

**STUDENTS' CHARACTERISTICS, TEACHERS' PERCEPTIONS AND
ACHIEVEMENT IN SCIENCE SUBJECTS AMONG STUDENTS IN
PUBLIC SECONDARY SCHOOLS IN LAIKIPIA COUNTY, KENYA**

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DECLARATION

I declare that this Research project is my original work and has not been presented in any other university for consideration of any certification. This research project has been complemented by referenced sources duly acknowledged. Where text, data, graphics, pictures or Tables have been borrowed from other sources including internet, these are specifically accredited and references cited in accordance with anti-plagiarism regulation.

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DEDICATION

This Research project is dedicated to my parents, my wife Ruth Wangari, my children Samuel Machira, Oliver Murungaru and Esther Wanjiku for their encouragement, patience and support during the time of research. May the Almighty God bless them.

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LIST OF ABBREVIATIONS AND ACRONYMS

APSP	African Primary Science Program
BSP	Biological Sciences Program
COPEs	Conceptually Oriented Program in Elementary Science
DEO	District Education Officer
FAWE	Forum for African Women Educationalist
FME	Federal Ministry of Education
GCSE	General Certificate of Secondary Education
INSET	In-Service Training
ISIS	Individualized Science Instructional System
JAB	Joint Admissions Board
KCSE	Kenya Certificate of Secondary Education
KUCCPS	Kenya Universities and Colleges Central Placement Service
MPSP	Midwest Primary Science Project
NFCS	Nuffield Foundation Combined Science.
NFJSP	Nuffield Foundation Junior Science Project
NFMP	Nuffield Foundation Mathematics Project
SCIS	Science Curriculum Study
SEPA	Science Education Program for Africa
SMASSE	Strengthening Mathematics and Sciences in Secondary Education
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nation International Children’s Emergency Fund

ABSTRACT

The way that students see their future is a central influence on what subjects they choose to take at Secondary school. Previous studies indicate that there exist gender disparities in most careers that are considered prestigious and especially Science-based careers. For national development both boys and girls should take up Science subjects aimed at enhancing innovations. This study therefore is set to find out the influence of students' characteristics and teachers' perceptions on Science subjects among secondary school students in Laikipia East District, Laikipia County. This study was guided by the following objectives: find out the learners' perception towards science subjects and its effect on performance in science subjects, determine how students' aspired science related careers affect on performance in science subjects, find out the gender differences on achievement in Science subjects in the secondary schools and determine the teachers' perception towards students' learning of Science subjects and its effect on performance. This study was conceptualized through expectancy-value theory which is a product of social psychological and cultural aspects that influences students' motivational behavior. The study employed both descriptive survey and correlational research designs. The population targeted was 4095 boys and girls in form 1-4 in all the 17 secondary schools in Laikipia East District. Probability sampling technique was used in the determination of sample size. The population sample was 216 respondents. Questionnaires and interview schedules were used as the main tools for data collection. For content and face validation, the instruments were presented to a panel of three experts in the area of education management at Kenyatta University. Their comments were incorporated in the final instruments. In the determination of reliability of the instruments, test-retest technique was used. A pilot study was conducted to ensure validity and reliability of the instruments. Data was collected at the appointed days and was subjected to simple descriptive statistics for analysis. These included means, percentages and frequency counts. The analyzed results were presented in summary form using Tables and Figures. The findings showed that: students' perception on Science Subjects was negative with a rating of 2.22 and affected their performance as reported by 64% of teachers. Students had developed career paths they wanted to pursue. Gender differences exist in Science Subjects with boys disposed to male-stereotyped occupations and girls to female-stereotyped occupations. Teachers' perceptions of Science Subjects and teaching methodologies affect students' performance. Based on the findings, Students' characteristics (Perceptions, Career aspirations and Gender) and Teachers' perceptions affect students' performance in Science Subjects. The study recommends collaborative teaching and guidance activities in Secondary Schools.

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

Chapter one highlights the background of the study, statement of the problem, the purpose of conducting the study, the study objectives, research questions, significance of the study, limitations and delimitations of the study, assumptions, theoretical framework, conceptual framework and operational definition of terms that shows the research variables and how they interact to influence students career aspiration on achievement in Science subjects in secondary schools in Laikipia East District, Laikipia county.

1.2 Background to the study

Secondary school education in Kenya is designed to enable the youth to be responsible in nation building by providing them with technical skills and creativity which, when combined with right attitude provides quality workforce in our country. As confirmed by Salisbury and Riddle (2000) preference at large is regarded highly in a democratic society because it gives students possession of their curriculum and reduces the probability that they will be separated by over authoritarian curriculum.

International studies have confirmed that females' representation in all the social aspects is very minimal compared to males (Bickerstaff, 2005; Adamuti-Trache, 2008; Brotman, 2008). This discrimination of women has deepened even in our classrooms where the feminist activists of the 1970's confirmed an existence of gender disparity where girls were marginalized and considered inferior to boys (Francis, 2000). Due to this discovery, awareness was created to encourage girls to have high aspiration to take science subjects that includes Physics, Chemistry and Biology. Teachers who used to discourage girls that science is for male student were also called to order (UNICEF, 2013). Studies conducted

worldwide have been majorly concerned with the general function or aim of education not considering the gender balance in the academic sphere. Most people stereotype girls to taking art-related subjects while believing science subjects to be hard for girls. This has created a problem which has been notable mainly in developing countries (Miller *et al.*, 2006; Mulemwa, 1997).

Bystidzienski & Bird, (2006) observes that there is low participation of girls in sciences compared to boys. Girls perceive science subjects as being difficult and on average record low grades compared to boys. This is attributed to negative attitude they have towards sciences. (Freeman, 2004). Despite the fact that in the 21st century the number of girls taking sciences has increased, majority tends to avoid taking science related courses after secondary school education and prefer art-related courses. Gender stereotyping still remains the key reason why girls perform poorly in science subjects in African schools. Science subjects are perceived to be masculine and hard subjects for girls hence reducing their self-esteem towards pursuing science-related careers. Art subjects which include humanities subjects are viewed as feminine and easy compared to science subjects, which are viewed as masculine, hence most girls prefer Art-based careers to Sciences. (Baker & Leary, 2003; Cleaves, 2005).

A study conducted in USA by Miller *et al.* (2006) confirmed that students in high schools were driven by attitude which enables them to like a specific science subject and the quest to pursue science courses in future. The quest to take careers relating to science which in psychology is referred to as career aspirations was mostly observed in male students compared to female. This study was supported by a study conducted by Christidiou (2006) in Greece, which found that girls were more interested in sciences which relate to human bodies and hence they preferred Biology to Physics and Chemistry. Girls also prefer

hands-on chores and group interactions while boys like abstract and constructional chores which includes innovation and creativity hence they prefer Physics and Mathematics when choosing subjects to pursue in preparation for their future careers (Baker & Leary, 2003). Studies conducted in Africa depict career aspiration influencing performance in science subjects. In Nigeria a study was conducted by Aigbomian (2002) who ascertained that boys' performance was slightly higher than that of girls in sciences. He also found out that socio-cultural and religious beliefs were also seen to contribute to this imbalance in enrolment and performance. In African setting, boys are more favored and own most of the family properties and are more preferred to be educated compared to girls who are given the domestic chores. This stereotypes is transferred to schools where most teachers perceive girls as minors who cannot do technical and science subjects perfectly and hence they develop negative attitude towards science subjects, leading to poor performance.(Aguale and Uhumuavbi 2003).

In Tanzania although the government through the Higher Education students' Loan Board (HESLB) has been giving priorities in funding to students taking science courses, Kizito and Siwel (2012), observes that the performance in science subjects still low for girls, who record low grades with Physics and Chemistry being the poorest performed. Since in most schools in Tanzania some subjects are optional, student prefer to drop Physics and Chemistry in favour for technical subjects and humanities. This has contributed to import of human resources to Tanzania to aid in industrialization due to low rate of science subject preference.

The concern in Kenya is the question of unequal gender representation in the choice and performance in Science subjects in secondary schools. Is it the students' attitude towards Science subjects? Is it the teachers or school administrators' attitude? Is it lack of guiding

and counseling on subject choices? Is it like or dislike for a subject or the career opportunities that the subject opens for the particular student? Moon& Shelton (1994) assert that everybody needs to be given direction in life endeavours. Students in secondary schools need guidance and counseling on such important issues as finding identity, relationships, careers and career choices and academic endeavors.

The secondary school Science subjects have been given a lot of attention by various organizations; key among them are the Forum for African Women Educationalists (FAWE), whose aim is to promote gender equity and equality in education in Africa by fostering positive policies, practices and attitudes towards girls' education. Conclusively researches worldwide including the current study have been conducted by different scholars aimed at bridging the gap between the choice and preference of science subjects that contribute much in strategic growth and development of any nation. Career aspirations act as the first motivating factor that attracts student to pursue a certain course in future learning and has been seen as the reason for performance of any student in science subject. It is against this background that the study seeks to determine the influence of career aspirations on science subjects' performance in Laikipia East District. The choice of study topic in this study was influenced by a public outcry in Laikipia East District among parents and teachers, government and other stakeholders who had called for a probe into performance in Science subjects especially among girls. It is for this reason that the study sought to investigate the determinants of girls' and boys' performance in Science subjects which include school factors like teacher qualification and attitude, students attitude, teaching load, guiding and counseling role, teaching-learning resources and class size and their influence on academic performance in Science subjects among boys and girls in the District.

1.3 Statement of the problem

Trends in KSCE performance for the last five years indicate poor performance in Physics, Chemistry, Biology and Mathematics among girls as compared to boys in Kenya. In Laikipia East District, very few girls who sat for Sciences subjects at KCSE level in the year 2013 obtained quality grades. Majority of them attained a mean grade of C- and below although they had to a large extent performed well in humanities and languages. KCSE 2013 results from Laikipia East District indicate that the general performance of boys was better than that of girls. Comparatively, the performance of each science subject as by the records shows that boys had a mean score of 2.522 in Physics compared to 1.808 for girls, boys had a mean score of 3.122 in Chemistry while girls had a mean score 2.456. In Biology boys had a mean score of 3.3096 while girls had a mean score of 2.876. The question is, does career aspiration influence achievement in Science subjects among students in secondary school students in Laikipia East District?

1.3.1 Purpose of the study

The purpose of the study was to assess the students' characteristics, teachers' perceptions and achievement in science subjects among students in public secondary schools in Laikipia County, Kenya. This study was imperative since it unearthed avenues that would effectively enhance in students' choices of subjects and future careers.

1.3.2 Objectives of the study

The study was guided by the objectives below:

- i. To find out the influence of learners' perception of learning of science on performance in Public secondary schools in Laikipia East District, Laikipia County.
- ii. To determine how students' aspired science related careers affect performance in science subjects in Laikipia East District, Laikipia County.

- iii. To find out the gender differences in achievement in Science subjects in public secondary schools in Laikipia East District.
- iv. To determine the teachers' perception towards students' learning of Science subjects and its influence on performance.

1.3.3 Research questions

- i. How does learners' perception of learning of science influence performance in Public secondary schools in Laikipia East District, Laikipia County?
- ii. How does students' aspired science related careers affect performance in science subjects in Laikipia East District, Laikipia County?
- iii. What are the gender differences in achievement in Science subjects in public secondary schools in Laikipia East District?
- iv. How does teachers' perception towards students' learning of Science subjects influence performance?

1.4 Significance of the study

This study will provide useful information to the following education stake holders. First to teachers, they will understand the importance of clearly stating the rationale for teaching various concepts in sciences. Curriculum developers intending to produce guidelines for the students on choice of optional subjects will find this research useful because it will highlight the limitations experienced by boys and girls in subjects' choice. The findings can be used in preparing materials to be used in seminars for parents, teachers and educational administrators so as to effectively play their rightful role in shaping students' choices of subjects and future careers. The findings are also expected to inspire subject teachers to explore the relationship between their subjects and career

opportunities in order for them to inspire boys and girls to make wise and informed decisions when choosing optional subjects.

1.5 Delimitations and limitations of the study

1.5.1 Delimitations of the study

The study mainly focused on students' characteristics, teachers' perceptions and achievement in science subjects among students in public secondary schools in Laikipia East District, Laikipia County, Kenya. Other factors that affect achievement in science subjects among students were not investigated, the study only focused on students' characteristics and teachers' perceptions. All the students and teachers in public secondary schools in Laikipia East District constituted the study population. The study also focused on public secondary schools only, private schools and other institutions of learning were not included in this study. Due to practical constraints such as limited time only four secondary schools were randomly selected as a sample of schools for the study.

1.5.2 Limitations of the study

The respondents may not have been truthful when giving information, which is difficult during interviews. In this study some respondents also refused to respond to questions they viewed to be too personal. This design also possesses the possibility of errors and subjectivity. This can be justified when a researcher designs a questionnaire where some questions are predetermined and prescriptive. This study was not exceptional as it could have contained some errors resulting from coding and recording of more positive results as opposed to the negative responses that may contract intended outcome. Care was however, taken and all responses were put into account in data analysis. To overcome the respondents' subjectivity all the respondents were assured confidentiality of the information they gave to make the research as accurate as possible.

1.6 Assumptions of the study

The study was carried out on the basis of the assumption that, all the respondents had vast information on the topic and gave genuine, truthful and honest information. It is also assumed that the respondents gave reliable responses.

1.7 Theoretical framework

The study adopted expectancy-value theory which is part of social Psychology. It is a constituent of sociology, Psychology and culture which have an effect on students' motivational behavior. The main concern of this model is the aspiration that drives the choice of participation in a future activity. This theory was designed and tested by Eccles in 2009 and also by the creative work of Barber and Jozefowicz (1999). In a school setting the theory is attributed to the understanding of achievement and how it is linked to aspirations and self-concepts in learning of sciences and other subjects in secondary schools (Denissen, Zarrett, & Eccles, 2007). This theory was also advocated for by Wigfield & Eccles (2000) whose main view was based on individual choices, persistence and hard work that determine a person's performance in a particular task.

Motivation in this case acts as catalyst which enables a student to achieve what he aspires. Motivation according to this theory consists of two major aspects in educational setting. They include students' aspirations and values attributed to a certain career. The theorists in this field of study predict that hope of success and skewed task value directly influence achievement-related choices. This study is conceptualized through this theory since choices among many subjects affect a students' future and may significantly affect their performance. Gender and cultural stereotypes are also seen be influencing career aspirations and science performance among secondary school students.

1.8 Conceptual framework

A conceptual framework as perceived by Orodho, (2009) is a diagrammatic representation of research variables. The variables include the dependent, independent and the intervening variables. The independent variables manipulate the dependent variable which is mediated by intervening variable. Figure 1.1 is clear picture of the study variables which shows the relationship between composite variables. Presence of the arrows indicates that there is an interaction between human and physical resources that influence the organizational goal set to be achieved. Therefore, it is clearly indicated that dependent variables depend on independent variables through the mediation of intervening variables as shown below.

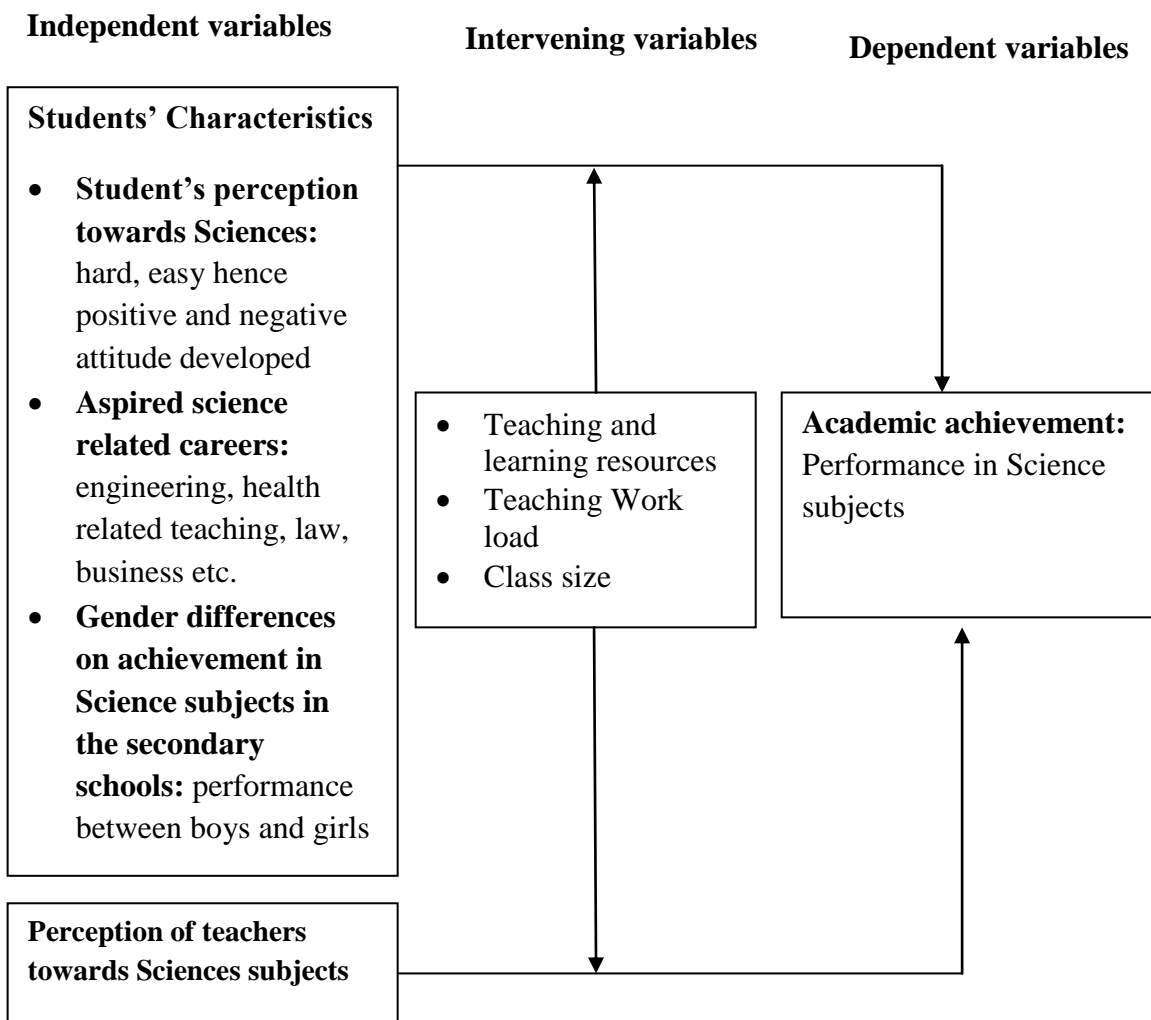


Figure 1.1 Conceptual Framework

In the conceptual framework the independent variables are student's perception towards Sciences (e.g. hard, easy hence positive and negative attitude developed), aspired Science related careers (e.g. engineering, health related teaching, law, business etc.), perception of teachers towards Sciences subjects and gender differences on achievement in Science subjects in the secondary schools (e.g. performance between boys and girls). The dependent variable is academic achievement i.e. Performance in Science subjects. The independent and dependent variables were mediated by intervening variables like classroom size, science teacher teaching work load, learning resources, instructional methods and pedagogy.

1.9 Operational definition of terms

In this study, the following are the operational terms:

Attitude - refers to the way of feeling, thinking and behaviors of secondary school boys and girls in Laikipia East District.

Academic performance – the progressive excelling in tests and science assignment presented to learners by their science teachers and national examination council.

Career - refers to a profession or an occupation with opportunities for advancement or promotion.

Career aspiration – refers to a path that one wants his/her career to follow

Choice - refers to a decision made against many other alternatives / preferences by a secondary school girl or boy in Laikipia East District

National curriculum – the country's broad decisions about what should be taught in schools and how and whom to teach where the syllabus and schemes of work are guided from to determine who education should take place.

Education System - refers to an organized plan, method or process of imparting or acquiring skills for a particular discipline which has sequence and progression.

Gender - this is the masculinity and femininity” or continuing process concerned with determining and providing for developmental needs of secondary school boys and girls in Laikipia East District.

Subject choices - refers to an opportunity provided by the school in the course of study where boys and girls carefully select subjects taught by the school for the purpose of their study.

Subject Guidance and Counseling - refers to a process of assisting boys and girls to choose a subject to prepare for it and progress in it later in a career.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter highlights the literature review which is guided by the study objectives. The researcher identified the gaps and subsequently broke down other related studies that were relevant to the intended solutions to the study problems.

2.2 Students' Perception of Learning of Science

Research has shown that students' perception of learning particular subjects influences their performance whereby the gender of the students is given a prior concern. Preference is considered in choosing particular subject where student attitude is the dominant aspect (Wikeley and Tables, 1999). According to Francis *et al* (2003), school as a learning institution is also one of the factors that influence subject choice between single sex and co-educational schools. In relation to gender differences in choice of subjects to be pursued, advice from parents, relatives and friends are usually sought by students.

According to Colley *et al* (2003) greater inter-school variability in student subject preferences amongst older students suggest that school-related factors become more important with age. School size is also found to have an effect on post 16 years students' subject choices. Likewise, other researchers identified substantial variations between schools in the proportion of students studying different subjects.

Learners' attitudes towards science subjects contribute to either avoiding or choosing to take the subjects. Attitude includes positive and negative perception towards something or somebody. A study conducted by Simpson and Oliver (1985) found that positive attitude towards science influences lifelong interest in learning of science. This remains the fact

why education in African is tirelessly reforming science teaching to encourage learners to have positive attitude towards science. Regardless of the effort being made, most learners in secondary schools in Africa continue to show negative attitude towards science subjects (Eccles, Jacobs and Harold, 2009).

A related study on learners' perspective towards learning of science subject conducted by Whitelaw et al. (2000), ascertained that gender of the student is the most important variable related to learners attitude towards science subjects. This research agrees with that conducted by Mwangi (2008) who found out that boys perform better in Chemistry and Physics compared to girls in Mathira district in Nyeri County, Kenya. This compares with Laikipia County as per the records in the DEOs office, where boys in general were seen to outdo girls in sciences. The disparity of performance can be attributed to gender stereotyping and discrimination. Laikipia County being one of male dominant areas in Kenya in terms of occupations, whereby it is inhabited majorly by Maasai and Kikuyu, socio-cultural beliefs has led to the reported gender disparity in performance of science subjects. The profession of being either an engineer or doctor is being eyed mostly by male students in the area hence career aspiration playing a significant role in academic performance in science subjects.

2.3 Relationship between Students' Career Preference and Performance

Performance in a subject has to some extent been found to depend on a student's career aspirations. Research in Africa, specifically in Nigeria by Okoli (1995) found out that learners in secondary school mostly prefer pursuing non-science subjects as economics literature, economics and commerce thinking that they are easier than science hence reducing their interest in science regardless of its necessity in the nation building.

Choice is centered in interest so students' subject choice is determined by the interest they have towards a particular science subject. Normally everyone chooses what he or she likes and what one considers being useful to him or her. As viewed by Ocho (1997) people have different interests in life and do not value things the same way. In a school setting students' attitude towards a subject affects choice of subjects. Fraser *et al* (1999) confirmed that a student's value for science and technology determines his/her behavior or attachment to such subjects. The choice of a science subject may also be influenced by the reinforcements the student gets from the school and particularly from subject teachers.

Social class stratification is another factor which influences the student motivation to perform well or poorly. All of the aspects determine the type of learning materials that should be provided to the learner to enable him/her perform well in his/her academic work. According to Kangania (2006) social class, to a large extent determines the career aspirations of learners since they copy mostly what their parent do to earn a living. The current study was set to find out why a particular student may perform excellently well in other subjects such as languages and humanity but record extremely poor in Science subjects.

2.4 Gender differences in Performance in Science Subjects

Gender differences have been seen as the most serious factor which brings about attitude formation towards a particular subject (Whitelaw *et al.*, 2000). Studies focusing on gender representation in the social arena like school setting have revealed that boys have slightly higher capacity of positive attitude towards science compared to girls (Greer, 1999). Girls are seen to have a negative attitude towards science since it calls for more concentration and that science appears more abstract compared to handcraft activities that girls would like to perform. A research for example conducted by Aguele and Uhumuavbi (2003)

found out that division of labour is centered in sex and age and is also supported by institutional arrangements which are relevant to home environment. Gender issues in Science and technology have been the concern of many educators, and a series of researches have been done in this area.

Globally, according to a report by Gateway Tool Kit (2004), women are underrepresented in almost every area of recognized scientific activity. The report presented claims that women are discriminated even higher learning institutions as well as in the organizations they work for. Cultural sex-oriented in activities have contributed to the increased underperformance of women in science field. If women are underrepresented in the field of science they will most probably, directly or indirectly instill negative attitude to school girls who will in turn develop negative attitude towards science, which will result in poor performance.

Religion has also provided a platform for discrimination of girls where boys are given more prominence, and more tasks to perform. In Nigeria according to Aguele and Uhumavbi (2003) where Christianity and Islam and the dominant religions, women are given inferior positions in the society. Muslim or Christian teachers also instill negative attitude toward science to girls since they encourage girls on house chores and home science (Ocho, 1997).

Kenya has made significant progress in enabling more children to benefit from education and the gender gap in primary school enrolment and retention has slowly been narrowed. The introduction of free primary education has had a notable impact on the increased enrolment rate of girls. However, as students transit from Primary to secondary school, girls on average have not matched boys in performance, especially in sciences.

The available literature also lacks a clear laid strategy that can help improve the choice and performance of Sciences among girls. No empirical study has been given to show a strategy which when applied resulted to a remarkable improvement in the choice and performance in the Sciences subjects among boys and girls. The important of this study will therefore be released due to its intent purpose of trying to find out the logicity of the same brain performing extremely well in one subject but performing extremely poor in another subject.

2.5 Perception of teachers Towards Students Learning of Science Subjects

Similar research done in America by Orloskey (2007) whose purpose was to look into management of school based assets that could enhance achievement in Mathematics, came up with tangible conclusions. For instance, he asserted that text books, classrooms and teachers were crucial in institutionalization of a curriculum innovation. However, due to over enrolments, most schools are overstretching the few facilities they have leading to poor curriculum implementation. The research done by Serem (2009) revealed that provision of adequate resources and facilities in an institution was necessary for effective implementation of any educational innovation.

According to UNESCO (2012, 2006), school-based factors start with teaching and learning strategies used by teachers during teaching and learning sessions. Various formats for training staff in curriculum innovation in various subjects are spelt out. Unlike in Kenya where teacher preparation and implementation were separate, implementation stage in the models of countries like America and Britain, teacher preparation activities are detailed (England Department for Education, 2011).

Teachers are mentioned by some studies as reinforcers of stereotype behavior and gender roles among students. Tobias (1990), Cain (1980) and Whyte (1986) have similar views that many classroom teachers encourage girls to do home science careers and take art leaving science subjects to boys. In a study conducted by Mulemwa(1997), teachers were found to treat boys and girls differently in which boys receive more attention than girls regardless of the teacher's sex. A live experience from observation made in a Physics class of "teachers to be" at a tertiary learning institution quoted this from the teacher, "Is there any girl in my class? How would you expect a girl to study and pass Physics?" This was rather an uncomfortable experience which needed ascertaining from the student's side (Dalget & Coll, 2004).

Interview data from a few students who have had a course with this same teacher revealed that this was a common treatment to all Physics students who happened to be taught by the teacher. "He naturally dislike girls in Physics", the students added (Dalget & Coll, 2004). Such statement by teachers causes a lot of damage to students and may have far reaching effects than it is lightly viewed. Students have a right not to be exposed to such statement. This study however, presumes that our practicing Science teachers might not be free from such perceptions towards girls.

Blaming or praising students, offering reward and punishment can either improve or lower students' self-esteem. Less attention to girls would motivate them in general learning. However, the degree of teacher negative treatment required to produce a negative effect on students is not known. Teachers unconsciously reinforce and validate pupil's perception of gender related behavior. This study will therefore establish the extent to which teachers' attitude towards science subject influences career aspirations among students and its impact on science subjects' performance among girls and boys.

Drawbacks for research into attitudes towards Science is that such attitudes do not consist of a single unitary construct but rather, consist of a large number of sub-constructs all of which contribute in varying proportions towards an individual's attitudes towards Science. Consequently, it is behaviour rather than attitude that has become a focus of interest and which has led researchers to explore models developed from studies in social psychology, in particular, Ajzen and Fishbein's (1980) theory of reasoned action which is concerned fundamentally with predicting behaviour. This theory focuses on the distinction between attitudes towards some 'object' and attitudes towards some specific action to be performed towards that 'object' e.g., between attitudes towards Science and attitudes towards doing school Science.

For instance, Koballa (1988) and Oliver and Simpson (1988) have all found that social support from peers and attitude towards enrolling for a course are strong determinants of student choice to pursue science courses voluntarily, which suggests that the theory has at least some partial validity. The main value of such a theory is its help in determining salient beliefs which can then be reinforced or downplayed to affect relevant behavioral decisions by students such as, girls do not do Science. Furthermore, this theory points towards the need to draw a demarcation between school Science and Science in society.

In Laikipia East District, during lesson observation sessions in both form one and upper classes, it was noted that three teaching and learning strategies were mainly being used in the delivery of the content, that is, explanation, question and answer and description where students were less involved in the learning activities except question and answer to some extent. The teaching and learning strategy such as fieldwork, observation and story-telling helps the learner to comprehend content and retain it in his /her memory much longer.

The simple nature of this technique still provides an effective answer to the question which is essentially that asked by teachers and schools; how popular is Science compared to other subjects? It is however surprising that such survey are not done more often and especially in third world countries. This study seeks to find out the influence of students' career aspiration on academic performance of science subjects.

2.6 Summary of Literature Review and Identification of Gaps

The researcher conducted review of literature on students' perception of learning of science; relationship between students' career preference and performance; gender differences in performance in science subjects and perception of teachers towards students learning of science subjects. There is much information on perception of students and teachers towards learning science. Nevertheless there are no empirical studies that have been conducted in Laikipia County that address students' characteristics and teachers' perceptions and achievement in science subjects among students, thus the rationale for this study in addressing this gap.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the methodology and procedures employed in this study that leads to accurate presentation of facts that leads to the understanding of the study objectives. It is arranged systematically from the study design, the study area, the study population, sample sizes and sampling procedures, research instruments, pilot study, data collection procedures, data analysis and ethical and logistical considerations.

3.2 Research design

This study employed both descriptive survey and correlational research designs, utilizing both quantitative and qualitative approaches, which complemented each other. While qualitative method allows researchers to describe in rich detail a phenomenon as it is situated and embedded in local context based on individual case information, quantitative approach provides precise, quantitative and numerical data that allows for generalizations to be made (Crotty, 1998).

According to Kombo and Tromp (2006) a descriptive survey design is employed to explore the existing status of two or more variables under scrutiny, by enabling the researcher to collect original data for the purpose of describing a population which is large to observe directly. The design was chosen because of its appropriateness to this study, which aimed at gathering facts, knowledge, opinions and judgements from the Science teachers and students regarding the choice and performances in Science subjects among boys and girls in secondary schools. Correlational research design is quantitative method of research in which a relationship of two or more quantitative variables from the same group of subjects is determined (Covariation).

The source of data collected was primary and was done through administration of questionnaires and carrying out interviews. Questionnaires were administered to students and Science teachers, in order to gather information about career aspirations and performance in Sciences subjects among secondary school students. An interview was also adopted; whereby pre-set questions were asked to the students in order to get in-depth information on the subject of study.

Secondary data on the other hand was collected through the use of books, journals of research related to career aspirations and performance. Analyzed KCSE results on the performance of Science subjects among girls and boys in the schools under study was also collected from their examinations departments.

3.2.1 Variables

The variables of this study were students' perception of learning Science, career preferences, gender differences and perception of teachers towards teaching and learning of Science as the independent variables while academic achievement in Science subjects was the dependent variable. The study variables were measured using nominal scale which grouped the subjects into two according to their gender. The interval at which career aspirations influence performance was found. Both family and school factors were considered in the interpretation of the research variables.

3.3 Location of the Study

This study was carried out in Laikipia East District of Laikipia County. The criterion for the choice of the location was based on the fact that the district has both private and public secondary schools and trained teachers. The district also has both day and boarding secondary schools, out of which 17 are public with an enrollment of 4095 students. The

student- teacher ratio in Laikipia County is 1:29 (KNBS, 2011). The rationale for choosing this area of study is due to the fact that the researcher is conversant with the area and the trend of performance among boys and girls.

3.4 Target Population

The target population was all the 4095 students drawn from forms one to four in the 17 Public Secondary Schools in Laikipia East District. The secondary schools were homogeneous in the sense that some schools are Boys boarding, Mixed day, Girls boarding and mixed day. Therefore they did not necessarily have similar characteristics. The district has one hundred and seventy eight (178) teachers out of which 68 are Science teachers (Laikipia East District DEOs records, 2014).

3.5 Sampling Techniques and Sample Size

This study mainly used probability sampling techniques. This is where there is probability of each member being selected. Gay (1981) has shown that a sample size of 10% - 30% of the total population is adequate for a study in descriptive research. By the aid of random sampling technique 200 students from the four selected schools formed the sample population. This was done through stratification technique which is combined by simple random sampling whereby one girls' school, one boys' school and two mixed day schools were selected. Fifty students were selected at random from each of the four visited schools making a total sample of 200 students who participated in the study. This was done using Detection Capability of the Sampling Scheme table.

Four Science teachers from each school were randomly selected, making a sample size of 16 teachers.

Table 3.1: Population sample

Category	Population (N)	Sample size (n)	Percentage (%)
Schools	17	4	23.5
Teachers	68	16	23.5
Students	4095	200	4.89
Total	4180	220	51.89

Source: Author (2015)

3.6 Data Collection Instruments

Two types of data collection tools were used. Questionnaires were used since they can collect large amounts of information from a large number of people in a short period of time and in a relatively cost effective way. They can also be administered by the researcher or by any number of people with limited effect to its validity and reliability.

Interview schedules were used since the researcher can correct the language in that any misunderstanding and mistake can be rectified. Interviews enable development of relationship, selection of suitable candidate and gathering of sufficient information (Mugenda and Mugenda, 1999). Basing on these facts, a combination of the Questionnaires and interview schedules were used in this study.

3.6.1 Questionnaires

A questionnaire is a research instrument that gathers data over a large sample and is one way to elicit self-values (Kombo & Tromp, 2006). Questionnaires were used to collect data from students whereby respondents were not manipulated since they filled the questionnaires independently. The questionnaire consisted of both open-ended and closed

questions which were designed specifically for students and teachers, in line with the research objectives.

3.6.2 Interview Schedules

An Interview schedule was used to conduct interviews for students. According to Kothari (2004) this approach involves direct contact between the researcher and his subject. It involves presentation of oral-verbal stimuli and reply in terms of oral-verbal responses. Face to face interview was carried out and this elicited responses which could otherwise not have been obtained from the main questionnaire.

3.7 Pilot study

The instruments were discussed with the help of supervisors and then a pilot study was carried out in the schools within Laikipia East District. Schools piloted were not used in the actual study since they had similar characteristic to the study schools. According to Mugenda and Mugenda (1999), it is necessary to pre-test the instruments to ensure that the items are clearly stated and can be understood by the respondents. The main purpose of the piloting was to determine validity and reliability of the research instruments. The instruments were administered to the same group of respondents after a period of two weeks. Results were analyzed and instruments modified.

3.7.1 Validity of Research Instruments

Validity is defined as the qualitative procedure of pre-testing or a prior attempt to ascertain that research instruments are accurate, correct, true, meaningful and right in eliciting the intended data for the study (Kasomo, 2006). The questionnaires were checked whether there were ambiguous, confusing and poorly prepared items. For content and face validity, the instruments were presented to a panel of three experts in the area of education

management at Kenyatta University. Their comments were incorporated in the final instruments.

3.7.2 Reliability of Research Instruments

According to Orodho (2009) reliability is the process of confirming whether the instruments are consistent in producing similar results on different but comparable occasions. Test-retest helps the researcher assess time taken and adjust accordingly for example if it takes too long it could help reduce problems of phrasing questions that can lead to being technical and too abstract which could be detected from the responses (Orodho, 2009). Test-retest was undertaken by administering the Students' Questionnaire to 20 students from the sample population, at two weeks interval. They completed the questionnaire using four-point scales, rated from strongly disagree to strongly agree. The analysis of the responses between the test and the retest was conducted, and the correlation averaged at 0.7 Cronbach's Alpha coefficient. This was done to determine whether there were any significant differences between the responses at each time point. Cronbach's Alpha coefficient of 0.7 was accepted since it's close to 1.0.

3.8 Data Collection Procedure

A letter from the graduate school in Kenyatta University was obtained which enabled application for a research permit from the National Council for Science, Technology and Innovation. After obtaining the research permit various schools were visited in the quest of obtaining permission from school principals and booking of appointment for the actual study. On the appointed day, two Questionnaires were used; one for students and the other for Science teachers. An interview schedule for students, with pre-set questions was also used. Subjects in the same institution were approached to fill in the questionnaires at the same time. This eliminated chances of the subjects influencing one another's responses.

3.9 Method of Data analysis

This study employed descriptive analysis method utilizing both quantitative and qualitative approaches respectively. Descriptive statistics such as frequency counts, Percentages, Mean values and Standard Deviations were used to assess how respondents agreed or disagreed with the items of research questionnaires. Results were presented in frequency distribution Tables, bar graphs and pie charts and were preceded by explanations. Inferential statistics was used to determine the relationship between the independent variables (Students perceptions of learning Science, Career preferences, Gender differences and Perception of teachers towards Science subjects), and the dependent variable (Achievement in Science subjects).

3.10 Logistical and ethical considerations

According to Mugenda and Mugenda, (1999), ethical considerations are important for any research. Ethical issues that were taken into consideration included proper conduct of the researcher and confidentiality of the information obtained from the respondents.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND PRESENTATION OF THE FINDINGS

4.1 Introduction

This section presents the analysis of the collected data, the interpretation of the findings and their presentation. The data was collected through the aid of the research questionnaires and interview schedules, analyzed through descriptive and inferential methods and presented in pie charts, bar graphs and tables. Due to the fact that the students and teachers came from similar cultural group it was possible to determine their similarities in terms of environment hence easier to make comparison on the research topic. Students' final Science grades observation were made in all schools visited to determine their performance in Science subjects in which grades were given codes and recorded as shown below: A had 4.0, A- as 3.75, B+ as 3.5, B as 3.0, B- as 2.76, C+ as 2.3, C as 2.0, C- as 1.75, D+ as 1.3, D as 1.0 and D- as 0.75. This was one of the sources of document analysis that showed the performance of students in Science subjects. This was highly attached to students' attitude towards learning of Science subjects and which was assumed to be influenced by career aspirations. Majority of students had low scores with girls recording lower mean scores compared to boys in Science subjects. To avoid confusion data was analyzed separately and independently by utilization of quantitative and qualitative approaches as recorded below. This chapter is organized in relation to the following objectives:

- i. To find out the influence of learners' perception of learning of science on performance in Public secondary schools in Laikipia East District, Laikipia County.
- ii. To determine how students' aspired science related careers affect performance in science subjects in Laikipia East District, Laikipia County.

- iii. To find out the gender differences in achievement in Science subjects in public secondary schools in Laikipia East District.
- iv. To determine the teachers' perception towards students' learning of Science subjects and its influence on performance.

4.2 Students Perception of Learning of Science

This section aims at addressing objective one. The first objective of the study was to determine the student's perception towards learning of Science subjects. Respondents who were mainly teachers were requested to give the extent to which students' perception towards learning of Science subjects affected students' performance in Science subjects. Information from the respondents was subjected to descriptive statistical analysis and the results are given in Figure 4.1.

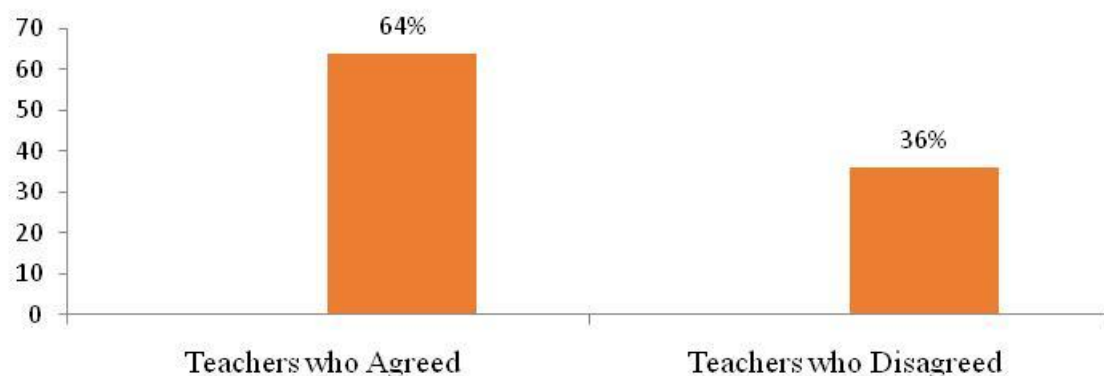


Figure 4.1: Attitude towards learning of Science subject

As shown in Figure 4.1, about 64 percent of teachers agreed that student attitude towards Science subjects affect their performance against the 36 percent who did not agree. This implies that students' perception towards Science and Science-oriented careers contributed to their performance. It draws the interpretation that a negative perception towards science leads to poor performance of particular science subject while positive attitudes leads to high achievement in the subject in question. This concurs to Kungania (2006) who found

that 67 percent of the respondents in his study agreed on the effect of individual perception towards a particular subject including Sciences subjects.

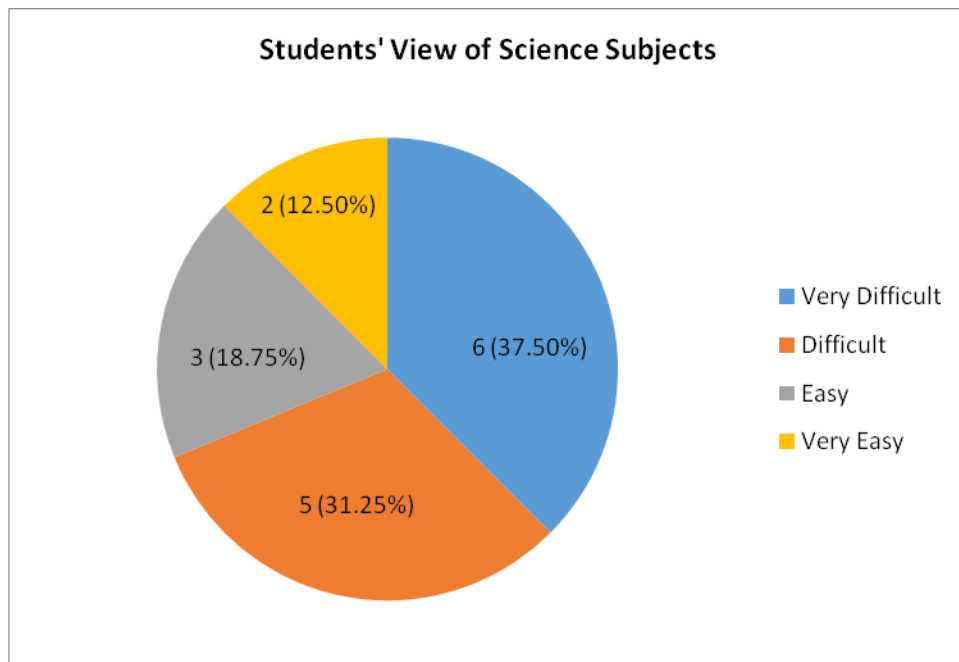


Figure 4.2: Student' View of Science subjects

Information in figure 4.2 presents responses from teachers when asked to indicate how students' view science subjects as either very difficult, difficult, easy, and very easy. It was indicated that 6 (37.5%) stated that students' view science subjects as very difficult, 5 (31.25%) views science subjects as difficult, 3 (18.75%) view them as easy and 2 (12.5%) view them as very easy. It is evident that majority of the students view science subjects as either very difficult or difficult as shown in figure 4.2. This information can explain why many students don't pursue science related careers in tertiary and higher education institutions. This concurs with Kihwele (2014) who notes that there is very low interest in studying science subjects in secondary schools in Tanzania.

Table 4.1: Perceptions of students' towards achievement in Sciences

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Rating/Weighted Average
I perform well because I have positive attitude towards Science subjects	29	45	12	35	65	3.33
I believe that am best in Biology, Chemistry and Physics than all my classmates.	72	50	26	28	10	2.22
I get pleasure doing sciences because I enjoy it.	60	50	31	20	25	2.46
I would work with my Science Subjects teachers to solve existing problems in Sciences to improve on my performance.	38	22	18	48	60	3.38
If I do well in Sciences. I will get a good course in college	7	11	20	63	85	4.12
I perform well because my school allows me to experience a personal satisfaction in my mission for excellence in Science subjects.	30	34	61	40	21	2.94
I put a lot of effort in Sciences because my parents motivate me to work hard in Sciences so as to get well paying profession in future.	22	23	59	42	40	3.30
I enjoy doing Mathematics, Biology, Physics and Chemistry since I admire to discover new things in the Science field.	53	43	50	20	20	2.52

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Rating/Weighted Average
I work hard to prove to myself that I am capable of completing secondary education and get good grade in Mathematics and Sciences	10	19	20	70	67	3.89
My parents advise me to take sciences seriously.	9	5	30	72	70	4.02
Honestly, am weak in science subjects I feel that it a waste of time doing science subject assignments	8	24	40	59	55	3.69
	1	2	3	4	5	
Science oriented careers are very competitive like Engineering and medicine.	17	16	3	76	74	3.94
	1	2	3	4	5	
My peers influence me to have a negative attitude towards Science subjects and perceived it hard.	11	68	62	20	25	2.89
Economic status of a parents dictates what courses their children take in the future	60	58	20	20	28	2.45
When I perform well in science subject I feel important.	22	23	59	42	40	3.30

n= 186

From the information in Table 4.1, several parameters were scored in a five point likert scale in relation to how individual students in public secondary schools in Laikipia East District view science subjects. The respondents who gave information in Table 4.1 are students. The statements as rated by students are described below; I perform well because I have positive attitude towards Science subjects with a rating average of 3.33, I believe that am best in Biology, Chemistry and Physics than all my classmates was rated 2.22 and I get pleasure doing sciences because I enjoy it was rated 2.46. Other parameters that were rated include I would work with my Science Subjects teachers to solve existing problems in Sciences to improve on my performance which had a weighted average of 3.38, If I do well in Sciences, I will get a good course in college scored 4.12, I perform well because my school allows me to experience a personal satisfaction in my mission for excellence in Science subjects was scored 2.94, I put a lot of effort in Sciences because my parents motivate me to work hard in Sciences so as to get well paying profession in future had a rating average of 3.30. I enjoy doing Mathematics, Biology, Physics and Chemistry since I admire to discover new things in the Science field was rated 2.52. The other parameters include “I work hard to prove to myself that I am capable of completing secondary education and get good grade in Mathematics and Sciences which was rated 3.89, My parents advise me to take sciences seriously had a weighted average of 4.02, honestly, am weak in science subjects, I feel that it a waste of time doing science subject assignments was rated 3.69, Science oriented careers are very competitive like Engineering and medicine was scored 3.94, My peers influence me to have a negative attitude towards Science subjects and perceived it hard had a weighted average of 2.89, Economic status of a parents dictates what courses their children take in the future had a rating average of 2.45 and finally the statement , “ When I perform well in science subject I feel important”, had a weighted average of 3.30. It was observed, the statement, “I believe that I am best in

Biology, Chemistry and Physics than all my classmates”, was rated the lowest with a rating average of 2.22, which falls under, “Disagree” category and the statement, “If I do well in Sciences. I will get a good course in college”, had the highest rating average of 4.12, which falls under, “Agree” category.

4.2.1 Students’ attitude towards Specific Science subjects

Table 4.2: Students’ attitude towards the Specific Science subjects as rated by students

Subject	Mean	Stdev
Physics	1.525	0.106
Chemistry	2.462	0.175
Mathematics	3.222	0.182
Biology	4.355	0.183

It was important to rate the students’ attitude towards the Science subjects. The information from the students was subjected to a 5-point likert scale as shown in Table 4.2. 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 4.355. In addition, students’ attitude towards Chemistry was fairly negative as shown by a mean of 2.462. Moreover, students’ attitude towards Physics was strongly negative as shown by a mean of 1.525.

According to Knecht (1965) science and technical subjects like Mathematics and business are closely linked that their teachings overlap. The higher commitment required in concentration to Mathematics concept may block some students from venturing into Chemistry and Physics. His study found out that students had negative attitude towards

Science subject which affected performance whereby attitude towards Physics had a mean of 1.497 compared to mathematic which had 6.567. Waititu (2004) revealed that approximately a half of secondary school student finds Biology very interesting, and about a quarter found it boring or very boring.

4.3 Relationship between Students' Career Preference and Performance in Sciences

The second objective was to determine the relationship between Students' Career Preference and performance in Science subjects. The respondents were asked to state the influence of future career preferred on their Science performance. The information from the respondents was subjected to descriptive statistical analysis and results are in Table 4.3.

Table 4.3: Career Preference and its influence on Science subjects' performance

Career aspiration	N	Mean	SDV	t-value
Professional and Academic 95	186	53.55	13.36	0.45 ^{n.s}
Professional and Vocational	186	53.55	13.36	0.56 ^{n.s}
Academic 95 and Vocational	186.00	12.62		0.86 ^{n.s}
	50.55	15.48		
	32	58.00	12.66	

Table 4.3 shows a Scheffe post-hoc test of two-group comparison of academic achievement in Science subjects of secondary students by career aspirations. It clearly shows that students' mean scores in Science subjects based on career aspirations is slightly

motivating them to work hard. But comparing the variables no significant difference in Science subjects' academic achievement was found among the three groups of career aspiration, since they scored slightly low t-values and the mean score were constant. The results of the post-hoc test of two-group comparison added credence to the non-significant differences in the students' academic achievement. There were no significant differences between the academic achievement mean scores of students in any of the comparative groups. Hence career aspiration was upheld.

Even though there were no significant differences in the educational attainment mean scores in Science subjects amongst the three groups of the occupational targets (professional, academic and vocational), learners who selected vocational occupations had the uppermost mean score of 58.00, followed by professional option cluster with a mean score of 53.55, whereas the academic alternative cluster came final with a mean score of 50.55. This result is held up by Udonwa (2008) whose investigation established no significant difference in junior secondary students' mean scores in the prevocational subject of Home Economics based on occupational targets even though having a mean of 54.67 on vocational jobs.

Career preference is a preferred choice of a course taken by a student which culminates to a specific career. A comparative lack of interest in a career can affect students' interest or commitment to a course and influence their academic performance. It is noted that students' motivation to undertake certain courses could be due to the recommendation of family members and friends, high availability of work and job security, rather than an interest in the course as a profession. The development of certain course professional identity is related to students' perception of themselves in the context of the course itself. Not having a strong professional identity may have a negative impact on motivation to do

well in certain subjects and other studies. The negative attitude towards learning could result in learners performing poorly, preventing them from obtaining required results.

4.3.1 Science-Related Careers Competitiveness

In this case respondents were asked to mention how competitive science-related careers are in the job market and how this affects science subject performance among students. The results were subjected to descriptive statistical analysis and the result presented in the Figure 4.5

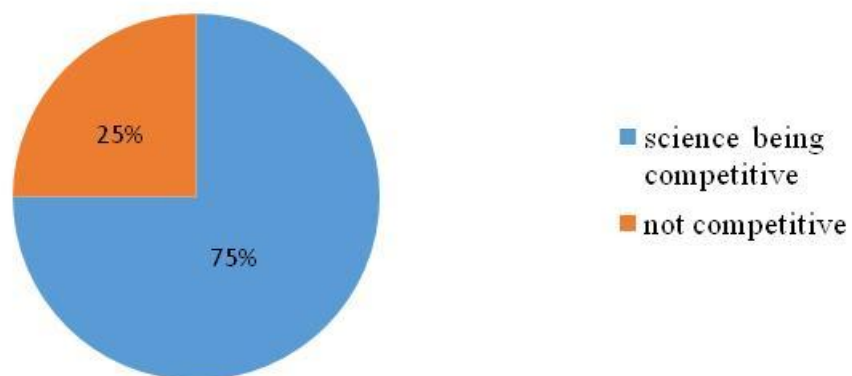


Figure 4.3: Competitiveness of Science-Related Careers in the Job Market

This research endeavored to unearth if Science subjects were believed to be competitive in the labour market. As per the results, 150 (80.6 percent) of the learners pointed out that Science subjects were competitive in the labour market whereas 36 (19.4 percent) of the learners observed that Science subjects were not competitive in the labour market. Students' enrollment of subjects based on its relevancy to their future occupational targets become even extra predominate as the learners get closer to graduation and they begin to search for jobs (Wilhelm, (2004). Wilhelm study found that 87% of his respondent agreed that job market influence students to pursue particular subjects especially when it comes to higher institutions.

4.4 Gender differences on aspired careers and performance in Science subjects

4.4.1 Gender of respondents

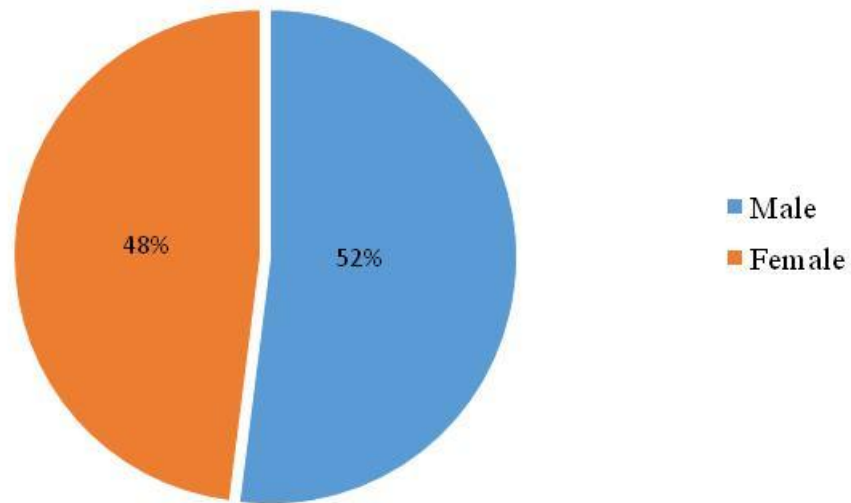


Figure 4.4: Gender of respondents

Figure 4.4 clearly shows that the majority of the respondents who participated in the study were males, who had a frequency of 97 (52 percent) compared to 89 (48 percent) for females as observed and presented by the pie chart. This gives an implication that the turnout was credible in relation to gender representation.

The third objective was to determine gender differences in aspired careers and performance in Science subjects. The respondents were asked to state their career aspirations and how it affected their performances. The information was presented in Table 4.4.

Table 4.4: Preferred careers and corresponding frequencies

Aspired career	Boys	Girls
Engineering	25	15
Nursing	22	28
Designing	10	18
Accounting	36	25
Teaching of Science	13	7

The information in Table 4.4 represents the specific number of student who aspired careers in given areas and this was not based on total number of students interviewed but was rather treated as per career aspired. From the information it can be implied that those careers that are abstract and constructive like engineering and accounting were preferred more by boys as compared to girls. The information was further subjected to thematic analysis and the results shown below.

The responses were coded under the influence of favorite academic subject if student made a linkage between their vocational aspiration and favorite academic subject in the school.

- i. I like Mathematics and Physics and I would like to be an engineer.
- ii. I like Mathematics and business because I aspire to be an accountant
- iii. I think am the best in Mathematics, Chemistry, Biology and Physics and I think I will be a nurse.
- iv. I am better in Mathematics and painting my teacher also likes it that is why I want to become a designer.

A notable vocational aspiration difference in student' favorite academic subject could be mentioned in terms of gender. For instance, statement (i) was from a boy who wanted to be an engineer stating his decision due to fun of the course. Statement (ii) was also from a

boy who wanted to be an accountant. What could be mentioned from these statements is that these were traditionally male-stereotyped occupations. Statements (iii) and (iv) were from girls who aspired careers in nursing and aspired designing. From their statement, it could be inferred that their vocational aspirations were traditionally female-stereotyped.

Students were also asked to state whether the occupation of their parents influenced their career aspirations and performance. The parents' vocation influences students through direct expressions of approvals, encouragements or discouragement about which vocations their children should pursue or not pursue in the future. Some examples were:

- a) They want me to become architecture. I do well in Physic and Mathematics.
- b) My mom told me that I should work hard to become a doctor.
- c) My dad wishes that I become a lawyer.

Role model referred to the statements where the students express that they take their mother or father as a model in their decision making for their vocation. Some expressions coded under this category were:

- a) My mom is nurse and my dad is a doctor and I admire both. It is a really nice work. I would like to become a doctor like them.
- b) I always wish to become a nurse, because my mom is a nurse. I would like to become a nurse like her; this makes me to love Biology and Chemistry.
- c) My dad is an engineer. I admire him, so I would like to become an engineer. This makes me work hard in Physics and Mathematics.

This study is in line with that conducted by Emmet and Preston (2001) who viewed that parental influence on career aspirations affects his child school performance. Their study found out that 89% of parents have influence on the career aspiration of the children. This

is seen through parental expectations of their children as they keep encouraging their sons and daughters to work hard.

Eccles et al. (1998) conducted interviews among students and found out that 62 percent of the respondent agreed that parents had a great influence to their children career aspiration hence affecting their academic performance. Their studies revealed that boys' Mathematics ability and their aspirations to enter Mathematics-related vocations, such as engineering and girls' (social) Science ability enable them to enter (social) Science-related vocations, such as nursing, designing and teaching.

4.5 Teacher Perception towards Students' Learning of Science Subject and its Influence on Performance

The fourth objective was to determine the teachers' perception and influence on students' Science performance. Respondents were asked to give their opinion on the teacher influence on choice and performance in Science subjects. Information from the respondents was subjected to descriptive statistical analysis and this was presented in the Figure 4.6.

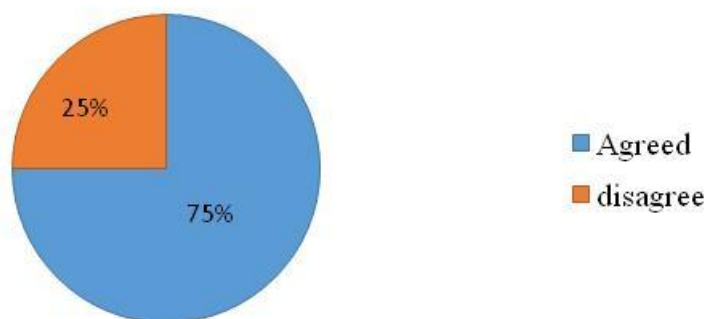


Figure 4.5: Teacher influence on subject choice

As indicated in Figure 4.5 12 (75 percent) of the teachers indicated that they influence students' choice of subjects while 4 (25percent) indicated that they do not influence subject choice. The relationship between the subject teacher and the student determines if the possibility of the student choose the subject or not. According to Kungania (2006) who investigated the factors influencing attitude of diploma teacher trainees towards science and Mathematics in Kenya found out that 70% students have a positive attitude towards Physics, perceive the Physics' teachers as competent and they perceive the Physics laboratories as well equipped compared to 30% who had different opinion. This implies that teachers who teach science subjects as a big role regarding the choice of science subject.

4.5.1 Students' level of satisfaction on teacher's methodology of handling the subject

The study sought to find out students' level of satisfaction on teacher's methodology of handling Science subject. The respondents were asked to state if the methodology employed by their teacher satisfied them. The information was subjected to descriptive statistical analysis and the results presented in Table 4.5.

Table 4.5: Students' level of satisfaction on teacher's methodology of handling a subject

Subject	Mean	Stdev
Biology	2.346	0.301
Physics	1.193	0.162
Chemistry	1.651	0.104
Mathematics	1.567	0.102

As indicated in the Table 4.5, Students were less satisfied with teaching methodologies applied in teaching Mathematics and Physics hence their low means of 1.567 and 1.193 respectively. It can also be implied that students were comfortable with teaching methods applied by Biology teacher as shown by table 4.9 with a mean of 2.346, and were averagely satisfied with teacher's teaching strategies employed by Chemistry teacher and recorded a mean of 1.651.

This study is in line with that conducted by Curran and Rosen (2003) who found that teachers who are enthusiastic, well spoken, knowledgeable, caring, and helpful as opposed to teachers, who are inflexible, and unclear influence student to like their subject the most. 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).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter outlines the summary of the findings, conclusion and recommendations of the study. Each research objective extensively summarized separately showing how it interferes with the variables of the study in order to show how they affect students' career aspiration in relation to Science subjects. This chapter is organized as per the following objectives:

The study was guided by the objectives below:

- i. To find out the influence of learners' perception of learning of science on performance in Public secondary schools in Laikipia East District, Laikipia County.
- ii. To determine how students' aspired science related careers affect performance in science subjects in Laikipia East District, Laikipia County.
- iii. To find out the gender differences in achievement in Science subjects in public secondary schools in Laikipia East District.
- iv. To determine the teachers' perception towards students' learning of Science subjects and its influence on performance.

5.2 Summary of the Findings

5.2.1 Students' perception of Learning Science

Students' attitude towards Biology was fairly positive (Stdev 0.183), Chemistry was fairly negative (0.175) and Physics was strongly negative (0.106). The findings from the teachers also indicated that 64 percent strongly agreed that students' perception influence Science subject performance whereby 36 percent disagreed.

Individuals' interests play strong roles in their choices of which activities to pursue, both in and out of school. The following factors have been suggested as being central to differences in interest and activity performances as well as academic performance of children: attainment value, intrinsic value, and utility value.

Children develop more positive competence-related beliefs and values for activities they believe are appropriate for their gender, and thus engage more in such activities. The acceptance of such a notion might have impacted students being either favourably or negatively disposed towards Science subjects. Competitiveness of science in the job market also contributes to student academic performance.

5.2.2 Relationship between Students' Career Preferences and performance in Science subjects

Subjects who opted for vocational jobs had the highest mean score of 58.00, followed by professional choice group with a mean score of 53.55, while the academic choice group came last with a mean score of 50.55. It was found that there was no significant difference in students' mean scores based on career aspirations.

The non-significant difference in the academic achievement mean scores in Science subjects among the three categories of subjects could be a reflection of the Career Aspirations Scale (CAS), students' age and sample size. The CAS made a description of the characteristics of each career options instead of specificity of the career status. Hence, the subjects might have made their career aspirations choice perfunctorily.

The age of the students might have also contributed to their completion of the career aspirations scale in perfunctory manner. The professional and academic group had equal

Sdt of 13.36 implying that students work hard in order to pass examination and attain the cutoff points of university for the academic group. While the professional group works hard to attain their dream hence this forces affect their performance. The vocational group deals with the urge to perform well regardless of the motive attached to it. This is for all round clever students who do not rely only on motivation. The outcome of the data analysis resulting in the highest performance mean score for the vocational career choice group might be due to chance. The highest performance mean score of the students who aspire for vocational career could further be accounted for as a factor of the utility value of the Science subjects as a pre-vocational subject.

The non-significant differences in the academic achievement mean scores in Chemistry, Biology and Physics among the students in the three different career aspirations group could also be attributed to the cognitive developmental theory. The theory assumes that children incorporate salient career knowledge gained from social interaction into existing mental schemas about self, prompting the reorganization of thinking over time about gender, career choice and related aspiration to accommodate new data.

These different self-schemas in turn can impact specific aspects of cognitive development in different achievement areas. Career-differentiated self-schema can drive choices of activities, indirectly affecting cognitive development. Hence, the use of career aspiration domains (professional, academic and vocational) and Science subjects to differentiate academic achievement among students may not produce any significant difference as each career domain has its own cognitive base which might not be totally offered in the school Science subjects' curriculum.

5.2.3 Gender differences in career aspiration and performance in Science subjects

This study investigated secondary school students' vocational aspiration and self-stated factors that may influence their aspiration. Utilizing a one-on-one interview procedure with 200 students, the findings of this study, in general showed consistent results with the previous studies. This study pointed out that there was a gender difference in vocational aspiration of the students as following statement made by students:

- a) I want to be an engineer.
- b) I like Mathematics and I would like to be an engineer.
- c) I am good at Mathematics and Sciences so I believe that I can become a doctor.
- d) Am good at Maths and painting and my teacher also likes it. That's why I want to become a designer

Of the 20 students interviewed and who gave related responses 9 boys against 4 girls were inclined to Science- relate careers, while 7 were neutral. For Art-oriented careers there were 6 boys against 10 girls while 4 were neutral.

In consistent with the previous studies, in this study, boys were found to aspire for more physically active, concrete and practical occupations, while girls aspired for more people-related, artistic and data-based occupations. Moreover, boys evidenced greater confidence in aspiring scientific and technological occupations, while girls evidenced more confidence in aspiring occupations in education, health and social services.

5.2.4 Teacher Perception towards Students' Learning of Science Subject and its Influence on Performance

The study revealed that the teacher influences the performance and subject choice. Students were averagely satisfied with teacher's methodology of handling Biology (mean 2.346) and Chemistry (mean 1.651) mean score respectively. They were less satisfied with

teacher's methodology of handling Physics (mean 1.193). Students' performance in Biology and Chemistry was fair compared to Physics and Mathematics. Their performance in Physics was poor. The method the teacher used to teach determined how the students performed in the subject thus choice of subject.

5.3 Conclusions

Based on the findings, the study concludes that:

- i. Students' perception of learning Science was generally negative. This results to poor performance in that particular subject.
- ii. Students appeared to have committed themselves to major decisions as regards future career. Students whose future careers were science-oriented were seen to work hard and to get better scores in sciences compared to humanities and technical subjects.
- iii. There existed gender differences in students' performance in Science subjects. Boys on average were seen to outdo girls in both enrolment and performance in science subjects.
- iv. Science Teachers influence students' career aspirations and performance in Science subjects. A teacher's methodology and the approach he/she gives the subject, contributes to students' attitude formation, liking or disliking of the subject, performance and future careers of students.

5.4 Recommendations

5.4.1 Recommendations for improvement

- i. To change the perception and negative attitude towards learning of Science, the teaching of Science should be given more practical approach. Teachers should give prescriptive feedback to students and be seen to support the students. They should at all stages of teaching/learning try to link classroom concepts to real life experiences.

- ii. Although students appeared to have committed themselves to major decisions as regards career aspirations, which in turn affect their performance in Science subjects, they should be guided to open up to a zone of acceptable alternatives. Vocational guidance should be enhanced in schools.
- iii. Girls should be encouraged to take up Sciences with seriousness. Teachers should expose girls to lady figures who have achieved in Mathematics and Sciences. This can be done through educational tours, biographies as well as inviting motivational speakers to invalidate this stereotype.
- iv. Teachers play a major role in influencing students' attitude and perception towards a subject. Science teachers in particular should not present themselves as sources of knowledge, but should rather facilitate learning. They should ensure that learning in classrooms and laboratories, is interactive to arouse interest, and that the knowledge and skills gained go beyond the classroom.

The study also recommends Effective guidance and counseling services unit to be established in secondary schools with qualified guidance-counselors to help students handle social, psychological, occupational and academic challenges meaningfully. Such services would enable the students to concentrate on studies with hope and confidence.

5.4.2 Recommendations for further studies

This study has explored the influence of career aspiration on achievement in Science subjects among students in secondary school in Laikipia East District. There is need to research on challenges facing students while choosing career. The study focused on Laikipia East District schools thus the same study should be done in other schools in Laikipia County to enable generalization of results.

REFERENCES

- Adamuti-Trache, M. (2008) Embarking on and persisting in scientific fields of study, Social class, gender and curriculum along Science pipelines, *International Journal of Science Education*, 30 (12) 1557-1584.
- Aigbomian DO (2002). *Science for All: Implication for the Teacher and National Development: 14th Inaugural Lectures of the Ambrose Alli University, Ekpoma, Edo State, Nigeria*, Benin City: Ambik Press.
- Aguele LI, Uhumuavbi P O (2003). Gender differentials in Science, Technology and Mathematics (STM) Education and self reliance. *Knowledge Review*, 2(2): 1-7.
- Ajzen I. (1980). *Understanding Attitudes and Predicting Social Behaviour*. PrenticeHall: Englewood Cliff.pg 278
- Akey, T. M. (2006). *School context, student attitudes and behaviours and academic achievement: An exploratory analysis*. www.mdrc.org. Retrieved on 20-5-10.
- Arasa JN (1995): *Relationship between students' attitudes towards, parental education and parental involvement with children's school work among slums children*. Unpublished master's thesis, Kenyatta University, Kenya.
- Aswani JS (1992). *Some of the home environment factors that influence educational and occupational aspirations of standards eight pupils*. Unpublished master's thesis, Kenyatta University
- Attar, D. (1990), *Wasting Girls' Time*, London: Virgo Press.
- Babad, E. & Tayeb, A. (2003). Experimental analysis of students' course selection. *British Journal of Education Psychology*, 73(3), 373-393.
- Baker, D. and Leary R. (2003) 'Division of Curriculum and Instruction, College of Education, Arizona State University', *Journal of Research in Science Teaching*, 40 pp.5176- 5200.
- Bandura, A. (2001). Self-efficacy and health. In N. J. Smelser & P. B. Baltes (Eds.), *International encyclopedia of the social and behavioral sciences* (Vol. 20, pp. 13815-13820). Oxford: Elsevier Science.
- Berber, N. & Jozefowicz (1999). *Gender, stereotypes and roles (3rd ed.)* Pacific Grove, CA: Brooks/Cole.
- Blickenstaff, J. C. (2005) Women and Science careers: leaky pipeline or gender filter? *Gender and Education*, 17 (4) pp 369-386.

- Bickerstaff, N. (2005). *Relationship between educational and career aspirations*. Tallahassee, Florida: Florida State University.
- Brotman, J. S. and Moore, F. (2008) „Girls and Science: A Review of Four Themes in the Science Education Literature“, *Journal of Research in Science Teaching*, 45 (9) pp.971-1002.
- Brotman, L.M. (2008) Construct validation of the social competence scale in preschool-age children. *Social Development Journal*, 123-124.
- Bystydzienski, J.M. and Bird, S. R. (2006) „Introduction“ in: Bystydzienski J.M. and Bird S.R (eds). *Removing barriers: Women in academic Science, technology, engineering and Mathematics*. Bloomington: Indiana University Press, pp. 1-22.
- Cain, M.A. 1980. *Boys and Girls Together*. Holmes Beach. Learning Publications.
- Chauhan, S. S. (2001). *Advanced educational psychology*. New Delhi: Vikas Publishing House PVT Ltd.
- Christidiou, V. (2006) „Greek Students“ Science-related Interests and Experiences“, *International Journal of Science Education*, 28 (10) pp.1181-1199.
- Cleaves A. (2005) The Formation of Science Choices in Secondary School. *International Journal of Science Education*, 27 (4), pp. 471-486.
- Crawley, F. E., & Black, C. B. (1992). Causal Modelling of Secondary Science Students intentions to Enroll in Physics. *Journal of Research in Science Teaching*, 29(6), 585-599.
- Crawley, F. E., & Coe, A. E. (1990). Determinants of middle school students' intentions to enroll in a high school Science course: An application of the theory of reasoned action. *Journal of Research in Science Teaching*, 27(5), 461-476.
- Colley, A., Comber, C. and Hargreaves, D. (2003) School Subject Preferences of Pupils in Single Sex and Co-educational Secondary Schools, *Educational Studies*, 20: 379-85.
- Crotty, M. (1998). *The Foundations Of Social Research: Meaning and Perspective in the Research Process*. London: Sage.
- Dalgety, J. and Coll R.K. (2004) „The influence of normative belief on students“ enrolment choices“, *Research in Science and Technological Education*, 22 (1) pp.59-80.

- Dennisson, B. et al. (2007). The role of aspirations, ambition and gender in predicting adult social status and earnings. *Journal of Vocational Behavior*, 77, issue 3, pp. 350-36.
- Eccles, J.S., Jacobs, J. E., and Harold, R. D.(2009) Gender role stereotypes, expectancy effects, and parents socialization of gender differences. *Journal of Social Issues*, 46, 186-201.
- Eccles, J. S. (1987). Gender roles and women's achievement-related decisions. *Psychology of Women Quarterly*, 11:135-172
- Fishbein, M., &Ajzen, I. (1980).*Attitudes and voting behavior: An application of the theory of reasoned action*. In G. M. Stephenson & J. M. Davis (Eds.), Progress in Applied
- Emmentt J. Preston D (2001). *Career Development in the elementary school in Sandu. Daya*
- England Department of Education (2011). Gender variation in developmental trajectories of educational and occupational expectations and attainment from adolescence to adulthood. *Developmental Psychology*, 44, 1069-1080.
- Francis, B. (2000) The Gendered Subject: students' subject preferences and discussions of gender and subject ability, *Oxford Review of Education*, 29(1): 35-48.
- Francis, B. Hutchings, M., Archer, L. and Melling, L. (2003) *Subject Choice and Occupational Aspirations among Pupils at Girls' Schools, Pedagogy, Culture and Society*, 11(3).
- Fraser B J, Docker JC, Fraser D 1999. Assessing and improving school climate. *Evaluation and Research in Education*, 2(3): 109-122.
- Freeman, C. E. (2004) Trends in educational equity of girls and women: 2004, Washington D.C: *National Centre for Education Statistics*.
- Gay, L.R. (1981). *Educational research: Competencies for analysis and application* (2nd ed.). Columbus, OH: Charles E. Merrill Publishing Company.
- Havard, N. 1996.Student Attitudes to Studying A-level Sciences. *Public Understanding of Science*.
- Harter, S. (1998).*The development of self-representations*. Handbook of Child Psychology (5thed.) Volume 3: 553-618. New York: Wiley.
- Igun, E. (2007). *Study Habits of Postgraduate Students in Selected Nigerian Universities*. Abraka: Delta State University Library.

- Jovanovic, J., & King, S. S. (1998). Boys and Girls in the Performance-Based Science Classroom: Who's doing the performing? *American Educational Research Journal*, 35(3), 477-496.
- Kamau, J. (2013) *Values, achievement goals, and individual-oriented and social-oriented achievement motivations among secondary school students in Kiambu County*. Unpublished Thesis University of Nairobi.
- Kasomo, D. (2006). *Research Methods in Humanities and Education*. Nairobi: Egerton University Press.
- Kibera HW (1993). *Career aspirations and expectations of secondary school students of 8-4-4 system of education in Kiambu, Kajiado and Machakos District*. Unpublished Doctoral thesis, Kenyatta University, Kenya.
- Knecht, W. (1965). *Teaching Physics Today*. Paris: OECD
- Koballa Jr., T. R. (1995). Children's Attitudes Toward Learning Science. In S. Glynn & R. Duit (Eds.), *Learning Science in the Schools* Mahwah, New Jersey: Lawrence Erlbaum.
- Koballa Jr., T. R. (1988). The determinants of female junior high school students' intentions to enroll in elective physical Science courses in high school: Testing the applicability of the theory of reasoned action. *Journal of Research in Science Teaching*, 25(6), 479-492.
- Kombo, T. (2006). *Guidelines to Proposal and Thesis Writing*. Pauline publication Africa, Nairobi Kenya.
- Kungania, M. (2006). *Factors Influencing Attitude of Diploma Teachers Trainees towards Mathematics and Science in Kenya*, Nairobi. Unpublished Masters Thesis, Kenyatta University.
- Laikipia East District (2014) DEOs records.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques*. (2nd ed.). New Delhi: New Age Techno press.
- Lightbody, P. et al (1996). Motivation and Attribution at secondary school: the role of gender. *Educational studies*, 22, 13-25
- Malgwi, C.A., Howe, M.A., & Burnaby, P.A. (2005). Influences on students' choice of college major. *Journal of Education for Business* 80(5), 275-282.

- Meece, J. L., Wigfield, A., & Eccles, J. s. (1998). Predicts of Mathematics anxiety and its consequences for young adolescents' course enrollment intentions and performances in Mathematics. *Journal of Educational Psychology*, 82:60-70.
- Miller, P.-B., Slawiski and Schwartz, S. (2006) ,Gender differences in High- School students' Views about Science", *International Journal of Science Education*, 28, (4) pp.363-381.
- Moon, B. & Shelton, M. (1994). *Teaching and Learning in the Secondary School*. Wallingford, United Kingdom: Routledge.
- Mulemwa, J. (1997) *Scientific, technical and vocational education of girls in Africa*. Uganda: Education Sector.
- Mugenda and Mugenda (1999) *Research methods*, Nairobi: Acts press.
- Mugenda, Kimani, Maina and Wainaina (2010). A survey of female representation in higher education in Kenya. *Identify opportunities for Policy action*. Longhorn Publications ISBN 978 9966 36 9988.
- Mwangi, C. (2008). Relationship between Achievement Motivation and Mathematics Performance . Unpublished thesis. University of Nairobi.
- Nagy, G., Trautwein, U., 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*, 12(4), 323-345.
- Newzealand Education Review Office, 1999.
- Njogu, R. (2014). *Educational and vocational Aspirations of Minority and Female Students*. A case Study of Mathira Division, Kenya. Unpublished Thesis. University of Nairobi.
- Norwich, B., & Duncan, J. (1990). Attitudes, Subjective Norm, Perceived Preventive Factors, Intentions and Learning Science: Testing a Modified Theory of Reasoned Action. *British Journal of Educational Psychology*, 60, 312-321.
- Obanya P 2007. *Fundamentals of Guidance and Counselling*. Ibadan, Nigeria: Heinemann Educational Books(Nig.) Plc.
- Ocho, R.A (1997). Gender valuation of Science and technology education among secondary school students in Enugu. In: GA Badmus and LO Ocho (Eds): *Science, Mathematics and Technology Education in Nigeria*. Enugu: The Nigerian Academy, pp. 207 – 219

- Okoli J.N., (1995). *Effects of Two Interactive Learning Styles on Students' Achievement and Interest in Biology*. Ph.D Thesis, Unpublished. Nsukka: University of Nigeria.
- Okeke AN 2000. The impact of school subjects on the choice of careers and profession. *West African Journal of Education*, XVII(1): 5 – 11.
- Ominde: (1965) Kenya Commission Report.
- Ormerod, M. B., & Duckworth, D. (1975). *Pupils' Attitudes to Science*. Slough: NFER.
- Ormerod, M. (1971). The 'social implications' factor in attitudes to Science. *British Journal of Educational Psychology*, 41, 335–338.
- Orodho, J. A. (2009). *Elements of Education and Social Science Research Methods*. Nairobi: Masola Publishers.
- Orloskey D.E. (2007). *Educational Administration Today*. Ohio: Charles, E. Merrill.
- Osborne, J. and Collins, S. (2001) „Pupils views of the role and value of the Science Curriculum: a focus group study. *International Journal of Science Education*, 23 (5) pp. 441-467.
- Peel, C (1998). The effect of learning environmental factors on students motivation and learning. New York; *International Journal of Science Education*.
- Piburn, M. D. (1993). If I were the Teacher.....Qualitative Study of Attitude Toward Science. *Science Education*, 77(4), 393-406.
- Phipps B J (1995). *Career dreams of preadolescent students*. J. Career Dev. 22:19-32
- Potter, J. and Wetherell, M. (1987). *Discourse and social psychology: beyond attitudes and behavior* (London: Sage Publications).
- Renninger, K. A. (1998). Individual interest and development: Implications for theory and practice. In K. A. Renninger, S. Hidi & A. Krapp (eds.), *The Role of Interest in Learning and Development* (pp.361-369). Hillsdale, NJ: Erlbaum.
- Rose, A. J. & Smith, Rubin, R. L., W. M. Bukowski & B, Laursen, (eds) (2009) *Sex differences in peer relationships: Handbook of peer interactions, relationships and groups*, pp.379-393. The Guilford Press, New York.
- Ruble, D. N. & Martins, C. L. (1998). Gender development. In W. Damon (Series Ed.) and N. Eisenberg (Vol.Ed.). *Handbook on Child Psychology*, (5th ed.), 3:933-1016.
- Schiefele, U. (1999). Interest and learning from text. *Scientific Studies of Reading*, 3: 257-280.

- Salisbury, G. & Riddle, P. (2000). *Career Aspirations and Knowledge about Career and Technical Education*. Blackwell Publishing Ltd.
- Serem, K. (2009). *Gender-role stereotyping and career aspirations: A comparison of gifted early adolescent boys and girls*. *Journal of Secondary Gifted Education*, 13(3), 96-107.
- Simpson, R. D., & Oliver, J. S. (1985). Attitude toward Science and achievement motivation profiles of male and female Science students in grades six through ten. *Science Education*, 69(4), 511-526.
- Smith, J.S., Feldwisch, R., & Abell, A. (2006). Similarities and differences in students' and parents' perceptions of the transition from middle school to high school. *Research in Middle Level Education*, 29(10), 1-9 (Anderson et al., 2008, p. 1316).
- Stables, A. (1997) Perspectives on subject choice: the case for a humane liberalism in Curriculum planning, *Journal of Curriculum Studies*, 29(2), pp. 197-208.
- Stanworth, M. (1981) *Gender and schooling*. London, Hutchinson.
- Somerset HCA (1971). Educational aspirations of fourth from pupils in Kenya *unpublished paper presented at the Science conference, Nairobi*.
- Talton, E. L. and Simpson, R. D. (1987). Relationships of attitude toward classroom environment with attitude toward and achievement in Science among tenth grade Biology students. *Journal of Research in Science Teaching*, 24, 507–525.
- Tobias, S. (1990). *They're not dumb, they're different: stalking the second tier* (Tucson, AZ: Research Corporation).
- Trice, McClellan and Hughes (1992). *Do children's career aspirations predict adult occupations? An answer from a secondary analysis of a longitudinal study*. *Psychol. Reports* 72:368-370
- Udonwa, R. E. (2008). *Individual and environmental variables on home economics achievement of junior secondary school students in AkwaIbom State, Nigeria*. Unpublished Ph.D. Thesis, Uyo: University of Uyo.
- UNESCO (2006). *Education for All Global monitoring Report: Literacy for life*. Parts.
- UNESCO. (2011). *Systematic monitoring of education for All Parts*. United Nations Education Organization.

- UNESCO (2006). *A human-right based approach to education for all*. Retrieved from www.unesco.org.
- UWEZO (2011). Trajectories of career aspirations through adolescence and young adulthood: Early math achievement as a critical filter. *Educational Research and Evaluation*, 12, 347-358.
- UWEZO (2014). The family and educational aspirations. *Journal of Marriage and the Family*, 60, 704–714.
- UNESCO (2012). *Institute for lifelong learning*. Retrieved from <http://www.unesco.org/en/confinteavi>
- Waititu, M. (2004). *Exploring and Students Perception of Difficulty in Topics Areas of the Kenya Secondary School Physics Syllabus*. Unpublished Masters Thesis, Kenyatta University.
- Wigfield, A., & Eccles, J. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25 (1), 68-81.
- Wigfield, A., Battle, A., Keller, L. B. & Eccles, J. S. (2000). Sex differences in motivation, self concept, career aspiration and career choice: Implications for cognitive development. In A. V. McGillicuddy-De Lisi & R. De-Lisi (Eds). *Biology, sociology and behavior: The development of sex differences in cognition*. Greenwich, CT: Ablex.
- Wikeley, F. and Stables, A. (1999) Changes in school students' approaches to subject option choices: a study of pupils in the West of England in 1984 and 1996, *Educational Research*, 41(3): 287-299.
- Wilhelm, W.B. (2004). The relative influence of published teaching evaluations and other instructor attributes on course choice. *Journal of Marketing Education*, 26(1), 17-30.
- Whitelaw S, Milosevic L, Daniels S 2000. Gender behaviour and achievement: A preliminary study of pupil perceptions and attitudes. *Gender and Education*, 12(1): 87 – 113.
- Whitehead, J. M. (1996). Sex stereotypes, gender identity and subject choice at A level. *Educational Research*, 38(2), 147-160.
- Whyte, I. 1986. *Girls into Science and Technology: The Story of Project*. London: Routledge and Kegan Paul.
- Woolnough, B. (1994). *Effective Science Teaching*. Buckingham: Open University Press.

APPENDICES

APPENDIX I: RESEARCH QUESTIONNAIRE FOR STUDENTS

SECTION A: Personal information

Please provide responses to the following items. Your answers will remain strictly confidential and WILL NOT affect your grade in this subject.

1. School name
2. Gender (tick \surd one)
Male Female
3. Age (in years) (fill in):
4. What is your guardians/parents occupation?.....
5. Are you repeating this class? (tick one)
Yes No
6. Who do you live with?
With both parents With your grandparents or aunt
With only father Staying with mother
With father and step mother relatives
With mother and step farther
Others (specify):
7. Where do your parents or guardians stay?
Near the school
Far from school
8. What is the academic level of your parent?
No formal education
Primary school certificate
Secondary school certificate
College certificate/Diploma
University degree

SECTION B: Career Aspirations and Influence on Achievement In Science Subjects

Direction: You are required to read the following statement and make a decision whether to agree, strongly agree, neutral, disagree or strongly disagree. Your choice will be highly appreciated.

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

S. NO.	Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
1.	I perform well because I have positive attitude towards Science subjects	1	2	3	4	5
2.	I believe that am best in Biology, Chemistry and physic than all my classmates.	1	2	3	4	5
3.	I get pleasure doing sciences because I think I enjoy it.	1	2	3	4	5
4.	I would work with my Science Subjects teachers to solve existing problems in Sciences to improve on my performance.	1	2	3	4	5
5.	If I do well in Sciences. I will get a good course in college	1	2	3	4	5
6.	I perform well because my school allows me to experience a personal satisfaction in my mission for excellence in Science subjects.	1	2	3	4	5
7.	I put a lot of effort in Sciences because my parents motivates me to work hard in Sciences so as to get well paying profession in future.	1	2	3	4	5
8.	I enjoy doing Mathematics, Biology, Physics and Chemistry since I admire to discovery new things in the Science field.	1	2	3	4	5
9.	I work hard to prove to myself that I am capable of completing	1	2	3	4	5

	secondary certificate and get good grade in Mathematics and Sciences					
10.	My parents advise me to take sciences seriously.	1	2	3	4	5
11.	Honestly, am weak in science subjects I feel that it a wastage of time doing science subject assignments	1	2	3	4	5
12.	Science oriented careers are very competitive like Engineering and medicine.	1	2	3	4	5
13.	My peers influence me to have a negative attitude towards Science subjects and perceived it hard.	1	2	3	4	5
14.	Economic status of a parents dictates what courses their children take in the future	1	2	3	4	5
15.	Due to the fact that when I perform well in science subject I feel important.	1	2	3	4	5

Open ended questionnaires

Do you think students' career aspirations affect their general performance?

Yes [] No []

If yes give a reason

.....

In your class who perform better than others in Sciences?

Girls [] Boys []

What can you say about your answer above?

.....

**APPENDIX II: TEACHERS' QUESTIONNAIRE ON STUDENTS'
PERFORMANCE IN SCIENCE SUBJECTS**

A: Background information

Please provide responses to the following items. Your answers will remain strictly confidential.

1. Numbers of years in teaching Science

1-5 yrs 5-10 yrs 10 -15 yrs
15 – 20 yrs above 20yrs

2. General academic performance of students in the school

Below Average Average
Good High

3. General performance in Sciences in the school

Below Average Average
Good High

4. General performance in Arts in the school.

Below Average Average
Good High

5. Please tick below on the way you view Science Subjects

Very Difficult Difficult
Easy Very Easy

6. Is there a variation in the general academic performance of boys and girls?

Yes No

7. Explain your answer in 6 above

8. What's your observation on performance between girls and boy in the school? Tick the following statements as true on false

Statement/Parameter	True	False
Boys perform better than girls in sciences		
Girls perform better than boys in sciences		
Both boys and girls perform poorly in sciences		
Both boys and girls score above average in sciences		

9. List possible factors that lead to the variation in performance in sciences between boys and girls.

- i)
- ii)
- iii)
- iv)
- v)

10. Explain the relationship between students' career aspirations and their performance in Sciences.....

.....
.....

11. Does students home background/ economic status has an influence on his/future career?

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

12. "Educational level of a student's parent contributes to the student's future career and performance in various subjects". To what extent do you agree/disagree with this statement?.....

.....
.....

APPENDIX III: INTERVIEW SCHEDULE FOR STUDENTS

SCHOOL:

GENDER: Male [] Female [] **Class** []

1. According to you, are Science and Mathematics subjects hard?
2. What would you like to become after you finish your studies? Tick in the spaces below
3. Would you like to pursue a Science-Oriented career in the future? Please explain.
4. Does your family background influence your future career?
5. Please Explain why you would like/not like a Science-Oriented career.
6. Some people think that Science Careers are meant for men. What is your view?

APPENDIX IV: AUTHORIZATION LETTER



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: E55/NKI/PT/23430/2012

DATE: 3rd September, 2015

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR SIMON MAINA MACHIRA – REG. NO. E55/NKI/PT/23430/2012

I write to introduce Mr. Simon Maina Machira who is a Postgraduate Student of this University. He is registered for M.Ed degree programme in the **Department of Educational Management Policy and Curriculum Studies**.

Mr. Machira intends to conduct research for a M.Ed Project Proposal entitled, **“Influence of Career Aspiration on Achievement in Science Subjects in Laikipia County, Kenya”**.

Any assistance given will be highly appreciated.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'L. Mbaabu', written over a horizontal line.

MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL

ST/rwm

APPENDIX V: NACOSTI AUTHORIZATION LETTER



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/15/66296/8243**

Date:

23rd November, 2015

Simon Maina Machira
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Influence of career aspiration on achievement in science subjects in secondary schools in Laikipia County, Kenya,”* I am pleased to inform you that you have been authorized to undertake research in **Laikipia County** for a period ending **13th November, 2016.**

You are advised to report to **the County Commissioner and the County Director of Education, Laikipia County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. S. K. LANGAT, OGW
FOR: DIRECTOR GENERAL/CEO

Copy to:

The County Commissioner
Laikipia County.

The County Director of Education
Laikipia County.





APPENDIX VI: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MR. SIMON MAINA MACHIRA
of KENYATTA UNIVERSITY, 273-10400
nanyuki, has been permitted to conduct
research in Laikipia County

on the topic: INFLUENCE OF CAREER
ASPIRATION ON ACHIEVEMENT IN
SCIENCE SUBJECTS IN SECONDARY
SCHOOLS IN LAIKIPIA COUNTY, KENYA

for the period ending:
13th November,2016

.....
Applicant's
Signature

Permit No : NACOSTI/P/15/66296/8243
Date Of Issue : 23rd November,2015
Fee Received :Ksh 1,000


by **Director General**
National Commission for Science, Technology and Innovation