

**FACTORS INFLUENCING STUDENT'S CHOICE OF PHYSICS AS AN
EXAMINABLE SUBJECT IN SECONDARY SCHOOLS IN WARENG
DISTRICT**

BY

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DECLARATION

DECLARATION BY THE CANDIDATE

This thesis is my original work and has not been presented for a degree in any University. No part of this thesis may be produced without prior permission from the author and or Moi University.

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DEDICATION

This thesis is dedicated to my beloved husband, Dr. Emmanuel Wanjala and our children Hope, Elisha and Joe for their love, patience, moral and financial support.

I owe my sincere thanks to my parents, brothers and sisters and my in laws for their moral and mutual support towards the successes of my education endeavors.

More so, I thank my staff mates at Kijabe Boys High School for their persistent assistance for the period that I was away for studies.

Above all I thank the Almighty God for having provided me with the opportunity to undertake the study.

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LIST OF ACRONYMS AND ABBREVIATION

AIP	American physics society
HOD	Head of Department
KIE	Kenya Institute of Education
KCSE	Kenya Certificate of Secondary School
KNEC	Kenya National Examination Council
MOE	Ministry of Education
MDG	Millennium Development Goals
SMASSE	Strengthening Mathematics & Science in Secondary Education
STM	Science Technology and Mathematics
SPSS	Statistical Package for Social Scientists
NTI	National Teachers Institute
UN	United Nations
UNESCO	United Nations Education Science and Cultural Organization

ABSTRACT

The purpose of this study was to establish the factors that influence the choice of Physics Subject by students as an examinable subject in secondary schools in Wareng District. The objectives were: to determine how student's career aspirations, family, peer pressure, teachers of physics and the school facilities influenced student's choice of physics in secondary schools in Wareng District. The study was based on Ecological systems theory by Urie Bronfen Brenner (1979) who believed that a person is influenced by culture and his surroundings, such as their parents, friends, school and work. The study adopted descriptive survey research design that made use of questionnaires, interviews and observation check list. The sample size consisted of 209 respondents comprising of 183 students and 26 teachers, from a target population of 850 students and 48 physics teachers. They were selected through Stratified and simple random sampling method from five area cluster zones; Cheptiret, Kesses, Timborowa, Kapseret, and Tulwet. This formed 30% of the target population. A total of 193 respondents gave information for the study, out of 209 giving a response rate of 91.90%. Data was collected using questionnaires for the form three students, an interview schedule for teachers of Physics and an observation check list. Data collected was presented in form of tables, frequencies and percentages. Data was analyzed by Statistical Package for Social Scientists (SPSS). The study found out that students were influenced to choose Physics by various factors; the students were influenced by future career aspirations and the fact that physics was a requirement for most of the science courses in the University. Family failed to provide advice and encouragement. The students also lacked role models in the family. Students did not take Physics to be respected by friends nor to suit in the peer group. Therefore most students did not chose physics because of peer pressure. Teachers of physics influenced students by allowing them to participate in science congress and symposium, using good teaching methods that made the subject simple and interesting, and taking them to the lab for practical more often. Finally availability of school facilities like enough text books, adequately equipped laboratories, organization and participation in physics contests influenced students. The study recommended that schools empower their careers department to initiate talks as early as in form one to make the students aware of the importance of learning physics subject, family members should learn to talk positively about the subject, encourage, and give advice to students, Teachers should emphasize on taking students to the labs for practical more often to simplify concepts, make the subject interesting, and draw learners' attention, organize and allow students to participate in science congress and symposium as often as possible to build the learner's confidence and finally schools should build laboratories and equip them with learning materials for practical lessons to meet the practical needs of the students. The findings will be used by head teachers, KNEC and parents to improve on the enrolment and performance of students who choose physics as an examinable subject in secondary schools.

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CHAPTER ONE

INTRODUCTION TO THE STUDY

1.0 INTRODUCTION

This chapter deals with the background of the study, statement of the problem, purpose and objectives, research questions, justification, significance, the scope, limitations of the study, the theoretical framework and definition of terms.

1.1 BACKGROUND OF THE STUDY

One of the overriding United Nations (UN) Millennium Development Goals (MDG) is the elimination of illiteracy among the residence of developing countries by the year 2015 as education is vital to development. Consequently, education is increasing gaining prominence as one of the more important subjects in Africa in her endeavor to escape illiteracy and poverty, (UNESCO, 2004). Many countries of the world, African countries included have invested substantial amount of money in their budget to enhance attainment of education to the citizens (Kyalo, *et.al.*, 2006).

During the curriculum development process in Kenya, various measures were put in place which included curriculum diversification and abolition of school fees in primary schools to make education affordable. In its efforts to reform the education system the government set up various commission and working parties to review education system which made recommendation for changes to make education relevant to the country. (Abagi and Olweya, 1999).

Milliron (2007) cited by Mbithe (2012) notes that if we outfit our students with skills such as critical thinking, creativity and courage they will be ready for a better life in a globally connected world. One way of doing this is through the teaching of physics in

secondary schools. Physics endeavors to understand the underlying laws governing our universe. By understanding those laws, we can better interact with and harness our environment.

To gain perspective into how much physics has contributed to our livelihoods Pravica (2005) cited by Mbaabu *et.al.*, (2011) considers the following as miracles from physicists; alternating current, hydroelectric power, electric motors, radio, microwave, ovens, satellites, radar, modern rocketry, nuclear magnetic resonance, magnetic resonance imaging, x-rays, lasers, transistors, light emitting diodes, oscilloscopes, television, holography and the world web among many others. There is a deep symbiosis between discovery in physics and new technology. We all benefit from the priceless contributions of physics. Contributions from physics, generate many trillions of dollars for the world economy and aid our existence immeasurably.

The importance of physics can not be over looked by humanity. Francisco,B.(2010) states

Even if perhaps the society does not realize it, many of the advances in science and technology that we know and enjoy today have been the result of scientific research where physics played a key role. In addition it is believed that knowledge of physics and physics related sciences are indispensable in many professions and for economic developments (pg 3)

Only science with physics as its foundation can solve many of the impending crises facing our society, such as global warming, overpopulation, waning energy and other natural resources, and the poisoning of our planet.“Vision 2030 on science, technology and innovation is to intensify its application, to raise its productivity and efficiency level across the country in accelerating economic development in all the newly industrializing country”. The aim of the vision is to transform Kenya into a

newly industrializing, middle income country providing a high quality life to all its citizens by the year 2030 (Kenya Vision 2030).

To realize this vision, i.e. educational vision of “raising the quality and relevance of education” (Vision 2030) has to be fulfilled. For Kenya to achieve its vision 2030 of industrialization, the issue of relevance should be geared towards fundamental subjects in its curriculum to its young generation. One of the relevant subjects in this case is physics. Physics is “a gate keeper for technology (Kale, 2005).

Physics is a fundamental subject in our society and a major ingredient of science and technology (Taylor, 1984) cited in (Omosewo, 2003). Physics as a science has the reputation of being a difficult subject to master, but like many challenging things in life, it leads to many satisfying rewards to the individuals and the nation in question. Physics is said to enhance career options and is necessary for technological progress to occur in a country

A degree in physics leaves one poised to enter many professions. The discipline of physics teaches skills that are transferable to those professionals. These transferable skills include mathematical modeling, problem solving, designing experiments, and interpretation of experimental data, research experiences, laboratory techniques and communication skills. Physics in the upper secondary is “a gate keeper” for technology and medical studies (Kale, 2005). Physics is the most basic and fundamental of all the sciences. American physics society AIP (physics central. com.). Taylor (1984) cited in (Omosewo, 2003). observes that physics remains a fundamental

subject in life and that it is so basic a subject that there is scarcely a single area of modern life which is not affected by physics.

According to AIP Physics: physics has various important applications for the benefit of the society: physicists invented nuclear energy and discovered superconductivity. They are the creators of Relative Theory and Quantum mechanics. Their theories explain gravitation, nuclear reactions, chemical reactions, energy transfers, light and radiation, the forms of matter and all the processes and interactions that we witness every day.

Physics theories are the basis of present scientific knowledge and physicists are the scientists that develop physical theory. Physicists end up in all sorts of interesting jobs and virtually never unemployed, because of their broad training and adoptability.

They are needed at the start of new technologies and machines or in particularly challenging projects such as space missions remote explorations and failure assessment, developing new materials for industry, electronic devices and components, doing medical physics in a hospital, teaching the next generation of physicists in schools and higher institutions, predict the next major earthquakes, developing flight simulation software, launching a new software company or product, performing urban planning and optimization. The above importance and applications agrees with what Taylor, (1984) said that physics is a fundamental subject in our society. According to (Omosewo, 2003) physics is a major ingredient of science and technology.

However despite the importance of physics subject especially in this modern age of science and technology, the subject is plagued by persistent low enrolments and poor performance of students in schools (Balogun, 1985), (Omosewo, 2003). In secondary schools in Kenya, physics is a compulsory subject in the first two years of the secondary cycle and in most schools students opt to do without it in third and fourth year of secondary cycle.

Inadequate supply of qualified teachers of Physics (Mwei, 1987) has also been improved. Several universities like Moi, Nairobi, Kenyatta, Egerton, Masinde Muliro and Jomo Kenyatta and private universities like Catholic and Mount Kenya to train science teachers for secondary schools. This has improved the availability of Physics teachers in most schools, though there is still a shortage of science teachers in secondary schools. (Ongeri, in Daily Nation 1st March, 2011).

Omosewo, (2003) comments on the situation in Nigeria and says it was recommended in Nigeria that a powerful awareness campaign be mounted to enlighten parents and teachers on the roles in promoting Science, Mathematics and Technology education among their female children. It was dedicated that special automatic scholarship should be given to female students studying physics from the secondary school level upwards, female participation in politics should increase so as to afford them opportunity of influencing policies that favour women participation in education.

Nevertheless despite the above efforts the choice of physics by students as an examination subject in Nigeria secondary schools is still on the lower side. Physics remains unpopular subject amongst students and this is why this study is designed to

find out what factors influence its choice.(Auster, 1982) cited in kiboss(1997) reported that most of the influence on subject and career choice of females was found to be related to parental level of education and occupation. According to Omosewo (2003) parents influenced the choice of physics by female students. Parental and social cultural background of the students had significant effects on student's choice of physics. It was noted that students depended more on their parent's advice in choosing physics and other science subjects (Jegede, 1984) (Diamond, 1986).cited in Kamau(2010)

Some scholars like Uyanga, (1999) and Balogun, (1985) have argued that Gender difference has been an issue in physics subject. There has been low participation rate of female in universities and more boys than girls tend to opt for all basic sciences at school certificate level examinations because boys are more generally disposed to Science and Mathematics than girls. However, in the KCSE 2010 results girls disapproved the above findings. Girls took top position in physics. Kenya High Schools, a girl's school was a leading with a mean of 11.2745 Daily Nation P.g 5. 1.13. 2011773 (pg 5)

There were four girls schools appearing in top 10 in physics performance in KCSE; Bahati girls fourth, Muthale girls fifth, Moi Tea girls ninth. This shows that gender is no longer an issue as long as a student has interest in the subject.

Interest in physics can be seen as a psychological construct that emerges from student's interaction with physical objects and with physics as a school subject (Kalle, 2005). Interest is a medium of supporting learning processes and the quality of learning.

Future relevance creates interest in the content of science subjects (domains of science). Interest is context e.g. science in society where certain science domain is met, interest in activity type of students, influence of peer and family. Therefore to increase the number of students choosing physics in secondary school, it is important to help them see the future relevance of physics (Kelle, 2005).

Table 1.1: Enrolments in KCSE Examination in Mathematics and Science Subjects in Kenya Subject

	2010 Total enrolment	Female	%	Males	%	2009 Total enrolment	Females	%	Male	%
Mathematics	353,871	157,816	44.5	196,055	55.5	335,014	151,915	45.3	183,099	51.7
Biology	315,063	148,729	42	166,334	47	299,302	143,359	42.7	155,943	46.5
Physics	109,072	29,964	8.5	79,108	22.4	104,188	29,233	8.7	74,955	22.3
Chemistry	347,378	155,725	44	191,653	54.2	328,922	149,755	44.7	179,167	53.4

[Http/www.scribd.com/doc/44933701KCSE/statc](http://www.scribd.com/doc/44933701KCSE/statc)

From the table it can be seen that the number of students who take physics at KCSE level are few as compared to other science subjects. The same problem is witnessed in wareng district where the number of students who took Physics at KCSE level in the year 2009 and 2010 is low as compared to those who took Chemistry and Biology. Table 1.2 below shows the enrolments in Mathematics and Sciences in Wareng district in the year 2009 and 2010.

Table 1.2: Enrolments in KCSE Examination in Mathematics and Science Subjects in Wareng District

Subject Enrolment	2010	2009
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Mathematics	3022	2968
Biology	2915	2830
Chemistry	2853	2778
Physics	361	329

In Kenya the KNEC examination report (2004-2008) indicates that the overall performance of students at KCSE has been on improving trend although it has raised deep concern over the low enrolment in physics. Considering the year 2007 only 54645(28.20%) candidates sat the KCSE examination out of the total number of candidates of 193 823 students.

Table 1.3. Enrolment of Physics In KCSE 2006 – 2008

Year	Total No. of Candidates	No. of Physics enrolment	Percentage of candidates	Mean score
2004	181947	40061	22.00	43.81
2005	193702	54645	28.20	35.24
2006	197118	54180	27.48	41.55
2007	205232	55877	27.22	44.06
2008	222676	60082	26.98	42.84

Source KNEC 2006:66

[Http/www.scribd.com/doc/44933701KCSE/statc](http://www.scribd.com/doc/44933701KCSE/statc)

Physics being a fundamental subject in our society (Taylor, 1984) and a major ingredient of science and technology, needs urgent readdress in terms of enrolment.

From the above analysis ,there was need to investigate what factors influenced students choice of physic as an examination subject in secondary schools ,leading to low enrolment and possibly try to improve on those factors early enough to increase the enrolment in the future.

1.2 STATEMENT OF THE PROBLEM

The development and progress of any nation depends on science. Our industry and thus national property depends on it. Physics is a “gate keeper” for technology and medical studies. Physics bridges between Engineering, Chemistry, Mathematics and Biology. Physics is very much involved in the manufacture of machines used in both major and minor industries.

There has been a joint effort from internal and external sources to improve the learning of physics as a science subject. The UNESCO and KNEC have tried to address the problem of teaching methodology (Kimiti, 1984). Several universities like Moi, Nairobi, Kenyatta and Egerton have been expanded to train science teachers for secondary schools thus improving the availability of physics teachers in most schools.

In addition, powerful awareness campaigns have been mounted to enlighten parents and teachers on their roles in promoting Science Technology and Mathematics. Also scholarships have been given to female students studying physics (Omosewe, 2003) and female participation in politics has an increased policy that favors women participation in education in most countries.

Nevertheless, the researcher has observed that in Kenya, the enrolment and performance of physics is still poor. Most schools have even opted to teach Biology and Chemistry leaving out Physics. In most schools where physics is taught, small number of students enroll for Physics, for example in 2010 there were only 109,072 students who enrolled for physics compared to 347,378 and 315,871 students in Biology and Chemistry respectively. In Wareng district the same year 2010 there

were 361 students who enrolled for physics compared to 2858 and 2915 students in Biology and Chemistry .Therefore there was need to find out why there is still low enrolment

The purpose of this study was therefore, to find out what factors influenced the student's choice of physics as an examination subject in secondary schools in Wareng District.

1.3 PURPOSE OF THE STUDY

The main purpose of the study was to investigate the factors that influenced the students' choice of Physics as an examinable subject in Secondary Schools in Wareng District

1.4 OBJECTIVES

The objectives of the study were:

1. To determine how student's career aspirations influenced their choice of physics as an examination subject in secondary schools in Wareng District.
2. To establish how student's family influenced their choices of physics as an examination subject in secondary Schools in Wareng District.
3. To establish how peer-pressure influenced student's choice of physics as an examination subject in Secondary Schools in Wareng District.
4. To determine how teachers of physics influenced the student's choice of physics as an examination subject in secondary schools in Wareng District.
5. To establish how the facilities available in the school influenced student's choice of physics as an examination subject in secondary schools in Wareng District.

1.5 RESEARCH QUESTIONS

The research was guided by the following questions

- i. How does the student's career aspiration influence their choice of physics as an examination subject in secondary schools in Wareng District
- ii. In what ways did the student's family influence their choice of physics in secondary schools in Wareng District?
- iii. In what ways did peer influence student's choice of physics in secondary schools in Wareng District?
- iv. How does the teacher of physics influence student's choice of physics in secondary schools in Wareng District and if yes to what extent?
- v. How does the facilities available at school influence student's choice of physics?

1.6 JUSTIFICATION OF THE STUDY

It was worth conducting an investigation on factors influencing choice of physics in schools because of the following: Physics is "a gate keeper" for technology and medical studies (Kale, 2005) (Omosewe, 2003). Physics is also a major ingredient of science and technology. Therefore for us to achieve vision 2030 of industrializing our country Kenya, there is need to increase the enrolment of physics subject in Secondary schools. More form four products need be released out with physics knowledge.

Vision 2030 aims at transforming Kenya into a newly industrializing, middle income country providing a high quality life to all its citizens by the year 2030. It aims at intensifying science, technology and innovation to accelerate economic development in all sectors of the country. For the vision to come true all citizens are to be part of

the vision. The government on its part can plant this vision in its young generation through control of the curriculum in this case, by increasing the enrolment of “gate keeper subjects” like Physics to impact knowledge needed for individual development. Student can use such knowledge at school and outside school like in the case of self employment in the *jua kali* sector.

1.7 SIGNIFICANCE OF THE STUDY

The findings of the study would be useful to the following;

- 1) The inspectorate unit, of the ministry of Higher Education that is responsible for curriculum development, interpretation, and implementation and through ‘SMASSE PROJECTS’ would be able to identify, judge and select suitable textbooks for use in secondary schools, and carry out the in-service courses to improve the teachers skills and competence on handling specific hard topics in physics subject.
- 2) The curriculum reviews like Kenyan institute of curriculumDevelopment (KICD) can use the results of this study to come up with a more student friendly curriculum.
- 3) Physics teachers will benefit from this study for they can use the results to improve on the teaching of Physics

1.8 SCOPE OF THE STUDY

The study confined itself to the factors that influence choice of physics by student as an examinable subject in secondary school. It was conducted in Wareng District in Rift Valley Province in Kenya. Using descriptive survey research design the study covered 46 schools.

The participants were only drawn from Form Three Class, since these students had just chosen the examination subjects thus could share the factors that influenced them to make choices in the physics subject. Specifically the study was an investigation of the factors that influenced the students' choice of Physics as an examinable subject in Secondary Schools in Wareng District

1.9 LIMITATION OF THE STUDY

In view of the scope of this study, the researcher anticipated the following limitations. The study was carried out in secondary school in Wareng district consequently the results of this study due to the uniqueness of the specified environment might be suitable only for drawing generalization within the schools of similar characteristics as those used in the study.

- 1) The focus was on form three students because several factors discussed in this study have influenced them to choose or not to choose physics. This may limit generalization of the findings to other classes.
- 2) School policies were likely to be a limitation

1.10 ASSUMPTIONS OF THE STUDY

The study was based on the following assumption;

- 1) All students were taught physics and were given equal chance to choose physics at form three at will and Physics was taught as a compulsory subject in forms 1 and 2.

1.11 THEORETICAL FRAMEWORK

The study was based on Ecological systems theory by Bronfenbrenner. (1979)

According to Bronfenbrenner, the process of human development is shaped by the interaction between an individual and his or her environment. The specific path of

development was a result of culture and of the influences of a person's surroundings, such as their parents, friends, school and work. This is clearly shown diagrammatically below.

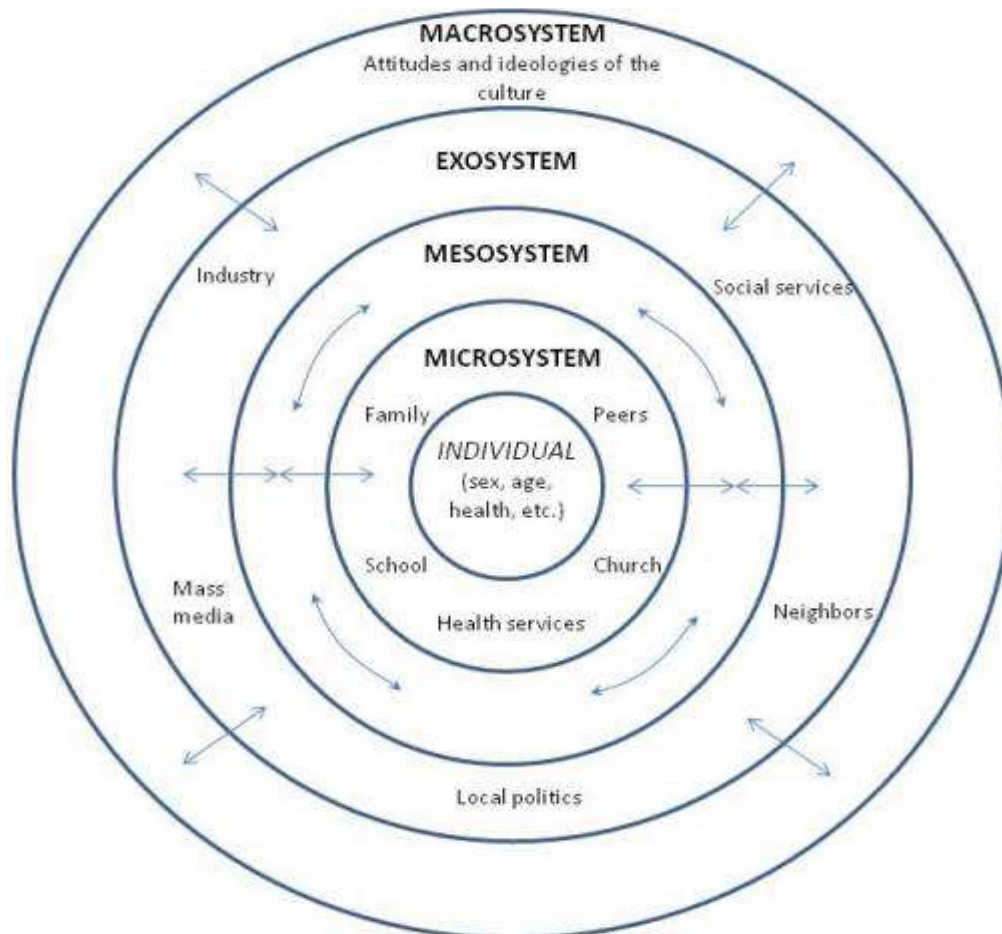


Figure 1.1: Ecological systems source Bronfenbrenner. (1979)

Ecological systems theory, also called development in context or human ecology theory identifies five environmental systems with which an individual interacts. This theory provides the framework from which community psychologists study the relationships with individuals' contexts within communities and the wider society. The five systems according to Bronfenbrenner (1979) are:-

Microsystems: Refers to the institutions and groups that most immediately and directly impact the child's development including: family, school, religious institutions, neighborhood, and peers. In this study it is very clear that a student has a very big impact from the microsystem where he/she interacts through out in life.

Mesosystem: Interconnections between the Microsystems Interactions between the family and teachers Relationship between the child's peers and the family

Exosystem: Involves links between a social setting in which the individual does not have an active role and the individual's immediate context. For example, a parent's or child's experience at home may be influenced by the other parent's experiences at work. The parent might receive a promotion that requires more travel, which might increase conflict with the other parent and change patterns of interaction with the child.

Macrosystem: Describes the culture in which individuals live. Cultural contexts include developing and industrialized countries, socioeconomic status, poverty, and ethnicity. A child, his or her parent, his or her school, and his or her parent's workplace are all part of a large cultural context. Members of a cultural group share a common identity, heritage, and values.

The macrosystem evolves over time, because each successive generation may change the macrosystem, leading to their development in a unique macrosystem.

Chronosystem: The patterning of environmental events and transitions over the life course, as well as sociohistorical circumstances. For example, divorces are one transition. Researchers have found that the negative effects of divorce on children often peak in the first year after the divorce. By two years after the divorce, family interaction is less chaotic and more stable. An example of sociohistorical circumstances is the increase in opportunities for women to pursue a career during the last thirty years

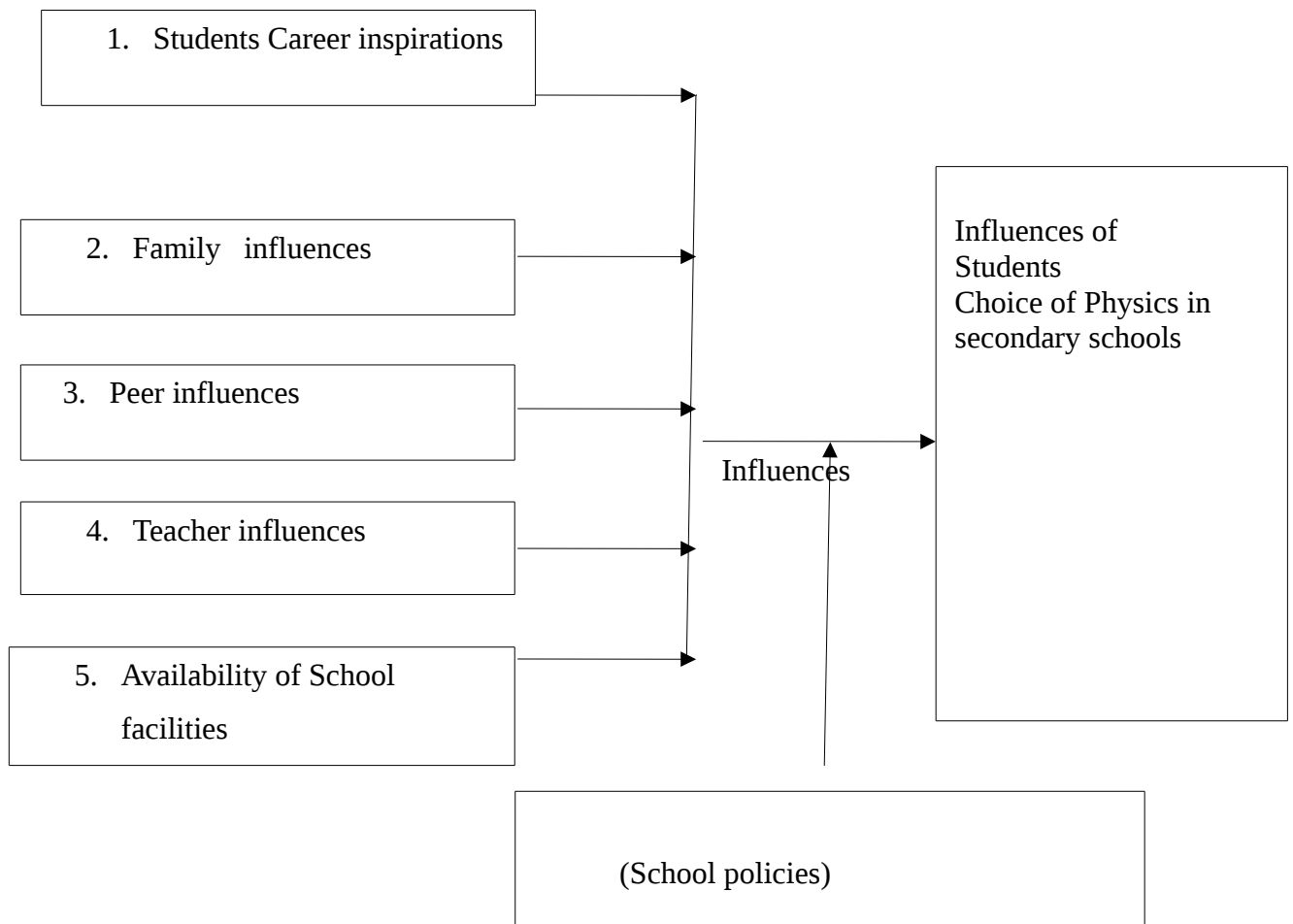
The above five systems relate to the study; the student is at the centre, his/her interaction with the microsystem which constitutes the family, peer, school, will influence the student to choose or not choose physics subject. The mesosystem involves the interaction between parent, student and the teacher. The exosystem involves the industry which in this case creates the need for career aspiration in the student. The mass media may talk positively about physics and local politics could offer scholarships to students who take physics. A neighbor constitutes uncles, aunts, and any other persons who act as a role models. The macro system constitutes the student's attitude and interests which automatically make a student choose or not choose physics as an examinable subject.

This also relates with the study because "a person's surroundings is formed by parents, friends, school and work will influence his or her choices. Parental advices and encouragement, peer talks on likes and dislike or ambitions, resources available in a school and job market will determine how students view subjects at school.

1.12 THE CONCEPTUAL FRAMEWORK

The conceptual framework of this study is presented below

Independent variable



The independent variables; are career, family, peer, physics teacher and school facilities.

The dependent variable is choice of physics. Intervening variable is school policies.

1.13 OPERATIONAL DEFINITION OF TERMS

An exam: Is a format test that you take to show you knowledge of a subject or to obtain a qualification.

Aspiration: A strong desire to have or to do something

Choice: Is an act of selecting or choosing between two or more possibilities according to this study students can either choose to take all the three sciences (chemistry, biology and physics) or take only chemistry and biology leaving out physics.

Career aspiration: A strong desire to work with physics related jobs. In this study students who want to work in physics related jobs like engineering would study physics in secondary school.

Career: The series of jobs that a person has in a particular area of work, usually involving more responsibilities as time pass.

Attitude: refers to the positive or negative evaluation of Physics.

Curriculum: refers to all that is selected, organized integrative, evaluative and innovative learning meant to achieve designated learning outcomes.

Enrolment: refers to the total number of students who have registered for the Physics course for examination at KCSE level.

Examinable subjects: Is that subject which is given for an exam. In this study physics is studied and offered in the KCSE examination by KNEC.

Factors: Is used in this study to refer to an influence contributing to choice of a subject.

Family: A group of people who are related to each other, especially parents and their children. In this study they have a great influence on what students study in secondary school.

Peer group: The group of people you know who may be the same age as you are or who have the same social status as you

Peer pressure: In this study the student's classmates and friend from other schools would influence one's choice of physics.

School facilities: They include physics laboratories, equipments, chemicals, lab technicians, available in a school which motivates students to choose physics.

Student Interest: it is the liking of something. In this study it means the liking and tendency towards choosing physics subject.

Teacher influence: Is the power that a teacher has to make his student agree to take or not take physics.

1.14 SUMMARY OF CHAPTER ONE

This chapter consisted of the background to the problem, statement of the problem, theoretical framework, hypothesis, purpose of the study, significance of the study, the limitations and scope of the study, and operational definition of terms.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews and summarizes the literature on the importance of science education in society, the development of science curriculum in Kenya and factors influencing choice of physics as an examination subject in KCSE.

2.1 Science Education in Society

Before the beginning of the nineteenth century, the study of science was either a hobby or the few people with means or solitary effort of someone with scientific talent (Das, 1985) cited by Wachanga (2000). Science has developed to a level where we today live in scientific civilization in which science is no longer confined to a few individuals or countries that are developed Wachanga (2000).

Science is involved in food production and preservation, health care, transport systems; telecommunication and energy conservations science affects all aspects of human life. Every person in the society requires scientific knowledge in order to fit in the present society. This teaching of science has become part of the general education of society Mohapatra (1989).

Physics as a science subject is like a pivot joint in the Kenyan secondary schools curriculum since other subjects like Chemistry, Biology and Geography depend on it. The study of physics involves pursuit of the truth and hence instills diligence, patience and objectivity among learners. Physics learning develops the scientific habits in students, which are transferable to other areas in life. Such habits involve non-reliance on superstition, critical thinking and respect for other people's opinions. The above qualities when learned help solve many problems for individual and social living Das (1985).

Physics also prepares students for vocation and careers at tertiary levels of learning and in life generally. The teaching of physics should therefore be done such that learners understand and like the subject. More students should be encouraged to take it as an exam subject in KCSE.

2.2 Aims of teaching science in secondary schools

According to Salleh (2004) Physics is a branch of knowledge about the material world. Nature provides all the material resources that human beings need to live and manage their living. The human beings-material resources interaction must be based on some understanding on the properties of matter, how they behave and the laws that they are subjected to. Physics is one of the sciences in the secondary school curriculum. Like 15 other subjects it performs some vital roles which help in the

achievement of some national goals. Goodstein (1999) cited in Wachanga (2000) believes that “a solid education in Physics is best conceivable preparation for the lifetime of rapid technological and social change that our young people must expect to face”.

The K.I.E (2005) syllabus presents Physics as a body of knowledge about the physical environment. It employs a systematic scientific methodology of study to arouse learners’ way of reasoning and create a positive attitude. To this end the use of teacher/learner discussion, teacher demonstration and group/class experiments as methods of instruction is encouraged. The syllabus not only emphasizes the understanding of the fundamental scientific concept and principles, but also the experimental approach of investigation. The experimental approach should prepare the learner to present scientific concepts and ideals in the modern technology. Further the syllabus presents project work and this approach provides the learner with opportunities in undertaking investigations for purposes of finding solutions to problems. According to Salleh (2004) advancement in science and technology is coupled with the deterioration of the ecosystem and greater use of chemicals and technologies that affect our health systems, we therefore need the relevant science or physics knowledge and understanding that can help us understand the physical world around us.

Kenya Institute of education (2005) outlines that students must choose at least two sciences or chooses all the three which include physics, chemistry and Biology
According to KIE (2005), after four years of instruction the science curriculum should;

- Create curious minds in learners which is basic requirement for carrying out inquiries and arriving at conclusions and make use of discoveries.
- Create confidence in students to an extent that they can perform experiments with events in their day to day life.
- Stimulate students to view science as interlay of theory, experimentation and application for scientific discovery.

The physics component of 8-4-4 system of secondary education cycle puts emphasis on the measurement of quantities and collection of data. Through experimentation and observation,

hypothesis established is drawn, tested and consequently laws and principles (KLB, 2003).

2.3 Students Achievements in Physics

In Kenya the KNEC examination report (2004-2008) indicates that the overall performance of students at KCSE has been on improving trend although it has raised deep concern over the low enrolment in physics. Considering the year 2007 only 54645(28.20%) candidates sat the KCSE examination out of the total number of candidates of 193 823 students.

Table 2.1 Enrolment of physics in KCSE 2006 – 2008

Year	Total No. of Candidates	No. of Physics enrolment	Percentage of candidates	Mean score
2004	181947	40061	22.00	43.81
2005	193702	54645	28.20	35.24
2006	197118	54180	27.48	41.55
2007	205232	55877	27.22	44.06
2008	222676	60082	26.98	42.84

Source KNEC 2006:66

[Http/www.scribd.com/doc/44933701KCSE/statc](http://www.scribd.com/doc/44933701KCSE/statc)

2.4 Factors Influencing Student's Choice of Physics in Secondary Schools

2.4.1. Career Choice

According to Lyons (2004) in his research on choosing physical science examination in Australia, physics and chemistry are conceptualized as subjects having a primarily strategic value, in that they would enhance the student's university and career options. Students would therefore choose the subjects strategically in preparation of future career. Springate et al (2008) observes that

The most important influence on decisions to study chemistry and physics across Bangladeshi interviewees was their perceptions of careers with a physics or chemistry degree. Other important influences were their future ambitions and their enjoyment of physics and/or chemistry. (pg 42)

Another important influence on student's career choice are extra-curricular activities, recent editorial (students belief about science, 2004). Student's free activities can influence their interest about science and their perspectives about career choice. For example science clubs, links with local industries, invitation of speakers, and scientists. School visits encourages students to enter science career. Mass media is the primary source of scientific information for most Americans. Studies of primary sources of information about the nursing profession found almost one-third of the nurses stated television as the information source for nursing careers, while only 3% cited information presented to them in school. Springate et al (2008) states this

it emerged that where role models existed in chemistry and physics they had considerable impact, with both A-level students and undergraduate students claiming that someone they knew or were aware of had inspired their enthusiasm for chemistry or physics. Such influential figures also included the young people's relatives, peers, older students and family friends (and in this sense the influence of role models overlaps with the peer influence, 'peers in careers/subjects (page 38)

Difficulty and prior achievement are strongly linked to course uptake and there is a relationship between them. Sharp, Hutchison and Keys (1996) in their survey teachers perceived difficulty as the highest factor that discouraged take up of science followed

by negative subject image. There is evidence that past or previous performance of Physics influence its choice. According to Weiner (1992) attributions for past performance influence future performance.

Real academic performance is influenced by the importance that students attach to good performance. According to Aduda (2003) students shun physics when given an option and this especially applies to girls. That is given a choice a student would rather drop physics in favour of other science subjects. For a long time physics has been mystified as difficult and hence some schools do not offer it. Cheng, Payne and Witherspoon (1996) as cited by Smyth and Hannan (2006) say that prior success within science in terms of performance is associated with subsequent take up of scientific subjects.

Further Smyth and Hannan (2006) found out that students are more likely to take science subjects if they find them interesting and useful and if they do well in science, and are less likely to take the subjects if they find science difficult. Polard et al. (2003), Wikeley and Stable (1999) as cited by Owoyele and Toyobo (2008) found that performance of students in junior school examination determine students placement in the senior school level. It is noted that students took account of their previous experiences academically in making option choices.

Attitudes of students towards Physics have been found to influence its choice. Attitudes are acquired through learning and can be changed through persuasion using a variety of techniques. Attitudes once established help to shape experiences the individual has with object, subject or person. Although attitudes can change gradually,

people constantly form new attitudes and modify old ones when they are exposed to new information and experiences. Attitude is an internal state that influences the personal actions of an individual, he recognized attitude as a major factor in subject choice. Mbaabu, (2011) states that

As students get involved in performance of experiments, making of observations and descriptions, they develop a liking for the subject. the availability of physics equipment influences students' attitude towards physics positively (page 19)

According to Hoofman (2002) as cited by Semela (2010) the choice of Physics as a major field of study or taking higher Physics courses is shaped by students interest, motivation and prior achievement. Existing literature show that interest in Physics strongly related to Physics self concept. Bloom (1976) found that twenty five percent (25%) of the variance in achievement could be attributed to students" attitude towards science. Kempa and Dude (1974) cited by Mbithe(2012) reported that students interest in science is associated with their achievement in science. Olatonye (2002) agrees with the two that students attitudes towards science have significant direct effect on student achievement.

Student's enjoyment and liking for the subject are reported to be very significant factors in career choice by students and teachers alike. Reid and Skryabina (2002) noted that in Scotland in contrast with the rest of the UK and other countries, Physics is the fourth most popular subject at higher grade students take at age 18. Literature shows that career goals influence the students" choice of Physics. Perceived strategic usefulness of Physics is a significant predictor of the choice. Mbithe (2012) observes that

career goals influence the students' choice of Physics. Perceived strategic usefulness of Physics is a significant predictor of the choice. Teachers and students rate career intentions as an important influence on school student course choice. Students report that they choose Biology for interest but tend not to choose the physical sciences for this reason.(pg 19

Teachers and students rate career intentions as an important influence on school student course choice. Students report that they choose Biology for interest but tend not to choose the physical sciences for this reason. Tinto (1993) as cited by Ogunkola and Fayombo (2009) asserted that well defined career plans or goals positively influence decisions of students to remain in college. In addition Hull-Blanks et. al (2005) found that students with a well defined job related career goal were more likely to decide to persist in college than students without such a career goal..

Study habits have been found to contribute significantly to students' physics achievement. Studies done by Olatonye and Ogunkola (2008) as cited by Ogunkola and Fayombo (2009) indicated that study habits makes significant contribution to the prediction of physics achievement. This implies that if a physics student exhibits negative study habits (e.g. lacks concentration, feels bored, tired and sleepy while studying physics, spends little time on physics and does not map out immediate goals to attain), it is likely that the student may lack the impetus to engage school students experience many physical, emotional and intellectual changes, their middle school years. This is the time when most of them some students begin to seriously consider future careers where parents, siblings, peers, teachers, and school play a significant role in helping students choose a career path.

If emphasis is placed on the importance of science throughout the middle school years, student's was influenced to choose science related career. The above research

indicates clearly that value should be put to science and in my case physics to influence the students choose the subject. Students are often not taught the importance of science during middle school. To better influence students to choose science-related careers, information about what do middle students believe about science and who has the greatest influence on middle school students' science career choice is needed. This indicates that in form 1 and 2 students need to be taught importance of physics and its value made clear to change their beliefs earlier enough to influence their choice.

2.4.2 Student's interest

(Lyons, 2004) found out that in his research that physics and chemistry are considered to be the most difficulty of the science courses and generally most difficult than other subjects. He noted that self efficacy was an important consideration especially by girls.

(Wachanga, 2000) noted that besides maximizing understanding, students who are self motivated will have interest in a subject and will make teacher's job of managing the instruction programe simple.(Ausubel, 1968) as cited by (Wachanga, 2000) suggests that in school setting motivation has three components which consist of cognitive drive, age enhancing and affinitive.

Cognitive drive: These are the motivational effects of a learner finding a task interesting or related to the individuals need for competence: in this study students was compelled to choose physics if they familiarizes with the subject.

Ego enhancing – these are factors that refer to learners feelings about status, self esteem and having success such factors would drive a student to choosing physics.

Afflicted components: These are factors that bring a person to a level of approval of others like winning administration of the peers. The factors will motivate a student to choose physics to as to be admired by peer.

If you think the subject is hard, it becomes hard. But if you think you are positive about it, it becomes simple Kananya (1996) cited by (Lyons, 2004) students who think that physics subject is hard they do not choose it but those have interest in it and are positive would choose the subject even if they have low marks, and work hard to improve. .

Taylor and Fransis (2012) As expected, the image of physics as a difficult subject surfaced in the study. The students recognized unequivocally the utilitarian value of physics: physics is said to enhance career options and is necessary for technological progress to occur in a country. They also showed high interest in school physics—this is so even for students who are not keen to study physics in the future, a finding which is at variance with other studies reported from Western countries. Though the physics choosers showed greater intention in physics, they were generally not inclined to pursue physics-related careers after graduation.

Springate et all (2008) observes that \high influence factors: enjoyment of physics and chemistry, future ambitions, perceptions of careers with a physics or chemistry degree, and the relevance of physics/chemistry study to life Mbithe (2012) in her study found that students were influenced in their choice of Physics through their career goals, their poor attitude towards Physics, their perception of Physics as difficult, poor study habits, poor previous performance and their gender.

2.4.2. Family Influence

(Lyons ,2004) in his research in Australia on choosing physical science effamin noted that students would chose physical science due to such cures as parents positive comments, positive behavior and personal histories about the science.(Lyons ,2004) found out some students saw the high status of their parents' credentials or occupation as representing what could be achieved through University study. When parents held positive discussions of science related issues, helping students with science projects and home work, sharing views of science, TV documentaries helped such students to choose science subjects even higher levels.

He noted that parental use of science language encouragement and good parental child relationship also motivated students. Parents occupations i.e. medicine, engineering science teaching etc, and parent's financial stability was the factor that motivates students.

Springate etal (2008) observes that family influence is a medium influence factors, images of scientists and the work they do, is also acts as a medium influence factor.

Springate etal (2008) observes this

The degree of influence that parents exerted on their children can be categorized into three levels: Parents encouraged their children towards specific subjects and careers, and actively discouraged them from other paths , Parents encouraged their children to ensure they worked towards a good career, without specifying what it should be. Parents supported and advised their children without influencing them to take any particular direction. (page 21)

(Lyons ,2004) on the other hand noted that students would not take science especially chemistry and physics if parents encourage them to do what they enjoyed or was good rather than basing decisions on the strategic values of particular courses.

It has been observed that girls generally experience a drop in their self-confidence in mathematics and science before they experience any academic decline (Wachanga, 2000). The drop in confidence is related to the deferential treatments girls and boys received in school (Shermen, 1978) cited by (Lyons, 2004). The low self confidence among girls is attributed to the cultural and moral values transmitted by the parents to their daughters such a case is when construction kits are given to boys and dolls given to girls. The attitude developed is then reinforced through the school systems

Physics, which is the bedrock of science and technology can be studied effectively by female students if parents make all efforts to see that their female children go for science technology and mathematics subject such as Medicine, Engineering, Architecture. Agriculture, Computer, Geology, Technology etc. The role of parents and society as a whole cannot be overlooded. This has been found to be inhibitive particularly where parents are illiterates. Auster and Auster (1982) cited by (omosewe 2003) reported that most of the influence on subject and career choice of females was found to be related to parental levels of education and occupation. More importantly, the report asserted that educated parents of females are in a better position to guide their children and motivate them to choose subjects and careers related to STM education because of their advent

According to Peel (1998) in Oriahi, Uhumuavbi and Aguele (2010) students often receive conflicting advice from parents, teachers, friends and career advisors, and upon entering senior secondary school there can be a mismatch between expectations and actual experiences. The difficulty students may have in obtaining informed advice can influence their choice of science subjects. According to Millican, Richards and

Mann (2005) cited in Mbithe (20012) one of the major difficulties inspiring students about careers in engineering is that their main source of information, their teachers, are usually not much better informed than them

2.4.3. Peer influence

According to Moon and Mayes (1994), cited in Mbithe (20012) membership to the norms and values of a particular peer group make a difference to the school attainment and involvement of students. A student whose friends work hard is likely to work hard and be tuned into the teacher's value. Taylor and Francis (2012) states that Parents and peers at school, on the other hand, are perceived to display unenthusiastic attitudes toward physics. Springate et al (2008) in his study stated that

The students discussed how peers could be a source of inspiration, support, motivation and encouragement to one another to achieve their best and aim for successful futures. Peers were also felt to be a source of competition. Within this environment, students are motivated to achieve well, and do as well as their peers. In so doing, messages emerged across the groups about how particular careers were more revered than others and hence some were a greater marker of achievement. Although chemistry and physics are considered respectable subjects and careers (e.g. indicator of intelligence), they were often not deemed as the most desirable and hence the sense of competition and motivation towards these destinations was undermined and directed towards alternative options. Young people may select subjects and careers from a limited range depending on their currency and value at that time amongst peers.(page 37)

Children tend to stick to the peer expectations if they had to fit with the peers (Beal, 1994) in Fennema and leader (1990) cited in Mbithe (20012) inobserved that peer group is an important reference for childhood and adolescent socialization and therefore perpetuates set role differentiation through gender patterns subjects' preference\ and carrier intentions peer would influence one to choose physics to suite in the group if others have chosen the subject. Peer would also influence one to work

hard if the others are working hard and will also influence one to choose physics related life, the whole group choosing engineering in Nairobi University.

According to a study by Owoyele and Toyobo (2008) students' choice of subjects at school is influenced by jointly peer pressure, parental will and academic ability but it is influenced more by peer pressure and parental will than their academic ability. A study by Tella et.al (2007) as cited by Owoyele and Toyobo (2008) indicated that peer pressure has a positive effect on students' subject selection and achievement growth. Further results of a study by Ablard (1997) in Owoyele (2008) reported that adolescents enjoy peer support on choice of school subjects and vocational aspirations.

Owoyele (2008) found out that peer support has also been found to be positively related to adolescents' academic achievement and choice of school subjects. According to Dryler (1999) as cited by Smyth and Hannan (2006) peer groups have also been found to be influential, with boys' and girls' choices correlating with the choices of their same sex classmates, but not with those of opposite sex classmates. A study by Balogun (1985) showed that more boys than girls tend to opt for all the basic sciences at school certificate level examination because boys are more generally disposed to science and mathematics than girls. Parents have great influence on their children especially when they are young. A study by 21

Labudde et. al (2000) as cited by Tuaundu (2009) revealed that there should be a strong bond between Physics contents and students everyday experiences. This implies that students who are exposed to technological toys and games (which in most

cases are boys) will have greater interest in mathematics and science because of the existing knowledge that they have. This knowledge plays an important role in the understanding of mathematics and science. Gilbert and Calvert (2003) as cited by Tuaundu (2009) found out that most young women do not see themselves as being capable of studying and succeeding in mathematics and science, therefore they are not interested in it.

The myths and realities of women progressing in mathematics and science field were studied by David et al (1996) in Tuaundu (2009) concluded that the attitudes adopted by girls from parents, teachers, friends, and society have a significant influence on the girls choice and performance in science and mathematics.

2.4.4 Teachers Influence

Taylor and Francis (2013) observed that School physics is seen to be relevant, and physics teachers are viewed as being able to foster students' interest in physics . the way physics and chemistry are taught, physics and chemistry teachers, it's the teachers who makes the subject real and interesting and attractive to students .This seen as a medium influence factors:Mbaabu, F. N. et.al (2011) noted that

It is important to appreciate that teacher competence will translate into learning gain the students if they are utilised in the process of instruction. teachers' characteristics and more so their competence influences students' attitude towards physics(pg 18)

Mbithe (2012) also found that teachers influenced the students' choice of Physics through their missing of classes, poor relationship with students, unsuitable pace of content delivery and poor methods of teaching. If teachers promote science related programs then one would expect students to develop positive attitude and liking towards such carriers. Teacher's effectiveness in teaching physics is a significant

variable of student's achievement. (Mondon, 1994) teachers mastery of contents, interpersonal skills and choice of teaching methods influence teaching effectiveness. This builds students confidence in the subjects.

Hargreaves (1989) says that what the teacher believes, what the teacher thinks, what the teacher assumes, all these things have powerful implications for the change process. According to Hewson and Hewson (1989) as cited by Freitas, Jimenex and Mellado (2004) science teachers are considered as having conceptions about the nature of science, about scientific concepts and about how to learn and teach them. These are usually deeply rooted conceptions and a teachers' first step in his or her education and professional development is to reflect on these conceptions critically and analytically.

Teachers do not change their conceptions easily, however and even less so their teaching practices. In some cases this is because their conceptions are the fruit of many years they themselves spend at school. Teacher preparation and mastery of subject influence effectiveness of teaching. According to Huibregtse and Wubbels (1994) cited by Kiboss(2000) many teachers use pedagogical methods that are similar to those they preferred in their own teachers when they were students or simply teach in the same way they themselves were taught.

Further Bell and Gilbert (1994) as cited by Freitas, Jimenez and Mellado (2004) say that teachers feel satisfied with certain teaching models that have been consolidated by professional experience or because they do not have any teaching strategies readily available that they find better for real daily work of teaching their specific subjects

and for the students learning. The teacher is the mediator who transforms content into depictions that are comprehensive to the students. Teachers' educational strategies depend very much on the material being taught, and their classroom practice and activities relating to the subject matter. A study by Kiboss (1997) as cited by (Kiboss (2000) showed that students' conceptions about science might be negatively affected by the way the teacher presents the subject. For example the use of such techniques as lecturing, giving notes and drilling students on past examination papers, which most teachers find as useful strategies, may make pupils perceive science subjects as the mastery of some formulas and / or as a way of receiving and storing information.

According to Linder (1992) and Simpson and Oliver (1990) as cited by Kiboss (2002) this eventually makes them lose interest in the subjects. Risala (1985) recommended that science teachers should use a variety of teaching methods. A study by Kumar and Altschuld (2002) showed that video-based science methods influenced the knowledge and understanding of effective ways of teaching science. The video-based science methods enabled teachers to plan and teach science with confidence, in addition to relating science with other disciplines and societal issues in classrooms.

UNICEF (2009) asserts that in many developing countries, a higher percentage of teachers lack the prerequisite levels of education and training needed to rise from challenges of school reforms geared for improved performance. Further Torongey (1986) established that science teachers especially Physics teachers' characteristics such as pace of content delivery, comments made in class, frequency of missing lessons among others contribute to negative attitudes by students towards science.

According to Rono (1985) some teachers even go a head to use very difficulty terms that students could not easily understand as an excuse to hide their ignorance.

A 1988 report on science achievement (international association for the evaluation of educational achievement. Elementary and secondary schools were not laying a satisfactory foundation for advanced science and engineering education and this was due to poor preparation in mathematics and science. The way in which physics is taught The way in which physics is taught within the school at junior cycle also influences students attitudes and orientations to the subject and thus their likelihood of continuing to take physics. 24

Further, teacher student relationship affects the performance of Physics. A study by Brekelmans et al. (1990) found that student perceptions of the teacher influence are related to cognitive outcomes. There has been high teacher turnover from public schools to privately sponsored schools in the recent past. Most teachers of natural science have moved to the industrial sector where the terms of service are better.

In Uganda teachers earn about US\$ 400 (KSHS 304,000) per year which is ten times less than their peer in private sector. South Africa is exceptions, as primary teachers have entry level salaries of between US\$ 70,000 (KSHS 532,000) and US \$1300,000 (KSHS988,000) per year according to the level of qualification and post (education insight, 2005) In Kenya teachers earn from Ksh 5,000 – 45,000

Due to low pay in most African countries, teachers are forced to take a second job or run their own business, poor moderation accounts for the high levels of teacher absenteeism developing countries. WBNAS (2004) showed that teacher's absence rate was 45%. In Ethiopia with 10% of the teachers absent themselves for more than three days a week, the absence rates was 28.4% in Kenya and 27%in Uganda

In Kenya absenteeism is lower in private schools as compared to public schools especially those not easily accessible to supervision by QUASO. Teachers is therefore caused by poor payments of the science rented by the teachers High level of teachers absenteeism is the main caused of insufficient syllabus coverage (Education Insight 2005).

(Cervone ,2001) stated that the function of an educator is not simply to give the student more information but rather to change them by giving them the tools they need to continue their learning throughout the rest of their life.

2.4.5 Interpersonal Skills

The role of the teacher is to make an effort to convey the subject contents in such a way that the content is effectively delivered. This is done by including an increased feeling in the students of being personally in control of overt the teaching experience. An efficient teacher provides effective devices for maintaining the students self esteem, (Frrant, 2005)

An effective method of teaching aims at linking Instructional methods used learning with life. The object in teaching should be to bring more and more (Aggarwal1995).

The quality of teacher in terms of training, teaching experience and frequency of attendance of in service courses improves students achievements

Kocher (1992) explains teaching as an art and a teacher as artists, who creates learning situations, motivates the child to learn, arranges for conditions that help in the growth of the child's mind and body. He further explains that a teacher utilizes the initiations and play urges of the children to facilitates learning, terns children to creative beings , inspires them with nobility of thoughts , feelings and actions, makes them self reliant and resourceful and helps them to be what they can be.

The only difference between an artists and a teacher is that an artists deals with a learner, a human being who is alive\ growing, developing with his or her own will. A teacher therefore plays an important role in shaping the leaner in her or his totality and can influence his/her attitude towards subjects. Teachers can encourage students to choose physics if they so wish. Teachers as role models catch the attention of their students in class. They influence what students learn and even how they choose their subjects. Bandura (1977)

2.4.6. Availability of School Facilities

Taylor and Francis (2012) observed that Laboratory work, enrichment activities, and physics textbooks were reported to be important in order to encourage students to like physics. This is true as physic is a practical subject .

Mbithe (2012) in her study found out that school environment influenced the choice of Physics by the type of school and the availability of laboratory equipment

Irmbi (1990) carried out a study to investigate the factors which influence students achievements in Kiambu district of Kenya the findings of this research revealed that schools related factors such as, availability of texts books, supplementary materials, of teachers , training and attitudes had significant effects on the students

achievements. Achievements is a factor of subject selection such as that if school have the above factors then students was motivated to chose physics.

According to Okakes, Selvin, Karoly and Guiton (1992) as cited by Smyth and Hannan (2006) schools are found to make assumptions about the abilities and needs of their student intake, assumptions which guide their decisions about which courses to offer. Roger and Duffield (2000) found that schools can influence course up-take indirectly through subject packaging for optional subjects and more subtle encouragement of the take-up of particular types of subjects. Aduda (2003) asserts that despite the fact that physics is an important subject in economic, scientific and technological development most schools have made it optional in form three and four and others do not offer it at all.

According to Smyth and Hannan (2006) schools vary in the way in which scientific subjects are made available within the school; they may allow certain ability groups to take particular subjects or they may set prerequisite for taking certain subjects (e.g., a student may need to achieve a certain grade in order to be allowed to take a subject). At upper secondary levels, schools vary in the way in which scientific subjects are made available within the school and the way they are time tabled against each other are factors which affect the take –up of physics

According to Millican, Richards and Mann (2005) physics is an experimental subject. General principles and concepts are more easily understood if they are demonstrated in the laboratory. Laws and relationships are more fully appreciated if the student investigates and verifies them at the laboratory bench. According to Shiundu and

Omulando (1992) the school management should endeavor to provide necessary resources for the support of teaching and learning especially the purchase of relevant textbooks, building and equipping laboratories with correct apparatus and chemicals to facilitate effective learning in the school. School with less provisions, fewer teachers, poor school buildings and inadequate facilities will have a negative influence on the attitudes and academic achievements of the learners.

A study conducted by Yildiz, Akpiner, Aydogdu and Ergn (2006) showed that having no science laboratories or inadequate equipment in science laboratories in schools affect teachers attitudes towards the aims of science experiments in a negative way. Science experiments are inseparable and indispensable parts of learning experiences. The experiments provide both acquiring science concepts and learning scientific method for learning experiences. According to NTI (2007) physics as a subject is activity oriented and the suggested method for teaching it is guided discovery method and is resource based. This suggests that the mastery of physics concept cannot be fully achieved without the use of instructional learning materials. The teaching of physics without learning materials will certainly result to poor performance.

According to Bolorunduro (1998) as cited by Alabi (2008) provision of necessary facilities in schools will provide a challenging environment for students to learn and for effective teaching by the teachers. On the other hand Olubor (1998) says that lack of adequate facilities such as textbooks, ill-equipped classrooms, laboratories, workshops and library are among the probable causes of students " poor performance in examinations. Further Smyth and Hannan (2000) indicate that science take up tends

to be higher in schools which emphasize practical work and students' participation in classroom activity at both lower and upper secondary levels.

According to Owoyele and Toyobo (2008) professional guidance and counseling services are needed to guide students on how to choose subjects based on their academic ability, interest and relevance of such subjects to their future career aspirations. Schools must endeavour to organize academic and career counseling services before such students are asked to select subjects. Subject choices are considered to be significant in determining career paths. Students need information about the structure and content of the science subjects they want to study. This will help influence their choice of the subject. Research by Igun (2007) and Obayan (2007) in Oriahi, Uhumuavbi and Aguele (2010) showed that students need information about what they are considering providing an understanding of what in particular a discipline involves.

2.4.7 Availability of computers

Several studies have been done in many centers and show the effectiveness of computers in the teaching of physics, (Altin ,2002) found that using computers assisted experimental method while teaching physics had a positive and significant effects on

- a. Students achievements
- b. Students concepts teaching
- c. Level of retention of students

Computers simplify hard physics concepts to topics (Kiboss, 1997).

From the above studies when a School has a culture of using computers in teaching physics so as to simplify concepts which leads to high students achievements will lead

to motivations of students choosing physics as an examination subject in KCSE development of technology. The importance of physics therefore cannot be over emphasized.

While the numbers attending high school has increased dramatically, the percentage enrolled in the physics course continues to drop. Studies by Bolstad and Hipkins (2005) in New Zealand, Lyons (2005) in Australia, Smither and Robinson (2006) in the UK, Dekkers and De-laeter (2001) in Western Nigeria observe that the number of senior students who choose physics is relatively small and has shown a declining tendency.

Further, literature reveals that senior secondary students “decisions to opt for physics seem to be based on a comprehensive consideration of a long list of factors which influence their decision making. Studies by Crawley and Black (1990), Lyons (2005), Nahashon’s (2003), Cleaves (2005), Munro and Elsom (2000), Woolnough and Cameron 2 .(1991) show that schools and science teachers have been identified to exert important influences on students decisions about taking physics by providing students with enabling learning environment and career information.

A study done in Indonesia by Abu Hassan as cited by Salleh (2004) on the assessment of basic physics laboratory reported that the approach to laboratory work was traditional in nature. It does not contribute towards conceptual understanding and the development of physics thinking. The Africa-Asia confidential (June 2009) observed that struggling with poor facilities, little money for equipment and inadequate training, Kenyan physics teachers in science and mathematics departments are used to

low numbers of students taking their subjects and poor grades from those who do choose to enroll.

Students are uninspired by their teachers, whose „chalk and talk mantra does little to bring science to life. Kibera (1993) in a study in Kiambu, Kajiado and Machakos Districts found that career aspirations and expectations are not merely outcomes of curriculum studied, rather they were a product of a variety of factors including school quality (quality of staff, equipment, workshops and school practices) and gender composition of students in schools.

According to the Kenya National Examination Council (2005) Kenyan schools that have adopted the countrys official system of education, that is 8-4-4, subject selection must be based on the availability of teachers and equipment in schools. 3

2.5. Related Studies

Kamau.N.J.(2010) conducted a study on the transitional factors that influence girls in choice of physics in kenyan secondary schools A case of Mathioya District, Kenya, the research intended to investigate why girls have really failed to pursue physics in form three after taking it in forms one and two where it is a core subject, he found out that lack of encouragement and lack of individual physics projects made girls not to pursue physics in form three. The study is similar to my study in that it researched on the physics subject in secondary schools. But this study differs with mine in that it focused on girls only, while my study was on both boys and girls, gender was not an issue.

Mujtaba1.T and Reiss. M (2012) conducted a study on the Factors Affecting whether Students in England Choose to Study Physics once the Subject is Optional. They found out that encouragement from others both in and out of the school are associated with students opting to study physics. They also found out that students choosing to study mathematics in year 12 were significantly associated with students studying physics in year 12. This study is related to my study in that the subject under the study is optional. But this study differs with mine in that it was done in England.

Mbithe(2012) carried out a study on the factors influencing the choice of physics in public secondary schools in Kangundo district on the students taking and those not taking physics in form four. The study found that students were influenced in their choice of Physics through their career goals, their poor attitude towards Physics, their perception of Physics as difficult, poor study habits, poor previous performance and their gender. The study also found that teachers influenced the students" choice of Physics through their missing of classes, poor relationship with students, and unsuitable pace of content delivery and poor methods of teaching.

The study finally found that school environment influenced the choice of Physics by the type of school and the availability of laboratory equipment. The study is similar to my study in that it researches on the physics subject in high school. But it differs with mine in that it looks at all students , those who chose and those who did not choose the subject in form four while my study focuses on those who chose physics in form three only.

Omosewo.O.E(2003) factors influencing female students' choice of physics in selected secondary schools in ilorin metropolisHe noted that ; parents influenced the choice of physics by the senior secondary female science students in ilorin metropolis. He also found out that parental as well as socio-cultural background of the students have significant effect on students' choice of physics. The study is similar to my study in that it researches on the physics subject in secondary schools. This study differs with mine in that it focused on female students' only, while my study was on both male and females students, gender was not an issue.

Springate,i et.al (2008) carried a study on the factors affecting A-level and undergraduate subject choice in physics and chemistry by ethnic group .They found out that there was a clear hierarchy of influences acting on students' decisions to study physics and chemistry:High influence factors: enjoyment of physics and chemistry, future ambitions, perceptions of careers with a physics or chemistry degree, and the relevance of physics/chemistry study to life medium influence factors: the way physics and chemistry are taught, physics and chemistry teachers, images of scientists and the work they do, and family influences low influence factors: the difficulty of physics/chemistry, role models, careers advisors and peers. The study is similar to my study in that it researches on the physics subject in high school. This study differs with mine in that it focused on physics and chemistry by ethnic group, while my study focused on physics only and ethnicity was not of concern.

Daramola (1982) conducted a study focusing on factors influencing the enrolment or lack of enrolment in physics in the upper forms of high school in Kwara states of Nigeria. He noted that several factors influenced choice of physics such as attitude,

interest, and mean score of the student. Non physics students indicated that they did not register for physics because they viewed it as ‘a difficult subject. The study is similar to my study in that it researches on the physics subject in high school. But it differs with mine in that it looks at all students, those who chose and those who did not choose the subject while my study focuses on those who chose physics only.

2.6 Chapter Summary

The chapter discussed in details the literature on the importance of science education in society, the development of science curriculum in Kenya and factors influencing choice of physics as an examination subject in KCSE and the related studies.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.0 Introduction

This chapter was a discussion of the research design and methodological assumptions adopted in the study specifically; it discussed research design and methodology that was used in carrying out the study on factors influencing the choice of physics in secondary school. It discussed the research design, the study area, the study population, the sampling procedure, the sample size, the research instruments, the research variables and data analysis procedures.

3.1.0. Research Design

The study adopted the descriptive research design. According to (Kothari, 2008) preparation of a research design facilitates research to be efficient as possible yielding maximum information. In other words the function of research design is to provide for the collection of relevant evidence with maximum expenditure of efforts time and money. The study entails fact finding inquiry: it sought to report what was happening: in other words, the study sought to find out the factors leading to choice to physics as an examinable subject by students in secondary schools in Wareng District. Mugenda and Mugenda (2003) define survey research design as;

The survey research design is also an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables. Survey research is therefore a self report study which requires the collection of quantifiable information from the sample. It is therefore a type of descriptive research (pg 164)

This design was used to collect information, record the information collected, analyze and report conditions that existed.

3.1.1. Research methodology

The research methodology used was mixed methods. Mixed method uses both quantitative and qualitative research. Qualitative research includes designs, techniques and measures that do not produce discrete numerical data. Data is given in form of words and collected through observation and interview schedule. While on the other

hand quantitative research includes designs, techniques and measures that produce discrete numerical data or quantifiable data like that collected through a questionnaire.

In this study the use of mixed methods has the following advantages; the two methods supplement each other in that qualitative method provide the in-depth explanation given by the interview schedule for teachers of Physics while the quantitative provide the hard data needed to meet the required objectives given by questionnaire for students.it also helps to avoid bias in that each method can be used to check each other. Mugenda and Mugenda,(2003), Kothari,(2008). One major disadvantage to this study is that combining both methods is prohibitively expensive. This applied to the study in that questionnaires were administered differently and separate time and money had to be allocated for every individual teacher to be interviewed.

3.2 Study Area

The study was conducted in Wareng District of Uasin Gishu County. Wareng District is one of the 43 districts in Rift Valley created through presidential pronouncements during the pre-election period of 2007. Wareng district covers an area of 989 square kilometers, it borders the following Districts: Eldoret East, Eldoret west.It is divided into two administrative divisions which are also educational divisions; Kapsaret and Kesses.Wareng district is a cosmopolitan district with a population of 178,162 and inter-sensual growth of 30.93% and a population density of 314 and 123 persons per

km² in Kapsaret and Kesses division respectively. Source; (Kenya population and Housing census 1990.)

Table 3.1. Distribution of schools in Wareng District

Zone	Number of schools			
	Public Number	Sample	Private Number	Sample
Cheptiret	6	2	0	0
Kesses	9	3	0	0
Timborowa	6	2	0	0
Kapsaret	11	3	7	2
Tulwet	6	2	0	0

Source: Wareng District Educational Office

3.3 Study Population and Sample

3.3.1 The Study Population

The target population comprised of all 44 secondary schools. There were 37 public schools and 7 private schools. Oso and Onen,(2005) defined target population as the total number of subjects that are of interest to the researcher. The accessible population was all the form three students in the sampled schools and teachers teaching physics. Form three students were chosen because they had just chosen examination subjects for their KCSE. They had also been in school long enough to provide reliable information on what influenced them to select physics. The study did not use form fours because they were an examination class and therefore very busy.

3.3.2 Sampling Procedure

The researcher employed probability sampling technique. This was because it provided equal chances to every sample of a given size in the accessible population (Mugenda and Mugenda, 2003). The research used stratified random sampling to

select the five school categories of educational zones: Cheptiret, Kesses, Timborua Kapsaret and Tulwet. 30% of each school zone was included in the study sample.

Simple random sampling technique was employed to sample schools from each zone because it ensured that each member of the target population had equal and independent chance of being included in the study sample (William, 2005). Simple random sampling was used to select 30% of form three students per school who were provided with the questionnaires to complete and return them to the researcher

3.4 Development of Research Instruments

This section gave a description of the tools to be used for data collection. This were questionnaires, interview schedule and observation check list

3.5.1 Questionnaires

A questionnaire is an instrument of data collection which consists of a number of questions printed or typed in a definite order on a form or set of forms to be answered by a respondent on their own. (Kothari, 2008). A questionnaire is a convenient tool for data collection especially where there are a large number of respondents to be handled (Kombo et al, 2005) a questionnaire is an instrument that gather information over a large sample.

The questionnaires included both open and closed ended items. According to Orodho (2009) the closed ended items were used because they are easy to fill, relatively objective and easy to tabulate. The open ended items were used to allow students to express themselves freely without restriction. It facilitates easy and quick deviation of

information within a short time. Self administered questionnaire was used by the research as it is less expensive in terms of time.

According to (Kothari, 2008) the use of questionnaires has the following advantages: there is low cost in use of the instrument, it is free from bias of the interviewer, answers are in respondents own words, respondents have adequate time to give well thought-out answers, respondents who are easily approachable can also be reached conveniently and large sample can be made use of and thus results can be made more dependable and reliable.

Questionnaires have the following disadvantages to the study Firstly, there is low rate of return of the duly filled in questionnaires, bias due to non response is often undermined, they can only be used when respondents are educated and co-operative, the control of questionnaires maybe lost once it is sent, there is inbuilt inflexibility because of difficulty of amending the approach once questionnaires have been dispatched. To mitigate this disadvantages the researcher administered in person and waited patiently and collected almost all the questionnaires on the same day and the remaining the following day .

The questionnaires were administered to the form three students in the sampled schools because they had just chosen physics. The questionnaires consisted of two sections; section one contained items that generated demographic data while section two contained items on factors influencing choice of Physics and and items were measured on a Likert scale of 1 =strongly agree 2 =Agreed 3=Undecided 4=

Disagreed5= Strongly Disagree. The questionnaires appear on Appendix B on page 110.

3.5.2 Interview Schedule

According to Oso and Onen(2005), an interview schedule involves person to person verbal communication where one person (or group of persons) asks the other questions intended to elicit information or opinion. (Mugenda and Mugenda 2003) observes that an interview schedule is an oral administration of a questionnaire. They are face to face encounters. An interview is a conversation with a purpose Marshal, (1999).

The interview schedule was generated by the researcher and was administered to teachers teaching physics. The sample is on Appendix D page 117. It had two sections; section A is on background information, section B is on how career aspiration influences students choice of physics, how family influence choice of physics, how peer influences choice of physics, how teachers teaching physics influences choice of physics and how the availability of school facilities influences choice of physics in secondary schools

The use of an interview schedule had an advantage in that it gives more information in greater depth and the interviewer by his own skills can overcome resistance from the respondents Mugenda and Mugenda (2003).

On the other hand, an interview schedule is expensive especially when a large widely spread geographical sample is taken, Kothari (2008). In this study this was controlled by the use of probability sampling where the interview schedule was administered to a smaller group ,two teachers teaching physics in every sampled school.

3.5.3 Observation Check List

In an observational study the current status of a phenomenon is determined not by asking but by observing (Mugend and Mugenda, 2003). An observation check list is there a list of items prepared by the researcher to be verified in the field. Observation indicators are useful for evaluation of physical condition (Kothari 2004).

Some of the advantages of observations are; Observation is the most direct measure of behavior, it provides direct information about a phenomena, its easy to complete and finally it saves time in collecting data. while on the other hand there are disadvantages when using observation; observer's presence may create artificial situation ,potential for bias, potential to overlook meaningful aspects potential for misinterpretation, and the data collected using observation method is difficult to analyze. The observation check list appears in appendix C page 116.

3.6 Pilot Study

3.6.1 Reliability of the research Instruments

Reliability is a measure of the degree to which a research instrument yields consistent results after repeated trials (Mugenda, 2003). An instrument is considered reliable when it is able to elicit the same responses each time it is administered (Koul, 1984). To test the reliability of the instruments, a pilot study was carried out. A test was administered to five students from four schools. These were schools not included in the sample to avoid bias. The second test was administered after two weeks. Responses of the closed and open ended items were compared in order to find out the similarity or difference between the two responses for each individual respondent.

Reliability was further ensured by minimizing biasness in data collection; administering the questionnaires and ensuring confidentiality such that student subjects did not discuss the instrument but gave own responses

3.6.2 Content validity of the research Instrument

A valid instrument is that whose content is relevant to the purpose of the study. It is a statistical or non-statistical method used to validate the content of the research instrument (Koul and Kerlinger, 1978). Therefore for the purpose of this study, the research supervisors in the department of Curriculum Instruction and Educational Media of Moi University were consulted. They examined the research instruments and commented on their validity. Their comments formed a basis for modifying the research tools.

3.7 Research Variables

This study had five independent variables and one dependent variables. The independent variables were career choice, family and peer, teacher and school facilities. The dependent variable is choice of physics.

3.8 Procedure for Data Collection

Before going to the field, the researcher had to sought permission from the relevant authorities; first, a letter of introduction was sought from the Dean, School of Education, Moi University. Then research permit was obtained from the Office of the President which was used to secure permission from the District Commissioner of Wareng District, the Education office in Wareng District. After this the researcher embarked on collecting data as explained below.

Data collection was carried out in three phases. The first phase was the pilot study which was carried out in mid-July 2012. Data obtained during this phase was used to

validate the research instruments and also estimate the timing. The second phase was the pre-study which was done at the end of July when the researcher sampled the schools of study. The researcher then visited the places of study to make arrangements for the actual study. Some of the arrangements included seeking permission from the schools, agreeing on the day and time when the actual study was to be carried out. Questionnaires were handed over to head teachers to relay them to physics teachers and students. This was done to give the respondents time to reflect on and respond to them at their own convenience. In the third phase the researcher traveled to the schools where the researcher will sample the teachers and administer the questionnaire. Direct observation was done to ascertain what facilities were available and the condition they were in.

3.9 Data Presentation

The research findings from questionnaires was presented in form of frequency tables, and percentages. The findings from interview schedule were presented in terms of narratives and observation check list was presented in form of frequency tables, and percentages.

3.10 Data Analysis

The data collected by questionnaires in this research was qualitative. The responses to the items in the instruments was tabulated on frequency tables and then converted into percentage. The findings from interview schedule were analyzed by narratives. Lastly the findings from observation check list were also was tabulated on frequency tables and then converted into percentage.

3.11 Ethical Issues

The researcher sought permission from the relevant authorities; first, a letter of introduction was sought from the Dean, School of Education, Moi University. Then research permit was obtained from the Office of the President which was used to secure permission from the District Commissioner of Wareng District, the Education office in Wareng District and the schools of study. The research permit was useful both during the pilot study and actual research study to legalize the study. The respondents were sensitized on what was expected of them, their consent was sought and they were assured of confidentiality with any information that they divulged. They were also assured that they were not to write their names on the questionnaire.

3.12 Summary

This chapter has described the procedures that were followed in conducting the research. The steps involved in conducting the study have been described in detail, the instruments to aid in collection of data outlined and the procedures of analyzing the data given

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION

4.0 Introduction

The study sought to achieve the following objectives.

- i) To determine how student's career aspirations influenced their choice of physics as an examinable subject in secondary school.
- ii) To establish how students family influenced their choice of physics as an examinable subject in secondary schools in Wareng District.
- iii) To establish how peer pressure influenced, students choice of physics as an examinable subject in secondary schools is Wareng District
- iv) To determine how teachers teaching physics influenced on the students choice of physics as an examinable subject in Secondary schools in Wareng District.
- v) To establish how availability of school facilities influenced student's choice of physics as an examinable subject in secondary schools in Wareng District

4.1.0 Background information of the students

The study sought to measure some student's characteristic which were necessary for the study to establish if they had an influence on the choice of physics in secondary schools in Wareng district. This were gender, type of school, Position of physics among other subjects, Subject liked most by respondents and school policy on physics, chemistry and biology. This variable were analyzed in the table below

Table 4.1 Background information of the students

Gender of respondent	F	%
Female	72	39.3
Male	111	60.7
Total	183	100
Type of school of the respondent		
Girls	60	32.8
Boys	89	48.6
Mixed	34	18.6
Total	183	100
Position of physics among other subjects.		
One of the best performed	110	60.11
One of the worst performed	12	6.56
One of the averagely performed	61	33.33
Total	183	100
Subject liked most by respondents		
Physics	91	49.7
Chemistry	58	31.7
Biology	34	18.6
Total	183	100.0
school policy on physics, chemistry and biology		
My school offered all the three subjects in form one and two	178	97

Gender of respondent	F	%
Female	72	39.3
Male	111	60.7
My school did not offer all the three subjects in form one and two	5	3
Total	183	100

Source: Researchers findings (2013)

The study sought to establish the gender of the respondent. From table 4.1 above there were 72 (39.3 %) female and 111 (60.7 %.) male. This shows that there was a fair representation of gender. And it also shows that more boys take physics compared to girls. Although gender was not an issue of study, these findings concur with those from a study by Gilbert and Calvert (2003) cited by Alabi (2008) who found that most young women do not see themselves as being capable of studying and succeeding in Mathematics and science, therefore they are not interested.

According to Summers, (1992) educating girls yields a higher rate of return than any other investment available in the developing world. In the recent past there has been a campaign which emphasized girl education. In Wareng district this could be attributed to the fact that there are few female Physics teachers who should act as role models for the girls. Further, it could be due to the fact that generally boys are more disposed to science and Mathematics than girls.

The study also sought to establish the type of the school. This was relevant to the study so as to ascertain whether type of school was a factor that influenced choice of physics

From the table above there were 60,(32.8%) respondents from the girl's school, 89, (48.6%) respondents were from boy's school and 34,(18.6%) respondents from mixed schools. From the findings it can be concluded that most of those who chose Physics were from boys schools and the least from mixed schools.

This implies that the type of school influenced the choice of Physics because single sex schools had a higher number of those who chose Physics. This could further imply that single sex schools favor the choice of Physics in Wareng district. These findings agree with those of a study done in Ireland by Smyth and Hannan (2006) on school effects and subject choice who found that single sex schools have a positive effect on attitudes to, and take up of Mathematics and science especially for girls.

The study also sought to establish the position of physics among other subjects in the last year of examination. This was necessary to position physics amongst other subjects and whether it was an influencing factor. From table 4.1 110,(60.11%) students said physics was one of the best performed subject 12, (6.56%) students said physics was one of the three worst performed subject 61,s(33.3%) students said it was one of the averagely performed subjects. This implies that majority of the students had chosen physics because they performed well in the subject. This findings agree with the study done in Ethiopia among university students on who is joining Physics and why by Semela (2010) who found that choice of Physics is shaped by students prior achievement.

The study sought to establish whether physics was most liked by the respondents. This was relevant to ascertain whether this was an influencing factor. From the table,

91 (49.7%) students. liked physics most. This indicates that 49.7% students who chose physics liked it most. 58 (31.7 %) of the students who had chosen physics liked chemistry most and 34(18.6%) of the students who had chosen physics liked biology most

4.1.1 Interview findings on preferred physics students by teachers.

Still on performance the teachers of physics were asked, which students they would allow to chose physics, 24(92.3%) said they would choose the ones who performed best, non of the teachers would choose the student who performed worst and 2(7.69%) would choose the one who performs average. It is very clear that teachers of physics would prefer students who perform best in the subject, and reason that most teachers gave was that they wanted to have a good mean score in KCSE, there is pressure from the school administrations to maintain or get a target mean score, that is why no teacher would choose a poor student to join his class. These findings concur with Mbithe(2012) who said that most teachers preferred students who had a good previous performance in Physics in junior secondary. These findings also agree with those from a study by Sharp et.al (1996) who found that prior achievement are strongly linked to course uptake

4.1.3 Guidance on subject and Career Choice

Students were asked if they had career and guidance office in there schools, 157(85.79%) of the respondents said yes they had the office and 26(14.21%) said no. This clearly indicates that in most schools in Wareng District there was an office for career guidance. The respondents were further asked to indicate whether they were guided on choice of subjects and career choice. The study found that 165

(90%) of the respondents said, yes they were guided before they chose the subject and career while 18 (10%) were not given career guidance. From the findings of the study most of the students in Wareng district were career guided before they chose their subjects.

It can be concluded that guidance on career choice affected choice of Physics. According to Owoyele and Toyobo (2008) professional guidance and counseling services are needed to guide students on how to choose subjects based on their academic ability, interest and relevance of such subjects to their future career aspirations. Research by Igun (2007) and Obayan (2007) cited by Mbithe (2012) showed that students need information about what they are considering providing an understanding of what in particular a discipline involves.

4.2. Interview findings on Background information of teachers

4.2.1 Background information of teachers

The study sought to measure some teacher's characteristic which were necessary for the study to establish if they had an influence on the choice of physics in secondary schools in Wareng district. These were; gender, teaching experience and highest level of education. These are summarized in table 4.2 below.

Table 4.2. background information of teachers

Gender of respondent	Frequency	%
female	7	26.92
Male	19	73.08
Total	26	100.0
Teaching experience		

Gender of respondent	Frequency	%
female	7	26.92
Male	19	73.08
0-4 years	8	30.8
5-6years	10	38.5
10-14years	5	19.25
15years and above	3	11.55
Highest level of education		
Diploma in education		
Bachelor of education	6	23.1
Masters of education	15	57.75
	5	19.25

Source: Researchers findings (2013)

The study sought to establish the gender of the respondent. From Table 4.2 above there were 7,(26.92%) female and 19,(73.08%) male. These findings show that in Wareng District there are few female teachers compared to male. This may have contributed to low enrolments amongst girls in Physics because they lacked female teacher role models.

Most teachers of physics have enough teaching experience as shown by majority with a teaching experience of 5-6 years (38.5%). This clearly indicates that they are able to deliver the content and handle students with varied individual needs. Majority of the teachers have bachelors degree 15(57.75%) which means that they were well trained to deliver.

4.3.1 Students Career Aspiration

This objective was to determine whether students career aspirations influences their choice of physics as an examinable subjects in secondary schools in Wareng District.

This was measured by the following variables: physics as a requirement for most of science courses in University ,physics is important in life ,future career ,physics knowledge leads to self employment ,have contributed to choice of physics by students in secondary schools.

Likert scale was used for answers

(1 =Strongly agree 2 =Agreed 3=Undecided 4= Disagreed 5= Strongly Disagree.)

This question were analyzed by use of frequencies and percentages below

Table 4.3 Students career aspirations

Statement	SA		A		U		D		SD	
	F	%	f	%	F	%	f	%	F	%
University science course requirement	60	32.8	82	44.8	17	9.3	17	9.3	7	3.8
Physics important for life	65	35.5	77	42.1	17	9.3	16	8.7	84	4.4
Physics for my future career	85	46.4	80	43.7	18	9.8	1	0.01	0	0
Knowledge leads to self employment	41	22.4	35	19.1	84	45.9	12	6.6	11	6.0

Source: Researchers findings (2013)

The study sought to establish whether students chose Physics because it was a requirement for most of the science courses in the university. From the Table 4.3 60, (32.8%) respondents strongly agreed, 82(44.8%) respondents Agreed. This implies that 142(77.6%) of the respondents agreed that physics is a requirement for most of the science courses in the university and that is why they chose physics. 17(9.3%) respondents were undecided. 17(9.3%) respondents Disagreed, 7(3.8%) respondents strongly disagreed. It shows that only 24(13.2%) disagreed.

From the findings of the study, it is very clear that the main reason for the choice of Physics is shown by 77.6% of the respondents who agreed that physics is a requirement for most of the science courses in the university and that is why they chose physics. These findings concur with those of Mbithe (2012) who found out that the major reason for the students' choice of Physics was because their career goals required Physics.

The findings also agree with those from a study by Hull-Blanks *et al.*, (2005) cited Springate *et al.* (2008) who found that students with a well defined job related career goal were more likely to decide to persist in college than students without such a career goal. This could be attributed to the perceived strategic usefulness of Physics in the field of technology where there seem to be employment opportunities.

When asked whether physics was important in life 65(35.5%) students strongly agreed and 77(42.1%) students agreed. This means a majority 77.6% of those students who had chosen physics were aware that physics was important in life. This is a clear indication that students had become aware of the importance of physics and that is why they chose the subject.

This finding concurs with Springate *et al.* (2008) who observed that high influence factors: enjoyment of physics and chemistry, future ambitions, perceptions of careers with a physics or chemistry degree, and the relevance of physics/chemistry study to life. Physics learning develops the scientific habits in students, which are transferable to other areas in life. Such habits involve non-reliance on superstition, critical

thinking and respect for other people's opinions. The above qualities when learned help solve many problems for individual and social living (Springate et. al.,2008)

When students were asked whether they chose physics for their future career, from table 4.3, it was established that: 85 (46.4%) respondents strongly agreed. 80(43.7%) respondents agreed.18 (1%) respondent undecided. Majority 165(90.2%) of the respondents agreed. It is very clear that most students chose physics for their future career. This could be attributed to the fact that most 165(90.2%) of the students in Wareng District were career guided before they chose their subjects.

These finding concur with those of Mbithe (2012) who found out that the major reason for the students choice of Physics was because their career goals required Physics. The finding also agree with Lyons (2005) in his research on choosing physical science examination in Australia ,he found out that physics and chemistry are conceptualized as subjects having a primarily strategic value, in that they would enhance the student's university and career options. Students would therefore choose the subjects strategically in preparation of future career

When students were asked whether physics knowledge led to self employment, from table 4.3,It was established that:41 (22.4%) respondents strongly agreed, 35 (43.5%) respondents agreed This implies that 65.9% of the students choose physics because they thought physics knowledge would lead to self employment and 45.9 % were undecided about it. This findings agree with Brenner (1979) who states that institutions and groups that most immediately and directly impact the child's development including: family, school, religious institutions, neighborhood, and peers

and Bandura(1977) imitation and modeling. People learn through others behaviour, attitude and outcomes of those behaviours. In this research students learn what is marketable, and needed by the job or institution or legislation, though the subject is difficult the students will chose to take physics

4.3.2 Teachers Interview findings on career aspirations

Teachers were asked how career aspirations influenced students choice of physics as an examinable subjects in secondary schools through an interview schedule. Most of them said that students choose physics because it was a requirement for most of the science courses in the university, especially focused students who were targeting courses like engineering. Some of them said that students chose physics because it was a requirement for their future career,

4.4.1 Family influences on choice of physics

This objective was to determine how family influences student's choice of physics as an examinable subject in secondary schools. This was measured by the following variables father /mother advised me to do it, my brother /sister pursuing a physics course, to be like my uncle/aunt in future.

Likert scale was used for answers (1 =strongly agree 2 =Agreed 3=Undecided 4= Disagreed5= Strongly Disagree.) This question were analyzed by use of frequencies and percentages below

Table 4.4 family influences on choice of physics

Statement	SA		A		U		D		SD	
	F	%	f	%	F	%	f	%	F	%
Father/mother/guardian advised me	16	8.7	19	10.4	5	2.7	63	34.4	80	43.7
Brother/sister is	19	10.4	17	9.3	00	00	53	29	94	51.4

pursuing a physics	8	4.4	23	12.6	27	14.8	55	30.1	70	38.
To be like my uncle/aunt										
Father/mother did physics and is	13	7.1	28	15.3	25	13.7	48	26.2	69	37.7

Source: Researchers findings (2013)

Students were asked whether they chose Physics because their father/mother/guardian advised them to do the subject. It was established that 80(43.7%) respondents strongly disagreed and 63(34.4%) disagreed that father/mother/guardian influenced them to choose physics. This shows that majority 78.1% of the students were not advised by either mother/farther/guardian to take physics. 16(8.7%) strongly agreed and 19(10.4%) agreed. This shows that only 19.3% were advised by father/mother/guardian It is very clear that most parents did not advise their children on this subject.

The findings agree with Lyons (2004) in his research in Australia on choosing physical science noted that students would chose physical science due to such cues as parents positive comments, positive behavior and personal histories about the science.

Students were asked if they chose physics because their brother/sister was pursuing a physics course in College, from the findings in the table above ,it was established that 33(29%) respondent disagreed and 94(51.4%) respondent strongly disagreed .This implies that majority of the respondents 127(80.4%) did not chose the subject because brother/sister pursuing a physics course in college . Avery small number 19(10.4%) agree, this implies that there could be a very small number of brother/sister pursuing physics courses in college. Any advice given by this group is also limited

The research did not limit itself to the immediate family alone; it went head to find out how the extended family influenced the students in choice of the subject. Students were therefore asked if they chose physics because they wanted to be like their uncle/aunt in future who pursuit physics. From Table 4.4 above 70(38.3%) respondents strongly disagreed and 55(30.1%) respondents disagreed. This implies that 125(68.4%) of the study population did not choose physics because they wanted to be like their uncle/aunt in future. This implies uncle/aunt had almost no influence in the choice of physic. On the other hand 8(4.4%) strongly agreed and 23(12.6%) agreed. This means 31(17%) were influenced to chose physics

Students were also asked if they chose physics because they wanted to be like their father/mother who did physics and was prospering. From the table above it is very clear that 48 (26.2 %) respondents disagreed and 69 (37.7%) respondents strongly disagreed. This implies that 117 (65.9%) respondents did not choose physic to be like their father/mother. It also indicates that most parents are not physics' and could be had no idea of the subject.13 (7.1%) strongly agreed and 26 (15.3%) agreed that they chose physic to be like their father/mother. This implies that 39 (22.4%) of the respondents had an influence on the fact that their father /mother were in this field could be physics teachers or engineers'etc and were role model to their children.

Lyons (2004) found out that some students saw the high status of their parents' credentials or occupation as representing what could be achieved through University study. This concurs with Bronfenbrenner (1979) theory which states that family, religious institutions, neighborhood influences an individuals decisions in life.

Bandura(1977) states that people learn through other people's behavior, attitude and

outcomes of those behaviors. In this research students learn from their parents, aunts, uncle if they talk positively and encourage the always the chose to take physics.

4.4.2 Teachers Interview findings on family influence

Teachers were asked how family influenced student’s choice of physics ,most of them said that if family members are educated and talk positively about physics, then a student from such background would chose physics. This depends on weather family members who come in conduct with the student are ; science based in terms of career eg engineers such a parent or guardian would definitely advice a student to choose physics.

4.5.1 Peer pressure influences on choice of physics

This objective was to determine how peer pressure influences students choice of physics as an examinable subject in secondary schools in Wareng District.

This was measured by the following variables: my friend take physics, suit in my peer group, to be respected by friends: Likert scale was used for answers (1 =strongly agree 2 =Agreed 3=Undecided 4= Disagreed 5= Strongly Disagree.)

This question were analyzed by use of frequencies and percentages below

Table 4.5 peer influence on choice of physics

Statement	SA		A		U		D		SD	
	F	%	f	%	f	%	f	%	F	%
my friends take physics	11	6.0	7	3.8	6	3.8	61	33.3	104	56.8
to suit in my peer group	14	7.7	15	8.2	9	4.9	44	24.0	101	55.2
respected by my friends	8	4.4	12	6.6	19	10.4	45	24.6	99	54.1

encouraged by friends	13	7.1	26	15.	25	13.7	48	26.2	69	37.7
				3						

Source: Researchers findings (2013)

The study sought to establish whether students chose physics because their friends took physics. From the table 4.5, it was established that 11(6.0%) strongly agreed and 7(3.8%) agreed to have chosen physics because their friends took physics. 104(56.8%) respondents strongly disagreed and 61(33.3%) respondents disagreed. This implies that majority 90.1% out of 183 respondents were not influenced by friends to take physics.

This finding concurs with Mbithe (2012) who concluded in her study that a very small percentage of the student indicated that it was due to their friends that they " choice of physics. According to a study by Owoyele and Toyobo (2008) students" choice of subjects at school is influenced by jointly peer pressure, parental will and academic ability but it is influenced more by peer pressure and parental will than their academic ability

The study sought to establish whether students choose physics to suit in their peer group

From the above table it was established that 101(55.2%) respondents strongly disagree, 44(24%) respondents disagreed .this implies that 145(79.2%) students out of 183 who are the majority did not choose physics to suit in their peer group . 14(7.7%) strongly agreed and 15(8.2%) agreed. This implies that the minority 15.9% of the respondents chose physics to suit in their peer group.

The finding 15.9% of the respondents who chose physics to suit in their peer group. Agrees with Moon and (Mayes, 1994), who found out that membership to the norms and values of a particular peer group make a difference to the school attainment and involvement of students. A student whose friends work hard is likely to work hard and be tuned into the teacher's value. Springate et al (2008) in their study found out that peer was a low influence factor to physic and chemistry

The study sought to establish whether students choose physics to be respected by their friends. From the table 4.5 above 8(4.4%) respondents strongly agreed and 12(6.6%) agreed. This implies that 20(10.9%) out of 183 respondents agreed. While 99 (54.1%) students strongly disagreed and 45(24.6%) disagreed. This implies that majority 144 (78.7%) students out of 183 disagreed that they choose physics to be respected by their friends .This clearly shows that to be respected by friends or not had a very small (10.9%) influence on the choice of physics.

The study sought to establish whether students choose physics because they were encouraged by their friends in higher class (form 4) taking the subject. From the table above 13(7.1%) respondents strongly agreed and 26(15.3%) agreed. This implies that 39(22.4%) out of 183 respondents agreed. While 69 (37.7%) students strongly disagreed and 48(26.2%) disagreed. This implies that majority 117 (63.9%) students out of 183 disagreed that they choose physics because they were encouraged by their friends in higher class (form 4) taking the subject.

The findings of the study concur with the findings of Mbithe (2012) who found out that most of the students are not affected by peer pressure in choice of Physics. These findings disagree with findings of Owoyele and Toyobo (2008) who found out that

peer pressure influenced choice of Physics. Bronfenbrenner(1979) states that peer immediately and directly impact the child's development and Bandura(1977) states that people learn through others behaviors, attitude and outcomes of those behaviours.

4.5.2 Teachers Interview findings on peer influence

Teachers were asked how peer pressure influenced students choice of physics as an examinable subject in secondary. Majority of them said that physics was a technical subject and therefore a student would not chose it just because a friend had chosen it. Most of them said that a student looked at his ability, before choosing the subject. Some of them said that peer pressure depended on the group ability. A student in a bright group would choose physics if most or all of the group members had chosen.

4.6.1 Teachers influences on student's choice of physics

This objective was to determine how teachers teaching physics influence student's choice of physics in secondary schools in Wareng Dsistrict. This was measured by the following variables teachers advised me, like my physics teacher, my physics teacher believes that I can pass physics, want to be a physics teacher in future. Likert scale was used for answers (1 =strongly agree 2 =Agreed 3=Undecided 4= Disagreed5= Strongly Disagree.) This question were analyzed by use of frequencies and percentages .

Table 4.6 teachers influences on student's choice of physics

Statement	SA		A		U		D		SD	
	F	%	F	%	F	%	F	%	F	%
Teacher advised me	24	13.1	34	18.6	7	3.8	71	38.8	47	25.7
Good teaching methods that makes it interesting	51	27.9	43	23.5	28	15.3	35	19.1	26	14.2
Participation in science congress and symposium	55	30.1	54	29.5	23	12.6	19	10.4	32	17.5
Peer teaching and group discussions	57	31.1	38	20.8	23	12.6	35	19.1	30	16.4
Taken to the lab for practical more often	65	35.5	57	31.15	17	9.30	26	14.21	18	9.84

Source: Researchers findings (2013)

The study sought to establish whether students choose physics because their teachers advised them .From table 4.8 it was established that 24(13.1%) of the respondent strongly agreed and 34(18.6%) agreed, this implies that only 58(31.7%)of the respondents chose physics because their teachers advised them to chose the subject. 71(38.8%) of the respondent strongly disagreed and 47(25.7%) disagreed. This implies that the majority 108(64.5%) disagreed and therefore they were not advised by their physics teacher to take physics. it is very clear that the physics teachers do not fully encourage the students to chose physics and some of the reasons could be to have small classes and bright students only. These findings concur with Mbithe (2012) who found out that none of the respondents indicated that it was due to teachers inspiration in form one and two. . It is worth noting that none of the student respondents chose Physics because they were inspired by teachers. Most teachers preferred students who had a good previous performance in Physics in junior secondary. Students who did not perform well would be negatively influenced by the

teacher therefore shun choosing Physics. This is attributed to the fact teachers are required to produce high mean grades which determine their promotion and therefore are concerned with performance than anything else. The findings concur with findings of a study by Africa-Asia confidential June,(2009) which found that students are uninspired by their teachers.

The study sought to establish whether students choose physics because their physics teacher used good teaching methods that made it interesting .From table 4.8 it was established that 51(27.9%) of the respondent strongly agreed and 43(23.5%) agreed, this implies that 94(51.4%)of the respondents chose physics because their teachers used good teaching methods that made it interesting . 26(14.2%) of the respondent strongly disagreed and 35(19.1%) disagreed. This implies that the minority 61(33.3%) disagreed and therefore their physics teacher using good teaching methods that made it interesting did not influence their choosing of the subject.

The study sought to establish whether students choose physics because physics teacher always motivates me by allowing me to participate in science congress and symposium From the table above 57(31.15%) respondents strongly agreed and 47(25.68%) agreed. This implies that majority 104(56.78%) out of 183 respondents agreed that they choose physics because physics teacher always motivates me by allowing me to participate in science congress and symposium While 30(19.1%) students strongly disagreed and 29(16.4%) disagreed. This implies that minority 59(35.5%) students out of 183 disagreed that they choose physics because their teacher motivates me by allowing me to participate in science congress and symposium

The study sought to establish whether students choose physics because their physics teacher used peer teaching and group discussions. From the table 65(35.5%) respondents strongly agreed and 57(31.5%) agreed. This implies that majority 122(66.65%) out of 183 respondents agreed that they choose physics because their physics teacher used peer teaching and group discussions. While 18(9.84%) students strongly disagreed and 26(14.12%) disagreed. This implies that minority 44(23.96%) students out of 183 disagreed that they choose physics because their physics teachers used peer teaching and group discussions. This findings are in line with the KIEs demand; . KIE (2005) states To this end the use of teacher/learner discussion, teacher demonstration and group/class experiments as methods of instruction is encouraged

The study sought to establish whether students choose physics because their physics teacher took them to the lab for practicals more often. From the table 65(35.5%) respondents strongly agreed and 57(31.5%) agreed. This implies that majority 122(66.65%) out of 183 respondents agreed that they choose physics because their physics teacher took them to the lab for practical's more often. While 18(9.84%) students strongly disagreed and 26(14.12%) disagreed. This implies that minority 44(23.96%) students out of 183 disagreed that they choose physics because their their physics teacher took them to the lab for practical's more often

It is very clear that practals done often will motivate and boost students interests in the subject because they make physics real and intermeeting. Frequent practicals builds confidence in the subject . According to NTI (2007) Physics as a subject is activity oriented and the suggested method of teaching is guided discovery which is

resource based. Mbithe (2012) found out that laboratory was mainly used during the double lesson. This could be because of sharing the laboratories with other science subjects. This implies that students involve themselves in practical work only during the double lesson.

4.6.2 Interview findings on teachers influence

Teachers teaching physics were asked how they influenced student's choice of physics in secondary schools. Majority said that they advised them. Other said they encouraged them especially bright or potentially capable students. They were categorical on those they advised. It is very clear that teachers of physics would prefer students who perform best in the subject, and reason that most teachers gave was that they wanted to have a good mean score in KCSE, there is pressure from the school administrations to maintain or get a target mean score, that is why no teacher would choose a poor student to join his class.

These findings concur with Mbithe(2012) who said that most teachers preferred students who had a good previous performance in Physics in junior secondary. Targeted mean score was echoed by majority of the teachers and this determined whom the teacher advised to choose physics. Others said that they allowed students to participate in science congress and symposium and other said that they took students to the lab for practical.

4.7.0. Influence of school facilities on choice of physics

This objective was to determine how availability of school facilities have any influence on students choice of physics in secondary schools in Wareng District.

This was measured by the following variable well equipped laboratory, enough physics teachers. Likert scale was used for answers (1 =strongly agree 2 =Agreed 3=Undecided 4= Disagreed 5= Strongly Disagree.)This question were analyzed by use of frequencies and percentages below

Table 4.7 Influence of school facilities on choice of physics

Statement	SA		A		U		D		SD	
	f	%	f	%	f	%	f	%	f	%
well equipped laboratory	59	32.2	68	37.2	16	8.7	17	9.3	23	12.57
enough physics text books	66	36.1	57	31.1	12	6.6	23	12.5	25	13.66
organized physics contests	42	23.0	69	37.7	25	13.7	12	6.6	35	19.1
enough Physics teachers	12	6.6	27	14.8	20	10.9	70	38.3	54	29.5
computer used for teaching	14	8.78	17	9.3	16	8.7	38	20.77	98	53.55

Source: Researchers findings (2013)

The study sought to establish whether students chose physics because of well equipped laboratory in their schools. From the table above it was established that 59(32.2%) respondent strongly agreed 68(37.2%) agreed. This indicates that majority of the respondents 127(69.4%) agree that they chose physics because of well equipped laboratory in their schools. While 17(9.3%) respondents disagreed 23(12.5%) respondents strongly disagreed. This shows that 40(21.8%) students out of 183 did not choose physics due to the well equipped laboratory in their schools.

The study sought to establish whether students chose physics because of enough textbooks in their schools. It was established that 66(36. %) respondents strongly agreed 57(31.1%) respondents agreed. This implies that majority 123(67.2%) out of 183 students agreed that enough textbooks in their school influenced them to chose

physics.12(6.6%) were undecided. 23(12.5%) respondents disagreed 25(13.66%) respondents strongly disagree. This implies that only 48(26.15%) did not chose physics because of there being enough textbooks in their schools. A study by Bolorunduro (1998) in Alabi (2008) found that provision of necessary facilities in schools provides a challenging environment for students to learn and for effective teaching by teachers.

The study sought to establish the students' text book ratio in schools. The findings are summarized in the table below.

Table 4.7.1. text book : students ratio

Text book : student ratio	Frequency (f)	Percentage (%)
1:1	40	21.86
2:1	95	51.91
3:1	30	16.39
More than 3:1	18	9.84
Total	183	100

Source: Researchers findings (2013)

The study established that 40(21.86%) of the respondents had Text book: student ratio 1:1, majority 95(51.91%) of the respondents had the Text book: student ratio 2:1. Another group 30(16.39%) of the respondents had Text book: student ratio 3:1. Lastly 18(9.84%) of the respondents had Text book: student ratio more than 3:1. This clearly shows that majority 95(51.91%) of the respondents had the Text book: student ratio 2:1 which is the ministry of education requirement. It also showed that schools have tried to ensure that students have enough text books.

The study also sought to establish whether students chose physics because their school organized physics contests in which they took part and enjoyed. From the table above it is very clear that 42(23.0%) respondents strongly agreed 69 (37.7%) respondents agree. This implies that majority 111(60.7%) students out of 183 choose physics because of their school organized physics contests in which they took part and enjoyed. While(6.6%) respondents disagreed 35(19.1%) respondents strongly disagreed. This implies that 47(25.7%) out of 183 students did not choose physics because of their school organized physics contests. this could be cases where schools did not organize contests at all.

The study sought to establish whether student's choice of physics was influenced by enough physics teachers in their schools. From the table above 12(6.6%) respondents strongly disagreed, 27(14.8%) respondents agreed. This implies that 39(21.4%) out of 183 students were influenced by enough physics teachers in their schools. 70(38.3%) respondent Disagreed 54(29.5 %) respondents strongly disagreed This implies that 124(67.8%) out of 183 students were not influenced by enough physics teachers.s

The study sought to establish whether student's choice of physics was influenced by computer being used for teaching in their school. From the table above 14(8.78%) respondents strongly agreed, 17(9.30%) respondents agreed. This 31(18.08%) out of 183 students were influenced by enough physics teachers in their schools. 38(20.77%) respondent Disagreed 98(53.55%) respondents strongly disagreed This implies that 136(74.32%) out of 183 students were not influenced by computer being used for teaching in their school.

Taylor and Francis (2012) observed that Laboratory work, enrichment activities, and physics textbooks were reported to be important in order to encourage students to like physics. This is true as physics is a practical subject

4.7.2. Findings from observation checklist

From the observation checklist physics laboratory available and adequate were 3(23.08%), available and not adequate 6(46.15) , not available 4(30.77 It was also observed that electricity in laboratory available and adequate were 4(30.77%), available and not adequate 4(30.77%), not available 5(38.46%).The researcher went ahead and observed that physics apparatus in laboratory available and adequate were 3(23.08%), available and not adequate(69.23%), not available 1(7.69%).

Lab assistant for physics subject in schools available and adequate were 2(15.38%), available . and not adequate were 3(23.08%), not available 8(61.54%). This shows that most of the laboratories in Wareng district schools are not well equipped. This could be attributed to the fact that the student population in most schools in the district has grown due to subsidized Secondary Education against the same facilities. This implies that the most popular method of teaching Physics is demonstration.

The teaching of Physics without adequate learning resources results to poor mastery of content leading to poor performance. This negatively affected the choice of Physics. A school with inadequate facilities has a negative influence on the attitudes and academic achievement of learners Mbithe (2012). This finding concurs with findings of a study by Yildiz.et.al., (2006) found that science experiments are inseparable and indispensable parts of learning experiences

From this observation it was very clear that most schools had tried to put up physics laboratory but the facilities inside were not adequate for the learners. Most of them had no electricity nor apparatus meant for practicals. Most labs turn out to be lecture halls such that when students went for lab lessons, no practical was done, instead normal teaching is done just as if in class. This finding concurs with (Mbithe 2012). Who said that most lessons in the laboratory were taught through teacher demonstrations.

This suggests that the mastery of Physics concepts cannot be fully understood without practicals as Physics requires an experimental approach of investigation by every student. This in turn leads to poor performance of Physics which influence the choice of Physics negatively

From the observation checklist physics teaching/class text books available and adequate were 9(69.23%), available and not adequate 3(23.08) , not available 1(7.69%). This is in agreement with the Text book: student ratio of 2:1. But when it came to the physics reference books available and adequate were 4(30.77%), available and not adequate 7(53.85%) , not available 2(15.38%).

It was also observed that library where reference books are meant for students to borrow and read were wanting, those available and adequate were 3(23.08) available and not adequate 7(53.85%) , not available 3(23.08). most schools kept the reference books in either Head of Department (HOD) offices or with the teachers where by students could borrow from them, and because they were few ,most teachers did not give them out for fear of losing them.This explains why a small number of students

chose Physics in Wareng district. These findings agree with Shiundu and Omulando (1992) that inadequate facilities have a negative influence on the attitudes and academic achievements of the learners.

From the observation checklist computers available and adequate were 2(15.32%), available and not adequate 4(30.77%), not available 7(76.92%). While on the other hand computers rooms available and adequate were 2(15.32%), available and not adequate 2(15.32%), not available 9(69.23%). Computers simply both the teachers and students work in terms of explaining and understanding hard concepts. It was therefore observed that only 15% of the schools under the study have adequate computes for learning.

Some schools had computers which had never been used for a long time as evidenced by heavy sticky foam of dust. Schools with available and not adequate computers were those with mostly computers in the secretary's, principals, and bursar's offices. Those with adequate computers do not even use them for teaching but mostly for revision of mocks, KCSE past exams.

4.7.7 Interview findings on availability of school facilities

Teachers were asked how availability of school facilities influenced students choice of physics in secondary schools. Majority of the teachers had the opinion that if a school had a well equipped laboratory then it will positively attract students. When a concept is taught and then illustrated practically, it motivates the student. If the laboratories are ill-equipped then students are not going to participate fully in practical work

which has been found to influence Physics take up. These findings concur with findings by Olubor (1998) who found that lack of adequate facilities such as laboratories are probable causes of students poor performance in examinations which influenced Physics take up. Most teachers also listed enough textbooks, enough teachers' and libraries as some of the major facilities that attract students.

4.8 Summary of Chapter four

This chapter presented the data analysis, interpretation and discussions of the results.

It analyzed the findings of the study from questionnaires, interview schedule and observation check list on factors influencing students' choice of physics as an examinable subject in secondary schools in Waeng District. The next chapter will summaries the findings of the study, give conclusion and recommendation based on the findings and finally suggests further research.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary of the findings as presented in chapter four, draws discussion and a conclusion based on the findings, gives recommendation based on the findings and ends up with suggestions for further research

5.1.0 Summary of the Study

The findings are summarized according to the objectives as presented below:-

5.1.1 Students Career Aspirations

The first objective of the study was to determine how student's career aspirations influenced their choice of physics as an examinable subject. The study found out that students chose Physics because it was a requirement for most of the science courses in the university as indicated by majority 142(77.6%) of the students respondents who indicated that physics was a requirement for most of the science courses in the university and that is why they chose physics. Majority (96.15%) of the teachers of physics said that it was true that students choose physics because it was a requirement for most of the science courses in the university,

Regarding to whether physics was important in life, the study found out that majority 77.6% of the students agreed that physics was important in life. Students also chose physics for their future career, as indicated by Majority 165(90.2%) of the respondents who chose physics for their future career. The study also found out that the role of career guidance office in every school can not be overlooked as evidenced by 165 (90%) of the student respondents who said they were guided before they chose the subject. It can be concluded that guidance on career choice influenced choice of Physics.

This was further supported by the teachers through the interview schedule majority who said that students chose physics because it was a requirement for their future career. When students were asked whether physics knowledge led to self employment it was found out that 65.9% of the students choose physics because they thought physics knowledge led to self employment

In conclusion it was established that students' choice of physics was influenced by future career aspirations and the fact that Physics was a requirement for most of the science courses in the university. Career affects how students perceive physics and whether it is important in their life, or whether physics knowledge leads to self employment. It is therefore very clear that future career aspiration and physics being a requirement for most of the science courses in the university influenced` students to choose physics in secondary schools

5.1.2 Family influence on student's choice of physics

The second objective of the study was to establish how family influenced students choice of physics as an examinable subjects in secondary school in Wareng District. The study found out that majority 143(78.1%) of the students were not advised by either mother/farther/guardian to take physics. It is very clear that most parents did not advise their children on this subject. This was also evidenced by the teachers through an interview schedule majority 21(80.77%) said that parents do not advice students to take physics. Only 19.3% students respondents were advised by father/mother/guardian .It is very clear that most parents did not advise their children on this subject.The findings agree with Lyons (2004) in his research in Australia on choosing physical science noted that students would chose physical science due to such cures as parents positive comments, positive behavior and personal histories about the science

The study further found out that majority 127(80.4%) of the student respondents did not chose the subject because brother/sister was pursuing a physics course in

colleges . A very small number 19(10.4%) agreed, this implies that there was a very small number of brother/sister pursuing physics courses in college. Any advice given by this group was also limited. The study further found out that 125(68.4%) of the student respondents of the study population did not choose physics because they wanted to be like their uncle/aunt in future.

Only 31(17%) of the student respondents were influenced to choose physics. Therefore the study established that family had very little influence on student's choice of physics in secondary school. The student's family failed to provide advice and encouragement. There were no Physics role models in the family and therefore family had insignificant influence on the student's choice of physics. When family members talk positively about the subject, encourage, and give advice to students, it builds student confidence and attitude towards the subject.

5.1.3 Peer pressure on students choice of physics

The third objective of the study was to establish how peer pressure influences students' choice of physics as an examinable subject in secondary schools in Wareng District.

The study found out that only 18(9.8%) of the student respondents chose physics because their friends took physics and majority 164 (90.1 %) did not. Teachers had the same opinion as their students. 145(79.2%) students respondents did not choose physics to suit in their peer group .and that the minority 29(15.9%) chose physics to suit in their peer group.

The study further found out 20(10.9%) student respondents agreed to have chosen physics to be respected by their friends. This clearly shows that to be respected by friends or not had a very small (10.9%) influence on the choice of physics.

.The study further found out 39(22.4%) of the student respondents choose physics because they were encouraged by their friends in higher class (form 4) taking the subject.

.Therefore the study established that peer pressure had a very small influence on choice of physics. majority of the students did not chose physics because of their friends.

5.1.4 Teacher's influence on the student's choice of physics

The fourth objective of the study was to determine how teachers teaching physics had influences on the student's choice of physics as an examinable subject in secondary school in Wareng district. The study found out that majority 108(64.5%) of the student respondents were not advised by their teacher of physics to take physics. it is very clear that teachers of physics did not fully encourage the students to chose physics and one of the reasons could be to have small classes of bright students only.

The study found out that most 94(51.4%) of the student respondents chose physics because their teachers used good teaching methods that made it intereting

The study also found out that 104(56.78%) of the student respondents agreed that they choose physics because teachers of physics motivated them by allowing them to participate in science congress and symposium. The study also found out that 122(66.65%) of the student respondents agreed that they choose physics because their teacher of physics used peer teaching and group discussions.

The study finally found out that majority 122(66.65%) of the student respondents agreed that they choose physics because their teachers of physics took them to the lab for practical's more often .It is very clear that practicals done more often will motivate and boost students interests in the subject because they make physics real and interesting. Frequent practical builds confidence in the subject.

In summary the study established that students were influenced to chose physics when physics teachers allowed students to participate in science congress and symposium, used good teaching methods that made the subject simple and interesting, and took them to the lab for practical's more often

5.1.5 Availability of school facilities.

The fifth objective of the study was to establish how availability of school facilities influenced students' choice of physics as an examinable subject in secondary schools in Wareng District The study found out that majority 127(69.4%) of the student respondents chose physics because of equipped laboratory in their schools , a fact that most of teacher respondents agreed with. The study also found out that majority 123(67.2%) of the student respondents were influenced to chose physics because of enough textbooks in their schools

The study found out that most student respondents indicated that they had the Text book: student ratio 2:1 which is the ministry of education requirement. This is a clear indication that schools have tried to ensure that students have enough text books.

The study also found out that majority 111(60.7%) students chose physics because of their schools organized physics contests in which they took part and enjoyed.

The study finally found out that 39(21.4%) of the students were influenced by there being enough physics teachers in their schools. While majority 124(67.8%) out of 183 students were not influenced by enough physics teachers. this means that there is still some shortage of physics teachers in most schools.

In summary the study established that availability of school facilities such as enough text books, equipped laboratory and physics contests had significant influences on student's choice of physics.

5.2. Conclusions

Based on the findings various conclusions can be drawn;

The first objective of the study was to determine how student's career aspirations influenced their choice of Physics as an examinable subject. In conclusion it was established that students' choice of physics was influenced by the fact that physics is a requirement for most of the science courses in the university, guidance on the subjects and career also influenced choice of physics. This clearly shows career affects how students perceive physics. It is therefore very clear those future career aspirations of the students and the fact that physics is a requirement for most of the science courses in the university influenced students to choose physics in secondary schools.

The second objective of the study was to establish if the family influenced student's choice of Physics as an examinable subject in secondary school in Wareng District In

conclusion the study established that the student's family failed to provide advice and encouragement. The students also lacked role models in the family and therefore family had insignificant influence on the student's choice of physics. Family members need to talk positively about the subject, encourage, and give advice to students to build student confidence and attitude towards the subject.

The third objective of the study was to establish how peer pressure influenced students' choice of physics as an examinable subject in secondary schools in Wareng District. Majority of the students were not influenced by their friends to take Physics, In conclusion the study established that peer pressure had insignificant influence on choice of Physics. Majority of the students did not chose physics because of peer pressure.

The fourth objective of the study was to determine how teachers teaching physics influenced student's choice of physics as an examinable subject in secondary schools in Wareng district. In conclusion the study established that students were influenced to chose Physics when Physics teachers allowed them to participate in science congress and symposium, used good teaching methods that made the subject simple and interesting, and took them to the lab for practical's more often. This implies that teachers play a major role in simplifying hard concepts, they are instruments of transmitting knowledge to the students therefore they must be well trained. They must use effective teaching methods that are student centered.

The fifth objective of the study was to establish how availability of school facilities influenced students' choice of physics as an examinable subject in secondary schools

in Wareng District .In conclusion the study established that availability of school facilities such as enough text books, equipped laboratory and physics contests had significant influences on student's choice of physics.

5.3. Recommendations

Based on the findings and the conclusions, the following recommendations were made;

- (i) Schools should empower their careers department in conjunction with guiding and counseling department to initiate talks as early as in form one to make the students aware of the importance of learning physics subject. This can also be done by having Guest speakers (physicists) invited in schools early enough to talk to Form1 and Form2 to motivate them so that at Form 3 they may choose physics. This would increase the enrolment
- (ii) Family members should learn to talk positively about the subject, encourage, and give advice to students, to build the students confidence and attitude towards the subject.
- (iii) A powerful awareness campaign should be mounted to enlighten parents on their roles in promoting physic
- (v) Teachers should empres the use of practical's in physics subject to simplify the concept, make it interesting, draw learners attention to build the learner's confidence in the various topics And physics teachers should allow students to participate in science congress and symposium as often as possible to build the learner's confidence

(vi) A powerful awareness campaign should be mounted to enlighten teachers on their roles in promoting physics through in-service training like. SMASSE, and also to encourage the use of practical's by teachers to simplify complex concept

(vii) Schools should organize regular and frequent physics contests and allow more students to participate .

(viii) Schools should construct and equip laboratories and try as much as possible to ensure that they have adequate and available apparatus for learning. This will allow students to do practical's more often right from form one and make the subject more interesting. This will have a positive impact on enrollment in form three.

5.4 Suggestions for further research

The role of physics teacher on performance of physics in secondary schools

Strategies that could enhance the teaching of physics

Similar studies can be done in other districts to have a more conclusive evidence so as to improve physics enrolment and performance in Kenya.

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APPENDIX A : LETTER OF INTRODUCTION

GLADYS KHAOYA

MOI UNIVERSITY

P.O BOX 3900

ELDORET.

RE: LETTER OF INTRODUCTION

I am a student undertaking a study on choice factor influencing the choice physics subject in Wareng secondary schools in Moi University. Questionnaires for students (Form 3) have been deployed and prepared for the purpose. Your school has been identified to take part in this study. It is hoped that will contribute towards improvement on enrolment of physics in secondary schools. The administrative of the questionnaires may last about one hour.

Thank you in advance for your cooperation.

Yours faithfully

Gladys Khaoya

APPENDIX B: STUDENT QUESTIONNAIRE

Dear Student

RE: LETTER OF INTRODUCTION

This is a survey to find out what influenced you to choose or not to choose physics as an examination subject for KCSE. The information you will provide was treated confidentially. You are therefore kindly requested to respond to all the items as honestly as possible. Time for completing the questionnaire is thirty minutes only.

Thanking you in advance for your cooperation.

Yours truly,

Gladys Khaoya

STUDENTS QUESTIONNAIRE

PART I: STUDENTS Characteristics & Background

1. What is your Gender?

Female []

Male []

2. What is the type of your school?

Girls []

Boys []

Mixed []

5. State the position of physics among other subject in your last end year examination.

a. One of the best performed subjects []

b. One of the worst performed subjects []

c. One of the averagely performed subjects []

6. Of the following sciences which one do you like most (✓) the appropriate one only

Physics

Chemistry

Biology

7. a) Do you have career and guidance office in your school (✓) the appropriate one only

Yes []

No []

b) If yes were you guided in subject and career choice as you joined form 3? (✓)

the appropriate one only

a. Yes []

No []

Part 2: How career aspiration influences the choice of Physics

Read the following statements and indicate by ticking the one you think is nearest to your feelings.

They are;

SA Strongly Agree

A Agreed

U Undecided

D Disagree

SD Strongly Disagree

	Statement	SA	A	U	D	SD
1.	I chose Physics because it is a requirement for most of the science courses in the university					
2.	I chose physics because its important for life					
3.	I chose physics for my future career					
4.	I chose physics because physics knowledge leads to self employment					
5	I chose physics because I was guided by our career teacher					

Part 3: Family Influences on choice of Physics

Read the following statements and indicate by ticking the one you think is nearest to your feelings.

They are;

SA Strongly Agree

A Agreed

U Undecided

D Disagree

SD Strongly Disagree

	Statement	SA	A	U	D	SD
1.	I chose Physics because my father/mother/guardian advised me to do the subject					
2.	I chose physics because my brother/sister is pursuing a physics course in College					
3.	I chose physics because I want to be like my uncle/aunt in future who pursuit physics					
4.	I chose physics because I want to be like my father/mother who did physics and is prospering					

Part 4. Peer influence on choice of physics

Read the following statements and indicate by ticking the one you think is nearest to your feelings.

They are;

SA Strongly Agree

A Agreed

U Undecided

D Disagree

SD Strongly Disagree

	Statement	SA	A	U	D	SD
1	I chose physics because my friends take physics					
2	I choose physics to suit in my peer group					
3	I chose physics because I want to be respected by my friends					

4	I choose physics because I was encouraged by my friends in higher class (form 4) taking the subject.					
----------	------------------------------------------------------------------------------------------------------	--	--	--	--	--

Part 5: Teacher Influence on choice of Physics

Read the following statements and indicate by ticking the one you think is nearest to your feelings.

They are;

SA Strongly Agree

A Agreed

U Undecided

D Disagree

SD Strongly Disagree

	Statement	SA	A	U	D	SD
1.	I chose physics because my teacher advised me to take physic					
2.	I chose physics because my physics teacher uses good teaching methods that makes it interesting					
3.	I chose physics because my physics teacher motivates me by allowing me to participate in science congress and symposium					
4.	I chose physics because my physics teacher uses peer teaching and group discussions					
5.	My physics teacher takes us to the lab for practicals more often					

Part 6: How school facilities influences choice of Physics

Read the following statements and indicate by ticking the one you think is nearest to your feelings.

They are;

SA Strongly Agree

A Agreed

U Undecided

D Disagree

SD Strongly Disagree

	Statement	SA	A	U	D	SD
1.	I chose physics because we have a well equipped laboratory for physics					
2.	I chose physics because we have enough text books for physics subject					
3.	I chose physics because our school organizes physics contests in which I take part and enjoy					
4.	I chose Physics because we have enough Physics teachers					
5.	I chose Physics because we have computer used for teaching in my school					

Part 7: what is the text book: Student ratio in your school
 (✓) the appropriate one only

1:1 []

2:1 []

3:1 []

More than 3:1 []

*Thank you for your cooperation
God bless you.*

APPENDIX C OBSERVATION CHECK LIST

Facilities/Resources	Available/adequate	Available/not adequate	Not available
1. Physics textbooks			
2. Physics reference books			
3. Physics laboratory			
4. Library			
5. Electricity in laboratory			
6. Physics apparatus			
7. Physics Lab assistant			
8. Computers			
9. Computer rooms			

APPENDIX D INTERVIEW SCHEDULE FOR TEACHERS

Thank you very much Mr/Mrs/Ms----- for the warm welcome. I will now ask you questions concerning:

Section A: Biographic information.

1) What is your gender

Male [] Female []

2) What is your teaching experience?

0-4 years []

5-9 years []

10-14 years []

15 years and above, []

4) What is your highest level of education?

a) Diploma in education []

b) Bachelor of education []

c) Masters of education []

d) Others

Please indicate if others.....

5 (a) Which student would you prefer to chose physics in your class

.....
.....

(b) give reason for your response in (a) above,

.....

Section B: factors influencing student’s choice of physics in Secondary schools

1) How does career aspiration influence students choice of physics in secondary schools?

.....
.....

2) How does family influence students choice of physics in secondary school

.....
.....

3) How does peer influence students choice of physics in secondary schools?

.....
.....

4) How do you, as a teacher teaching physics influence students’ choice of physics in secondary Schools?

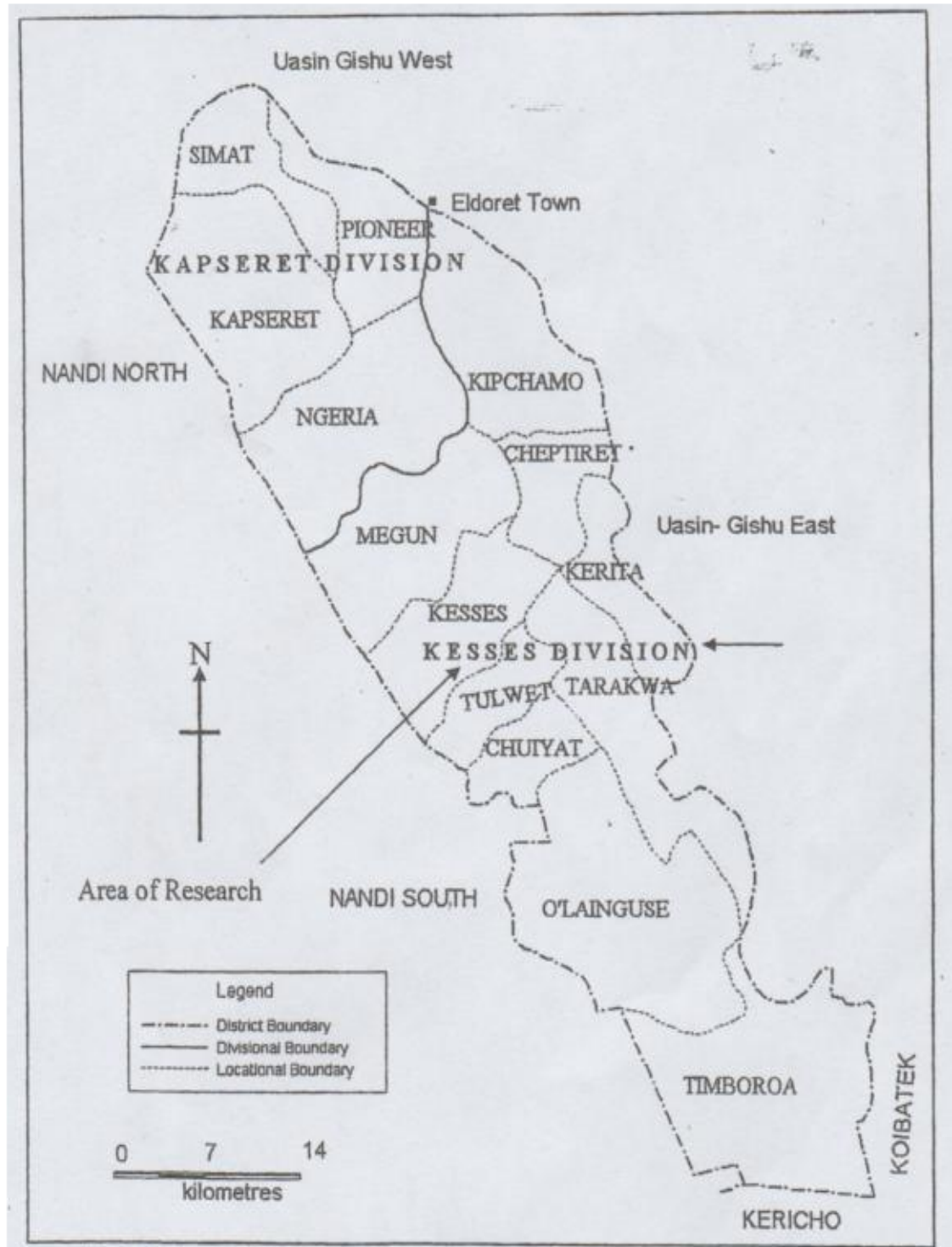
.....
.....

5) How does availability of school facilities influence student’s choice of physics in secondary schools?

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

*Thank you for your cooperation
God bless you.*

APPENDIX E: WARENG DISTRICT MAP



Appendix E: Wareng District Map

APPENDIX F: RESEARCH PERMIT

CONDITIONS

1. You must report to the District Commissioner and the District Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2)/four(4) bound copies of your final report for Kenyans and non-Kenyans respectively.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.

REPUBLIC OF KENYA
RESEARCH CLEARANCE PERMIT

GPK60553mt10/2011 (CONDITIONS - see back page)

PAGE 2 **PAGE 3**

Research Permit No. NCST/RCD/14/012/385

THIS IS TO CERTIFY THAT: **Date of issue 18th April 2012**

Prof./Dr./Mr./Mrs./Miss/Institution **Fee received KSH.1,000**

Gladys Khaoya

of (Address) Moi University

P.O.Box 3900-30100, Eldoret


has been permitted to conduct research in

Location

Wareng District

Rift Valley Province

on the topic: Factors influencing students' choice of physics as an examinable subject in secondary schools in Wareng District.



[Signature]
Applicant's Signature

[Signature]
Secretary
National Council for Science & Technology

for a period ending: 30th September, 2012.

APPENDIX G: RESEARCH AUTHORIZATION LETTER

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349
254-020-310571, 2213123, 2219420
Fax: 254-020-318245, 318249
When replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: **NCST/RCD/14/012/385**

Date: **18th April 2012**

Gladys Khaoya
Moi University
P.O.Box 3900-30100
Eldoret.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Factors influencing students' choice of physics as an examinable subject in secondary schools in Wareng District,*" I am pleased to inform you that you have been authorized to undertake research in **Wareng District** for a period ending **30th September, 2012**.

You are advised to report to **The District Commissioner and the District Education Officer, Wareng District** 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. M. K. RUGUTT, PhD, MSc.
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioner
The District Education Officer
Wareng District.

"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development."

REPUBLIC OF KENYA



MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
STATE DEPARTMENT OF EDUCATION

Telegrams: "EDUCATION", Eldoret
Telephone: 020 2112779
Email: deowarengdistrict@yahoo.com

District Education Office,
Wareng District,
P.O. Box 65,
MOI UNIVERSITY.

When replying please quote:
Ref: No. EDU/WAR/E/41/6

Date: 14TH MAY, 2012

TO PRINCIPALS
SECONDARY SCHOOLS,
WARENG DISTRICT

RE: AUTHORITY TO CONDUCT RESEARCH: GLADYS KHAOYA

The above subject refers,

The above is a student of Moi University pursuing a Masters course in Education.

She is hereby authorized to conduct research on "Factors influencing students' choice of physics as an examinable subject in secondary schools in Wareng District," for a period ending 30th September, 2012.

Accord her the necessary assistance.

Thank you.

FOR
DISTRICT EDUCATION OFFICER
WARENG DISTRICT
JOSPAT SAMOEI
FOR DISTRICT EDUCATION OFFICER
WARENG DISTRICT