

**FACTORS INFLUENCING THE CHOICE OF SCIENCE SUBJECTS IN KENYA'S  
SECONDARY SCHOOLS: A CASE STUDY OF LANGATA HIGH SCHOOL IN  
NAIROBI COUNTY**

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### **STUDENTS' 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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### **SUPERVISOR'S DECLARATION**

This research project has been submitted for examination with our approval as university supervisors.

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## **DEDICATION**

I dedicate this research project to my family, for their understanding and support during my entire period of study.

May God bless you.

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## **ABSTRACT**

Students in Kenya's secondary schools have been often faced with the problem of indecision when they are about to choose the science subjects in their third form of the secondary school education. With good background, students still need to develop themselves on the subject areas they are keenly interested in and particularly that they have potentiality for. The overall aim of this research was to gain a deeper understanding of the factors influencing the choice of science subjects in Kenya's secondary education schools, a case study of Langata High school in Nairobi County. The study would be of great significance to the school management because it would help the management fraternity in understanding the factors affecting the choice of science subjects. The study adopted a descriptive survey design. The population for this study was all students in Lang'ata High School in Nairobi. Sample size of 11 teachers and 150 students was drawn from the teachers and the students from form two to four. Primary data was collected by use of a questionnaire. The study generated both qualitative and quantitative data. Quantitative data was coded and entered into Statistical Packages for Social Scientists (SPSS Version 17.0) and analyzed using descriptive statistics. Qualitative data was analyzed based on the content matter of the responses. The study found that that the school encouraged students to take up science subjects. Science subjects were competitive in the job market. Students had developed a career path that they strived to achieve/attain in life. The study revealed that the teacher influenced the subject choice. The study found that gender did not influence choice of subject. Teachers influenced choice of science subjects'. The study concludes that when students are allowed to choose which classes to enroll in increased motivation and independence which in turn increased a student's performance. Students had developed a career path that they strived to achieve/attain in life. A student's attitude about a teacher has a large

impact on their attitude toward a class. Different perceptions men and women have in regards to their ability and competency in those certain classes influenced choice of subject. School has a great role to play in influencing students' choice of science subjects. The study recommends students to have good attitude towards science subjects. They need to consider their interests, personal academic goals while choosing subjects. Competent and qualified teachers should teach science subjects. Science teachers should strive to be enthusiastic, well spoken, knowledgeable, caring, and helpful. Gender differences should be discouraged amongst students. Women should be encouraged to change their perceptions in regards to their ability and competency. Parents need to help students when making their study choices. The school should support subjects and careers decision making.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the Study

Science is recognized widely as being of great importance internationally both for economic well-being of nations and because of the need for scientifically literate citizens (Fraser and Walberg, 1995). Knowledge of science and technology is therefore a requirement in all countries and all people globally due to the many challenges that are facing them. These challenges include emergences of new drug resistant diseases, effects of genetic experimentation and engineering, ecological impact of modern technology, dangers of nuclear war and explosions and global warming among others (Alsop & Hicks, 2001). As a result there are rapid changes taking place in industry, communication, agriculture, and medicine. Science as an instrument of development plays a dominant role in bringing about these changes by advancing technological development, promoting national wealth, improving health and industrialization (Validya, 2003). Weham, Dorlin, Snell and Taylor (1984) emphasized that sciences are and will remain the fundamental subjects through the ages.

Statistics on international trends in science subjects selection in 46 countries shows that in the US, among fourth graders in 2007, males continued to prefer science subjects to females in where males scored significantly higher overall than females in science (Mullis, Martin and Foy, 2008). The 1986 National Assessment of Educational Progress (NAEP) carried out in the United States earlier had reported that boys had outperformed girls in sciences achievement and the gender gap increased as students progressed in school. A later assessment by NAEP in 2005 revealed that males preferred sciences subjects to females in grades 4, 8 and 12. Females at all

levels made relatively little gains in their average science scores since 1996. In most cases by grade 11, the areas of largest male advantage were physics, chemistry, earth science and space science (Kahle and Meece, 1994). In the final year of secondary school, males had a significantly higher achievement in scientific literacy than females in all participating countries (European Union Report, 2009).

In Kenya, in the third year of studies (form 3), students choose to study at least two science subjects from biology, physics and chemistry and are assessed at the end of the fourth year. The choice of which science subject to study in third and fourth forms has been an issue to many of students; an issue that have since received varied interpretation among the students themselves and the various stakeholders in the education fraternity. Studies have revealed that most students will prefer chemistry and biology when allowed to choose science subjects (Waititu, 2004). Moreover, female student have been noted to shy away from physics and chemistry citing the reason being the tedious mathematical calculations involved in such subjects (Murithi, 1996)

Implementing Vision 2030 will require more knowledge based skills. This calls for more training in science and technological related courses. If secondary school graduates are not realizing the required grades in order to enroll in such courses, the vision remains just a mirage. There must therefore be concerted effort among all stakeholders to address the problem of deplorable choice and performance in science subjects.

## **1.2 Statement of the Problem**

Students in Kenya's secondary schools have been often faced with the problem of indecision when they are about to choose the science subjects in their third form of the secondary school

education. This problem has plagued many Kenya's secondary school students for quite sometimes. It is such a problem that must be looked into, knowing fully well that the place of sciences in secondary education cannot be over emphasized in the educational development of a nation. With good background, students still need to develop themselves on the subject areas they are keenly interested in and particularly that they have potentiality for. Many students have been found choosing subjects for KenyaCertificate Secondary Examination without considering the aspect of their potentiality and the directive of the school counselor where available.

In Kenya, secondary school ends with the Kenya Certificate of Secondary Education (KCSE) examination. Students are expected to take two science subjects drawn from the cluster of Chemistry, Biology and Physics. However, most schools treat Biology and Chemistry as compulsory science subjects which must be taken by all the candidates. It is very important for students to be proficient in these subjects because they play an important role in career choices and professional development.

Dismal performance in the sciences limits individuals opportunities in competitive professional courses that are science oriented. Furthermore, Kenya's vision 2030 initiative aims at making the country a newly industrializing middle income country providing high quality life for all its citizens. The realization of this vision calls for the harnessing of the science ability of both men and women in the country so that they can contribute to nation building. However, this vision is not about to be realized for as long as students continue to underachieve in subjects that determine their placement in science oriented fields which are expected to spur industrialization. It is against this background that this study seeks to establish the factors that influence the choice of science subjects in Kenya's Secondary Schools.

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

The overall aim of this research was to gain a deeper understanding of the factors influencing the choice of science subjects in Kenya's secondary education schools, a case study of Langata High school in Nairobi County. The researcher sought to analyze the effects of perception of the value of the science subjects on students choices of subjects in Langata high school, The research's findings were achieved by assessing a number of indicators deemed best for the study and also more importantly through the following specific research objectives;

### **1.4 Specific Objectives of the Study.**

The study was guided by the following specific objectives:

- i) To determine the effects of the value of the science subject on students' choices of the subject in Langata high school
- ii) To find out the influence of the subject teacher on students' choices of science subjects in Langata high school
- iii) To find out the influence of gender differences on students' choices of science subjects in Langata high school.
- iv. To investigate the role of parents and teachers in students' choices of science subjects in Langata high school

### **1.5 Research Questions**

The study was guided with the following Research Questions:

- i. What are the effects of the value of the science subject on students' choice of science subject in Langata High School?

- ii. How does the subject teacher influence students' choices of science subjects in Langata High School?
- iii. How does gender difference influence affect students' choices of science subjects in Langata High School?
- iv. What is the role of parents and teachers in students' choices of science subjects in Langata high school?

### **1.6 Significance Of the Study**

The study would be of great significance to the school management because it would help the management fraternity in understanding the factors affecting the choice of science subjects and be able to initiate appropriate measures to improve on students' performance in science subjects

The relevant government ministries would also benefit from the study findings and be able to come up with policy issues touching on subject choice and later career choice at higher levels of education in Kenya.

The study would add to the wide academic knowledge in the area of education which can be used by other researchers as reference in future. Researchers and research institutes may use the study to come up with other research studies.

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

The study investigated the factors that influence the choice of science subjects in Kenya's Secondary Schools. Specifically the study sought to investigate the factors that influence the choice of science subjects in Lang'ata High School.

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

The study faced various shortcomings that may affect effective research undertaking. Respondents may be suspicious and fail to answer the questionnaire. The researcher intended to overcome this by adopting objectivity approach (by asking general questions on the issues pertaining to science subject selection) to the staff. Simple questions with answers to choose from will be used.

The research study focused on four variables that were addressed by specific objectives; this may deny an opportunity to explore further on other factors that influence the choice of science subjects in Kenya's Secondary Schools.

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

The assumptions of this study included the following: that the sample chosen respondents represent the population; the data collection instrument to be used has validity and is measuring the desired constructs.

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

**Science subjects:** These involves subjects which are core to the examination board in Kenya secondary Education and they includes such subjects as Biology, chemistry, physics and others, for the purpose of this study the focus was on the factors influencing students choice on selecting them.

**Choice:** Refers to the students' preference over one science subject as compared to the other science subjects the study focused on identifying the critical factors that influenced students' choice on the subjects. The choice of subject can either be to great extent or to low extent.

**Secondary schools:** This is an education level in Kenya that precedes primary education in the



Kenya's curriculum system which follows 8.4.4 systems where students sit for the KCSE to signify transition to the next level after four years.

**KCSE:** Refers to the Kenya Certificate Of Secondary Education. This is the summative evaluation exam given to the students at the end of form four.

**Performance:** The outcome or result of an exam which can be good or poor.

**Value of science subject:** Content and relevance of the subject as related to career aspirations.

**Teacher influence:** The way a teacher make students choose a subject or not choose it.

**Gender influence:** Perception of male or female while choosing subjects

**Role of teacher in subject selection:** what is required/the responsibility of the teachers when students are choosing subjects.

**Role of parent in subject selection:** what is required/the responsibility of the parents when students are choosing subjects.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

The chapter gives detailed information on effects of perception of the value of the science subjects on students' choices of subjects. It looks at the value of the science subject, influence of the subject teacher, influence of gender differences and role of parents and teachers on students' choices of science subjects. At the end of the chapter, there is a conceptual framework by the researcher of the various variables used in the research and an explanation of their interrelation.

### **2.2 Factors Influencing Students' Choice of Science Subjects**

Students look forward to the opportunity to choose their academic plans and classes (Smith, Feldwisch and bell, (2006). According to the enhanced cognitive engagement theory, allowing students to choose which classes they enroll in increases motivation and independence which in turn increases a student's cognitive processing and performance (Flowerday and Schraw, (2003). However, the task of subjects is very complex with multiple considerations, most of which overlap with one another. Students are influenced by the different academic portions of the class such as the value of the content, the structure, and the workload. They also have to decide what is important to them with regards to their interests, personal academic goals, and their schedule. But students do not make these decisions alone because they do occasionally seek advice from their family, faculty, and/or friends.

Not all of the different considerations of a course are as influential as others, but it is important to know what students want from their classes, what they expect of themselves, and who they will listen to. Educators and schools need to know this information; especially those of elective courses so they can meet the needs of students and have them continue to enroll in their class.

More importantly though, if teachers can adapt their classes to better meet the needs of students the students will be more engaged which will increase their comprehension and excitement for the curriculum, which should be any teacher's ultimate goal (Flowerday &Schraw, (2003):. 214). From the Kenya National Examinations Council KCSE Report (2008), Journal of Research in Education and Society; Volume 4, April 2012, 15 percentage candidatures for physics for the years 2009, 2010, and 2011 were 30.41%, 26.69% and 26.78% respectively. The other science subjects had figure above 90%.In the same year physics was better performed than biology and chemistry. This showed that although students have the ability to score high grades in physics, other factors were hindering them. It may be that the attitude that students develop towards a subject is dependent on their experiences in school. Furthermore, Waititu (2004) indicates that although the link between performance and attitude is not very strong, what is very clear is the strong relationship between attitude and the choice of a subject of study. A key property of physics is that there are many mathematical concepts and processes.

The mathematical calculations in physics may make the subject a preserve of very few learners. The high number of these concepts and processes do provide a background or have a high utilitarian value in understanding scientific programs especially in physics. In this case, calculations are very important in expressing physics content (Bassey, (2003). In contrast, Murithi (1996) states that physics is taught to selected students who have knowledge of its mathematical concepts and symbols.

This reveals that while some scholars value the contribution that mathematics has on the science content, others view the interdependence as an obstacle to excellence in these science subjects. Contributing on the issue, Knecht (1965) says that sciences and mathematics are closely linked

that their teachings overlap. The requirement of mathematical knowledge thus could be blocking some students from venturing into chemistry and Physics. Wadsworth (1998) puts it that underachievers who fail in mathematics remain passive and are often blocked out of sciences such as physics and chemistry since the mathematical principals and applications lower their morale in pursuing their agenda.

Statistics from the Imenti South District results reports revealed that in the years 2006, 2007 and 2008, the highest candidature registered for physics in the district was 23.31% in 2007. This represents low candidature registration for the subject and predicts negative attitude towards physics. Kungania (2006) conducted an investigation on the factors influencing attitude of diploma teacher trainees towards science and mathematics in Kenya. The research findings revealed that students have a positive attitude towards physics, perceive the physics' teachers as competent and they perceive the physics laboratories as well equipped. Further, Waititu (2004) explored students' perception of difficulty in topic areas of the Kenya secondary school science syllabus. The research findings revealed that about half of the students found biology very interesting or interesting, and about a quarter found it boring or very boring. In contrast, only about a quarter of the students thought that physics was very interesting or interesting and about half thought it boring or very boring. There was no significant difference in the responses of the males and females to the closed-form item about biology, whereas statistically significantly fewer females than males thought that physics was interesting. Thus, the results to this section of the questionnaire support the contention that students find physics less interesting than a comparator science subject, biology, and that fewer girls than boys find physics interesting. Therefore from the perspective of the various thinkers as mentioned above its

undisputable that series of factors interplay in the students mind for the right choice of the science lessons, a myriad of factors are deemed to influence students choice of the subjects of their interest.

### **2.2.1 Perception Of the Value of the Subject**

Students' attitudes towards science subjects affect their choice of the subjects. Generally, a negative attitude towards a given subject leads to lack of interest and when subjects 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 lifelong interest and learning of science. This is the reason why major science education reform efforts in Africa have emphasized the improvement of students' attitudes towards science subjects.

The quality of a subject can have a tremendous effect on whether a student chooses to enroll in a class because it covers a wide variety of factors. Quality of a subject means that the laboratories for this subject are well equipped and the subject is taught by qualified teachers. A subject can be interesting to a student but the class needs to be well executed for the content to actually be understood and beneficial. Research has found that the majority of students will choose classes based on its high quality of learning rather than the deciding based on the instructor and/or the ease of the class (Babad Tayeb,( 2003) and Wilhelm, (2004). In fact, according to Wilhelm (2004), students are four times more likely to choose a class where they have the opportunity to learn a "great deal" of knowledge even if the class requires a lot of readings and assignments. Students want to know how they will be assessed throughout a class and if aspects like effort and improvement will play a role in that assessment (Ferrer-Caja Weiss, (2002). Therefore, classes

with set expectations and the ability to actually meet those expectations are very likely to positively influence a student's choice in enrolling in a course (Curran Rosen, 2006).

The knowledge a student gains in a class can be beneficial and desired by a student because they simply want to gain knowledge; however, students may also prefer quality of education because of the relevancy and perceived value it can have on their life once they graduate, including their search for employment. According to Nagy, Trautwein, Baumert, Koller, and Garrett (2006), high school students are likely to enroll in subjects that will pertain to what they want to study in college. Students in secondary schools are then greatly influenced by the potential for career opportunities and advancement; therefore, the more valuable a subject is to a future career, the greater the likelihood a student will enroll in it (Ackerman Gross, 2006). Students' enrollment of subjects based on its relevancy to their future career aspirations becomes even more predominate as the students get closer to graduation and they begin to search for jobs (Wilhelm, (2004).

Research findings have shown that the pattern of students' interaction inside and outside the classroom has significant effects on their interest and achievement in science (Fraser et al. 1999). In terms of the classroom, the individual child is motivated not only by his basic needs and drives, but also by the stimulation provided by his peer group.

Every student has their own perception of the values attached to the specific subjects that they would wish to undertake, a series of factors play an important role on the value associated with the subject lesson these can include the suitability in the job market, career choice etc.

### **2.2.2 The Influence of The Subject Teacher on Students' Choices of Science Subjects**

Although research has indicated that students have a larger preference for the knowledge that they can receive from a class rather than the instructor, it is the instructor who has a significant impact on how useful the subject can be (Wilhelm, 2004). Also, the preference of an instructor's lecturing style is very close to being as important as the quality of the value of the content (Babad and Taybe, 2003). A student's attitude about an instructor has a large impact on their attitude toward a class (Curran and Rosen, 2006). Students prefer subjects that are taught by teachers who are enthusiastic, well spoken, knowledgeable, caring, and helpful as opposed to instructors who are dry, inflexible, and unclear (Curran and Rosen, 2003). If instructors are inflexible and unclear, they are much more likely to be difficult to learn from, which is a major concern for students (Smith et al., 2006). If students are concerned about a teacher they are less likely to enrol in that class, and vice versa, according to the research done by Wilhelm (2004: 23).

Subject teachers play a crucial role in taming students choices over the science subject to go for some teachers are perceived by the students to be good teachers they teacher and this will influence students into his class while students perceive other teachers not to be the right teachers for such subjects this will reduce the rate of the subject by the students.

### **2.2.3 The influence of Gender-difference on Students' Choices of Science Subjects in Secondary Schools**

The gender of a student can often affect their enrollment in a class. Men and women can have different values, and there are also certain standards or expectations that vary between genders.

Gender differences are especially apparent in high school aged students. Females are less likely to enroll in science and math classes compared to men, but more likely to enroll in English classes (Tenenbaum, 2008). One reason for this could be the different perceptions men and women have in regards to their ability and competency in those certain classes because students are more likely to enroll in classes where they think they can excel (Nagy et al., 2006).

According to Riegle-Crumb et al (2006), females often score better in science despite the fact that men often think they are better in that subject. This could be explained because females often expect more from their education than men do and therefore put forth more effort and have high levels of school engagement (Grebennikon Skaines, 2009). But despite the scores indicating that girls are capable, the gender gap still exists in classes like science and math. A main reason for this could be that, according to Tenenbaum,( 2008), parents use double the amount of discouraging comments towards daughters than they do sons when it comes to the subjects their children take, which only enforces the stereotypes that already exist about gender differences leading females to feel less secure in certain subjects and opting to take other classes.

However, as students go from high school to college, they often become more alike in the choices they make in regards to what they study (Malgwi et al., 2005). Interest in the subject is still one of the main factors of enrollment regardless of gender (Malgiw et al, 2005). However, females find more importance in a subject that has clear assessment requirements, provides constructive feedback, and has a fair amount of work throughout the study period (Grebennikon and Skaines, (2009)



But despite some differences, research has indicated that the gender gap is closing between college males and females' perception of their abilities. Zhao, Carini, and Kuh (2005) have found that women in science, math, engineering and technology classes (SMET) are becoming either equal to or more satisfied with their college experience than males which leads to their greater academic success and the continuous closing of the gender gap in certain course enrollment.

A national indicator in Kenya of implicit gender-science stereotyping was related to a nation's sex differences in science achievement and by extension, to other markers of diverse scientific leadership (Nosek, et al, 2006). Research thus attributes low enrolment of girls in science to lower parental expectations and encouragement. Girls are socialized into characteristics of dependence, nurturance and passivity. They therefore develop a set of attitudes and beliefs that do not promote high levels of achievement and participation in science. Studies have found that females have more negative attitude towards math and science (Wasanga, 1997). According to Wasanga (1997), the majority of girls found science subjects difficult and they perceived science subjects to be more useful to boys. Aghenta, (1989) found that perceived difficulties of science occupations was a significant factor preventing girls from entering Science, Technology and Mathematics (STM) fields. The attitude that one holds towards science appears to be a powerful predictor of achievement in the respective field. A poor attitude to STM was a barrier to access of STM related fields but conversely, a good or positive attitude was one of the several factors that facilitated performance in STM. Achievement differences are also influenced by single sex versus mixed sex schools.

According to Whitelaw et al. (2000), sex is probably the most important variable related to pupils' attitudes to science. Many studies for instance, Francis and Greer (1999), Jones et al. (2000), reported that males have more positive attitudes toward science than females. Also, Osborne et al. (2003) stressed that there is still a bias against

physical sciences held by girls, suggesting that at an individual level the overwhelming majority of girls still choose not to do physical science as soon as they can. In the same vein, Aigbomian (2002) observed that boys perform better than girls in science, technical and mathematical subjects. It is generally believed that socio-cultural and religious practices are at the root of this imbalance.

Gender difference differentiates the girls' subject choice from boys. Girls tend to generally like other subjects and hate other science subjects; there is also a variation between science subjects for boys compared to the subject choice for the ladies.

#### **2.2.4 Role of Parents and Teachers in Students' Choices of Science Subjects in Secondary Schools**

Career advice by parents and teachers can influence students' choice of science subjects especially in Africa. In a related investigation Okeke (2000) revealed that parents have significant effect on students' 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 sciences 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 students' choice of science subjects particularly in Africa. The school should support subjects and careers 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 subjects they want to study. This will help to influence their choice of the subject.

According to (Malgwi et al., (2005)), Parents are more likely to influence students' decisions than guidance counselors or teachers. Students are likely to enroll in more classes if they talk with their parents first, which implies that parents do have an effect on their child's decisions (Tenenbaum, 2008). Parents look forward to their children having new teachers and classes with the end result of them getting good grades (Smith et al., 2006). Therefore, parents will encourage their students to take a variety of classes where they think they can excel. Tenenbaum (2008) further argued that fathers are more likely to discourage their children from taking certain difficult classes, especially with daughters.

Teachers in the schools are supposed to provide assistance and guidance to their students on subject, but research indicates that teachers are not as influential as family or peers in a student's choice of courses (Malgwi et al., 2005). Consequently, teachers do have more influence over a student's decision than guidance counselors (Malgwi et al, 2005). Either way, teachers and guidance counselors are not likely to discourage students from enrolling in classes, but to encourage the enrollment in certain classes (Anderson et al., 2008).

### **2.3 Summary and Gaps**

Every school institution wants to be successful and have desire to get constant progress in students' performance. The current era is highly competitive and learning institutions are not spared as the enrolment of form four graduates into higher institutions of learning and the pursuant of courses thereof depend on their subject combinations from secondary schools. To overcome the problem of selection of science subjects, there is a need to do an analysis of the root causes of disparity in the subject choice among the learners in secondary schools a gap that many writers have not since explored adequately.

Unless and until, the problem of science subjects choice is unearthed and the students are motivated and made to understand the vital role the science subjects play in their future career development, there will be in competition in the technological advancement across the world whose major drive is science. It is in this light that the researcher aimed to fill this gap by carrying out a research on the factors that influence the choice of science subjects in Kenya's Secondary Schools.

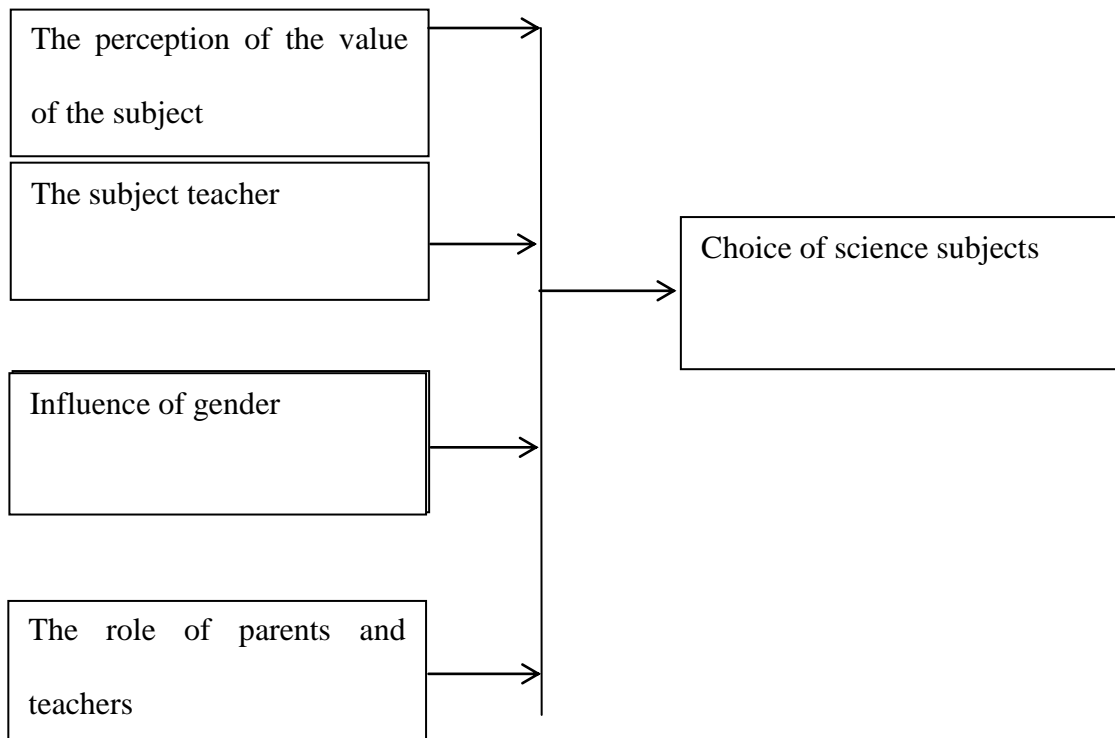
#### **2.4 Conceptual Framework**

A conceptual is defined as an element of the scientific research process in which a specific concept is defined as a measurable occurrence or in measurable terms that basically gives a clear meaning of the concept. Conceptual framework is a diagrammatic presentation of the relationship between dependent and independent variables. In this study, the dependent variable is the choice of science subjects while independent variables are: the perception of the value of the subject, the subject teacher, students' interests, influence of gender, and the role of parents and teachers.

**Figure 1.1** Perceived factors that influence the choice of science subjects by students in secondary schools.

**Independent Variables**

**Dependent Variables**



**Source: Author, 2013**

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter presents the methodology, which was used to carry out the study. It further describes the type and source of data, the target population and sampling methods and the techniques that were used to select the sample size. It also describes how data was collected and analyzed.

### **3.2 Research Design**

The study adopted a descriptive survey design. Descriptive research is concerned with conditions or relationships that exist, practices that prevail, processes that are going on, attitudes that are held or trends that are developing (Best, 1970). The design facilitated the collection of information on the current disparities on choice of science subjects. It yields information which is analyzed using descriptive and inferential statistics. The design also permitted an assessment of the factors influencing achievement in the two science subjects.

### **3.3 Target Population**

A population is a well-defined or set of people, services, elements, and events, group of things or households that are being investigated. This definition ensures that population of interest is homogeneous. Population studies are more representative because everyone has equal chance to be included in the final sample that is drawn. The population for this study was all students in Lang'ata High School in Nairobi.

Target population is the specific population about which information is desired. The target population of interest in this study consists of students in form two, three and four as they are the

one who make choices for the subjects to be taken from form three onwards. The target populations from which the respondents were drawn from include 36 teachers and 500 students from form two to four.

### 3.4 Sampling Design and Procedure

The sampling plan describes how the sampling unit, sampling frame, sampling procedures and the sample size for the study. The sampling frame describes the list of all population units from which the sample are selected. Sample size of 11 teachers and 150 students was drawn from the teachers and the students from form two to four.

From the above population of 536 possible respondents, a sample of 30% will be considered (from each group) using stratified random sampling technique which gives each item in the population an equal probability chance of being selected. According to Gay (2001) a sample of 10 - 30% is representative to a given population. From the table 3.1, 10 teachers, 58 form two students, 53 form three students and 39 form four students were selected to form the sample size. This generated 161 sample respondents of this study. The selection was as follows.

**Table 3. 1: Target population and the sample size**

	<b>Target Population</b>	<b>Ratio</b>	<b>Sample Size</b>
Teachers	36	0.3	10
Form two students	195	0.3	58
Form three students	176	0.3	53
Form four students	129	0.3	39
<b>Total</b>	<b>536</b>	<b>0.3</b>	<b>160</b>

**Source: Author (2013)**

### **3.5 Data Collection Technique**

The study used primary data. Primary data was collected by use of a questionnaire. Questionnaires are appropriate for studies since they collect information that is not directly observable as they inquire about feelings, motivations, attitudes, accomplishments as well as experiences of individuals. The questionnaire comprised of both open and close-ended questions.

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

The study generated both qualitative and quantitative data. Quantitative data was coded and entered into Statistical Packages for Social Scientists (SPSS Version 17.0) and analyzed using descriptive statistics. Qualitative data was analyzed based on the content matter of the responses. Responses with common themes or patterns were grouped together into coherent categories. Descriptive statistics involves the use of absolute and relative (percentages) frequencies, measures of central tendency and dispersion (mean and standard deviation respectively). Quantitative data was presented in tables and graphs while the explanation to the same was presented in prose.



## **CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION**

### **4.0 Introduction**

This chapter presents analysis and findings of the study as set out in the research methodology. The study findings are presented on factors influencing the choice of science subjects in Kenya's secondary education schools, a case study of Langata High school in Nairobi County. The data was gathered exclusively from the questionnaire as the research instruments. The questionnaires were designed in line with the objectives of the study.

### **4.1 Response Rate**

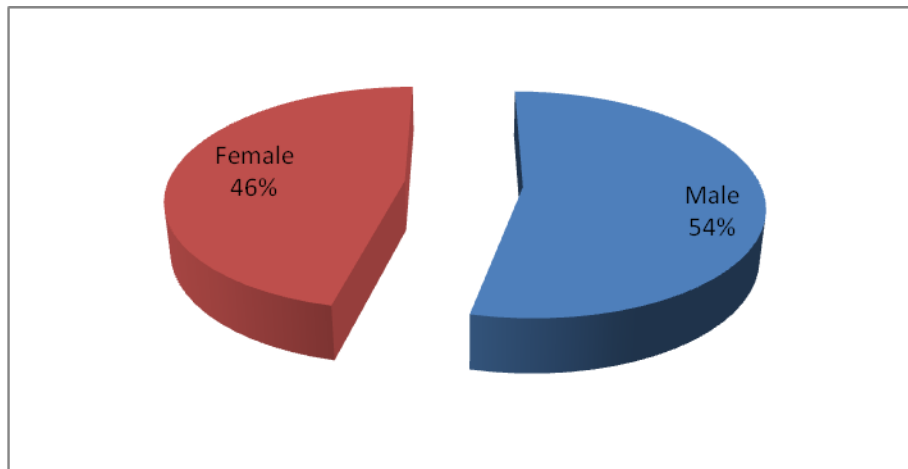
The study targeted 11 teachers, 57 form two students, 53 form three students' and 39 form four students in collecting data with regard to the management and access of mobile schools in Tana River County. From the study, 11 teachers, 57 form two students, 53 form three students' and 39 form four students sample respondents filled-in and returned the questionnaires making a response rate 100%. According to Mugenda and Mugenda (1999) a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent; therefore, this response rate is adequate for analysis and reporting.

## 4.2. Background Characteristics of Students

### 4.2.1 Distribution of Respondents by Gender

The respondents who were interviewed consisted of 46% females and 54%. These results are shown in the figure 4:1 below.

**Figure 4.1: Distribution of Respondents by Religion.**



### 4.2.2 Distribution of Respondents by Age

The respondents who were interviewed according to the findings, 89.40% of the respondents were aged 14-18 years, 7.95% of the respondents were aged above 18 years and 2.65% of the respondents were aged below 14 years.

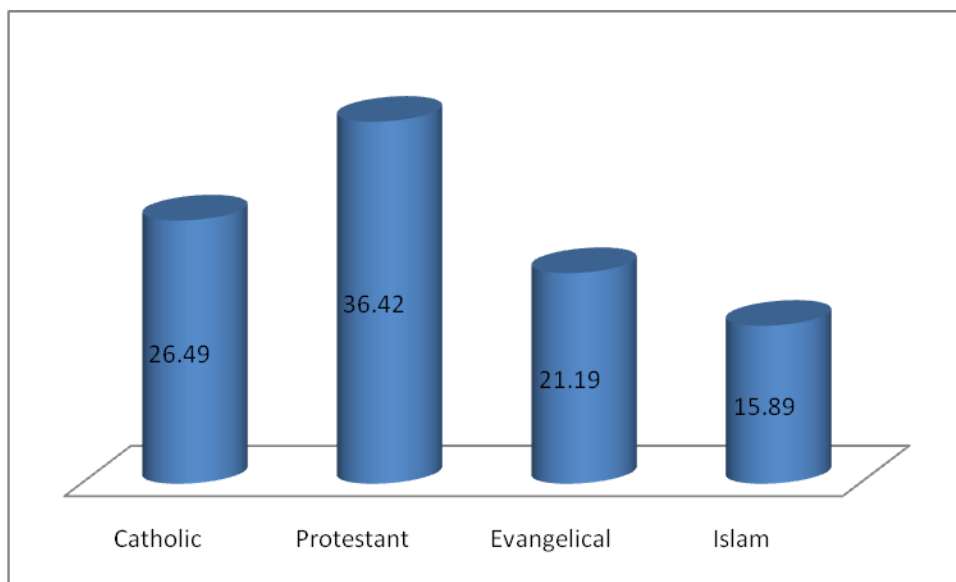
**Table 4.1: Distribution of Respondents by Age**

	Frequency	Percentage
14-18 years	135	89.40
Below 14 years	4	2.65
Above 18 years	12	7.95
<b>Total</b>	<b>151</b>	<b>100.00</b>

### 4.2.3 Distribution of Respondents by Religion

The respondents who were interviewed from the findings, 36.42% were Protestants, 26.49% were Catholics, 21.19% were evangelists and 15.89% were Islam's. This implies that the school admitted students without considering denomination.

**Figure 4.2: Distribution of Respondents by Religion**



### 4.2.4 Respondents by Class

The study sought to find out class of the students. According to the findings, 38.41% of the students were in form two, 35.10% of the students were in form three and 26.49% of the students were in form four.

**Table 4.2: Respondents by Class**

	<b>Frequency</b>	<b>Percentage</b>
Form two	58	38.41
Form three	53	35.10
Form four	40	26.49
<b>Total</b>	<b>151</b>	<b>100.00</b>

#### **4.2.5 Marks attained in the KCPE exams**

The study sought to find out the marks attained in the KCPE exams. From the findings, 83.44% of the students had 250-300 marks in the KCPE exams, 10.60% of the students had below 250 in the KCPE exams, 5.30% of the students had 300-350 marks in the KCPE exams, 0.66% of the students had 350-400 marks in the KCPE exams. This implies that the students were average performers.

**Table 4.3: Marks attained in the KCPE exams**

	<b>Frequency</b>	<b>Percentage</b>
350-400 Marks	1	0.66
300-350 Marks	8	5.30
250-300 Marks	126	83.44
Below 250	16	10.60
<b>Total</b>	<b>151</b>	<b>100.00</b>

#### **4.2.6 Science subject the teachers teach**

The study sought to find out the science subject the teachers teach. According to the findings, 45.45% of the teachers taught biology, 36.36% of the teachers taught chemistry and 18.18% of the teachers taught physics.

**Table 4.4: Science subject the teachers teach**

	<b>Frequency</b>	<b>Percentage</b>
Chemistry	4	36.36
Physics	2	18.18
Biology	5	45.45
<b>Total</b>	<b>11</b>	<b>100.00</b>

#### **4.2.7 Teachers' level of education**

The study sought to find out the teachers' level of education. From the findings, 63.64% of the teachers had a Degree, 18.18% of the teachers had a Diploma and 18.18% of the teachers had a Masters.

**Table 4.5: Teachers' level of education**

	<b>Frequency</b>	<b>Percentage</b>
Diploma	2	18.18
Degree	7	63.64
Masters	2	18.18
<b>Total</b>	<b>11</b>	<b>100.00</b>

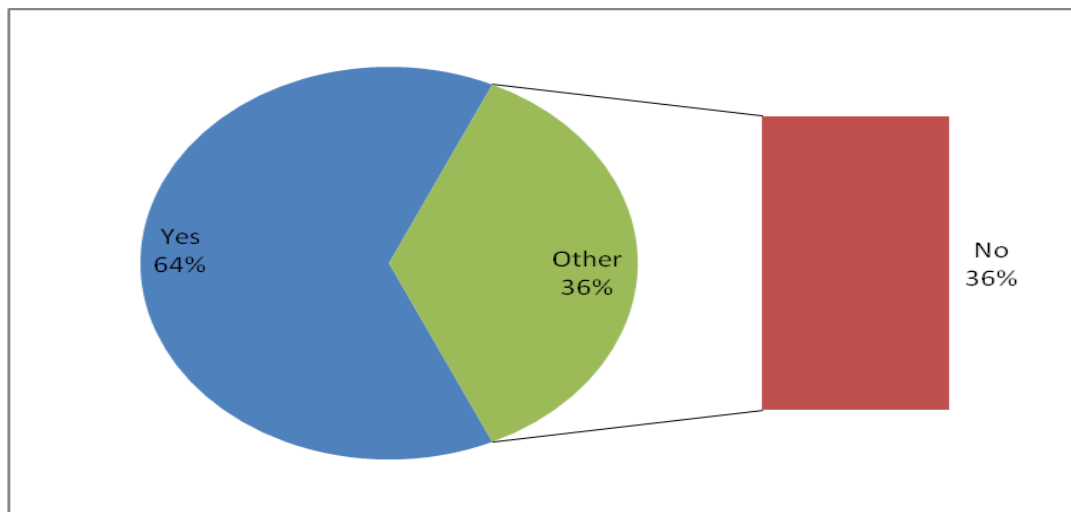
#### **4.3 Respondent's Perception on Science Subject**

Students' attitudes towards science subjects affect their choice of the subjects. Generally, a negative attitude towards a given subject leads to lack of interest and when subjects are to be selected, as in secondary schools, it leads to avoiding the subject.

The study sought to find out if the school encouraged students to take up science subjects. From the findings, 64% of the teachers indicated that the school encouraged students to take up science

subjects while 36% of the teachers indicated that the school did not encourage students to take up science subjects.

**Figure 4.3: Responsibility of the school on the choice of the science subject**



#### 4.3.1 The science subjects done in the School

The study sought to find out if the three science subjects were done in the school. According to the findings, all the students indicated that the three science subjects were done in the school.

**Table 4.6: The science subjects done in the School**

	Frequency	Percentage
Yes	151	100.00
<b>Total</b>	<b>151</b>	<b>100</b>

### 4.3.2 Students' attitude towards the science subjects as rated by students

It was important to rate the students' attitude towards the science subjects as rated by students. A 4-point Likert scale was used. 1-1.49 represented strongly negative, 1.5-2.49 represented fairly negative, 2.50-3.49 represented fairly positive and 3.50-4.0 represented strongly positive. From the findings, students' attitude towards biology was fairly positive as shown by a mean of 3.325. In addition, students' attitude towards chemistry was fairly negative as shown by a mean of 2.461. More over, students' attitude towards physics was strongly negative as shown by a mean of 1.347. Knecht (1965) says that sciences and mathematics are closely linked that their teachings overlap. The requirement of mathematical knowledge thus could be blocking some students from venturing into chemistry and Physics. Waititu (2004) revealed that about half of the students found biology very interesting or interesting, and about a quarter found it boring or very boring.

**Table 4.7: Students' attitude towards the science subjects as rated by students**

<b>Subject</b>	<b>Mean</b>	<b>Stdev</b>
Biology	3.325	0.104
Physics	1.347	0.291
Chemistry	2.461	0.173

### 4.3.2 Students' attitude towards the science subjects as rated by teachers

The study sought to find out the students' attitude towards the science subjects as rated by teachers. A 4-point likert scale was used. 1-1.49 represented strongly negative, 1.5-2.49 represented fairly negative, 2.50-3.49 represented fairly positive and 3.50-4.0 represented strongly positive. From the findings, students' attitude towards biology was fairly positive as

shown by a mean of 3.278. In addition, students' attitude towards chemistry was fairly negative as shown by a mean of 2.214. More over, students' attitude towards physics was strongly negative as shown by a mean of 1.201. The mathematical calculations in physics may make the subject a preserve of very few learners. The high number of these concepts and processes do provide a background or have a high utilitarian value in understanding scientific programs especially in physics. In this case, calculations are very important in expressing physics content (Bassey, (2003).

**Table 4.8: Students' attitude towards the science subjects as rated by teachers**

<b>Subject</b>	<b>Mean</b>	<b>Stdev</b>
Biology	3.278	0.381
Physics	1.201	0.471
Chemistry	2.214	0.835

#### **4.4 Value of the Science Subject**

Allowing students to choose which classes they enroll in increases motivation and independence which in turn increases a student's cognitive processing and performance.

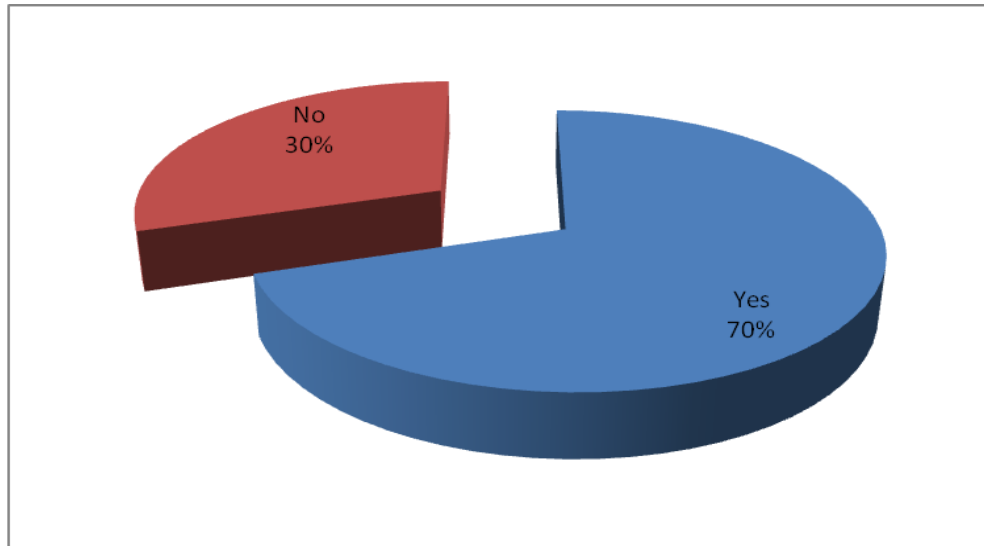
##### **4.4.1 Values attached to subject choice in relation to career development**

The study sought to find out whether there were values attached to subject choice in relation to career development. According to the findings, 70% of the students indicated that there were values attached to subject choice in relation to career development while 30% of the students indicated that there were no values attached to subject choice in relation to career development.



According to Wilhelm (2004), students are four times more likely to choose a class where they have the opportunity to learn a "great deal" of knowledge even if the class requires a lot of readings and assignments.

**Figure 4.4: Values attached to subject choice in relation to career development**



#### **4.4.2 Competitiveness of sciences in the job market**

The study sought to find out if science subjects were competitive in the job market. From the findings, 75.50% of the students indicated that science subjects were competitive in the job market while 24.50% of the students indicated that science subjects were not competitive in the job market. Students' enrollment of subjects based on its relevancy to their future career aspirations becomes even more predominate as the students get closer to graduation and they begin to search for jobs (Wilhelm, (2004).

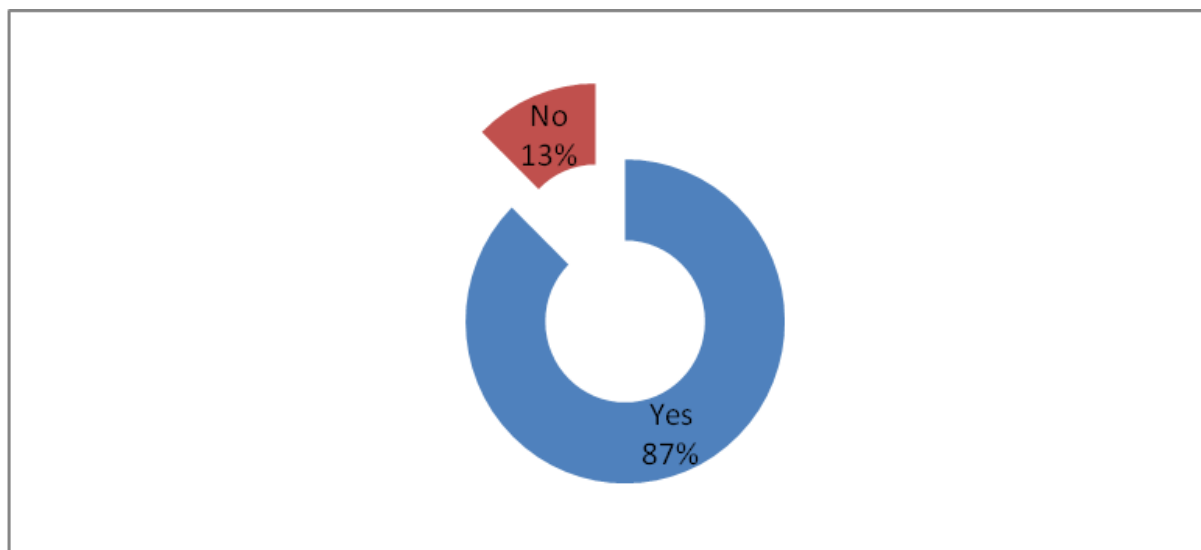
**Table 4.9: Competitiveness of sciences in the job market**

	<b>Frequency</b>	<b>Percentage</b>
Yes	114	75.50
No	37	24.50
<b>Total</b>	<b>151</b>	<b>100.00</b>

#### **4.4.3 Students Career Path that they Strive to Achieve/Attain in Life**

The study sought to find out if the students had developed a career path that they strived to achieve/attain in life. According to the findings, 87% of the students indicated that they had developed a career path that they strived to achieve/attain in life while 13% of the students indicated that they had not developed a career path that they strived to achieve/attain in life. According to Nagy, Trautwein, Baumert, Koller, and Garrett (2006), high school students are likely to enroll in subjects that will pertain to what they want to study in college.

**Figure 4.5: students career path that they strive to achieve/attain in life**



#### 4.4.3 Career choice of the students

The study sought to find out the career choice of the students. From the findings, 27.15% of the students indicated that their career path was lawyer, 25.83% of the students indicated that their career path was accountant/banker, 21.19% of the students indicated that their career path was doctor/physician/dentist, 17.22% of the students indicated that their career path was engineering, 5.30% of the students indicated that their career path was social scientist and 3.31% of the students indicated that their career path was teaching.

**Table 4.10: Career choice of the students**

	<b>Frequency</b>	<b>Percentage</b>
Doctor/physician/Dentist	32	21.19
Accountant/Banker	39	25.83
Social scientist	8	5.30
Lawyer	41	27.15
Teaching	5	3.31
Engineering	26	17.22
<b>Total</b>	<b>151</b>	<b>100.00</b>

#### 4.4.4 Availability of science facilities in the school

The study sought to find out if there were enough science facilities in the school. According to the findings, 79.47% of the students indicated that there were enough science facilities in the school and 20.53% of the students indicated that there were no enough science facilities in the school. The facilities in the school were biology, chemistry and physics lab which were partially equipped. The teachers were qualified and competent. Research has found that the majority of students will choose classes based on its high quality of learning rather than the deciding based on the instructor and/or the ease of the class (Babad Tayeb,( 2003) and Wilhelm, (2004).

**Table 4.11: Availability of science facilities in the school**

	<b>Frequency</b>	<b>Percentage</b>
Yes	120	79.47
No	31	20.53
<b>Total</b>	<b>151</b>	<b>100.00</b>

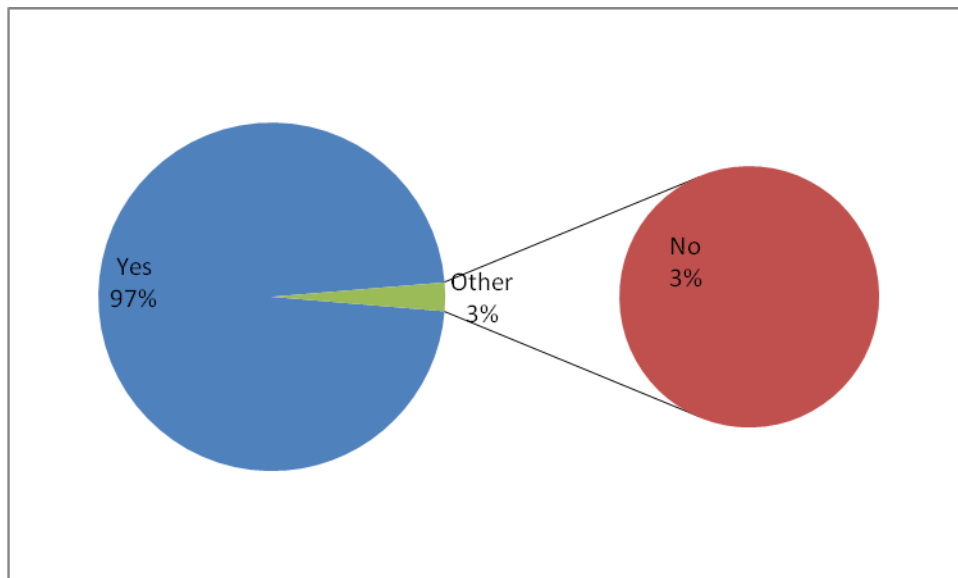
#### **4.5 Influence of the Subject Teacher**

The instructor has a significant impact on how useful the subject can be. A student's attitude about an instructor has a large impact on their attitude toward a class (Curran and Rosen, 2006).

##### **4.5.1 Teacher Influence on the Subject Choice**

The study sought to find out if the teacher influenced the subject choice. From the findings, 97% of the students indicated that the teacher influenced the subject choice while 3% of the students indicated that the teacher did not influence the subject choice. The relationship between the subject teacher and the student determined if the student chooses the subject. The method the teacher used to teach determined how the students performed in the subject thus choice of subject. Kungania (2006) conducted an investigation on the factors influencing attitude of diploma teacher trainees towards science and mathematics in Kenya. The research findings revealed that students have a positive attitude towards physics, perceive the physics' teachers as competent and they perceive the physics laboratories as well equipped.

**Figure 4.6: Teacher Influence on the Subject Choice**



#### **4.5.2 Students' level of satisfaction on teacher's methodology of handling the subject**

The study sought to find out the students' level of satisfaction on teacher's methodology of handling the subject. A 3-point likert scale was used where 1-1.49 represented less satisfied, 1.50-2.49 represented averagely satisfied and 2.50-3.0 represented highly satisfied. According to the findings, students were averagely satisfied with teacher's methodology of handling biology as shown by a mean of 2.346. In addition, students were averagely satisfied with teacher's methodology of handling chemistry as shown by a mean of 1.651. More over, students were less satisfied with teacher's methodology of handling physics as shown by a mean of 1.193. Students prefer subjects that are taught by teachers who are enthusiastic, well spoken, knowledgeable, caring, and helpful as opposed to teachers who are inflexible, and unclear (Curran and Rosen, 2003). If instructors are inflexible and unclear, they are much more likely to be difficult to learn from, which is a major concern for students (Smith et al., 2006).

**Table 4.12: Students' level of satisfaction on teacher's methodology of handling the subject**

<b>Subject</b>	<b>Mean</b>	<b>Stdev</b>
Biology	2.346	0.301
Physics	1.193	0.162
Chemistry	1.651	0.104

#### **4.5.3 Performance of the students in the science subjects**

The study sought to find out how students perform in science subjects. A 5-point likert scale was used where 1-1.49 represented very poor, 1.50-2.49 represented poor, 2.50-3.49 represented fairly, 3.50-4.49 represented good and 4.50-5.0 represented very good. From the findings, students performed in biology fairly as shown by a mean of 3.436. In addition, students performed in chemistry fairly as shown by a mean of 2.251. More over, students performed in physics very poor as shown by a mean of 1.393. The preference of an instructor's lecturing style is very close to being as important as the quality of the value of the content (Babad and Taybe, 2003).

**Table 4.13: Performance of the students in the science subjects**

<b>Subject</b>	<b>Mean</b>	<b>Stdev</b>
Biology	3.436	0.161
Physics	1.393	0.212
Chemistry	2.251	0.134

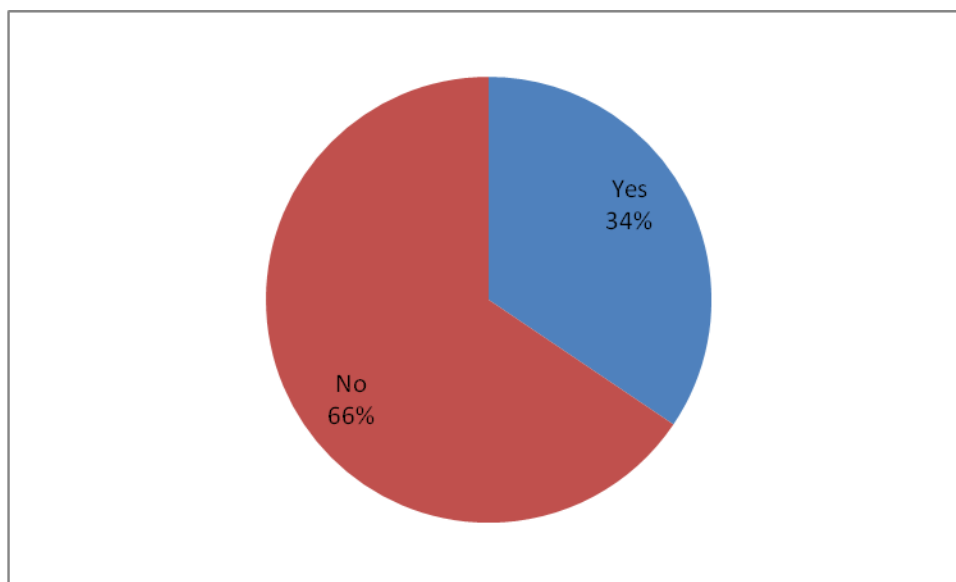
#### **4.6 Influence of Gender Differences**

Men and women can have different values, and there are also certain standards or expectations that vary between genders. Gender differences are especially apparent in high school aged students. Females are less likely to enroll in science and math classes compared to men, but more likely to enroll in English classes (Tenenbaum, 2008).

#### 4.6.1 Gender Differences in Choice of Science Subject

The study sought to find out if gender influenced choice of subject. From the findings, 66% of the students indicated that gender did not influence choice of subject while 34% of the students indicated that gender influenced choice of subject. Tenenbaum,( 2008), parents use double the amount of discouraging comments towards daughters than they do sons when it comes to the subjects their children take, which only enforces the stereotypes that already exist about gender differences leading females to feel less secure in certain subjects and opting to take other classes.

**Figure 4.7: Gender Differences in Choice of Science Subject**



#### 4.6.2 Ratio of boys to girls who take up science subjects

The study sought to find out the ratio of boys to girls who take up science subjects. According to the findings, the ratio of boys to girls who take up biology was 1:1. In addition, the ratio of boys to girls who take up physics was 4:1. More over, the ratio of boys to girls who take up chemistry was 2:1. According to Wasanga (1997), the majority of girls found science subjects difficult and they

perceived science subjects to be more useful to boys. Aghenta, (1989) found that perceived difficulties of science occupations was a significant factor preventing girls from entering Science, Technology and Mathematics (STM) fields. The attitude that one holds towards science appears to be a powerful predictor of achievement in the respective field.

**Table 4.14: Ratio of boys to girls who take up science subjects**

<b>Subject</b>	<b>boys: girls</b>
Biology	1:1
Physics	4:1
Chemistry	2:1

#### **4.7 Role of Parents and Teachers**

Career advice by parents and teachers can influence students' choice of science subjects. The school should support subjects and careers decision making.

##### **4.7.1 Influence of Parents on Choice of Science Subjects**

The study sought to find out whether parents influenced choice of science subjects. According to the findings, 58.94% of the students indicated that parents influenced choice of science subjects while 41.06% of the students indicated that parents did not influence choice of science subjects. Okeke (2000) revealed that parents have significant effect on students' choice of career and subjects. According to (Malgwi et al., (2005)), Parents are more likely to influence students' decisions than guidance counselors or teachers.



**Table 4.15: Influence of Parents on Choice of Science Subjects**

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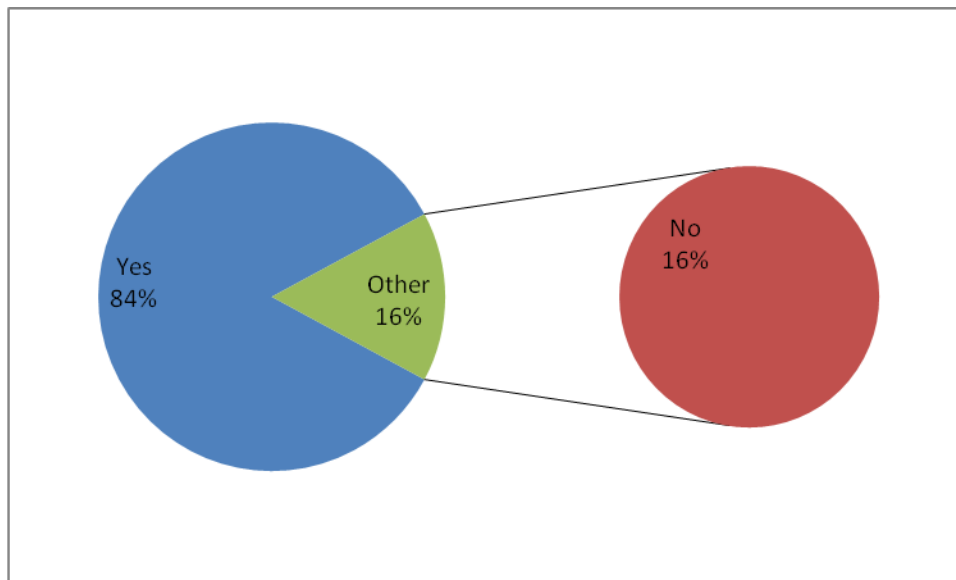
	<b>Frequency</b>	<b>Percentage</b>
Yes	89	58.94
No	62	41.06
<b>Total</b>	<b>151</b>	<b>100.00</b>

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#### **4.7.2 Teachers Influence on Choice of Science Subjects**

The study sought to find out if teachers influenced choice of science subjects. From the findings, 84% of the students indicated that teachers influenced choice of science subjects' while 16% of the students indicated that teachers did not influence choice of science subjects. Teachers do have more influence over a student's decision than guidance counselors (Malgwi et al, 2005).

**Figure 4.8: Teachers Influence on Choice of Science Subjects**



### 4.7.3 Availability of Career Counselor in the School

The study sought to find out whether the school had a career counselor. According to the findings, 91.39% of the students indicated that the school had a career counselor while 8.61% of the students indicated that the school had no career counselor.

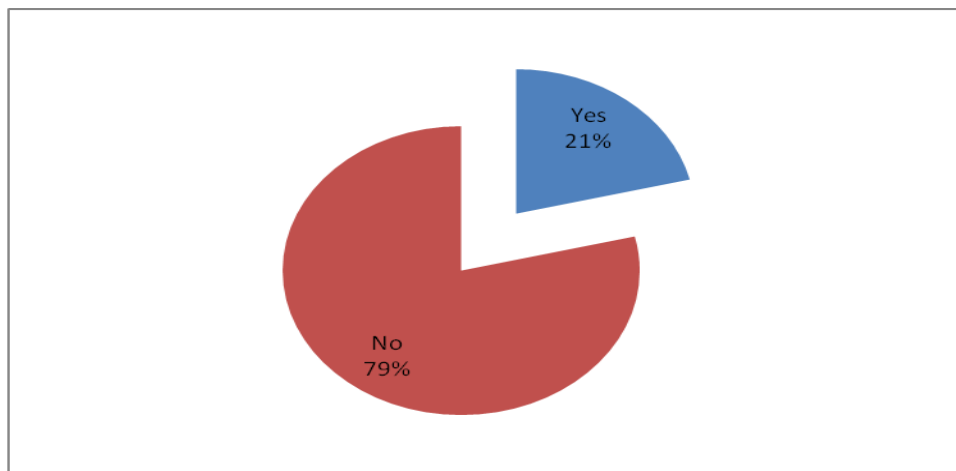
**Table 4.16: Availability of Career Counselor in the School**

	Frequency	Percentage
Yes	138	91.39
No	13	8.61
<b>Total</b>	<b>151</b>	<b>100.00</b>

### 4.7.4 Role of career counselor on subject choice

The study sought to find out if the career counselor advised students on subject choice. From the findings, 79% of the students indicated that the career counselor did not advise students on subject choice while 21% of the students indicated that the career counselor advised students on subject choice. Teachers and guidance counselors are not likely to discourage students from enrolling in classes, but to encourage the enrollment in certain classes (Anderson et al., 2008).

**Figure 4.9: If the career counselor advised students on subject choice**



#### 4.7.5 Role of the school on choice of certain science subjects

The students were asked whether the school forced them to do certain science subjects. According to the findings, all the teachers indicated that the school forced students to do certain science subjects. This was ascertained by the fact that chemistry was compulsory in the school.

**Table 4.17: Role of the school on choice of certain science subjects**

	<b>Frequency</b>	<b>Percentage</b>
Yes	11	100.00
<b>Total</b>	<b>11</b>	<b>100.00</b>

## **CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter provides the summary of the findings from chapter four, and also it gives the conclusions and recommendations of the study based on the objectives of the study. The objective of this study was to identify factors influencing the choice of science subjects in Kenya's secondary education schools, a case study of Langata High school in Nairobi County...

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

The study found that that the school encouraged students to take up science subjects. The three science subjects were done in the school. Students' attitude towards biology was fairly positive, chemistry was fairly negative and physics was strongly negative.

The study established that there were values attached to subject choice in relation to career development. Science subjects were competitive in the job market. Students had developed a career path that they strived to achieve/attain in life. Few students had career paths which needed science subjects. There were enough science facilities in the school

The study revealed that the teacher influenced the subject choice. Students were averagely satisfied with teacher's methodology of handling biology and chemistry. They were less satisfied with teacher's methodology of handling physics. Students performed in biology and chemistry fairly. They performed in physics very poor.

The study found that gender did not influence choice of subject. The ratio of boys to girls who take up biology was 1:1. In addition, the ratio of boys to girls who take up physics was 4:1. Moreover, the ratio of boys to girls who take up chemistry was 2:1.

The study established that parents influenced choice of science subjects. Teachers influenced choice of science subjects'. The school had a career counselor. The career counselor did not advise students on subject choice. All the teachers indicated that the school forced students to do certain science subjects.

### **5.3 Conclusions**

The study concludes that when students are allowed to choose which classes to enroll in increased motivation and independence which in turn increased a student's performance. Physics was selected by students who had knowledge of its mathematical concepts and symbols. Students view interdependence of science subjects with mathematics as an obstacle to excellence in these science subjects. This had made them to perceive physics and chemistry negatively. They perceived as fairly positive.

The study concludes that negative attitude towards a subject led to lack of interest. Quality of a subject has tremendous effect on whether a student chooses to enroll in a class. Students had developed a career path that they strived to achieve/attain in life. Students' enrollment of subjects was to a moderate extent based on its relevancy to their future career aspirations.

The study concludes that students were averagely satisfied with teacher's methodology of handling biology and chemistry and less satisfied with teacher's methodology of handling

physics. A student's attitude about a teacher has a large impact on their attitude toward a class. Subject teachers play a crucial role in taming students' choices over the science subject.

The study concludes that there existed gender differences in high school aged students. Gender influenced choice of subject to some extent. Different perceptions men and women have in regards to their ability and competency in those certain classes influenced choice of subject.

The study concludes that parents and teachers influenced students' choice of science subjects'. School has a great role to play in influencing students' choice of science subjects.

## **5.4 Recommendations**

### **5.4.1 Recommendations for Improvement**

The study recommends students to have good attitude towards science subjects. They need to consider their interests, personal academic goals while choosing subjects. Teachers need to adapt their classes to better meet the needs of students. Curriculum developers need to ensure that science subjects contain quality content and the workload be reduced.

Students should be encouraged to develop a positive commitment to science at a tender age. Schools should have well equipped laboratories. Competent and qualified teachers should teach science subjects. Examination council need to ensure that science subjects are assessed fairly.

Science teachers need to develop good relationship with students. Science teachers should strive to be enthusiastic, well spoken, knowledgeable, caring, and helpful. Subject teachers need to try to tame students choices over the science subject.

Gender differences should be discouraged amongst students. Women should be encouraged to change their perceptions in regards to their ability and competency. Parents need to encourage their daughters to take up sciences and show them that they can perform in any career.

Students need rich opportunities to find out about the many ways sciences can be used in interesting careers. Parents need to help students when making their study choices. The school should support subjects and careers decision making. Students need to be given information about the structure and content of the science subjects.

#### **5.4.2 Recommendations for Further Studies.**

This study has explored factors influencing the choice of science subjects in Kenya's secondary education schools in Langata High school. There is need to research on challenges facing students while choosing career. The study focused on Langata High school thus the same study should be done in other schools in Nairobi County to enable generalization of results.

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## APPENDICES

### Appendix: Introduction Letter

I am OKUMU JOSHUA OMONDI, a Postgraduate Diploma student at the University of Nairobi. I am conducting an academic survey on the factors influencing the choice of science subjects in Kenya's Secondary schools: a case of Langata High schools in Nairobi County. You have been randomly selected to participate in this survey. Your answers will remain strictly confidential and they will be used only for research purposes on aggregate. Your sincere assistance will help establish extent of the factors and fulfill the objectives of this study. Information given will be used only for the purpose of this research and will be accorded utmost confidentiality.

Please fill in the questionnaire as diligently as you can. Tick in the appropriate box where the question requires you to do so, where the space is provided, and Please fill in your answer.

### Appendix II: Students Questionnaire

#### Section A General Question

1. Gender : Male (1)  Female (2)
2. Age (14-18) years (1)  Below 14 years(2)  Above 18 years (3)
3. What is your religion/denomination?  
Catholic (1)   
Protestant (2)   
Evangelical (3)   
Islam (4)   
Hindu (5)   
Other (specify).....
4. Indicate your class

Form two (1)

Form three (2)

Form four (3)

5. Indicate the marks attained in the KCPE exams.

400 Marks and Above (1)

(350-400) Marks (2)

(300-350) Marks (3)

(250-300) Marks (4)

Below 250 (5)

**SECTION B: STUDENTS' PERCEPTION ON SCIENCE SUBJECT**

1. Which science subjects are done in your School

Biology (1)

Physics (2)

Chemistry (3)

Others specify \_\_\_\_\_

2. What is your attitude towards the science subjects rate your feeling using the following order scale.

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

**SECTION C: VALUE OF THE SCIENCE SUBJECT**

1. Are there values attached to subject choice in relation to career development?

Yes (1)  No (2)

Explain your response\_\_\_\_\_

\_\_\_\_\_

2. According to you are science subjects competitive in the job Market?

Yes (1)  No (2)

3. Have you developed a career path that you strive to achieve/attain in life?

Yes (1)  No (2)

3. If yes what is your career Choice?

Doctor/physician/Dentist (1)

Accountant/Banker (2)

Social scientist (3)

Lawyer

Teaching

Engineering

Others specify\_\_\_\_\_

\_\_\_\_\_

4. Are there enough science facilities in your school?

Yes (1)  No (2)

5. If yes what are these facilities\_\_\_\_\_

\_\_\_\_\_

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

Does the teacher teaching you influence your subject choice?

Yes (1)  No (2)

If yes explain your argument \_\_\_\_\_

\_\_\_\_\_

Rate your level of satisfaction on your teacher’s methodology of handling the subject(which subject – be specific)

Subject	Less satisfied	Averagely satisfied	Highly satisfied
Biology			
Physics			
Chemistry			

**SECTION E: INFLUENCE OF GENDER DIFFERENCES**

Does your gender influence your choice of subject?

Yes (1)  No (2)

**SECTION F: ROLE OF PARENTS AND TEACHERS**

Do parents influence on your choice of science subjects?

Yes (1)  No (2)

Do teachers influence on your choice of science subjects?

Yes (1)  No (2)



Does the school have a career counselor?

Yes (1)       No (2)

Does the career counselor advice students on subject choice?

Yes (1)       No (2)

## Appendix II: Teachers' Questionnaire

### Section A General Questions

1. Indicate the science subject you teach

Chemistry

Physics

Biology

1. Indicate your level of education.

Diploma

Degree

Masters

### SECTION B: STUDENTS' PERCEPTION ON SCIENCE SUBJECT

6. Do the school encourage students to take up science subjects?

Yes (1)  No (2)

7. What is the students' attitude towards science subjects in your school.

Subject	Very bad	bad	good	very good
Biology				
Physics				
Chemistry				

### SECTION C: VALUE OF THE SCIENCE SUBJECT

8. Are there values attached to subject choice in relation to career development?

Yes (1)  No (2)

Explain your response \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. According to you are science subjects competitive in the job Market?

Yes (1)  No (2)

11 Are there enough science facilities in your school?

Yes (1)  No (2)

10. If yes what are these facilities \_\_\_\_\_

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

How do the students perform in science subjects?

Subject	Very poor	poor	fairly	good	very good
Biology					
Physics					
Chemistry					

**SECTION E: INFLUENCE OF GENDER DIFFERENCES**

Does your gender influence students' choice of subject?

Yes (1)  No (2)

Explain \_\_\_\_\_

---

Indicate the ratio of boys to girls who take up these subjects

Biology

Physics

Chemistry

**SECTION F: ROLE OF PARENTS AND TEACHERS**

Do parents influence students' choice of science subjects?

Yes (1)  No (2)

Do teachers influence students' choice of science subjects?

Yes (1)  No (2)

Does you counsel students' on subject choice?

Yes (1)  No (2)

Does the school force students to do certain science subject?

Yes (1)  No (2)