

**FACTORS INFLUENCING THE CHOICE OF SCIENCE SUBJECTS IN KENYA'S  
SECONDARY SCHOOLS: A CASE STUDY OF KIRIMUNGE MIXED DAY  
SECONDARY SCHOOL IN KIRINYAGA COUNTY**

**BY**

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REQUIREMENTS OF AWARD OF POSTGRADUATE DIPLOMA IN  
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**2020**

## **STUDENT’S DECLARATION**

This research project is my original work and has not been presented for examination in any other university.

Signature .....

Date.....

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### **DECLARATION BY THE SUPERVISOR**

This research project has been submitted for examination with my approval as the university supervisor.

Signature .....

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## **DEDICATION**

I dedicate this project to the almighty God for giving me the grace to finish writing this project.

# TABLE OF CONTENT

STUDENT’S DECLARATION .....	ii
ACKNOWLEDGEMENT .....	iii
DEDICATION.....	iv
LIST OF TABLES.....	viii
LIST OF FIGURES .....	ix
ABSTRACT .....	x
CHAPTER ONE.....	1
INTRODUCTION .....	1
1.1Background of the Study .....	1
1.2 Statement of the Problem.....	2
1.3 Purpose of the Study.....	2
1.4 Objectives of the Study.....	2
1.5 Research Questions.....	3
1.6 Significance of the Study.....	3
1.7 Scope of the Study .....	4
1.8 Limitation of the Study.....	4
1.9 Assumptions of the Study.....	4
1.10 Definition of terms.....	4
CHAPTER TWO.....	6
LITERATURE REVIEW .....	6
2.1 Introduction.....	6
2.2 Factors influencing student choice of science subjects.....	6
2.2.1 Student factors influencing choice of science subjects.....	6
2.2.2 Influence of the subject teacher on students’ choice of science subject. ....	9

2.2.4	Role of parents in student’s choice of science subject in secondary school. ....	12
2.3	Summary and Gaps.....	13
2.4	Conceptual framework.....	14
CHAPTER THREE .....		15
RESEARCH METHODOLOGY .....		15
3.1	Introduction.....	15
3.2	Research Design .....	15
3.3	Target population.....	15
3.4	Sample and Sampling .....	15
3.5	Data Collection Technique .....	16
3.6	Data Analysis and Presentation .....	17
CHAPTER FOUR .....		18
INTERPRETATION AND ANALYSIS OF DATA.....		18
4.0	Introduction.....	18
4.1	Response rate.....	18
4.2	Student factors that determine selection of sciences.....	18
4.2.1	Distribution of student respondents by gender .....	18
4.2.2	Age distribution of the participants .....	19
4.2.3	Distribution of respondents by religion .....	19
4.2.4	Distribution of participants by form .....	20
4.2.5	Marks attained in the K.C.P.E Examination.....	21
4.2	Perception of learners towards sciences as outlined by the teachers .....	22
4.2.9	Relevance of the science subjects to future career aspirations .....	24
4.3.0	Student career path .....	24
4.3.1	Influence of gender on selection of sciences .....	25

4.3.2	Number of learners enrolled in science classes by gender .....	25
4.4	Influence of subject teachers on selection of sciences.....	26
4.5	Influence of the school environment on student choice of science subjects.....	26
4.5.1	School Policy on subject offered .....	27
4.5.2	Frequency of the use of Laboratory equipment .....	27
4.5.3	Access to career counseling.....	27
4.5.4	Influence of career guidance on subject choice .....	28
4.6	Role of parents on choice of science subjects.....	28
CHAPTER FIVE .....		30
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS.....		30
5.1	Introduction.....	30
5.2	Summary of the findings .....	30
5.2.1	Student influence on selection of sciences.....	30
5.2.2	Teacher influence on selection of sciences.....	30
5.2.3	School influences on choice of science subjects.....	31
5.2.4	Role of parent on choice of subject choice .....	31
5.3	Conclusion .....	31
5.4	Recommendations.....	32
5.4.1	Recommendations for improvement.....	32
REFERENCES .....		33
APPENDICES.....		36
APPENDIX 1: INTRODUCTION LETTER.....		36
APPENDIX II: QUESTIONNAIRE.....		37

## LIST OF TABLES

Table 3.1: Target population and sample size .....	16
Table 4.1: Distribution of respondents by gender.....	19
Table 4.2: Distribution of respondents by age.....	19
Table 4.3: Respondents by religion .....	20
Table 4.4: Respondents by class .....	21
Table 4.5: Marks attained in KCPE examination.....	21
Table 4.6: Perception of the learners towards science as outlined by the learners.....	22
Table 4.7: Perception of the learners towards science as reported by the teacher .....	23
Table 4.8: Effect of peer pressure on the choice of science subjects.....	24
Table 4.9: Relevance of science subject to future career aspirations .....	24
Table 4.10: Student career aspirations.....	25
Table 4.11: Effect of gender on selection of sciences.....	25
Table 4.12: Ratio of boys to girls who take up science subjects.....	26
Table 4.13: Teacher influence on choice of science subjects.....	26
Table 4.14: Frequency of using laboratory.....	28
Table 4.15: Access to career counseling.....	28
Table 4.16: Guidance on subject choice.....	29
Table 4.17: Parental influence on subject choice .....	29



## **LIST OF FIGURES**

Figure 2.1: Conceptual framework.....	14
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## ABSTRACT

The education systems of today are characterized by several optional subjects that students have to choose from. It is from this observation that the researcher sought to get a more profound comprehension of the variables that impact the decision of science subjects in Kenya's auxiliary schools, a contextual investigation of Kiriungu Mixed Day Secondary School. The scientist expected for the investigation to edify the school administration on the components that guide the understudies in their decision of science subjects. The examination embraced an expressive review plan. The populace for the investigation was every one of the understudies in Kiriungu Mixed Day Secondary School in Kirinyaga Central Sub-County. An example size of 6 educators and 126 understudies was drawn from the instructors and understudies from frame two to four. Essential information was gathered by utilization of a poll. The examination created both subjective and quantitative information. Quantitative information was broke down utilizing enlightening insights. Subjective information was broke down in light of the substance matter of the reactions. The examination discovered that the school administration was in the forefront in promoting science subjects by hiring extra science teachers (peer teachers) whom the students could identify with and whose purpose was to promote a positive attitude towards science subjects. The study revealed that teachers influenced choice of science subjects through poor association with understudies, unacceptable pace of substance conveyance and poor strategies for instructing. Sexual orientation was a key factor in the decision of science subjects as demonstrated by the fact that most female students shied away from selecting physics since they felt it was better left to the boys who performed better in mathematics. In the study, few cases of parental influence on subject choice were recorded. This was through students who reported that their parents had already set career paths for them hence they had to pick subjects that were in line with the said careers. The study found out that most students had an already set out career path that they wished to pursue and this was what greatly influenced their subject choices. The study concluded that it was important to allow students a free hand in the subject choice as this increased their motivation which in turn boosted performance. The study recommends that students should be encouraged to develop a positive attitude towards sciences. Teachers should cultivate cordial relationships with the student in an effort to improve student's negative attitudes. Only competent and qualified teachers should be allowed to handle science subjects. Gender differences should be discouraged amongst students. Parents need to positively influence the subject choices of their children. Career guidance and counseling is useful in enhancing informed subject choices and the school should fully support the support the subject choices of the students and provide a favorable environment for learning of science subjects by establishing fully equipped laboratories for practical. For further research the study recommends a study to be carried out to evaluate the factors influencing the student choice of humanity subjects in the same school.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

Science and technology is essential for the development of the economy, an individual and the society in general (Jugessur, 2008). Since knowledge is inexhaustible, scientific knowledge has proved to be more useful for creating wealth than either land or capital. Technology, engineering and applied sciences have their origin in the basic sciences namely Mathematics, Chemistry, Physics and Biology. Lack of basics in these sciences would make sustainable development in science impossible to achieve. Despite the crucial role of science in many aspects of man's life, statistics reveal low enrollment in science classes internationally.

Okoli (1995) observes that a majority of the learners tend to select business oriented courses such as banking, finance and economics or literature rather than sciences. Studies by Francis and Greer (1999) and Jones et al (2000) demonstrated a more inspirational state of mind towards science in males than females. The passage Tool pack Report (2004) on sexual orientation disaggregated information shows a low representation of girls in most areas of science. Data collected by the ROSE project of Schreiner and Sjoberg (2004) concurs with this, by noting that girls are becoming less fond of sciences than the boys hence making the declining interest in sciences a matter of international concern.

In Kenyan secondary schools students in the second or third form choose at least two science subjects from Biology, Physics and Chemistry which are assessed in the Kenya Certificate of Secondary Examination. Research has showed that learners tend to pick Chemistry and Biology when given the opportunity to choose (Waititu, 2004). Girls are likely to avoid Physics and Chemistry due to the rigorous mathematical concepts involved (Muriithi, 1996). For Kenya to realize vision 2030, science and technology has to be emphasized. The secondary graduates will have to be prepared for enrollment in science and technology related courses. This will only be achieved through concerted efforts by all partners to address the issue of despicable decision and execution in science subjects.

## ***1.2 Statement of the Problem***

Learners in Kenya's optional schools are looked with the test of picking science subjects in their second or third type of the auxiliary school training. This test has held on for a long while. It is a challenge that has to be overcome considering the place of science in economic development. Students will need to be guided into choosing subjects that they are interested in and have potential to handle rather than being allowed to choose subjects without putting into consideration their academic prowess and future career aspirations. In Kenyan secondary schools, students are expected to pick two science subjects from the cluster of Chemistry, Biology and Physics. In some schools Chemistry is a compulsory subject taken by all students. It is essential that students gain proficiency in science subjects hence achieving the main goal of science education in the world which is scientific literacy (MRC, 2001, ROSE, 2005). Scientific literacy will in turn help the learner to acquire citizenship skills and access lucrative occupations in the field of science and innovation. It is against this foundation that this examination looks to build up the components that impact the decision of science subjects in Kenya's auxiliary schools.

## ***1.3 Purpose of the Study***

The point of the exploration was to think of the elements that decide the determination of science subjects in Kenya's auxiliary schools, a contextual investigation of Kirimunge Mixed Day Secondary School, Kirinyaga Central Sub County.

## ***1.4 Objectives of the Study***

The research was based on the following objectives

- i. To determine the influence of student related factors on the choice of science subjects in Kirimunge Mixed Day Secondary School.
- ii. To determine the role of the subject teachers in student choice of science subjects in Kirimunge Mixed Day Secondary School

- iii. To find out the influence the school environment has on students' choice of science subjects in Kirimunge Mixed Day Secondary School.
- iv. To find out the role parents play in student choice of science subjects in Kirimunge Mixed Day Secondary School.

### ***1.5 Research Questions***

The study was based on the following research questions:

- i. Do student factors influence choice of science subjects in Kirimunge Mixed Day Secondary School?
- ii. Does the subject teacher influence the student's choice of the science subjects in Kirimunge Mixed Day Secondary School?
- iii. How does the school environment affect student choice of science subjects in Kirimunge Mixed Day Secondary School?
- iv. Do parents influence student's choice of science subjects in Kirimunge Mixed Day Secondary School?

### ***1.6 Significance of the Study***

The exploration will help the administration in picking up an understanding on the variables that impact learners' decisions of science subjects. The administration will thus be in a situation to set up the important measures meant for enhancing execution of science subjects.

The relevant government ministries will also benefit from the study in their efforts to come up with policies concerning selection of science courses and careers in tertiary institutions of learning. The information gained from the study will boost the already existent knowledge in educational research and provide researchers and research institutes with content for further research.

### ***1.7 Scope of the Study***

The study explored the components that impact the decision of science subjects in Kenya's optional schools. The examination particularly explored the components that impact the decision of science subjects in Kirimunge Mixed Day Secondary School.

### ***1.8 Limitation of the Study***

The research faced several hindrances that may have deterred effective research outcome. First and foremost the researcher faced financial constraints. Time was a limiting factor and some respondents were suspicious and failed to answer the questionnaire.

The study was based on four factors that were captured in the objectives; this may have denied the researcher an opportunity to look into other factors which may influence the choice of science subjects in Kenya's secondary schools.

### ***1.9 Assumptions of the Study***

The study was undertaken with the assumption that the respondents would give reliable and independent responses especially on the part of the student respondents.

The researcher also assumed that the sample selected was representative of the entire population and the instrument for collecting data was valid and reliable.

### ***1.10 Definition of terms***

**Science subjects** : Refers to the basic science subjects taught in Kenyan secondary schools and which are examined in the Kenya's Certificate of Secondary Education

**Choice** : Refers to the act of selecting one science subject over the other.

**Influence** : is the power to affect the decision made by a person.

**Secondary schools** : The education level that comes after the primary education level in Kenya.

**Teacher influence** : How the teacher makes the student select one subject and not the other

**Gender influence** : The effect of being male or female on selection of subjects.

**School environment**: The factors surrounding the student while at school

**Role of teacher in subject selection**: The part played by the teachers when students are selecting subjects.

**Role of parent in subject selection**: The part played by the parents when students are selecting subjects.

**STEM** : Science, Technology, Engineering and Mathematics.

# **CHAPTER TWO**

## **LITERATURE REVIEW**

### ***2.1 Introduction***

This chapter outlines the factor influencing the choice of science subjects in detail. It looks at the influence of student related factors, the influence of the subject teacher, the school environment and the contribution of parents in student choice of science subjects. The chapter ends with a conceptual framework of the variables that were studied and their interrelationships.

### ***2.2 Factors influencing student choice of science subjects***

Students await the opportunity to choose their academic plans and classes with bated breath. Allowing students the independence to choose their class not only increases their motivation but also improves their performance (Flower day and Schraw,2003).The task of choosing subjects is a complex one as it involves putting various factors into consideration. The student chooses the subject based on their interests, academic goals and career choices. They also make the decisions putting into consideration advice from their parents, peers and role models. There is thus need for the school to recognize the factors that influence student choices so that they can cater for the student needs and have them continue to enroll in the various science classes.

#### **2.2.1 Student factors influencing choice of science subjects**

Research has showed that students choose subjects they think are interesting, useful in future or that they performed well in previous examinations. To emphasize the role of student factors in choice of sciences, studies by Lazarowitz (2006) in Israel found out that students decisions on choice of sciences depended on individual student attribute.Shertzer and Stone (2003) reported that interest and ability influence choice of subject. Lack of interest leads to low efficiency in science. Another key factor in learning science is the students' attitude towards science. According to Adesina and Akinbobola (2005) attitudes



are learned and change over time as an individual is exposed to new information and experiences. Osborne et al (2003) reported that attitudes to science are influenced by factors such as how the learner perceives the subject teacher, how highly the learner regards sciences, how motivated the learner is towards science, how anxious the learner is to learn science, the nature of the classroom environment and the perception the learner's parents and peers hold towards science.

Development of interest in science education and careers in science requires a favourable view of science subjects (George, 2006). According to Oliver (1990) having a positive outlook towards sciences makes the learner more committed and interested to learn sciences. A negative attitude on the other hand, creates disinterest in sciences and on choosing subjects every effort is made to avoid science subjects. Watitu (2004) concurs with the above observations by indicating that though the relationship between attitude and performance may be weak, attitude is clearly a factor linked to selection of subjects. Mwamwenda (1995) further emphasizes the role of attitude by observing that the achievement of students in a subject is determined by their attitudes rather than by their inability to study.

Student subject choices are greatly affected by their perceived potential to handle a subject. How easy or difficult a subject is to learners determines its uptake. Survey by Sharp, Hutchison and Keys (1996) showed perceived difficulty as the most important factor that discouraged students from taking up sciences. Past outcomes in sciences influence their choice. Weiner (1992) concurs with this by stating that student past outcomes in a subject affect their future outcomes. Physics is normally perceived by students as a difficult subject due to the many mathematical concepts and processes involved. Thus students tend to avoid physics when given the freedom to choose and this is more so for female students. Physics is thus taught to selected students who grasp the mathematical concepts and symbols since there is a close link between science and mathematics as their teachings overlap (Knetcht, 1965). Wadsworth (1998) further observed that students who perform dismally in Mathematics are locked out of Physics and Chemistry classes due to their lack of basic mathematical concepts which are a prerequisite for these sciences.

A report by Kempa and Dude (1974) concurs with that of Weiner (1992) as the two agree that outcomes in science are determined by how interested the learner is in the

course. Olatoye (2002) links student achievement to their attitudes towards science. Study habits significantly contribute to achievement in science. Studies by Okpala and Onocha (1988) and Olatoye and Ogunkola (2008) show that lack of concentration, boredom and dozing while studying science results in unproductive learning of science during ones personal study or while at school. Nauhi, Shakoori and Nakhei (2008) observed that students who had mastered key scientific concepts enjoyed studying science and this boosted their interest in science. The role of peers in a learner's academic performance is clearly evident in studies that have been carried out. Peer influence is seen to trickle down to selection of subjects. Students may tend to choose subjects based on the expectations of their peers or the expectations set by the school for their peers.

According to a study by Tella et al (2007) peers tend to influence a learner's subject choices and academic performance positively. Further studies by Ablard (2007) reported that adolescents enjoy peer support on choice of subjects and vocational aspirations. Dryler (1999) emphasizes the role of peers on subject selection noting that the choices made by either gender tend to be similar to those of peers of the same sex. Dalgety and Coll (2004) announced that the subject selections of young ladies are enormously influenced by their folks, associates and educators. Writing demonstrates that profession objectives impact understudy decision of science subjects. This is so since professions in science and innovation are fundamental to accomplish versatility in a general public. People with qualifications identified with science and innovation land more lucrative positions.

As indicated by Nagy, Trautwein, Baumert, Koller and Garrett (2006) understudies in secondary school tend to pick subjects they mean to seek after at more elevated levels of training. Student subject choices greatly depend on the career prospects offered by a particular subject. The learners will thus tend to select subjects that will draw them closer and closer to the careers they aspire in future (Ackerman and Gross, 2006). Ting (1997) reported that having a clearly defined career path resulted in favourable academic outcomes while lack of clearly set career goals resulted in poor academic outcomes. As outlined earlier academic achievement is a crucial factor influencing subject choice (Kempa and Dude, 1974).

The influence of gender on selection of sciences has been reported in both developed and developing countries (Eccles, 1994). The effect is more clear in the female understudies as delineated by investigations of Cheng et al (1995), Adamson et al (1998), Osborne and Collins (2001), Baker and Leary (2003), Cleaves (2005), Miller et al (2006) which single out sexual orientation as the most persuasive factor in determination of science subjects. An examination by Bologun (1985) showed that most young men enlisted in all the fundamental sciences at school declaration level examination and were extraordinarily arranged to science and arithmetic than young ladies. Research associates the low enrolment of girls in science to low parental encouragement and expectations. The attitudes and beliefs girls hold towards science also contribute to their low enrolment in science classes. Wasanga (1997) stated that girls found science subjects difficult and more useful to boys. Gilbert and Calvert (2003) as cited by Tuaundu (2009) added that many female learners lost interest in sciences and mathematics because they perceived themselves as incapable of successfully handling these subjects.

Francis and Greer (1999) reported that females had a more negative attitude towards sciences than their male counterparts. One's attitude towards a subject is an important factor in determining performance. A negative attitude results in low performance. Achievement differences are influenced by sex. According to Whitelaw et al (2000) sex is an important predictor of a learner's attitude towards sciences. According to Jones et al (2000) females have a less favourable perception of sciences when compared to their male counterparts. Hence boys perform better in science, technical subjects and mathematics. Gender differences will thus continue to differentiate the subject choices of girls from those of boys for as long as the girls stay away from science classes with the perception that sciences are difficult and an area of interest only to their male counterparts (Attar, 1990, Archer, 1992)

### **2.2.2 Influence of the subject teacher on students' choice of science subject.**

The subject teacher plays an important role in developing learners' attitude towards a subject and hence influencing the choices they make in future. Maychell et al (1988)

highlights the role of the teacher in his study in which he noted that learners who continued with education past the age of 16 must have been influenced by their teacher. Robert (2002) highlighted that though a teacher's mastery of the content and its efficient delivery is essential, more often than not it's how enthusiastic they are that draws a student's interest and motivation to enroll in a subject. According to Huibregtse and Wubbels (1994) many individuals who join the teaching profession tend to teach using methods borrowed from their teachers or just exactly the same way they were taught by their teachers. Adayemi (2009) concurs with this, by observing that most teachers are regarded as role models by their learners hence learners are likely to pick subjects taught by their favorite teachers. A study by Kiboss (2000) showed that the learner's attitude towards a subject can be influenced by the teacher's delivery of the subject's content. To make learning of science interesting and appealing to learners the teacher has to apply a variety of teaching methods (Wellington, 2000). A teacher centered approach adopted with the excuse that time and other resources are limiting, and the syllabus too wide is likely to result to boredom. Such an atmosphere would discourage students from science classes. Teaching of science thus requires up to date facilities and functional laboratories to appeal to learners to enroll in science classes. However Osborne (2000) is keen to emphasize the role of the teacher by observing that a team of competent, passionate and well-paid teachers is more useful to a school than a well-equipped laboratory. Teacher preparation as well as mastery of the subject is crucial. Bajah (1975) observes that scholars in the field of education concur that a teacher can only teach what he or she is familiar with. This makes it necessary for the science teacher to be quite articulate in the subject he specializes in. Teaching science concepts outside a teacher's area of specialization results in lack of confidence during content delivery hence ineffective learning of science. Further, how the teacher relates with the learners is important in shaping their attitude towards a subject. A study by Brekelmans et al (1990) found that student perceptions of the teacher were related to cognitive outcomes. Good teaching calls for the teacher to develop a cordial relationship with the students and to enhance his communication skills. A friendly learning environment motivates learners to take up a subject despite the challenges that may be involved.

### **2.2.3 Effect of the school environment on student choice of science subject.**

Provision of a particular subject in a school depends on the school policy. The school policies and organization may either facilitate or constrain the choice of science subjects. Research by Manguti (2004), Munyalo (2006) and Gacarira (2007) revealed that the process of subject selection is an area where students are not fully involved but rather hurriedly coerced into either to balance the classes or to limit the number due to facilities or cost. Roger and Duffied (2000) observed that schools play an important role in the subject choices of learners through the way they package selective subjects and the emphasis put on the individual subjects. Aduda (2003) notes that despite the role of Physics in the economic and technological progress of a nation, most schools have made it a selective subject while some schools do not offer it completely.

According to Smyth and Hannan (2006) schools vary in the ways they package science subjects. Some schools only allow selected students to enroll in certain science classes while others have a set criterion for enrolment in certain science classes. Schools also vary the way they do the timetabling of science subjects. Timetabling of science classes affects their uptake. Smyth and Hannan (2006) highlighted that the way Physics is timetabled produced a gendered uptake of the subject. The learning environment is crucial in determining enrollment of learners in a science class. To achieve excellent academic results there must be teamwork among learners, guidance from the subject teacher and availability of the necessary teaching and learning resources.

Robert (2002) found out that science laboratories are vital for pupil education in science subjects. Friedman (2002) emphasizes the role of laboratory work by observing that girls who had used laboratory components had a higher achievement in science than those who had not used these components. Bolorunduro (1998) as cited by Alabi (2008) observes that availability of the required teaching and learning resources creates a conducive teaching and learning environment while lack of the said resources results in poor performance in examinations (Olubor, 1998). A study by Yildiz, Akpınar, Aydogdu and Ergin (2006) showed that lack of a science laboratory or having one that is ill-equipped results in the science teacher having a negative attitude towards science practicals. Science practical lessons are part and parcel of effective learning of science since they enhance acquisition

of scientific knowledge .Smyth and Hannan (2000) noted that schools that emphasized science experiments had a higher enrollment in science classes and students were more involved during science lessons. Omulando (1992) thus concludes that the school management should endeavor to provide resources such as the relevant course books, well-equipped laboratories to facilitate teaching and learning of science.

The school also plays the role of supporting the subjects and career decisions of the learners. The school should provide the learners with the basics about the subjects they intend to enroll in (Igun and Obayan, 2007) .This can be attained through establishment of guidance and counseling units. According to Owoyele and Toyobo (2008) an expert in guidance and counseling is required to advice the learners on their subjects choices with reference to their preferences, individual academic prowess and the careers they intend to pursue. It's obvious that wrong choice of subject will lead to misfits in job and this will deprive the nation off her real manpower needs. Thus Okeke (2003) emphasizes that there need to guide students adequately to choose subjects that will allow them to achieve the prime objectives of education.

#### **2.2.4 Role of parents in student's choice of science subject in secondary school.**

Career advice by parents and teachers has been reported to influence choice of science subjects especially in Africa .Okeke (2000) observes that parents play an important role in the educational and vocational decisions of their children. According to Michael (2001) the home provides many things for the child such as protection, guidance, shelter and encouragement. Thus the influence of parents is the strongest and most persistent factor that determines the child's attitude towards studying different school subjects. Parental and family attitude to science has been reported as important in determining a child's attitude towards science and their academic achievement in general. Pollard et al (2003) notes that the effect of parents on the decisions made by their children is more crucial than any other. Further research by Millward et al (2006) found out that children were more likely to seek advice on careers and the courses to enroll in from their parents rather than from their peers or teachers.

However, it is worth noting that parents may also generate a gendered outlook towards uptake of sciences. Studies by Adre et al (1999) revealed that most parents regarded sciences as more useful to boys than girls. Boys were thus encouraged to be more adventurous and allowed to handle electrical and mechanic devices while girls were allowed to play with toys and help their mothers in household chores. This gave boys a greater opportunity to integrate the science subjects learnt at school. Further, it is worth noting that the role of parents in the science choices of their children declines with age as they acquire new role models (Johnstone and Selepeng, 2001).

### ***2.3 Summary and Gaps***

The literature review revealed a number of factors that affect the selection of science subjects. These factors are centered on the learner, the subject teacher, the parent and the learning environment. Research has revealed that the student's attitude, career goals, previous achievement, peers and gender influence their choice of science subjects. Further literature has shown that the teachers, their attitude, teaching methods and relationship with the students influence the student choice of science subjects. A study by Torongey (1980) carried out in Kericho district established that the subject teacher influences the student's attitude towards science through their relationship with the learner, lesson attendance and the speed at which they deliver the subject content. These studies however did not go further to show how these teacher characteristics influence student decisions during selection of sciences in high schools in Kirinyaga central sub- county.

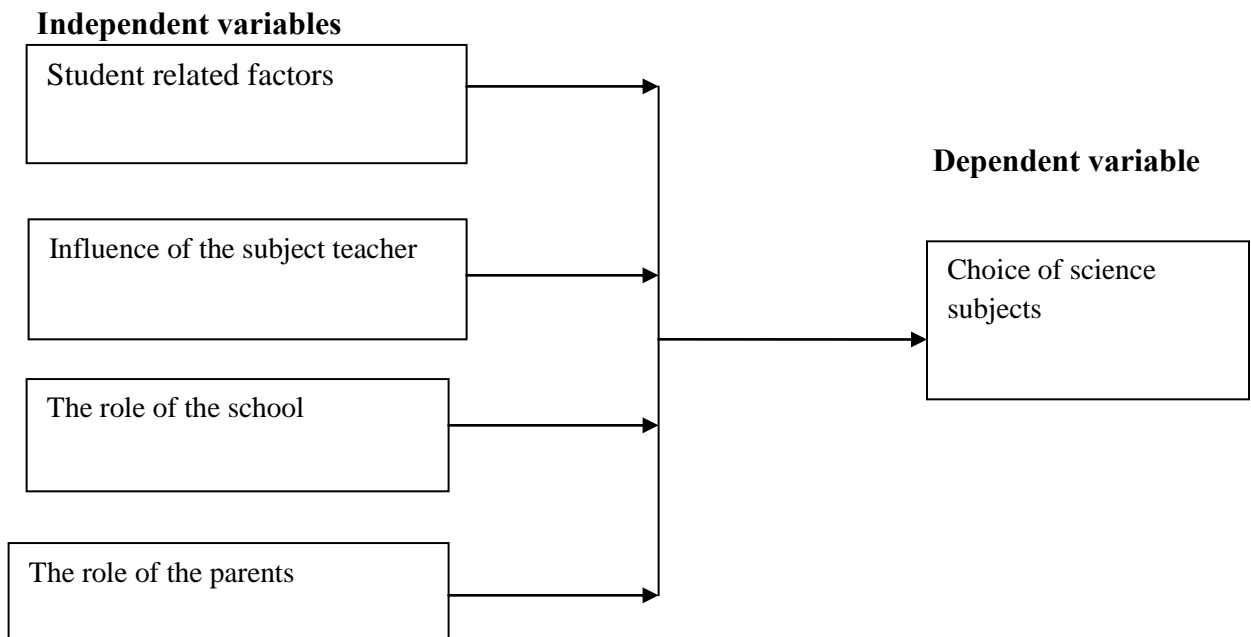
Studies have also showed that the school can influence uptake of sciences directly by availing the required learning resources and career guidance and counseling or indirectly by the way they package selective subjects. However the studies did not go further to outline this influences on secondary school in Kirinyaga Central Sub County. Finally, literature has shown parental influence in the selection of sciences. There is thus evidence of the existence of factors that decide choice of science subjects. It is in this light the scientist looked to round this hole via completing examination on the variables that impact the decision of science subjects in Kenya's optional schools, a contextual investigation of Kirimunge blended day auxiliary school in Kirinyaga focal sub district.

## 2.4 Conceptual framework

Miles and Hubermann (1994) allude to an applied system as a scientist's portrayal of key elements, ideas or factors and the assumed connections among them. The part of a reasonable structure is to control the specialist in his examination (Robson, 2011, Miles and Huberman, 1994).

A calculated system exhibits the association between the reliant and free factors. In this investigation the reliant variable is the decision of science subjects while the free factor are understudy factors, the subject educator, the part of guardians and the part of the school.

**Figure 2.1 Conceptual framework**



**Figure 2.1 Perceived factors that influence the choice of science subjects by students in Kenyan Secondary schools.**



# **CHAPTER THREE**

## **RESEARCH METHODOLOGY**

### ***3.1 Introduction***

This part takes a gander at the approach used to attempt the investigation. It plots the objective populace, the examining procedure used to touch base at the example, the nature and wellspring of information. Further, it plots the technique utilized in examining information.

### ***3.2 Research Design***

The study utilized clear review outline. As indicated by Moulton (1996) a study is appropriate to utilize when managing a populace whose substantial size cutoff points coordinate perception. In a study the analyst readies an arrangement of inquiries from which he gets reactions (Polit and Hungler, 1993). In this exploration the agent acquired reactions from the respondents utilizing polls. The polls encouraged the accumulation of data on the present pattern in the determination of sciences.

### ***3.3 Target population***

A population is the whole set of units from which the researcher obtains data used to make inferences on a survey. The population for this study is all the students at Kirimunge mixed day secondary school. On the other hand, a target population refers to a set of units which has features which are of interest to the researcher. The target population for this study are the students in form two, three and form four since they are the ones involved in making choices in science subjects. It's from the target population that samples were taken.

### ***3.4 Sample and Sampling***

A sample refers to the individuals chosen to participate in a survey. The people constituting a sample are referred to as participants. A sample is representative of the entire population

and the findings derived from it can be used to make conclusions on the general population.

From the above population of 420 possible respondents, of sample of 30% will be considered (from each group) using stratified random sampling. Stratified random sampling involves picking the desired smaller groups from the larger population (Heiman, 2002). Random sampling is an efficient sampling technique since every participant stands an equal opportunity to be picked. The result of this is a sample that is representative of the target population and free from error and bias. According to Gay (2001) a sample of 10-30% is representative of a given population. Thus for the study 6 teachers, 36 form two students, 48 form three students and 36 form four students were selected. The selection was as follows:

**Table 3.1 Target population and the sample size**

<b>Category</b>	<b>Target population</b>	<b>Ratio</b>	<b>Sample size</b>
Teachers	20	0.3	6
Form two students	120	0.3	36
Form three students	160	0.3	48
Form four students	120	0.3	36
<b>TOTAL</b>	<b>420</b>		<b>126</b>

**Source: Author (2020)**

### ***3.5 Data Collection Technique***

The study employed questionnaires to collect the primary data from the participants. The questionnaires included open and closed ended questions. According to Orodho (2009)

investigators opt for close ended questions due to the ease with which they can be filled, tabulated and their level of objectivity. On the other hand, open ended questions give the respondents the lee way to express themselves freely without restriction.

### ***3.6 Data Analysis and Presentation***

The study resulted both qualitative and quantitative data. Analysis of the quantitative data was carried out using descriptive statistics. Qualitative data was interpreted depending on the responses offered by the participants. Quantitative data was presented in tables and graphs.

## CHAPTER FOUR

### INTERPRETATION AND ANALYSIS OF DATA

#### *4.0 Introduction*

This chapter analyses the data collected. Data was collected from 126 (120 students and 6 teachers) out of the 420 targeted respondents. The findings of the study are presented as per the aim of the investigation. The aim of the investigation was to find out the factors that determine selection of sciences in secondary schools in Kenya, a case study of Kirimunge mixed day secondary in Kirinyaga Central Sub- County.

#### *4.1 Response rate*

The researcher obtained responses from 6 teachers, 36 form two students, 48 form three students and 36 form four students, making the percentage rate of responses 100%. With a 100% response the researcher can adequately analyze and report the findings of the study (Mugenda and Mugenda, 1999).

#### *4.2 Student factors that determine selection of sciences*

This section sought to find the distribution of students by gender, class, age and religion. It also looks at the students' attitude towards science subjects, the value they attached to the subjects in reference to future careers, effect of gender differences as well as peer pressure on the choice of science subjects.

##### **4.2.1 Distribution of student respondents by gender**

The respondents who were interviewed consisted of 57% girls and 43% boys. The outcome of the research was as shown in Table 4.1

**Table 4.1 Distribution of the respondents by gender.**

Category	Percentage
Girls	57%
Boys	43%

#### ***4.2.2 Age distribution of the participants***

Out of the participants interviewed, 2.40% were aged below 14 years, 84.92% were aged 14-18 years and 12.70% were above 18 years.

**Table 4.2 Distribution of Respondents by Age**

<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>
Below 14 years	3	2.4
14-18 years	107	84.92
Over 18 years	16	12.70
<b>TOTAL</b>	<b>126</b>	<b>100</b>

**Source: Author (2020)**

#### ***4.2.3 Distribution of respondents by religion***

From the respondents interviewed 60% were Protestants while 40% were catholic. Therefore the majority of the respondents were Protestants.

**Table 4.3 Distribution of respondents by Religion**

<b>Category</b>	<b>Percentage</b>
Protestants	60%
Catholics	40%
<b>TOTAL</b>	<b>100%</b>

#### ***4.2.4 Distribution of participants by form***

The researcher wanted to find out the distribution of the learners by their form and indicated the findings in table 4.3.

According to the findings, 30% of the respondents were form two, 40% were form three and 30% were in form four students. Therefore the majority of the students who participated in the study on the factors that determine the choice of sciences in secondary schools were in their third form.

**Table 4.4 Participants by form**

<b>Category</b>	<b>Number of students</b>	<b>Percentage</b>
Form 2	36	30
Form 3	48	40
Form 4	36	30
<b>TOTAL</b>	<b>120</b>	<b>100</b>

**Source: Author (2020).**

#### **4.2.5 Marks attained in the K.C.P.E Examination**

The researcher wanted to determine the marks attained in the KCPE examination by the students that participated in the study as summarized in table 4.4.

**Table 4.5 Marks attained in the KCPE Examination**

<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>
350-400 marks	1	0.83
300-350 marks	10	8.33
250-300	66	55.00
Below 250	43	35.83
<b>TOTAL</b>	<b>120</b>	<b>100</b>

**Source: Author (2020).**

They study found out that 0.83% of the students scored 350-400 marks, 8.33% had 300-350 marks, 55% had 250-300 marks while 35.83% had below 250marks. Therefore the majority of the respondents scored between 250 and 300 marks in KCPE examinations.

#### **4.2.6 The perception of learners towards sciences as outlined by the learners**

The student respondents were asked to rate the perception of learners on sciences. The research showed a negative attitude towards physics and preference for biology. These findings are in agreement with those of a study done in Machakos County, Kenya by Musyoka (2000) who found that most learners avoid enrolling in physics classes since they perceive it as abstract and are afraid of the mathematical concepts involved. Waititu (2004) concurs by observing that most learners were interested in biology and only a few were bored by it.

**Table 4.6 Perception of the learners towards science as outlined by learners**

<b>Category</b>	<b>Biology</b>	<b>Chemistry</b>	<b>Physics</b>
Strongly negative	10	20	40
Fairly negative	25	44	50
Fairly positive	60	30	8
Strongly positive	5	6	2
<b>TOTAL</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Source: Author (2020).**

The majority of the students as indicated in table 4.5 had a negative attitude towards science subjects with only less than 10% who had a strongly positive attitude towards the subjects. This implied that the attitude of the students towards science subjects had an effect on the selection of such subjects.

#### ***4.2 Perception of learners towards sciences as outlined by the teachers***

The teacher respondents were asked to rate the attitude of the students towards science.

The findings of the study were that majority of the students had a satisfactory attitude towards biology 50% whereas 50% of the students had a negative attitude towards physics, with only 2% having an excellent attitude.



**Table 4.7 Perception of learners towards science as reported by the teacher**

<b>Category</b>	<b>Biology</b>	<b>Chemistry</b>	<b>Physics</b>
Poor	10	20	50
Satisfactory	50	40	30
Good	46	22	18
Excellent	14	18	2
<b>TOTAL</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Source: Author 2020**

#### **4.2.8 Effect of peer pressure on selection of science**

The student respondents were asked whether peer pressure influenced their choice of science subjects. The study found out that 85% of the student choices were not influenced by peers and only 15% were influenced. These findings concur with the studies by Milward et al (2006) who noted that children tend to seek advice from their parents on courses and careers to take up rather than from their tutors or peers.

**Table 4.8 Effect of peer pressure on the choice of science subjects**

<b>Category</b>	<b>Percentage</b>
Students not influenced by their peers	85%
Students influenced by their peers	15%
<b>TOTAL</b>	<b>100%</b>

#### ***4.2.9 Relevance of the science subjects to future career aspirations***

The study intended to find out if the subject choices made by the learners had any relevance to future career aspirations.

The study revealed that, 80% of the subject choices were based on future career aspirations while 20% of the learners did not relate their subject choices to career development. Wilhelm (2004) reported that students tend to select subjects that are relevant to their future careers.

**Table 4.9 Relevance of science subject to future career aspirations**

<b>Category</b>	<b>Percentage</b>
Students' subject choice based on career development	80%
Students subject choice not based on career development	20%
<b>TOTAL</b>	<b>100%</b>

#### ***4.3.0 Student career path***

The researcher intended to find out if the learners had future career aspirations. 85% of the students indicated they had careers they intended to pursue in future while 15% had not yet decided on the careers to pursue. Studies by Nagy, Trautwein, Baumert, Koller and Garrett (2006) indicate that high school students select subjects they intend to pursue at higher levels of education.

**Table 4.10 Student's career aspirations**

<b>Category</b>	<b>Percentage</b>
Student with career path	85%
Student without career path	15%
<b>TOTAL</b>	<b>100%</b>

### 4.3.1 Influence of gender on selection of sciences

According to the investigation, 70% of the learners stated that their gender affected the sciences they picked while 30% refuted the role of gender in their subject choices. According to Johnson and Murphy (1986), learners may have a gendered outlook towards certain science. Female learners prefer biology due to its more interactive and less abstract nature.

**Table 4.11 Effect of gender on selection of sciences**

Category	Percentage
Student subject choice influenced by gender	70%
Student subject choice not influenced by gender	30%
<b>TOTAL</b>	<b>100</b>

### 4.3.2 Number of learners enrolled in science classes by gender

The researcher was able to determine the number of boys and girls who took up science subjects. The study indicated that the ratio of girls to boys who took up biology was 3:1. The ratio of girls to boys taking physics was 1:4 while that of girls to boys taking chemistry was 2:1.

**Table 4.12 Ratio of boys to girls who take up science subjects**

Category	Girls	Boys
Biology	3	1
Physics	1	4
Chemistry	2	1

Therefore it can be concluded that the gender of the students affected their choice of sciences as only a few girls chose physics. These findings concur with those of Gilbert and

Calvert (2003) who reported that majority of the female learners view themselves as incapable of handling mathematics and other sciences. Aduda (2003) also found out that students, especially girls avoid physics when given an option. Studies by Hoffman (1985) further illustrated that learners lost interest in Physics as they progressed in age and this was more so for female students. He attributed this to the fact that there was a greater acceptance of the girl's gender role.

#### ***4.4 Influence of subject teachers on selection of sciences***

The study found out that 76% of the student decisions on sciences were influenced by the subject teachers while 24% of the learners reported that the teacher had no effect on their subject choices. Adayemi (2009) observed that learners tend to select the subjects handled by the teacher they regard as their role models.

**Table 4.13 Teachers influence on choice of science subjects**

<b>Category</b>	<b>Percentage</b>
Student influenced by the subject teacher	76%
Student not influenced by the subject teacher	24%
<b>TOTAL</b>	<b>100%</b>

#### ***4.5 Influence of the school environment on student choice of science subjects***

In this section, the researcher wanted to find out the school policy on sciences, the availability of and frequency of using laboratory equipment and guidance and counseling services in the school.

#### ***4.5.1 School Policy on subject offered***

The student responses indicated that the school offered all the three sciences namely: Biology, Physics and Chemistry. The response from the students indicated that all the three science subjects were offered in the school. However, according to the school policy, chemistry was compulsory.

#### ***4.5.2 Frequency of the use of Laboratory equipment***

The teacher respondents were asked to report on the frequency with which they made use of laboratory equipments.

The study found that 67% of the teacher respondents indicated they used the laboratory during the double lessons while 33% indicated they used the laboratory in all the science lessons. From this, it can be concluded that the laboratory was mostly used during double lessons. According to Sir Robert (2002) science laboratories are vital to pupil education in science subjects. Yildiz, Akpiner, Aydogdu and Ergn (2002) concur by stating that science experiments are an inseparable and indispensable part of learning.

**Table 4.14 Frequency of using laboratory**

<b>Category</b>	<b>Teacher frequency</b>	<b>Percentage</b>
Double lessons	4	67
All the lessons	2	33
<b>TOTAL</b>		<b>100%</b>

#### **4.5. Access to career counseling**

The research intended to reveal whether the learners received career counseling.

**Table 4.15 Access to career counseling**

83% of the students indicated that they received career counseling while 17% indicated they received no career guidance

<b>Category</b>	<b>frequency</b>	<b>Percentage</b>
Career guidance received	100	83
No career guidance received	20	17

#### **4.5.4 Influence of career guidance on subject choice**

The researcher sought to find out from the student respondents if they found career guidance useful during subject selection. 66% of the students indicated that they found career guidance useful during subject choices while 34% indicated that career guidance did not guide their subject choices. According to Owoyele and Toyobo (2008) students require career guidance to ensure the learners' subject choices are in line with their academic achievement, interests and the intended future careers.

**Table 4.16 Guidance on subject choice**

<b>Category</b>	<b>Percentage</b>
Student applied career guidance from the counselor	66%
Student did not apply career guidance from the counselor	34%

#### **4.6 Role of parents on choice of science subjects**

Okeke (2000) observed that parents play an important role in the educational and vocational decisions of their children. The researcher thus sought to find out from the

student respondents whether their parents influenced them during selection of sciences. The study revealed parental influence on the subject choices of 90% of the learners while 10% stated that their parents did influence their decision.

**Table 4.17 Parental influence on subject choices**

<b>Category</b>	<b>Percentage</b>
Student subject choice influenced by parents	10%
Student subject choice not influenced by parents	90%
<b>TOTAL</b>	<b>100%</b>

## **CHAPTER FIVE**

### **DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

#### ***5.1 Introduction***

Chapter five serves to summarize the outcome of the study, draw conclusions from the study and make recommendations.

#### ***5.2 Summary of the findings***

##### **5.2.1 Student influence on selection of sciences**

The research revealed that the school offered all the three science subjects. The students had a fairly positive attitude towards biology, a fairly negative attitude toward chemistry and a strongly negative attitude towards physics. The students mainly chose their subjects based on an already set out career path that they wanted to follow. Gender was a key determinant of subject choice especially in relation to physics. Most girl students were keen to avoid physics as illustrated by the ratio of 1:4 of girls to boys taking physics. Peer pressure was not a key factor in the student subject choice as indicated by 85% of the student respondents who did not associate their choices to peer pressure.

##### **5.2.2 Teacher influence on selection of sciences**

The study revealed that the subject teacher did influence subject choice through his delivery of the content, rapport with students and enthusiasm for the subject taught.



### **5.2.3 School influences on choice of science subjects**

Research on influence of the school environment on subject choice showed that the school had a specific policy on science subjects. Chemistry was compulsory for all students while choices were made between biology and physics.

The availability of career guidance had influenced the choice of science subjects as indicated by only 34% of the students who claimed not to have received guidance.

### **5.2.4 Role of parent on choice of subject choice**

The study established that parents did not significantly influence the choice of science subjects. Most student respondents reported that their parents had not attended high school.

## ***5.3 Conclusion***

This study concludes that student's characteristics do influence the choice of science subjects. Attitude towards a subject is significant in determining its choice. Attitude is shaped by prior achievement in the subject. A negative attitude and low achievement leads to lack of interest in a subject. The value attached to a subject in relation to a student's career aspirations is also a key factor in subject choice. Students tend to choose subjects based on their relevance to future career aspirations.

The subject teacher greatly influences subject choices through his mastery and delivery of the content, and the relationship he has with the students. The study also sees the school as a relevant factor in subject choice. It is the school that sets the policy on the subject combinations and their timetabling. The school also provides the necessary resources to implement the subject syllabus. Finally, the study found out that parents had minimal influence on their children's decision on subject choice.

## ***5.4 Recommendations***

After analyzing the findings, the researcher made recommendations both for improvement and for further studies.

### **5.4.1 Recommendations for improvement**

From the findings, the study recommends the following

- i. Teachers should encourage and give students the opportunity to develop a favourable attitude towards sciences. This will make them enjoy the subjects.
- ii. Science teachers should cultivate a cordial relationship with students so as to inspire them to improve their attitude towards science subjects.
- iii. Gender differences should be discouraged amongst students. Girls should be encouraged to take up science subjects.
- iv. The school administration should strive to establish well equipped laboratories to facilitate a practical approach to sciences which will in turn encourage students to take up science subjects such as Physics.
- v. The school should support career guidance counselors who offer students crucial information about the content and structure of science subjects.

### **5.4.2 Recommendations for further studies**

The analyst suggests that an investigation ought to be done to assess the components impacting the decision of specialized subjects in a similar school.

## REFERENCES

- Aigbomian D.O (2002). *Science for All: Implication for the Teacher and National Development: 14<sup>th</sup> Inaugural Lectures of the Ambrose Alli University, Ekpoma, Edo state, Nigeria, Benin city: Ambik Press.*
- Alibi , A. O. (2008). School of Junior size and Facilities as currelates secondary school students performamce in Oyo state, Nigeria. *Pakistan Journal of social sciences* 5 (8): 836-840.
- Bologun ,T.A (1985). Interests in science and technology education in Nigeria. *Journal of the science teachers association of Nigeria ( STAN) ,* 23 (a & 20, 92-99).
- Flowerday, T.,Schraw, G. (2003). The effect of choice on cognitive and affective engagement. *Journal of educational Research, 96 (4), 207-215.*
- Francis L, Greer, J.(1999). Measuring attitudes towards science among secondary school students: The affective domain. *Journal of Research in Science teaching, 35(2):877-896.*
- Friedman, M.P (2002). The influence of Laboratory Institution on science achievement and attitude toward science across gender differences. *Journal of Women and Minonties in science and Engineering, 8pp, 191-200.*
- Gay, R.L. (2003). *Educational Research: Competences for Analysis and Application* (7<sup>th</sup>ed) Columbus : Charles and Mervill Publishing company.
- George R. (2006). *A cross- domain analysis of change in students attitude towards science and attitudes about utility of science.*
- Huibregtse, I., Korthagen, F., &Wubbels, T. (1994). Physics teachers conceptions of learning, teaching and professional development. *International journal of science Education, 16 (5) 539-561.*
- Igun S.N (2007). *Fundamental of Vocational Guidance and Choice.* Benin- city, Nigeria: OtohaguaEnt.
- Kaboss, J.K. (2000). Teacher/ Pupil perspectives on computer argmented physics lessons on measurement in Kenya secondary schools. *Journal of information Technology for Teacher Education, Vol 9, Nos, 2000.*

- Kampa, R.F and Dude, K. (1974). Science interest and attitude traits in students subsequent to study of the chemistry at O level of general certificate of Education. *Journal of Research in Science Teaching*. 11(4) 361-370.
- Lazarowitz R., &Lazarowitz R.H (2006) Choices and preferences of science subjects by junior high school students in Israel. *Journal of Research in science teaching*, 16(4): 317-329.
- Miles, M. and Huberman, M. (1994). *Qualitative Data Analysis*. 2<sup>nd</sup> Edition Beverly Hills, CA: Sage.
- Mugenda O.M. and Mugenda A.G.( 2009). *Research Methods*. ACTS publishers.
- Munyalo, W.F. (2006). *Factors influencing the choice of physics by female students in Kitui District*. Unpublished MED Thesis Kenyatta University.
- Nagy, G., Trautwein, H., Baumert, J., Koller, O., & Garrett, J. (2006). *Gender and course selection in upper secondary education: effects of academic self-concept and intrinsic value*. Educational Research and Evaluation.
- Okeke AN (2000). The *impact of school subjects on the choice of careers and profession*. West African Journal of Education, XVII(1): 5-11.
- Olatoye, R.A. (2002) *A casual model of school factors as determinants of science achievement in Lagos state secondary schools*. Unpublished PhD Thesis, University of Ibadan, Ibadan.
- Osborne J, Simon S, Collins S (2003). Attitudes towards science: A review of the Literature and its implications. *International Journal of science education*, 25 (1) : 1049- 1079.
- Orodho, J.A. 2<sup>nd</sup> (2009). *Elements of Education and Social Research Methods* Maseno: Kanzin Publisher.
- Owoyole, J.W. and Toyobo, O.M (2008). *Parental will, Peer Pressure, Academic Ability and School subjects selection by students in senior secondary schools*. The school sciences, Medwell Journals.
- Pollard, E., Jagger, N., Perryman.S., Van Gent, M.& Mann, K. (2003). *Ready SET GO A Review of AET Study & careers choices*. Warwick: IES.

- Roger, A. & Duffield, J. (2000). *Factors underlying persistent gendered option choices in school science and technology in Scotland*, gender and education, 12(3) , 367 -383.
- Schreiner, C., and Syoberg, S. (2004). *Sowing the seeds of Rose. Background, Rationale, Questionnaire Development and Data collection for ROSE ( The relevance of science Education)* A comparatives study of students' views of science and science Education (ActaDidactica 4/2004), Department of Teacher Education and School Development, University of Oslo, Norway.
- Sharp, c., Hutchison, D. Davis, C. and Keys, W. (1996). *The take up of advances mathematics and science courses summary report*. National foundation for Educational.
- Smyth, &. And Hannan, C. (2006). School effects and subject choice. The uptake of science subjects in Ireland. School Effectiveness and Improvement. *An international Journal of Research, Policy and Practice Vol.17, No.3, September, pp. 303- 327.*
- Ting, S.(1997). Estimating academic success in the first year of college for specially admitted white students. A model combining cognitive and psychosocial predictors. *Journal of college student development*, 38 (4) 401- 409.
- Torongey P.K.(1986). *A survey of the problems experienced by girls in learning physics at 'O' Level and their implication of girls interest in the subject in Kericho district*. Unplished thesis med, Kenyatta Univesity.
- Whitelaw S, Miloseric, Daniels S (2000). *Gender, behavior and achievement: A preliminary study of pupil perceptions and attitudes*. Gender and Education, 12(1) :87-113.
- Waititu, M (2004). *Exploring and students Perception of Difficulty in Topic Areas of the Kenya Secondary School Physics syllabus*. Unpublished masters Thesis, Kenyatta University.
- Wasanga, C.M. (1997).*The attitude towards science among primary and secondary school students in Kenya*. Academy of science publishers.

## **APPENDICES**

### **APPENDIX 1: INTRODUCTION LETTER**

I am Kimotho Jane Njeri, a Postgraduate Diploma student at the University of Nairobi. I am undertaking an academic survey on the factors influencing choice of science subjects in Kenya's Secondary schools, a case study of Kirimunge Mixed Secondary school in Kirinyaga county. You have been randomly picked to participate in this survey. The information you offer will be treated with confidentiality. Also, the information will not be used for any other purpose other than this research.

Your assistance in facilitating this research will be highly appreciated.

Thank you for your co-operation.

## APPENDIX II: QUESTIONNAIRE

**Instruction:** Fill all questions by providing the information required by either ticking ( ) or explaining where necessary.

### STUDENT QUESTIONNAIRE

#### SECTION ONE : DEMOGRAPHIC DATA

1. What is your gender?      Male ( )      Female ( )
2. Age 14-18 years       Below 14 years       Above 18 years
3. What is your religion / denomination?
  1. Catholic
  2. Protestant
  3. Evangelical
  4. Islam
  5. Hindu
  6. Other (specify).....
4. Indicate your class
  - i. Form 2
  - ii. Form 3
  - iii. Form 4
5. Indicate the marks attained in the KCPE exams
  - i. 400 marks and above
  - ii. 350-400 marks
  - iii. 300-350 marks
  - iv. 250-300 marks
  - v. Below 250

**SECTION TWO: STUDENTS INFLUENCES ON SCIENCE SUBJECT**

1. Which science subjects are done in your school

- i. Biology
- ii. Chemistry
- iii. Physics
- iv. Others

specify.....

2. What is your attitude towards the science subjects?

Subject	Strongly negative	Fairly negative	Fairly positive	Strongly positive
Biology				
Chemistry				
Physics				

3. Have you developed a career path you desire to attain in life

Yes  No

4. Do you attach any value to career development in subject choice

Yes  No

5. Did your friends influence your subject choice?

Yes  No

6. Does your gender influence your choice of subject?

Yes  No



**SECTION THREE: SCHOOL ENVIRONMENT INFLUENCES**

1. Does your school offer all the three sciences?

Yes

No

If yes, what is the criteria for choosing the science subjects?

i. Students are free to choose

ii. Teachers choose for the students

iii. Following previous performance

2. Which science subject did you choose?

i. Biology

ii. Physics

iii. Chemistry

3. Does the school have a career guidance department?

Yes

No

If yes, were you guided by the career counselor before making subject choices?

Yes

No

4. Are there enough science facilities in your school?

Yes

No

**SECTION FOUR: INFLUENCE OF THE SUBJECT TEACHER**

Does the teacher influence your subject choice?

Yes

No

If yes explain your argument .....

**SECTION FIVE: ROLE OF THE PARENT**

Do parents influence your choice of science subjects?

Yes

No

**TEACHERS QUESTIONNAIRE**

**SECTION ONE: Demographic Data**

1. What is your gender? Male  Female

2. Indicate the science subject you teach

Chemistry

Biology

Physics

3. Indicate your level of education

Diploma

Degree

Masters

**SECTION TWO: STUDENT INFLUENCES**

1. How would you rate the students attitude towards science subjects

Subject	Poor	Satisfactory	Good	Excellent
Biology				
Physics				
Chemistry				

2. Are there values attached to subject choice in relation to career development by your students

Yes

No

If yes, explain .....

3. Does gender influence student's choice of science subjects?

Yes

No

If yes, explain .....

4. Indicate the ratio of girls to boys who choose these subjects

Biology

Chemistry

Physics

5. Was there peer influence in the way the students choose their subjects? Yes

No

**SECTION THREE: INFLUENCE OF SCHOOL ENVIRONMENT.**

1. Does the school offer all the three sciences for choice ie. Biology, Chemistry and Physics.

Yes

No

If not, what subjects are offered \_\_\_\_\_?

2. If your school offers all the three sciences, what is the policy in choosing?

i. Students are free to take all the three sciences

ii. Students are allowed to freely choose 2 sciences

iii. Biology is compulsory, choice is between Biology and Physics

iv. Chemistry is compulsory, choice is between Biology and Physics

3. Is there professional career guidance and counseling in your school?

Yes

No

4. Are students career guided before choosing their subjects?

Yes

No

5. Are the laboratories well equipped?

Yes

No

#### SECTION 4: TEACHER INFLUENCES

1. What is your subject combination? \_\_\_\_\_
2. Do you enjoy teaching your subject?  
Yes  No
3. Do teacher influence student's choice of science subjects?  
Yes  No