

**FACTORS INFLUENCING GIRLS' LOW ENROLMENT AND POOR
PERFORMANCE IN PHYSICS IN MFANGANO ISLAND WARD, HOMA BAY
COUNTY, KENYA.**

BY

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DECLARATION

This research project is my original work and has not been presented in any university for the award of any certificate, diploma, degree or postgraduate degree.

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DEDICATION.

This work is dedicated to Jane Olumwa- my beloved mother, Maurine Olumwa- my wife and Ann Merishi and Prince Braxton-my dear children. May God bless you all and give you a long life.

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I sincerely thank the almighty God who gave me life, strength and knowledge to undertake and accomplish this work. It only by his grace that has made me complete this work successfully.

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LIST OF ABBREVIATIONS

H.O.D: Head of Department

I.E.A: International Evaluation of Education Achievement

K.C.P.E:Kenya Certificate of Primary Education

K.C.S.E:Kenya Certificate of Secondary Education

K.I.C.D:Kenya Institute of Curriculum Development

K.I.E:Kenya Institute of Education

K.N.E.C: Kenya National Examination Council

N.A.E.P:National Assessment of Education Progress

N.C.B: National Science Board

M.D.G: Millennium Development Goals

M.O.E: Ministry of Education

T.S.C :Teachers Service Commission

U.N.E.S.C.O:United Nations Educational Scientific and Cultural Organization

ABSTRACT

The study sought to investigate the factors influencing the performance and enrolment of girls in Mfangano Island ward. The choice of this topic was influenced by the fact that Physics is offered as an optional subject and thus fewer girls opt for it as the subject of choice and again performance and enrolment in Physics in Kenya and particularly in Mfangano Island Ward has remained low over the years.

The design of the study was descriptive survey and was carried out in 5 (five) schools sampled from the Ward, two of which were pure mixed day secondary schools, two were mixed day and boarding schools and one was a pure boarding school which was selected using stratified sampling. A total of 130 students and 17 practicing teachers (7 Physics teachers, 5 HODs and 5 principals) participated in the study. Data was collected using teachers' questionnaire, students' questionnaire, HODs' interview schedule as well as Students' achievement tests. These included achievement test scores, entry behavior, learners' attitude towards Physics, teacher characteristics and teaching methodology. Data was analyzed using descriptive and inferential statistics techniques. Tables were also used to display data.

The study found out that peer influence affects the performance and enrolment in physics. It again revealed that students attitude do affect performance and enrolment in Physics so as the entry behavior. The study did not find any relationship between mathematical and spatial ability on enrolment and performance. The study recommended that teachers should try to work on students' attitude and teachers' service commission should post female teachers to act as role model to female student

CHAPTER ONE

INTRODUCTION

1.1 Background of study.

In early eighteenth and nineteenth century Science was either studied as a hobby or studied by individuals who had developed interest in acquiring scientific knowledge. Since then Science has developed to the level where we today live in scientific civilization in which science is no longer confined to few individuals or countries that are devoted (Momanyi, 2010) but to the entire world. It is unfortunate that less than a half of the world's population venture in Science education. The knowledge of science very crucial to any person living within any modern society, for example, scientific knowledge have improved the food production in the world at large.

Physics is a branch of science that is believed to be one of the oldest and probably the most developed of all the Sciences (Keith 1996). It concerned with nature, structure and properties of matter. Physics as a subject is a foundation of many occupations such as Telecommunication, Architecture, Engineering, Building and Construction and Health. It is therefore important part of any country's economic development. It enable learners to develop analytical skills necessary for problem solving in various situations they encounter in life (Adeoye, 2010).

The physics enrolment and graduation rate has been an issue in many countries including USA, United Kingdom and Holland and even Kenya (Osborne et al 2003). The issue of enrolment and performance of girls in Physics has been a subject of discussion and research globally (Farmer ,1993). Danton report of 1998 established that the number of boys studying Physics as a science subject outweighed the number of girls. Some of the general objectives of secondary school physics include;-using the acquire knowledge to discover and explain the order of the physical environment, use the acquired knowledge in the conservation and management of environment, Contribute to technological and industrial development of a nation, Develop capacity for critical thinking in solving problem of the nation and to acquire adequate knowledge in physics for further education or training of others (K.I.E, 2002).

In spite of the important contributions of Physics to the life of members of the society, a decline in enrolment and performance has been registered over the years (KNEC 208-2017)

Education is an avenue of training and learning, as well as enhancing knowledge and skills. Sintayehu et al (2014) says that the ultimate goal of education is to empower an individual to excel in his career field and to be able have positive impact on his or her environment. In confronting the many challenges that the future hold in store, humankind sees education as an indispensable asset in its attempt to attain the ideals of peace, freedom and social justice (U.N.E.S.C.O, 1996). Increasing the accessibility of education will have positive impact on the lives of individuals on the globe . If we educate members of a given nation properly by providing quality education there will be an increase in food productivity, increase in individual income, improved health care, high fertility rate, reduction in income disparity, enhanced democracy and good governance.

Governments in many parts of the world are aware of the importance of female education. From this say “educating a boy is like educating a person while educating a girl is like educating a whole community “, it is generally recognized today that the education of girls and women is one of the wisest and most profitable investment in social and economic terms, these benefits are very many and the first person to benefit is the woman herself or the girl child as an individual and as a member of a given community (U.N.E.S.C.O, 1999). Due to these benefits most countries all over the world have invested in girl child education. Despite all the investment and the importance attached to Physics as a subject, the enrolment and performance of girls has generally remained very low. Women who do pursue careers in Science, Engineering and Mathematics most often choose fields in Biological sciences where they represent 42% of the work force, 36% found in Mathematics, 25% in Physical sciences and 7% in Engineering (The National science board 1998).

The disparity in performance between male and female child in Sciences has been a challenge in the world for many years . A wealth of research has documented the disparity in the academic performance of male and female child (Dwyer and Johnson, 1997; Entswisle et al., 1997; Hydee, Fennemar and Lamonn, 1990; Kimball, 1989). All over the globe, it has been noted that boy child register significant greater performance in Science than girl child (Gamze, 2010; Miyanke et al, 2010; Kost et al, 2009; Lorenzo et al, 2006; Gonzales et al, 2004; Martin et al, 2004). This observation has been reinforced by the fact

that boys are “naturally” better equipped to excel in Science (Hammond & Hammond, 2002; Marksamer, 2001; Jacobs and Eckles, 1985). These views are also enhanced by the societal stereotype that girls are only meant to perform easy tasks and boys child are meant to do heavy tasks. At our homes girls are usually given dolls while boys are given cars and hence increase this disparity.

The disparity in Science subject performance between boys and girls has also been manifested by the cross cultural survey conducted by International Evaluation of Educational Achievement (IEA, 2003) which revealed that male child outperformed girl child. Additionally, male child outnumbered girl child by 25% in performance of science (Chan’g, 2008).

The National Assessment of Educational Progress 2005 (N.A.E.P) carried out by the United States revealed that male child outperformed female child in science achievement in grades 4, 8 and 12. Females at all levels made relatively little gains in their average science scores since 1996.

In most cases by grade 11, the areas of largest male advantage were Physics, Chemistry, Earth Science and Space Science (Kahle and Meece, 1994; Stencamp and Maehhr, 1983; Becker, 1989; Lee and Burkam, 1996).

In Africa the female enrolment and involvement in field of science has remained low in the world (Frazier, 1999). The number of males enrolled in science related at the undergraduate level still outweighs the number of female enrolling in the same science courses (National Science Foundation, 2005). In Kenya this disparity is still witnessed even after the government initiative to expand the accessibility to quality education and retention of girls. This gap widens in Physics as manifested by the research conducted by IPAR in 2003 on the performance and enrolment of students in KCSE that revealed that 5.6% of student in Kiambu enrolled in Physics, 10.2% from Kisumu enrolled in physics and 0.2% of girls enrolled in physics in Garissa.

Table 1.1 National enrolment of learners in the three sciences as a percentage from 2008 to 2017

Enrolment in Physics as compared with other Science subjects among the students across the country and Mfangano Island Ward

Year	Total entry	Physics	%	Chemistry	%	Biology	%
2008	300794	92648	30.8	296360	98.5	271735	90.3
2009	338834	104188	30.7	328922	97.1	299304	88.3
2010	357488	104188	30.5	347378	97.2	315063	88.1
2011	410585	128359	31.3	403096	98.2	366533	89.3
2012	434121	118508	27.3	427303	98.4	386538	89.0
2013	446696	119654	26.9	439847	98.5	397319	88.9
2014	483630	131410	27.2	476582	98.5	432977	89.5
2015	522870	144551	27.6	519241	99.3	486278	93.0
2016	574125	178462	31.1	566871	98.7	532676	92.8

(Source: KNEC Examination Annual Report, 2008- 2017)

From table 1.1 it is clear that enrolment in Physics has been low as compared to other Science subjects among the learners across the country and Mfangano Island Ward is not left out.

Table 1.2 National performance in science subjects by gender from 2011 to 2016

Disparity in the performance among girls in physics subject in terms of subject means score

Year	Total		Score Subject				
	Enrolment	Girls	Boys	Girls	Boys	Girls	Boys
2011	410585	32.6	33.2	28.3	30.3	19.9	21.3
2012	434121	36.2	38.5	24.4	27.9	26.0	29.5
2013	446696	37.4	39.7	32.1	36.2	29.4	33.6
2014	483630	40.1	43.2	36.7	40.2	34.2	37.9
2015	522870	44.2	47.8	39.8	46.6	36.4	40.2
2016	574125	40.3	43.9	38.6	41.2	34.5	37.7

Source: KNEC; KCSE Annual Report, 2011 – 2016

Table 1.2 shows clearly the disparity in performance among girls in physics subject. Mfangano Island ward the performance among girls in Physics as remained extremely very low. It is against this background that the study sought to investigate the poor performance and low enrolment among girls in secondary school in Mfangano Island Ward.

1.2 Statement of the problem

K. N. E. C Report (2015) shows that the performance of girls in Mathematics and Sciences was extremely very low compared to boys. The enrolment among girls has generally remained low and even the performance has remained poor and this puts at a risk and not appealing to girls due to its past performance record (Ng'etich, 2008). Low enrolment of girls give them little opportunity to pursue careers such as Engineering, Medicine, Erchitecture and other Technical discipline that do reward economically (I.J.E.A.P, 2013).

A number of researches (Okerre & Mugendi, 2017; James, 2014; Mutai, 2016; Mutai, Gude & Role, 2015) have been conducted on the performance and enrolment of physics in other regions around the globe but not in Mfangano Island Ward. Therefore this study will be very important in establishing factors influencing enrolment and performance of girls in physics in Mfangano Island Ward, Homa Bay County.

1.3 Purpose of the study

This study was to investigate the factors influencing enrolment and performance of girls in physics in Mfangano Island Ward in Homa bay county with aim of improving enrolment and performance in Physics in our schools. The factors investigated were peer influence, teacher characteristics, entry behavior and girls attitude.

1.3 Objectives of the study

- a).To determine the teacher's influence on girls enrolment and performance in Physics as a science subject.
- b).To investigate how peers pressure affect the enrolment and performance among girls in Physics as a science.
- c).To study how student's mathematical skills affect their enrolment and performance of Physics in girl child.
- d).To determine how the entry behavior affect the learners' ability in enrolment and performance in Physics as a science in girls.
- e).To determine whether girls' attitude have an impact on their performance and enrolment in Physics.

1.5 Research questions.

- a). Do teachers play any role in enrolment and performance of girls in Physics?
- b).What role is played by peer influence in enrolment and performance girls in Physics as a science?

- c). How do girl's attitude affect their performance and enrolment in physics as a science subject?
- d). How does girls' mathematical skill determine enrolment and performance in Physics?
- e). What is the relationship between entry behaviour and enrolment and performance of girls in Physics as a science?

1.6 Significance of the study

The findings in our research will guide the teacher on how to chose the best method to apply when handling female students and provide information to assist in guiding and counseling of learners especially the girl child on the importance of Physics. This research will provide information to parents on how to guide their female students on the role played by Physics in the world of today.

This research will be will help the Kenya national examination council or any other examination body in Kenya and entire globe in determination the best evaluation procedure to be applied in Physics as a science.

This research will help female learners in understanding factors that can lead to performance and enrolment in Physics among their gender as females.

The results of this study will help institutions training teachers to modify their training methodologies so as to improve enrolment and performance of learners especially girls in Physics and sciences in general.

This study will help Principals, H.O.Ds, teachers in guiding learners while making their career choices as they chose different subjects.

1.7 Limitation of the study

The research was only done in Mfangano ward and not in the entire country, therefore for inclusive result to be obtained, the study should be carried out in all the wards in Kenya. Due to time and financial resource constraints it was not possible to conduct this study in a wider region.

The sample size used in this study was too small to allow for the generalization of the result in the whole ward. This research was limited due to lack of proper and reliable records in the schools where the study was conducted due to unprofessional record management in some of the schools. This research was also limited to school principals, head of Physics department, Physics teachers and some selected students in the selected schools, hence we cannot use it to generalize the results.

This study was only done in schools within Mfangano Island Ward in Mbita sub county, Homa Bay County and therefore research outcomes cannot be used to generalize the schools outside the ward. Moreover, Mfangano being an island made movement from one region to the another very difficult as one is expected to use water boat to move from one school to the another hence resulting to an extra cost incurred.

1.8.Delimitation of the study

This research was only conducted in secondary schools only. This means that higher institutions of learning were not touched. The study was done in Mfangano ward, an area which has a relatively high poverty index. This research was majorly focusing on the factors affecting performance and enrolment of girls in Physics in Mfangano ward.

1.9 Assumptions

This research was guided by the assumptions highlighted below:

- a).The respondents would cooperate from the beginning to the end of the study and that they would give reliable responses more willingly.

- b). All the teachers that were sampled were well trained and had enough good mastery of the subject content to enable them handle Physics as a subject.
- c). The learners that were sampled had good background information in Physics as a subject.
- d). The responses provided by the respondents were honest, trustworthy and accurate as expected by the researcher.

1.10. Theoretical framework

This research was guided by constructive theory of learning by Piaget (1971), who is considered as the father of constructivism. Constructivism is a theory of learning which suggests that people acquire knowledge by experiencing things and in conjunction with knowledge that they already possess, 'construct' their own understanding of these things. Piaget (1971) further argues that learning is an active, contextualized process of constructing knowledge rather than acquiring it. He stated that the learner selects and transforms information, constructs hypotheses, and make decisions, relying on cognitive structure to do so. Physics being one of the branches of science offered in secondary schools in Kenya, there is need to guide students in constructing knowledge from their previous experience.

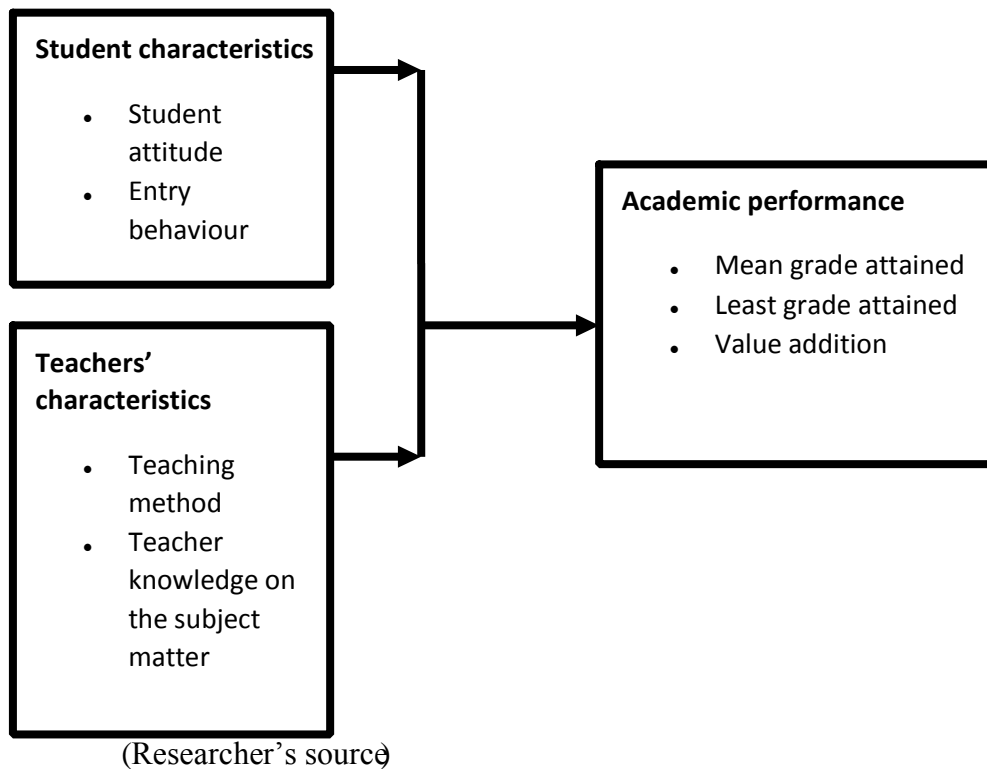
According to the theory, learning does not begin from scratch, rather, new information acquired builds on the existing knowledge; this constructs a new, broader understanding of the world around us. Each and every learner is genetically unique. They therefore need to be proactive in how they learn, take new information and also shape it according to their understanding rather than passively absorbing the information learnt like a sponge. The theory empowers the role of the learner. The role of the teacher is simply to act as a guide and not a domineering figure. It further emphasizes on the importance of a customized curriculum aimed at sharing knowledge where students are able to take a more active role in judging their own progress.

1.11. Conceptual framework

The performance and enrolment of Physics as a subject among girls has remained low due to such variables like; student's attitude, teaching methodology, teacher characteristics, peer pressure, mathematics skills and knowledge. Government should formulate policies that will

enable them overcome these challenges and make physics enrolment among girls to rise.
(Aftin K Dube, 2011).

Figure 1: Conceptual Framework



In the figure 1 above, the factors which influence the performance of students in any subject include the student and teacher characteristics. The performance of the learners in Physics can be traced back to teacher's characteristics such as competence and teaching methods employed. Other characteristics influencing learner's performance are learner related including learners entry behaviors and learners attitudes towards the subject.

The effects of these factors are manifested in their mean grade attained when exams are administered to learners.

1.12. Definition of significant terms used in the study

- 1).Entry behavior:** Student characteristics at the enrolment time.

- 2).Enrolment:** Refers to the number of learners taking Physics and are able to do it up to the final examination.

- 3).Gender:** Refers roles assigned to an individual by the society.

- 4).Performance:** Outcome obtained by learners after exam administration to learners.

- 5).Physics:** Study of matter in relation to its energy

- 6).Teaching method:** Method used by the teacher in delivering subject content.

CHAPTER TWO.

LITRATURE REVIEW

2.1 Introduction.

A lot of research has been done concerning factors affecting the enrolment and performance in Science subjects among girls in most areas in Kenya and beyond her border with the aim of improving the performance (Mwangi,1983;Okere and Mugendi,2017;James,2014;Mutai,2016; Gude and Role,2015) but not in Mfangano island ward, Homa bay county. Therefore, this chapter is going focus on what educationist and researchers have done with an objective of improving the enrolment and performance of girls in Physics and to reduce the disparity that has been witnessed in terms of gender.

A number of factors have been highlighted by researchers to affect the performance and enrolment of girls in physics and this study will look at most of these factors which includes student attitude, students' entry behavior and the teacher characteristics.

2.2. Factors affecting performance and enrolment of girls in physics.

2.2.1 Students' entry behavior.

learners entry behaviour is a prerequisite skills or knowledge that the learner has at the start of a lesson or class. student's behaviour is a collective activity that is displayed by the learners and it differs every time the learner takes part in a teaching learning process. For this particular study we will focus on the relationship between the marks obtained by pupils at primary level in science subject and her performance at secondary level. The quality grades obtained by an individual at Kenya certificate primary education level will always influence the grades obtained by the a particular learner at Kenya certificate of secondary education.

Kiptum (2016) in his study stated that there is a strong relationship between performance and entry behaviour which was supported by Hudson (2006). Enrolment is defined as the number of students taking Physics and is ready to take it up to KCSE (Akweya, Twoli, & Waweru, 2015). According to DeWitt, Archer & Moote (2018), there is a strong correlation between enrolment and entry behaviour mainly because most students without quality grades will always shy away from doing physics even with all the importance attached to it.

2.2.2 Characteristics of the teacher.

Teacher characteristics is a broad concept which encompasses very many factors which includes; teaching methodology, subject mastery, attitude towards the subject, skills i.e. either trained or not trained, this makes it difficult to be defined fully. Kiptum (2016), in his study on the impact of low enrolment in Physics, established that most teachers find some challenging topics to students easy to handle due to their competency which is indicated in their high academic qualifications which do affect their instructional methods. However, in his studies on teacher qualification in Kenya Mackatiani (2017) noted that the examination oriented system of Kenyan education only encourages rote learning since the teachers are only guided by the examination result and not the teaching methodology. The exam oriented models contributes to stresses to the teachers and learners since tests determine their worth. In the society, most teachers are assessed based on the results that students pose i.e. a good teacher is one who produces a good result. The one who produces a poor result is always considered as a bad one. Science is not about acquiring knowledge but it is about constructing meaning out of it and hence it is not possible for one or the teacher to ascertain whether the student has understood the concept or not (Kolb, 2014). This shows that there is need to discourage rote learning and allow students to construct their own knowledge from the existing phenomena.

Gender imbalance is also a major factor; female teachers always act as a role model to their female learners. There are efforts to deploy female teachers to rural areas and arid areas to be role model to the girls and to address low representation of women among all levels (MOE, 2007). The gender imbalance has also been addressed by the current constitution of the republic of Kenya which encourages a third gender rule in any public office.

This study sought to look at how the teaching methodology, quality of the teacher, training background of teachers affect the enrolment and performance of Physics among girls in Mfangano Island Ward.

2.2.3 Peer pressure.

Peer pressure refers to the direct influence on the people by their peers or it can also be defined as the habit of following what your peers do. Peer influence is a reciprocal event in which one child may affect the other positively or negatively.

2.2.3.1 Negative Influences

Peer groups with low aspirations in life will always think about making money first that going to college or pursuing certain careers. This group of people or students might engage in risky behaviour. At 14 years of age they are likely to engage in a destructive behaviour as compared to at 18 years where they have clear aspirations of their life.

2.2.3.2 Positive Influences

Peer groups with high aspirations in life will always tend to focus on their academic achievement than anything else. They will always try to copy their teachers.

2.2.4 Girl's attitude

It is true that the girl's attitude towards a particular subject affect their performance in that subject. Ogembo, Otanga & Yaki (2015), in their studies posted that girls have less interest than boys especially towards science subjects. This has been supported by many researchers in their studies (David & Cheruiyot, 2016; DeWitt, Archer & Moote 2018). A study on the student's attitude and its effect on performance aimed at assessing the interaction between feelings and behaviour as observed in performance found out that the level of expectation and performance is related to attitude and anxiety (Okere & Mugendi, 2017). Moreover, the low academic achievement is likely to lead to low enrolment due to learner's low attitude towards the subject. As indicated by (Kariuki, 2007), persistently low academic performance or achievement may discourage the learners and leads to negative attitude towards the subject. Besides, the past performance may have an impact on how learners perceive the subject (Orodho, 1996). When one views her academic performance she would believe that she is not able to perform well in any forth coming examination. As cited by Adelaide (2010) in a study carried out in Australia, high school girls perceive mathematics, sciences, engineering and technology as technical, too hard and boring.

To improve girls' attitude towards Physics there is need to motivate girls in every step of their learning process (Kolb, 2014). There is need to encourage girls so as to enable them to perform better in Physics. This can be done by employing female instructors who would form part of the role models. The researcher aimed at finding whether the student's attitude

towards Physics will affect their performance in KCSE examination in Mfangano Island Ward, Homa Bay County, Kenya.

2.2.5 Summary

This chapter focused on literature review of related to the factors affecting poor performance and enrolment among girls in Mfangano Island Ward. The factors which were investigated included the teacher characteristics, student characteristics and entry behavior to find out what scholars have said on their relationship to academic performance and enrolment of girls in Physics. From this literature it was revealed that there is correlation between the academic performance and their attitude. The methods employed by the teacher will always affect the enrolment and performance among girls in Physics and lastly the entry behavior affect the enrolment and performance among girls.

Many studies have been conducted across the globe which focuses on the factors affecting performance among girls in physics and even enrolment but there is no such research that has ever been conducted in Mfangano Island Ward. Ngetich (2008) looked factors affecting poor performance and low enrolment among girls in secondary schools in Nandi which is a small region within the country, to make a better conclusion then there is need to do this research in Mfangano ward.

CHAPTER THREE

RESEARCH METHODOLOGY.

3.1 Introduction.

This chapter is concerned with research methodology and design that was used in data collection and analysis and interpretation. It also describes the research location, the target population, sample size and sample selection. The research instruments that were used and how they were administered are also discussed. An attempt will also be made to describe how both piloting and actual data collection was done.

3.2. Research design and process.

A research design is a program which provides a researcher with a roadmap on how to collect, analyze and interpret the collected data. The research design that was employed was descriptive survey design. The adoption of the research design was based on its capacity to extract information from a wide sample of respondents so as to warrant generalization of the study findings (Mugenda and Mugenda, 2003). Data collection was done via administration of questionnaires as the main research instrument to a sample of respondents. An interview guide and achievement test was also used to extract further information from learners and teachers.

3.3 Location of the study

The study was carried out in Mfangano Island ward in Mbita sub county, Homa Bay County in Kenya. Mfangano Island Ward was selected for the study because most of the schools in the island have low enrolment and poor performance among girls in Physics over the years. Hence the study was meant to come up with a way of improving girls enrolment and performance in Mfangano island.

3.4 Target population

The target population of Mfangano Island Ward was estimated to be 95 practicing teachers and 2500 students (Suba North sub-county education office, 2018). Subjects for the survey comprised samples that were drawn from the population of students and practicing teachers which was considered to representation of the entire population of Mfangano.

3.5 Sample and sampling procedure

Sampling refers to statistical procedure that deals with selection of a given number of subjects from a target population to represent the target population. The study involved all practicing Physics teachers in the sampled secondary schools, principals and randomly sampled students from forms two, three and four. The research sample that was used in the study consists of 3 schools in Mfangano Island Ward which represented 25% of the entire population. The selection of the sample was by stratified random sampling since both day and boarding schools participated in the study. A sample size of 10% to 20% is acceptable in a descriptive survey (Mugenda and Mugenda, 2003).

Using Mugenda and Mugenda's (2003) suggestion, the researcher came up with 6 schools out of 13 schools, 8 physics teachers out of 30 physics practicing teachers and 260 students.

Table 3.1 Sampling grid.

Type Of School	Total number of schools	Schools sampled	Population sampled			
			Number of Physics students	Number of Physics teachers	Number of HOD	Number of School Principals
Mixed Day schools	6	3	95	3	3	3
Mixed day and boarding schools	5	2	105	4	3	2
Girls boarding schools	2	1	60	1	1	1
Total	13	6	260	8	7	6

The table 3.1 indicates that 6 schools were sampled through stratified random sampling method where schools from each category were put in stratum and a total of 260 Physics

students were sampled. One physics practicing teacher was picked from each school, H.O.D was picked from each school and the school principal from each of the sampled school was also picked for the purpose of this study.

3.6 Research Instruments.

The research instruments that were used consists of questionnaires for students, questionnaires for teachers, oral interview and achievement test for students.

3.6.1 Questionnaire for student.

Questionnaire for students consisted of open and close ended questions, which were meant to obtain information about the girls' attitude towards physics, their entry behavior and their opinion on teacher characteristics and teaching methodology. It was administered to form two, form three and form four physics students. A sample of that questionnaire is attached in appendix III

3.6.2 Questionnaire for teachers

This questionnaire was meant to gather information about teachers' characteristics, teachers role in enrolment and performance among girls, teaching methodology, availability of teaching or learning resources in the school and their opinion regarding mathematical skills of girls in physics examination and its effect on performance and enrolment. The sample of this questionnaire is attached as appendix IV.

3.6.3 Oral interview.

Oral interview was used to gather information to supplement those that were obtained from other instruments like questionnaires for teachers and students and achievement test. The interview was in form of discussion between the researcher and the respondents involved. The researcher took notes in the course of discussion. A sample of oral interview is attached in appendix II.

3.6.4 Achievement test.

The objective of this test was to obtain information on students' mathematical and spatial ability. The results for this test were used to compare their entry behaviour and to find out the extent to which the mathematical and spatial skills affected enrolment and performance of physics among girls. The test was also used to improve the reliability and the validity of the data collected. A sample of achievement test is attached in appendix V.

3.7. Pilot study

The study was meant to validate the research instrument by ensuring that the instruments used do not have deficiency. Piloting was carried in one day and boarding secondary school and one day secondary school which were not sampled. Twenty form three students and four students and 10 practicing teachers who were not sampled due to their similarity of setting and characteristics took part in the pilot study. From the findings of the pilot study, alterations were done on test tools which included, reframing, removal or addition of some questions. The information obtained from pilot study was used to calculate the reliability by use of Pearson's product moment of correlation

3.8 Validity of the instruments

Validity is defined as the extent to which an instrument measures what it was supposed to measure and performs as it is designed to do so (www.slideshare.net). Validity can also be defined as accuracy and meaningfulness of inferences, which are based on the study results (Mugenda and Mugenda, 2003). According to Borg and Gall (1989), validity of instruments is improved through expert judgment. The researcher sought assistance from the research expert who validated the research instruments.

3.9 Reliability of instruments

Kimberlin (2008), believes that reliability of estimates, evaluate the stability of measures, and internal consistency of the measurement instruments. The instruments were administered to respondents during pilot study and responses noted. One week after the administration the same instruments were administered to the same respondents and responses noted. Comparison of the two administrations was done and Pearson's' Product Moment formula was used to compute correlation coefficient in order to establish whether instruments were consistence and were able to give the same results whenever they are administered. A correlation coefficient of +0.8 was found and was considered to be high enough to judge the instruments as a reliable for the study.

3.10. Procedure for data collection.

The researcher visited the selected schools before the actual data collection day to arrange with the school administration on best time possible for data collection. After establishing good rapport with the school administration, the researcher distributed the questionnaire alone to students, teachers and head of departments. Oral interview was conducted by the researcher as he was taking notes.

3.11. Procedure for data analysis.

The data obtained was presented in form of tables, cross tabular and analyzed using descriptive statistics with the help of SPSS. Tables, charts and graphs were used where possible present the results and to make the results appear more clear. The scores were calculated and the correlation coefficient determined using the Pearson correlation formula:

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

3.12 Ethical Considerations

Before the research was done, permission was obtained from those in authority and a go a head was authorized. Prior arrangements were made to make the actual collection of data relatively easy and affordable. The respondents were instructed not to fill their names and were assured of the confidentiality of information they give and the information given was not to be used for other purposes rather the findings of the study. The respondents were not coerced to give information but the participation was voluntary.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction.

This chapter captures data analysis process, data presentation and the outcomes that are in line with research objectives which include;

- i) To determine the teachers influence on girls enrolment and performance in physics as science subject.
- ii) To determine how peer pressure affect enrolment and performance among girls in physics as a science.
- iii) To determine whether girl's attitude have an impact on their enrolment and performance in physics.
- vi) To study how students' mathematical skill affect their enrolment and performance of girl child in physics.
- iv) To determine how students' entry behavior affect the learners' ability in enrolment and performance in physics as a science in girls.

To obtain the information the following research instruments were used; students' questionnaire, teachers' questionnaire, oral interview and achievement test. The research was descriptive in nature and hence the data was analyzed using percentages and tables.

4.2 Attitude of girls towards Physics on enrolment and performance

The research was to determine how girls attitude towards Physics affect their enrolment and performance in the subject. This achieved by sampling form two, three and four girls from all the sampled schools in the region under the study. Students' attitude was tested using questionnaire for students using items 2(a), (b), 3(a), (b), 6(i) (ii) and 12 (a), (b) (Appendix III).

A five scale Likert's items were used to gauge students' attitude towards Physics in students' questionnaire items 16, 17, and 20. A value of 1 and 2 was taken to represent negative attitude while the value of 4 and 5 were taken to represent positive attitude.

Some responses were considered in the cohorts using the statement "I look forward to a physics lesson"

Table 4.2. Students' attitude compared to performance

I study physics on my own		Performance using mean grades obtained in the achievement test					
Type of school	Attitude	A	B	C	D	E	TOTAL
Girls Boarding	4 & 5	3	1	2	0	0	6
	Positive						
	3	0	0	0	2	0	2
	1 & 2	0	0	1	3	1	5
Mixed day and Boarding	Negative						
	Total	3	1	2	5	1	13
	4 & 5	6	5	9	0	0	20
	Positive						
Mixed day	3	1	2	1	6	2	12
	1 & 2	0	1	4	15	12	32
	Negative						
	Totals	7	8	14	21	14	64
Mixed day	4 & 5	6	15	8	0	1	30
	Positive						
	3	1	3	4	2	0	10
	1 & 2	1	3	0	18	9	31
Mixed day	Negative						
	Total	8	21	12	20	1	72
Total		18	30	28	56	25	140

Most students who performed poorly in achievement test had negative attitude towards physics and they can't study physics on their own and most of them came from mixed day and boarding and mixed day secondary schools, while those who had positive attitude towards physics performed well in achievement test. This shows that good performance in subject area reinforces attitude towards the subject. Most students whose performance was low reported a negative attitude towards physics. Most students who performed well especially in Form Three had a positive attitude towards physics and looked forward to a physics lesson. Students who did not look forward to a physics lesson all came from Form Two. This shows that all the students who had already

enrolled in physics have a positive attitude towards the subject. Students' performance in a subject affects their attitude towards the subject. Pupils' feelings are very important when teaching and have a strong impact on the amount of work, effort put towards as well as the learning that is acquired (Callahan, 1971; Orodho, 1996). Positive attitude towards a given subject can as well determine the time spent and effort put on that particular subject hence this have an impact on performance (Nderiitu, 2007).

Learners who are highly motivated in area of interest are likely to perform hard task than those learners who are less motivated or not motivated at all (Weiner, 2006). There exist a relationship between the grades obtained by a learner and sustained learners' interest in physics during the period of the lesson. This would mean that for an improved result in physics, tutors must come up with innovative strategies of teaching that can entice the learners' interest throughout the period of the lesson.

4.3 Student entry behaviour on enrolment and performance

Student entry behaviour is a skill inherent in a student before a teacher begin giving the instructions. In any subject , this skill should be assessed before the learner is admitted or enrolled in any programme. The student entry behaviour in this research was limited to the mean that the students attained in KCPE or the grade they got in Physics in their previous class. Student questionnaire was used as instrument to determine the girl's entry behaviour on enrolment and performance. The entry behaviour was tested in the students' questionnaire using item 15 (Appendix III). The table below shows the relationship between entry behaviour (K.C.P.E science grade) and the performance in achievement test.

Table 4.3: Relationship between marks obtained in achievement test and entry behaviour

Mean grades on the assessment of the relationship between the entry behaviour and the performance in physics

Type of school	Examination	Mean grade					TOTAL
		A	B	C	D	E	
Girls boarding	KCPE	4	6	3	2	0	15
	Achievement test	3	4	2	4	1	15
Mixed day and boarding	KCPE	18	12	32	3	0	65
	Achievement test	4	9	11	26	15	65
Mixed day	KCPE	20	21	23	1	0	65
	Achievement test	6	14	15	18	12	65

From this data, it is of great significance to assess learners' entry behaviour as and what they are capable of doing before you choose the instructional method to use in class. This would mean that learners' performance depends greatly on his/her entry behavior. When we compare K.C.P.E marks obtained in science and the marks obtained in achievement test in this study, it was noted with great concern that those who performed well in KCPE did perform well in the achievement test. This indicates that failure to assess the learners entry behaviour and their prior knowledge in a subject will automatically have a negative impact on their performance and subsequently interfere with the capacity of the tutor to meet his goals and objectives. This can clearly be justified by

studies conducted by Ladd & Sorensen (2017), Entwistle & Ramsden (2015) and Kolb (2014). Therefore, it is in order to assess learners's entry behaviour and and come up with a prerequisite to understand the level of their abilities before giving them instructions. Failure to adhere to this may have a negative impact on learners and and the tutor may fail to achieve his set goals and objectives set for instructions. Gross (2015) contends to a large extent that cognitive entry behaviour affects achievement in any subject. Therefore the knowledge of students' cognitive entry behaviour helps the teacher to design the best instructional method that suits his learners.

4.4. Mathematical/spatial ability on enrolment and performance.

This research sought to establish the effect of mathematical or spatial ability in physics on enrolment and performance among girls. This was tested using students' achievement test items 1, 2, 4, 6, 11(b), and 17, Appendix (V). It was also tested using students' questionnaire item 13 and teachers 'questionnaire item 24. Most students who performed well in the achievement test scored high in the questions that required mathematical calculation. All teachers who responded to item 24 either accepted or strongly accepted that students who performed well in mathematics do perform well in physics. Table 4.4 shows a cross tabulation of the frequency of students per grade from last end of term examination.

Table 4.4: The influence of Mathematical/spatial ability on enrolment and performance A
cross tabulation of the frequency of girls' per grade from previous end of term exams from students' questionnaire item 13

School Category	Subject	A	B	C	D	E	Total
Girls	Physics	0	2	4	7	2	15
Boarding	Mathematics	0	2	3	6	4	15
Mixed Day and Boarding	Physics	0	3	21	25	16	65
Boarding	Mathematics	0	4	18	22	21	65
Mixed Day	Physics	0	4	18	24	19	65
	Mathematics	0	5	16	20	24	65
Total		0	20	80	104	92	290

Chi square statistics is 0.4698

*(p - value =0.493076. the result is not significance at $p < 0.5$)

We can observe from the Table 4.4 that students who do well in mathematics also do well in physics and those that do poorly in mathematics also do poorly in physics. Most research that has been conducted shows that there is relationship between the mathematical skills and performance in physics among students.

Mathematical and spatial visualization has been found to contribute towards achievement in science (Cirino et al., 2016). Spatial visualization ability was also found to be higher among the boys than among the girls (Lyons 2005). It has also been found that the link between mathematics and physics is a strong one (Madsen, McKagan & Sayre, 2015). Mathematical ability did contribute towards achievement in physics. As observed by Docktor et al., (2016), the use of mathematical formulae in physics provided an economical use of mental effort. However, in this study the correlation between mathematical skills and performance was not statistically significant.

4.5 Peer influence on subject choice and performance of physics among girls.

This was tested using item 18 in students questionnaire (Appendix III) requiring them to state whether the classmates influenced them to choose physics was put in the students' questionnaire. The findings are shown in the table 4.5.

Table 4.5: Peer influence on the performance and choice of physics among girls. *Response to questions on the influence of peers in the choice of physics as a science subject by students inform three*

Response to Questions	Frequency	Percentage (%)
Strongly Accepted	51	38.7
Accepted	18	9.6
Don't know	12	8.4
Didn't accept	10	3.8
None of the above.	54	42.5
Total	145	100.0

Out of the 145 girls presented with the questionnaires, 51 (38.7%) strongly accepted that peers had a great influence on the choice of physics as science subject, 18 (9.6%) accepted, while 12 (8.4%) did not know and 10 (3.8%) did not accept that peers had an influence on the choice of the science subjects while 54 (42.5%) gave none of the above as their answer. Those students who Accepted

and Strongly accepted to the item were deemed to have been influenced by their peers in choosing physics and those who were didn't accept and the none of the above were taken to have chosen physics on their own initiative.

The study findings indicate that most students do not accept with the peer influence on the choice of subject.

4.6 Role of the teacher on enrolment and performance of physics among girls'.

The study sought to establish the role played by the teacher on performance and enrolment among girls. This was tested using items 24 and 25 in student's questionnaire (Appendix III) and items 5(a), 6(a), 7, 13, and 24 of teachers' questionnaire (Appendix IV).

Table 4.6.1 Total Syllabus Coverage by teachers

Response to questions on syllabus coverage

Response to Questions	Frequency	Percentage (%)
Very efficient.	3	29.6
Adequately efficient.	2	13.5
Fairly efficient.	4	44.7
Not Adequately efficient.	2	13.5
Total	11	100.0

Table 4.6.1 show that 29.6% cover the syllabus very efficiently, 13.5% cover the syllabus adequately efficient, 44.7% covers the syllabus fairly efficient and 13.5% do not cover the syllabus adequately efficient and this may be the reason as to why there was poor result in the achievement test. Learning of physics is largely dependent on the role of the teacher as an instructor or facilitator. Compared to the significant influence of a good teacher, academic qualifications and systematic in-service training, the teacher's age, sex and a pre-service professional training have only minimal influence on student achievement, (Duckworth & Yeager, 2015). Sadker and Sadker (1991), observes that, as opposed to males, females tend to be less aggressive and assertive in asking and responding to questions, or expressing their views, or taking the lead in practical activities, they tend to be sidelined and dismissed by the teacher, (with preference to male student) as lacking in

Table 4.6.2. Teacher's attendance to practical lesson*Responses on how frequent teachers attend to practical activities during learning*

Response to Questions	Frequency	Percentage (%)
Daily	10	7.1
Weekly	52	37.2
Twice a week.	64	45.7
Monthly.	8	5.7
Termly.	6	4.3
Total	140	100.0

Table 4.6.2 shows that most teachers 45.7% perform practical or attend a practical lesson twice a week followed by 37.2% on a week basis, 7.1% on a daily basis and 5.7 % who do practical a monthly basis and lastly 4.3% who do practicals on a termly basis with the student at. This shows that teachers with positive attitude towards physics will always have influence on enrolment and performance among girls. Teacher being the source of knowledge in any class therefore he or she has a direct impact on the learners. The impact may be either affect students positively or negatively. The findings are agreement with the previous research that teachers do play a role in academic performance of students.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter this research has captured the summary of the study, conclusion of the study and recommendations of the study which are in line with objectives.

5.2 Summary of the study.

The aim of the research was to determine factors influencing the performance and enrolment of girl child in Physics. This research captured factors such as; learners entry behaviour, learners attitude especially that of girl child, peer pressure, teachers' role, and the mathematical/spatial ability.

5.2.1 Mathematical and spatial abilities

It was observed that the effect of mathematical or spatial abilities on performance and enrolment a in physics in girl child was insignificant even though most learners shy off from enrolling for physics as a subject basing their reasoning that physics require more of mathematical knowledge for one to perform well in the subject.

5.2.2 Student attitude towards Physics on enrolment and performance

The study found out that most girls in the schools where the research was done, had negative attitude towards physics as a subject and this resulted into poor performance that was witnessed in the achievement test. Majority of the learners were not even in a position to study physics on their own with the stereotype that physics is a hard subject. Some female students believed that physics is a masculine subject due to the fact that all the physics teachers found in Mfangano ward were all male. T.S.C should therefore post female physics teachers in Mfangano ward to boost the morale of the female students.

5.2.3 Student entry behaviour and enrolment and performance in Physics

Entry behaviour defines the students' prerequisite knowledge, or skills possessed by the learner before the instruction is given by the teacher. In my study it was entry behaviour means the marks obtained by the learner in Science subjects at K.C.P.E. In my study there was positive relationship between student entry behaviour and student performance. The learners who had quality grades at K.C.P.E level also had quality grades on achievement test. This is an indication that entry behaviour had an impact on future performance of a learner. However, other factors like learners' previous exposure to relevant content in a subject may have an impact on performance. This research therefore established that there was a correlation coefficient between entry behavior and performance in physics.

5.3 Conclusion of the study

The findings of the study established that the enrolment and performance of girls in physics is affected by learners' attitude, learners' entry behaviour and teacher characteristics. The study further concludes there lack of adequate learning and teaching resources, lack of teachers preparedness and the curriculum is not fully intergrated to address girl child enrollment and performance in physics.

5.4 Recommendations of the study

Study was investigating factors influencing performance and enrolment among the female students in Physics as a subject. From the above findings and conclusions the following are the recommendations of this research study.

1. Learners and all stakeholders in the education sector should be aware of how peer pressure can affect the enrolment and performance among girls in physics.
2. Teachers should try as much as possible to change the negative attitude of girls towards physics by guiding them and sensitizing them on the important of physics in terms of the available jobs in the job market. Negative attitude can also be done away with through proper teaching and presentation of the subject matter which will make learners to enjoy the subject.

3. Education stakeholders should encourage learners in primary schools to work hard in science subjects and also inform them on what sciences mean in the modern world.

5.5 Recommendations for further research

The researcher recommends the following for further research:

1. The study was limited to Physics subject hence the need for further research in other subjects in schools.
2. The study location was limited to Mfangano Island ward with unique cultural and economic background and hence the need to for further research in other locations for the purpose of generalization.
3. There is need to explore other factors which affect enrolment and performance in physics such as class size, students' literacy level, subject's difficulty index, students' cultural back ground and type of curriculum offered. Hence there is need for further research to establish the extent to which those factors affect performance and enrolment.

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APPENDIX I

INTRODUCTION LETTER TO RESPONDENTS.

University of Nairobi,
Department of education and external studies,
P.O.Box 92-00902 Kikuyu. Nairobi.

17th May, 2019.

To,
The principal,

.....
P.O.Box45- 40319. Mfangano.
Dear sir/madam,

RE: Research on factors influencing girl's low enrolment and poor performance in physics in Mfangano island ward.

I am a postgraduate diploma student in the University of Nairobi pursuing a postgraduate diploma in education. I am conducting research on the above mentioned topic.

I have selected your school to participate in the research. I hereby kindly request you and your school to respond to the questionnaire items with a lot honesty as possible and to the best of your knowledge. The questionnaire is meant for this research and the respondents' responses will be treated with utmost confidentiality. No name of the respondent or institution will be written in the questionnaire. Please I request for your cooperation. Be blessed.

Thanks in advance,

Yours faithfully,

Olumwa Bostance.

L40/10874/2018.

APPENDIX II

QUESTIONNAIRE FOR HEAD OF DEPARTMENTS

NAME OF THE SCHOOL.....

RESPOSIBILITY IN THE INSTITUTION.....

NUMBER OF YEARS YOU HAVE TAUGHT.....

1. Do you create awareness to students about the career opportunities that are available in real life situation as they study physics?

i) Yes.

ii) No.

2. Can you rate your Physics students' entry behavior at form one?
.....

3. Do Physics teachers give students enough illustrations and examples in relation to the experiences and the environment around as they study Physics?

i) Yes.

ii) No.

4. From your experience, is there any positive or negative attitude shown by students towards Physics in your school?

- i) Positive.
 - ii) Negative.
5. If negative, what action have you taken as a school to change the attitude of the students towards Physics?
-
6. Name the teaching method that is often employed by teachers in your department as they handle their subjects?
-
-
7. Do you assist learners to view Physics learnt in class to be relevant in relation to what they come across in the environment and in choosing their career opportunities?
- i) Yes.
 - ii) No.
8. Do you often check learner' work in relation to syllabus coverage?
- i) Yes.
 - ii) No.
9. If yes, how often?
-
10. Do you have an evaluation policy in your school's department that you head?
- i) Yes.
 - ii) No.
11. If yes, state it.
-
-
12. How do you carry out evaluation done in your school?

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

13. Do you have revision and reference materials in the science department available and enough for students in your school?

- i) Yes.
- ii) No.

14. If no, what action have you taken to ensure that there are enough reference materials.

.....
.....

15. Can you compare the enrolment of physics as a science subject in Form Three with other science subjects .

.....
.....

16. Are students given opportunity to choose subjects themselves or teachers choose for them?

.....

17. As a science teacher, how do you ensure that all the students participate in practical activities in the laboratory?

.....
.....

18. How do you encourage students to design investigations aimed at solving physics problems?

.....
.....

19. Do you involve parents when their children make subject choices?

.....

20. How frequent do you talk to the Physics students?

.....

21. How do you motivate learners to take a keen interest in science subjects and mathematics?

.....

22. Do you take learners out for field trips, symposium or contest to learn Physics?

.....

23. What strategy to you have or apply in improving the performance and enrolment of physics in your school?

.....

.....

APPENDIX III

Questionnaire for students.

General instructions

1. Your name should not be written on this paper.
2. Attempt all the questions in the provided spaces.
3. Where choices are available, choose the most appropriate answer.
4. Please try and give the most honest and sincere answers as possible

General information

Name of school

Form

Gender:

i) male

ii) Female

a. Name two science subjects that are you taking?

i. Chemistry and Physics

ii. Biology and Physics

iii. Biology and Chemistry

iv. Chemistry, Biology

and Physics?

b. (a) Name the four subjects that you like most and in order of your preference.

i.

ii.

iii.

iv.

(b) account for your order of preference.

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

3. (a) Name the science subject that you like least?

.....

(b) Account for your answer in question 3 (a) above.

.....
.....

4 .After form four what do you want to do?

.....

5. Do your family influence your career choice ?

i) Yes

ii) No

6. (i) suppose you are a form Two now, will you take physics if you are promoted to form three the following year?

i) Yes

ii) No

(ii) Account for your answers in question 6 (i) above.

.....

7. Do you see any relevance between what you learn in physics class and what happens real life situation?

.....

8. Do you have career master in the school where you are learning?

i) Yes.

ii) No

8. If yes in question 8 above, how frequent do you consult him/her when making career choices?

9. Do your school take you for field trips for the purpose of learning physics as a science?

i) Yes

ii) No

10. If yes, how frequent do you go for the trip and where?

.....

11. (a) Are for the stereotype that physics is a difficult subject?

i) Yes.

ii) No .

(b). Account for your answers.

.....

12. Name the grades you got in the following subjects in the last end term exam?

a) Physics

b) Biology.....

c) Chemistry.....

d) Mathematics.....

From questions 13 to 25 tick the appropriate answer

13. How often do you perform physics practical lessons in the laboratory with your subject teacher?

a).Daily

b).Weekly.

c).Twice a week.

d). Monthly

e).Termly

f).Yearly.

a) Never.

14.What was your performance in sciences in K.C.P.E ?

a) A Above 75 marks

b) B (66 to 75)

c) C (41 to 65) .

d) D (20 to 40)

e) E (0 to 19)

16. Physics will be a useful subject in your future life.

a) I accept strongly.

b) I accept.

c) I don't accept.

d) I don't know.

17. most students don't study Physics on their own.

a) I accept strongly

b) I accept

c) I don't accept

d) I don't know

18. I influenced by my classmates and friends to take Physics

a) I accept strongly

b) I accept.

c) I don't accept.

d) I don't know.

e) None of the above.

19. I was influenced by my parents to take physics in form three.

a) I accept strongly.

b) I accept.

c) I don't accept.

d) I don't know.

e) None of the above.

20. Physics is a subject that is very difficult to most students.

a) I accept strongly.

b) I accept.

c) I don't accept.

d) I don't know.

e) None of the above.

21. We take physics lessons in groups.

- a) I accept strongly.
- b) I accept.
- c) I don't accept.
- d) I don't know.
- e) None of the above.

22. Physics text books are normally very few in our class in school.

- a) I accept strongly
- b) I accept.
- c) I don't accept.
- d) I don't know.
- e) None of the above.

23. I was influenced by my physics teacher to take physics.

- a) I accept strongly.
- b) I accept.
- c) I don't accept.
- d) I don't know.
- e) None of the above.

24. The class physics teacher is always very patient when showing us how to solve problems in Physics.

- a) I accept strongly
- b) I accept.
- c) I don't accept.
- d) I don't know.

e) None of the above.

25. Physics lessons are enjoyable.

a) I accept strongly.

b) I accept.

c) I don't accept.

d) I don't know.

e) None of the above.

Thank you

APPENDIX IV

Questionnaire for teachers

General information

SCHOOL:.....

SUBJECT SPECIALISED IN:.....

HIGHEST ACADEMIC QUALIFICATION.....

Gender:

A) Male

B) Female.....

Years in the teaching profession.....

Attempt all the questions below, please.

1. Apart from Physics, name the other subjects that you teach?

.....

2. As teacher, did you acquire enough skills in college to teach the subjects you are now teaching in your school?

a) Yes?

b) No?

3. If yes, how have your skill enhanced your teaching of the subject physics?

.....
.....

4. If no, how has this affected your delivery in teaching physics?

.....

5. (a) By what efficiency do you cover the syllabus especially Physics syllabus?

i).Very efficient?

ii.Adequately efficient?

iii).Fairly efficient?

iv). Not adequately efficient?

(b) Justify the answer you have given in (a) above.

.....
.....

6.(a) As a subject specialist do you usually complete the Form One and Two syllabus in time.

i) Yes

ii) No

(b) If no, approximately what number of topics do you leave uncovered?

i) In form One

ii) In form Two

(c) Do you think completion of syllabus in two have impact on how students choose physics in form three?

i) Yes

ii) No

7. Among the methods of teaching physics which one do you prefer?

- a) Lecture method
- b) Questions and answers
- c) Demonstration
- d) Discussion
- e) Class experiment/ Practicals.

8. Give the exact number of students taking physics in Form Three class in the institution where you teach?

- i) Boys.....
- ii) Girls.....

9. Account for the disparity in (8) above if any.

.....

.....

10. Suggest the possible remedy that can help in lowering the disparity shown above?

.....

.....

11. Are students given opportunity to chose subjects willingly?

- a) Yes.
- b) No

12. If no, elaborate how you chose physics students in form three class in your school.

.....

.....

For questions 13 to 24 tick where appropriate.

13. Physic teachers enjoy teaching physics.

- a) I accept strongly?
- b) I accept?
- c) I don't accept?
- d) I don't know?

14. The learners we admit in our institutions of learning cannot perform well in Physics because they are below average in terms of entry behaviour.

- a) I accept strongly?
- b) I accept?
- c) I don't accept?
- d) I don't know?

15. The students I teach perform poorly in physics as a subject.

- a) I accept strongly?
- b) I accept?
- c) I don't accept?
- d) I don't know?

16. Learners taught physics in forms three and four did not take it willingly.

- a) I accept strongly?
- b) I accept?
- c) I don't accept?
- d) I don't know?

17. Students are not working hard to pass Physics due to their laziness.

- a) I accept strongly?
- b) I accept?

c) I don't accept?

d) I don't know?

18. The institutions administrators do not provide adequate materials for teaching and learning of Physics .

a) I accept strongly?

b) I accept?

c) I don't accept?

d) I don't know?

19. The broadness of Physics syllabus affect the performance of secondary students in Physics.

a) I accept strongly?

b) I accept?

c) I don't accept?

d) I don't know?

20. The performance of boys in physics supersedes that girls.

a) I accept strongly?

b) I accept?

c) I don't accept?

d) I don't know?

21. Rather I would teach my other subject than teaching physics.

a) I accept strongly?

b) I accept?

c) I don't accept?

d) I don't know?

20. Physics is chosen by very few girls because the career opportunities in the subject are very limited.

a) I accept strongly ?

b) I accept?

c) I don't accept?

d) I don't know?

21. Girl's enrolment in physics in form three can be influenced by Physics teachers and their parents.

a) I accept strongly?

b) I accept?

c) I don't accept?

d) I don't know?

22. Students who perform poorly in mathematics do not perform well in physics.

a) I accept strongly?

b) I accept?

c) I don't accept?

d) I don't know?

Thanks

APPENDIX V

ACHIEVEMENT TEST

Achievement Test in physics for Forms Two, Three and Four

Term two 2019

Student's name:.....

Form.....

Student's instructions.

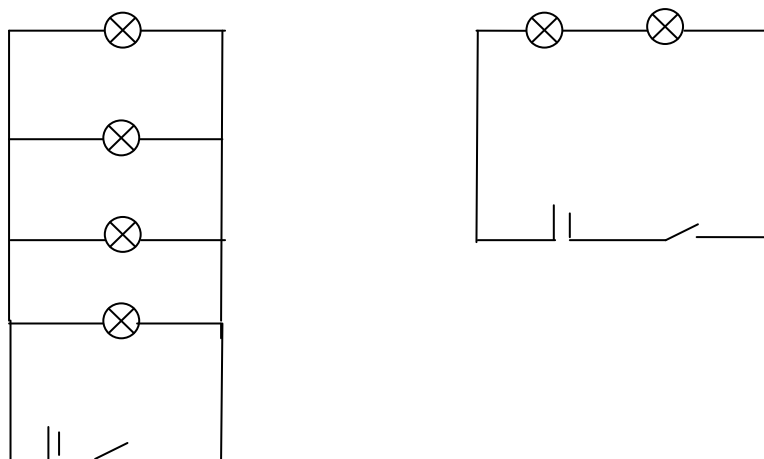
- This paper consists of ten questions only.
- The questions contains a total of 25 marks only.
- Marks will be awarded for correct working and correct answers.
- Students are allowed to use Scientific calculators and mathematical tables where necessary.
- Answer questions in the space provided for you.

The table below is to be used by the Examiner only.

	TOTAL MARKS	MARKS SCORED BY STUDENT
TOTAL.	25	

- 1) A block of glass measures 5cm by 5cm by 7cm. When it is resting on the smallest face and viewed from above it appears to be a cube. What is the refractive index of glass? (2mks)

2.a) The figure below shows two sets of circuits.



Which set of bulbs had a brighter bulbs? Explain your answer. (2mks)

b) Give reason why it is not advisable to smoke a cigarette near a charging battery. (1mk)

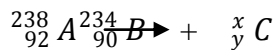
3.) A student had pieces of Aluminium, cobalt, nickel, steel and soft iron. State the metal most suitable for use as a magnetic keeper (1mks)

4) The chart below shows arrangement of electromagnetic waves in the electromagnetic spectrum in order of increasing energy.

U.V light	Visible light	Infrared	X-Rays	Gamma rays
-----------	---------------	----------	--------	------------

Does the arrangement have a mistake? If there is, provide the remedy. (2mks)

5) A radioactive substance decays to reduce its mass and atomic number.



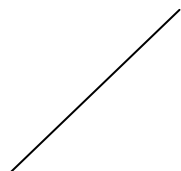
A and B are not real symbols. determine the value of x and y and hence identify the type of the radiation emitted.

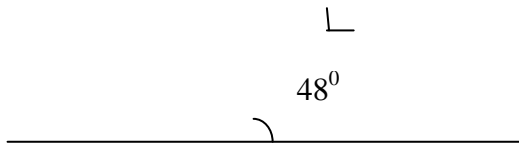
x.....(1mk)

y.....(1mk)

Type of radiation.....(1mk)

6) The diagram below shows a ray of light that is shone on a plane mirror.

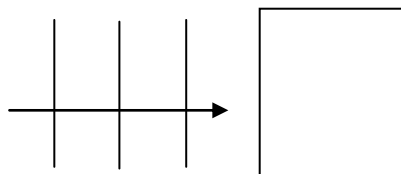




The plane mirror is rotated clockwise through 20° keeping the incident ray fixed .What is the new angle of reflection? (2mks)

7) State two ways in which the strength of an electromagnet can be increased. (2mks)

8) The figure below shows straight waves incident on an interface of deep and shallow waters. deep shallow deep



On the diagram,complete the waves on the shallow and deep water sections. (2mks)

9) State the number of images formed when an object is placed between two planes mirrors placed in parallel. (1mk)

- 10) An electric kettle is rated at 1.8Kw, 240v. Which is safest fuse for the kettle if the available fuses are 10A,7.5A , 8A, And 20A.
(3mks)

Appendix VI

Schools that took part in the study

Serial number	Name of school	Type of school
1	Gethsemane Secondary	Mixed Boarding Secondary School
2	Shalom Secondary	Mixed Day Secondary School
3	Uozi Secondary	Mixed Day and Boarding Secondary School
4	Karega mutai Secondary	Mixed Day and Boarding Secondary School
5	Mauta Secondary	Girls Boarding Secondary School

APPENDIX VII
BUDGET ESTIMATE

Serial number	Task	Cost
1	Type setting.	1800
2	Printing	3500
3	Binding	1500
4	Transport	16000
5	Material used	6500
6	Other expenses	4500
7	Printing papers	3500
Total		37300

APPENDIX VIII

TIME OF THE EVENT

Time	Event	Where it is done	Period
9th May – 26th May 2019	Data Collection	Schools	2 Weeks
1st June - !8th June 2019	Data Analysis	Home	1 Week
20th June – 8th July 2019	Report Writing	Home	3 Weeks
15th Aug – 28th Aug 2019	Presentation	University of Nairobi	2 Weeks