your views concerning the teaching of science subjects?

.....  
.....

6(a).What role do parent's play in the participation of students in sciences?

.....  
.....

(b). what role are parents expected to play in the students selection of sciences?

.....

.....  
.....

(c).To what extent are they performing them and what is the effects on students participation in sciences?

.....  
.....

7. What do you as a teacher prefer for your students if you are to choose between pure sciences and General Science?

.....  
.....

What is the role of principal in improving the implementation of General Sciences in the school?

.....

## APPENDIX III

### PRINCIPAL INTERVIEW SCHEDULE

1. Name of the school.....

2. When was the school started .Year.....

3. How many students are their in:

-Form1.....

-Form 2.....

-Form 3.....

-Form 4.....

4. Give your years of teaching experience and the subjects.

Number of years..... Teaching subjects.....

5. Does your school have enough teachers for sciences? .....

6(a). Were any of your sciences teachers in-serviced on how to implement the General Science curricula?  
.....

(b) If YES, how many teachers were in-serviced?  
.....

(c).How many teachers were NOT in-serviced and why?  
.....  
.....

7(a). Do you feel that the school has enough facilities such as textbooks laboratories, equipment for the teaching of pure sciences?

	Very adequate	Adequate	Not adequate
Textbooks	( )	( )	( )
Laboratories	( )	( )	( )
Equipments	( )	( )	( )

7(b) Depending on the answer to number (7a) would the students be better off doing pure sciences or General sciences?

.....  
.....

8. Is the support you get from parents adequate/inadequate to support the science programs in your school? What opinions do parents give concerning the implementation of a General Science Curriculum?

.....  
.....  
.....

9. As a Head teacher, what role do you play in the implementation of a General Science Curriculum?

.....  
.....  
.....

10. As an administrator state the major reasons hindering the implementation of General Sciences Curriculum in the school? .....

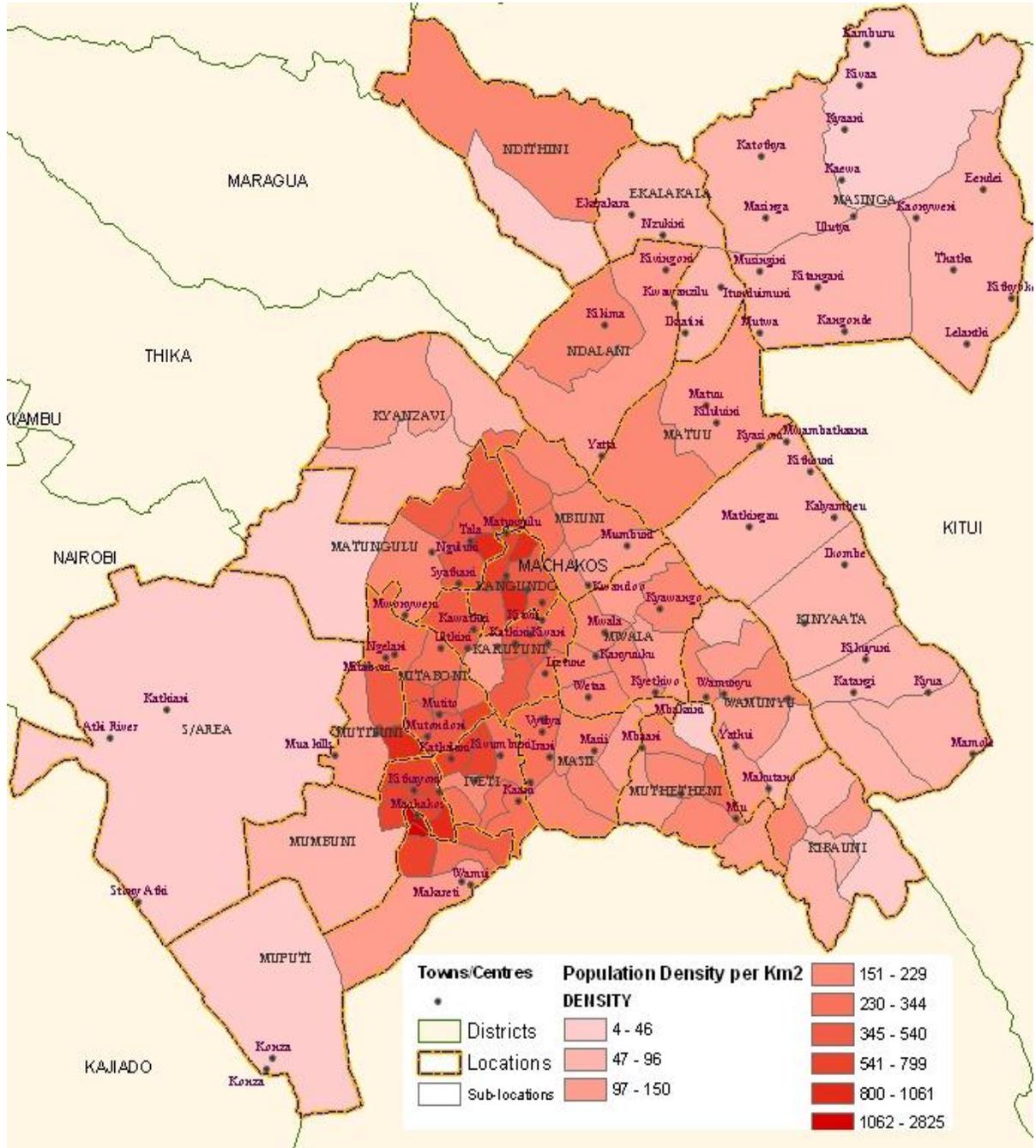
.....  
.....  
.....

11. How has the K.N.E.C affected the implementation of General Science curriculum in secondary schools?

.....

# APPENDIX IV

## MAP OF KANGUNDO DISTRICT



# **APPENDIX V**

## **WORK PLAN**

**MWANGI FLORENCE WANGARI**

**E55/10280/2008**

### **WORK PLAN**

<b>Proposal Writing</b>	<b>July 2010 –Feb. 2011</b>
<b>Piloting Research</b>	<b>March 2011</b>
<b>Data Collection in the Field</b>	<b>March 2011</b>
<b>Data Analysis</b>	<b>March – April 2011</b>
<b>Reporting Writing</b>	<b>May 2011</b>
<b>Presentation of Draft Report</b>	<b>June 2011</b>
<b>Submission of Final Report</b>	<b>July 2011</b>