

**DETERMINANTS OF GIRLS PERFORMANCE IN SCIENCES IN
PUBLIC SECONDARY SCHOOLS IN NYATIEKO ZONE, KISII
CENTRAL DISTRICT, KISII COUNTY**

BY

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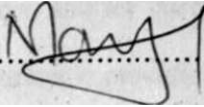
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**A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF ARTS IN
PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI**

2012

DECLARATION

This research project report is my original work and has not been presented for a degree
any other award in any other university.

Signature 

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This research project report has been submitted for examination with my approval
University supervisor.

Signature

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DEDICATION

This research project report is dedicated to my beloved husband Mr. Mbugua whose encouragement and inspiration played an important role in the development of this research project report, and my parents Mr. and Mrs. Hudson Nyaundi for their dedication, support and commitment in providing for me all I needed when I was schooling.

ACKNOWLEDGEMENT

I wish to express my appreciation to a number of persons of good will both individually and collectively for their contribution towards this project report, my dedicated supervisor Dr Harriet Kidombo who guided me in writing this proposal .I also thank The University of Nairobi for offering me a chance to pursue a Masters of Arts Degree in Project Planning and Management. I recognize the immeasurable support of all my lecturers for their devotion in shaping my research skills. I acknowledge in a special way my respondents from Nyatieko Zone , Kisii county for sparing their valuable time and giving me the data that helped me carry out my research successfully. I appreciate the support and contributions of all my classmates including David ,Bett , Rose and Mary. With whom I shared and exchanged lasting academic ideas. I also wish to thank my Principal for allowing me to do my studies while teaching.

ABSTRACT

The purpose of this study was to determine the determinants of girls' performance in science subjects in public secondary schools in Nyatiekio zone, Kisii Central District Kisii county. The study was based on the connectionism theory advanced by Thorndike. According to the theory, learning is the result of associations formed between stimuli and responses. Such associations or habits become strengthened or weakened by the nature and frequency of the stimulus-response pairings. Therefore learning requires both practice and rewards. Transfer of learning occurs because of previously encountered situations. The study targeted all girls in form 3 and 4 in Nyatiekio zone in the 7 secondary public schools and according to the records in the schools, 480 girls were in form 3 and 4 in the schools. Therefore the 480 girls formed the study's target population. Sample size for the study was, 241 drawn from the total target population of 480 girls from the 7 schools in the Zone drawn by random sampling technique from the target population as shown in Krejcie and Morgan's sample size. The study design was an *ex-post-facto research*; which is where the researcher measures changes or differences which have already occurred. In this design the researcher does not have direct control over the independent variables. The researcher consulted with his colleagues and experts to establish the validity of the measurement instrument. Data was collected through the use of questionnaires, containing both structured and unstructured questions which were used to collect primary data. The raw data collected was organized systematically so as to facilitate analysis. Data collected was checked for consistency and then coded with regard to the type and source. Data was analyzed and interpreted both quantitatively and qualitatively in light of the research objectives. Analysis of data was conducted with the aid of the Statistical Package for Social Sciences (SPSS) version 20 software for windows and Microsoft Excel 2007 computer software whereby data collected was coded and fed to the computer programme for easy analysis. Qualitative statistical techniques were used to describe and summarize data. Data was analyzed for descriptive statistics (frequencies, Percentages and mean). The analyzed data was presented in the form of tables and graphs. The study findings indicated that self-efficacy, attitude, family background and school factors determine performance of girls in sciences. To enhance performance of girls in sciences the study recommended a high self-efficacy towards the sciences is required, attitude of the girls to the sciences should be enhanced by the teachers and their parents and the Ministry of education to ensure the schools have science laboratories that are equipped with apparatus and reagents to be used in practical lessons and it should recruit more science teachers.

TABLE OF CONTENT

CONTENT	PAGE
DECLARATION.....»	»
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENT.....	v
LIST OF FIGURES.....	x
LIST OF TABLES.....	xi
ABBREVIATIONS AND ACRONYMS.....	xiii
ABSTRACT.....	xiv
CHAPTER ONE:	
INTRODUCTION.....	1
1.1 Background to the Study.....	1
1.2 Statement of the Problem.....	3
1.3 Purpose of Study.....	3
1.4 Research Objectives.....	4
1.5 Research Questions.....	4
1.6 Significance of the Study.....	5
1.7 Delimitation of the Study.....	5
1.8 Limitations of the Study.....	6
1.9 Basic Assumptions of the study.....	6
1.10 Definitions of Significant Terms.....	6
1.11 Organization of the Study.....?	?
CHAPTER TWO:	
LITERATURE REVIEW.....	8
2.1 Introduction.....	8
2.2 Selfefficacy and performance of Girls.....®	®
2.2.1 Sources of efficacy beliefs in academic performance.....	10
2.2.2 Mastery experiences	
2.2.3. Vicarious experiences	
2.2.4 Persuasion.....'	'
2.2.5. Enhancing physical status	
3.1. Attitude and performance of Girls in sciences	

3 .1.2 Gender difference in attitude and performance of girls in sciences	16
3.1. 3Traditional belief of a woman as a wife and mother.....	18
4 .1 Family background and performance of Girls in sciences	20
4. 1 .2 Parent level of education.....	20
4.1.3Family income level.....	21
5.1 School factors and performance of Girls in sciences.....	22
5. 1.2. Repetition versus promotion.....	22
5.1.3. School Fees and Indirect Costs of Schooling.....	24
2.7 Theoretical framework.....	25
2.8 Conceptual Framework.....	27
2.6 Summary of Literature Review and research gap.....	29

CHAPTER THREE:

RESEARCH METHODOLOGY.....	30
3.1 Introduction.....	30
3.2 Research design.....	30
3.3 Target Population.....	31
3.4 Sample Selection and Sample Size.....	31
3.5 Data Collection Instruments.....	32
3.5.1 Piloting of the Study.....	32
3.5.2 Validity of Research Instruments.....	32
3.5.3 Reliability of Research Instruments.....	33
3.6 Data collection Procedure.....	33
3.7 Data analysis.....	34
3.8 Ethical consideration.....	34
3.9 Operational Definition of Variables.....	35

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.0 Introduction.....	36
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4.1 Questionnaire Return Rate	37
4.2 General Characteristics of the Respondents	37
4.2.1 Age of the respondents	37
4.2.2 Duration in Secondary School of the Respondents	38
4.2.3 Number of Sciences Taken by the Respondents	39
4.2.4 How the respondents rate their performance in sciences	39
4.3. Information on Self Efficacy	40
4.4 Information on attitude	42
4.5 Family Background	43
4.6 School Factors	45
4.7 Summary	45
CHAPTER FIVE	
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	
5.0 Introduction	46
5.1 Summary of findings	46
5.2 Conclusions	47
5.3 Recommendations	48
5.4 Suggestions for further research	48
REFERENCES.....	49
APPENDICES.....	55
Appendix 1: Letter of Transmittal.....	55
Appendix 2: Questionnaire for the girls in form 3 and 4.....	56
Appendix 3; Research Authorization	57

LIST OF TABLES

Table 3. 1: Sample size table	59
Table 3.2: Operationalization Table.....	36
Table 4.2.1: Age characteristics of the respondents.....	38
Table 4.2.2: Years Respondents have been in Secondary School.....	38
Table 4.2.2: Years Respondents have been in Secondary School.....	38
Table 4.2.3: Number of sciences taken by the respondents.....	39
Table 4.2.4, How the respondents rate their performance.....	40
Table 4.3: Self Efficacy.....	41
Table 4.4: Attitude.....	42
Table 4.5: Family Background.....	44
Table 4.6 School factors.....	45

LIST OF FIGURES

Figure 1: Conceptual framework showing relationship between variables

ABBREVIATIONS AND ACRONYMS

AAUW, American Association of University Women.

DEO : District Education Officer

EFA : Education for All

KCPE : Kenya Certificate of Primary Education

KCSE : Kenya Certificate of Secondary Education

UNESCO : United Nations Educational Scientific and Cultural Organization

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The old age stereotype that girls are naturally good at reading comprehension and that boys are naturally good at math and science has long been a focus of feminist critics of science. The consequences of this stereotype, however, have been hotly debated. Some researchers believe that girls' performance in math and science suffers considerably as a result of the influences and expectations of society. But others argue that these differences no longer apply, and only slight differences in attitude and self-confidence in these subjects continues to linger. Whatever differences truly still remain, any difference is too much. In a modern world where women make up over half the workforce (Adya & Kaiser, 2005) it seems only fair that women should have an equal opportunity to pursue whichever career they choose.

Traditionally masculine jobs, such as those in science, math, and technology, should not be out of reach for women. The World Conference on Education for All (EFA) held in March 1990 in Jomtien, Thailand; observed that despite notable efforts by countries around the globe, the following realities persisted, out of a hundred million children who have no access to primary education worldwide, 60 % are girls, more than 960 million adults, two thirds of whom constitute women, are illiterate, and more than one third of the world's adults have no access to printed knowledge, new skills and technologies that could improve the quality of their lives. Despite the fact that the general aims of education include social equity, full and equal rights between boys and girls, men and women, little has been achieved (Republic of Kenya, 1986). A World Bank study conducted in 2001 in sub-Saharan Africa noted that gender differences are close to being eliminated at the primary school level at least in the region as a whole. However, the disadvantage towards females is still prominent at the

secondary school level (World Bank, 2001). Coombs (1985) acknowledges regional and gender disparities virtually in all countries in the provision of education albeit at varying levels. Besides, this imbalance also disadvantages women and girls have been shown to have very specific interests within the field of science (such as biology), yet these are the subjects that students are tested on least often (Kahle, 2004). This trend of girls' interests pointing toward natural and biological sciences was also supported and discussed in a study addressing questions to a science website (Tsabari et al., 2006); girls ask more questions relating to the natural sciences. The results of such studies make it questionable whether girls are actually performing worse on standardized science tests because they have lower ability levels or if gender differences only reflect a bias in question selection toward the hard sciences. However, in the 2011 KCSE examination results, it was noted that most girl students in Kisii Central District could hardly score a grade of B- in science subjects. In addition, the results revealed that the general girls' performance in the district was poor with a mean of 4.1 which was attributed by the poor performance in science (D.E.O, Kisii Central, 2012). Clearly if this trend continues, it may not be possible for Kisii central District to get female professionals like engineers, doctors, scientists, and nurses to name a few that require one to pass in the sciences in order to be admitted in college or university to take the courses. Thus, this study will seek to find out determinants of girls performance in Sciences among secondary school students in Nyatieko Zone of Kisii Central District.

1.2 Statement of the problem

The education of girls in science is a very important topic as it relates to future equality of the next generation of women. This is why feminist critics of science are so interested in correcting the flaws of the system. It is evident that direct and tangible changes need to be made. Although there are serious problems with the structure, language, and epistemologies

of science, a complete overhaul of science is nearly impossible to implement. The more feasible approach is to discover the most prevalent symptoms of the problem of the gender gap in science education (e.g., belief in stereotypes, lack of science self-confidence, and dissatisfaction with the way science is presented) and address these with treatments. In Kenya education has been given prominence as a prerequisite for an individual's upward social mobility and wholesomely for national development. Education is believed to equip individuals with those positions and hence executes the duties associated with those positions. The better and higher the performance the higher the opportunity to compete for those valued social positions. The results for students in KCSE in Kisii central district for the last three years (2009-2011) have not been very satisfactory nationally compared to that of other districts. More than half of the total numbers of candidates in most of the schools who are girls have been scoring C - (minus) and below in the sciences, (DEO Kisii central records). Also when the girls are in form one and two they perform well in the sciences but as they move to form three their performance starts to drop. Thus this study sought to find out determinants of girls' performance in science subjects in public secondary schools in Nyatieko zone, Kisii Central District.

1.3 Purpose of the study

The main purpose of the study was to investigate determinants of girls' performance in science subjects in public secondary schools in Nyatieko Zone, Kisii Central District.

1.4 Objectives of the Study

The objectives of this study were to:

1. Establish the extent to which self efficacy determines girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District;

2. Assess how attitude determines girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District;

3. Investigate how family background determines girls' performance in Sciences in public secondary schools in Nyatieko Zone, Kisii Central District;

4. Examine how school factors determine girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District;

1.5 Research questions

Based on the above objectives, this study sought to answer the following research questions:

1. To what extent has self efficacy determined girls' performance in sciences in public secondary schools in Nyatieko zone, Kisii Central District?

2. In what manner has attitude determined girls' performance in sciences in public secondary schools in Nyatieko zone, Kisii Central District?

3. How does family background determine girls' performance in sciences in public secondary schools in Nyatieko zone, Kisii Central District?

4. To what extent have school factors determined girls' performance in sciences in public secondary schools in Nyatieko Zone, Kisii Central District?

1.6 Significance of the study

This study was designed to investigate the determinants of girls' performance in science in public secondary schools in Nyatieko Zone Kisii Central District. It was hoped that the findings from the study may be useful to the teachers in enabling them to facilitate girls'

learning and their academic performance in sciences. The results of the study are expected to form a basis for continuing search on determinants of girls' performance in sciences.

1.7 Limitations of the study

The study results may not be generalized to all public secondary schools within the country since the study carried out was in Nyatieko Zone, Kisii Central District. However, the results may be generalized to all secondary schools within Kisii Central District. Other variables like attitude, motivation or aptitude which affect achievement were controlled by selecting only public schools which have trained teachers. It was therefore taken that there is uniform teacher and student interactions. Teacher made class tests and examinations may not be the best measure of academic performance. The scores obtained will be converted into standards scores to give an index for purpose of correlation.

1.8 Delimitations of the study

The study was concerned with determinants of Girls performance in sciences in public secondary school students in Nyatieko Zone, Kisii Central District. It was conducted in Kisii Central District of Nyanza province Kenya between August 2012 to October 2012. The study was conducted in 7 public secondary schools in Nyatieko Zone in Kisii Central district to form the study population. Three secondary schools from 7 schools were selected using stratified random sampling method to form the sample population size. This method involved dividing the population into homogeneous subgroups and then taking a simple random sample in each group. This sample comprised from three and four girls from the schools. Primary quantitative data was collected using structured questionnaires.

1.9 Assumptions of the study

The study was based on the following assumptions:

1. That the respondents were of the same age group.
2. That the respondents were brought up in the same environment and by the same parents
3. It is hoped that the sampled schools had similar facilities to reduce on variation and classifications.

1.10 Definition of significant terms

Academic performance: -This is the manifestation of learning that has taken place. It is measured by the scores obtained at the end of a session, topic, and end of a term or at the end of a course.

Science ; is the systematic study of the nature and behavior of the material and physical universe, based on observation, experiment, and measurement, and the formulation of laws to describe these facts in general terms

Self-efficacy: It is the belief or opinion of one's ability to perform successfully in a certain task and show persistence or the belief that one can master a situation and produce positive outcomes

Attitude: A positive or negative evaluation of people, objects, event, activities, ideas, or just about anything in your environment. It is a relatively stable overt behavior of a person which affects

1.11 Organization of the Study

This research was organized in five chapters and an appendices section. Chapter one, which is the Introduction, gives the background of the study, statement of the problem, research objectives that guided the study, research questions that sought to be answered. It also contained the basic assumptions of the study, significance of the study, limitations of the study and delimitation of the study. Significant terms as used in the study also were defined.

Chapter Two contains a comprehensive literature review of related studies and publications conducted regarding determinants of girls' performance in sciences. The section contains theoretical framework and conceptual framework that gives the relationship between the variables.

Chapter three of this research project report contains a description of the methodology used in the study. The research design and sampling procedure used are explained. The method of sample selection and determination is explained. The methods of data collection, analysis and presentation have been discussed. This chapter is concluded with the operational definition of variables which associates the research objectives with the methodology and provides a map to the expected results.

Chapter four contains the presentation and interpretation of the findings arising from data analysis using the techniques described in chapter three. The findings are presented in form of tables accompanied by explanations of the findings below each table.

Finally, chapter five contains summary of the findings, discussions of the findings, conclusion and research recommendations. The chapter also outlines suggested areas for further studies arising from the study findings and is concluded with a section of the study's contribution to the body of knowledge.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examined pertinent literature related to the study. It reviewed self efficacy, attitudes, family background, school factors, and performance of Girls in sciences. It also reviewed empirical literature related to the study, a theoretical framework is addressed and then it concludes with a conceptual framework.

2.2 Self efficacy and performance of Girls in science

Self-efficacy is the idea that people decide how to behave based more on their belief in their own capabilities of accomplishment rather than in their knowledge or skills (Pajares, 2002). Self- efficacy is not a simple "believe in yourself and you will succeed" concept because certain knowledge, skills, and experiences are also prerequisites to success. Still, self-efficacy is important for several reasons. It helps determine our life choices, it motivates us, and it helps us deal with failures and setbacks in life (Bandura, 1994). That said, people's self-efficacy and their actual skills or abilities do not always match or combine in productive ways. Sometimes, someone who is extremely skillful or knowledgeable may actually have low self-efficacy, thus hindering their abilities to accomplish grander things. Having varied levels of self-efficacy among individuals can help explain why two individuals with very similar skills and knowledge can end up exhibiting extremely different behaviors.

The good thing about self-efficacy is that it can be developed over time. Bandura (1994) identifies four main sources of self-efficacy. First, experiences in which the individual can

experience success helps build self-efficacy. However, success should not come too easily, since if success always comes easily, it is likely that when the individual encounters failure, they will have a harder time recovering from it. Second, self-efficacy can be built by the observation of models similar to the individual who are achieving success. The strength of the self-efficacy is more strongly influenced if the individual associates very closely with the model. Third, encouragement or persuasion by others is another source of self-efficacy. While not usually totally effective on its own, persuasion accompanied by the identification of elements which may enhance the likelihood of success are more likely to improve self-efficacy. Finally, self-efficacy is also built based on an individual's judgment of the state of their bodies-for example personal strength or tiredness-and their emotional state.

Self-efficacy, also called perceived ability, refers to the confidence people have in their abilities for success in a given task (Bandura, 1997). If they possess the ability to successfully perform, then that task will be attempted. The task will be avoided if it is perceived to be too difficult (Bandura, 1986, 1997). Although inefficacious individuals usually avoid challenging tasks, when they do attempt them they give up more easily than individuals with high efficacy. When inefficacious individuals fail, they attribute the unsuccessful result to a lack of ability and tend to lose faith in their capabilities. When they succeed, they are more likely to attribute their success to external factors (Bandura, 1986, 1997). If students master a challenging task with limited assistance, their levels of self-efficacy will rise (Bandura, 1986). Self-efficacy is especially important in learning difficult subjects (such as Biology and other sciences) given that students enter courses with vary levels of fear and anxiety. Individuals who possess a high degree of self-efficacy are more likely to attempt challenging tasks, to persist longer at them, and to exert more effort in the process. If highly efficacious individuals fail, they attribute the outcome to a lack of effort or an adverse environment. When they succeed, they credit their achievement to their abilities. It is the perception that

their abilities caused the achievement that affects the outcome rather than their actual abilities (Bandura, 1986).

2.2.1 Sources of efficacy beliefs in academic performance

People's beliefs concerning their efficacy can be developed by four forms or factors of influence. The four factors that determine self-efficacy are: mastery experience, vicarious experience, verbal persuasion, and physiological and emotional states (Bandura, 1986, 1997).

2.2.2 Mastery experiences

It refers to previous task experience and performance. Mastery experiences are opportunities to learn and practice the rules and strategies necessary to perform a task effectively

Moreover, mastery experiences provide evidence of whether an individual has the capability to succeed. They provide the most authentic evidence of whether one can master whatever it takes to succeed (Bandura, 1982). Successes built on a robust belief in one's personal efficacy. Mastery experience is the most influential factor, which refers to individuals' experiences with success or failure in past situations. Information gathered from these experiences is then internalized. Past success raise self-efficacy and repeated failures lower it, which indicates to individuals their levels of capability (Bandura, 1986, 1997). Failure undermines it, especially if failures occur before a sense of efficacy is timely established. If people experience, they easy successes they come to expect quick results and are easily discouraged by failure. Such a resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort.

2.2.3. Vicarious experiences

Refers to learning through observing others perform tasks. For example, while observing a more advanced student, a novice thinks, "If she can design and construct a working robot, so can I." Role models are especially influential when they are perceived as similar to the observer, suggesting that interaction with female faculty members and advanced students in sciences would positively affect the self-efficacy of female students. Indeed, research suggests that vicarious experience is a particularly powerful determinant of girls' and young women's sciences self-efficacy (Seymour, 1995; Zeldin & Pajares, 2000).

i

2.2.4 Persuasion

Refer to others' judgments, feedback, and support. Positive feedback and encouragement, especially from influential others (e.g., parents, teachers), enhances self-efficacy. Negative feedback erodes self-efficacy. Although almost any negative remarks will decrease self-efficacy, not just any positive comments will increase it. Positive feedback and praise is most effective when it is aligned with past performance and actual ability. The receiver of the feedback must perceive the feedback to be genuine. For example, a B student who earns a C in an exam should be encouraged to aim for a B+, rather than an A, on the next exam; whereas, an A student who earns a C on an exam should be encouraged to work towards an A on the next exam. Furthermore, social persuasion is particularly powerful when it accompanies a mastery experience (Bandura, 1997)—that is, feedback about task-related strengths and weaknesses is more informative when it is tied to a specific learning experience or previous performance (Betz & Schifano, 2000; Pintrich, 2003). J. G. Wenzel has shown that when women received positive feedback related to specific events in training, their self-efficacy for the trained tasks was increased (Betz & Schifano, 2000). Verbal persuasion tries to convince individuals who may doubt their capabilities that they possess the skills needed for success at a given task. In education, verbal persuasion delivered by teachers often

takes the form of verbal feedback, evaluation and encouragement. Persuasion must be realistic, sincere and form a credible source; otherwise it can negatively affect student self-efficacy beliefs (Bandura, 1986, 1997).

2.2.5. Enhancing physical status

Efficacy beliefs can be altered by enhancing the physical status, reduce stress and negative emotional productivities and incorrect misinterpretations of bodily states. An individual interprets his or her emotional and physical states to determine his or her self-efficacy beliefs. If nervousness and a fear of failure occur during task preparation, an individual is likely to doubt his or her ability to succeed, and the increased anxiety is likely to have a detrimental effect on performance. It is not the sheer intensity of emotional and physical reactions that is important but rather how they are perceived and interpreted. For example, people who have a high sense of efficacy are likely to view their state of affective arousal as an emerging facilitator of performance, whereas those who are beset by self-doubts required their arousal as debilitating.

A host of factors, including personal, social and situational ones, affect how efficacy relevant experiences are interpreted. Physiological state implies that failure or some degree of performance impairment can result if a person fearing failure is in a hyperactive state (Bandura, 1986). A physiologically hyperactive state includes symptoms experienced during "fight and flight" responses of the autonomic nervous system, such as increases in heart rate, breathing rate and sweating. Emotional state refers to the mood one is in when performing, such as feeling anxious.

In terms of academic functioning, self-efficacy level refers to variations across different tasks, such as increasingly complex scientific problems; generality pertains to the transfer of self-efficacy beliefs across activities, such as different academic subject matters. The strength of perceived efficacy is measured by degrees of certainty that one can perform given tasks (Bandura, 1977, 1986).

Self-efficacy involves judgments of capabilities to perform activities rather than personal qualities such as one's physical characteristics or psychological traits. Students judge their capabilities to fulfill given task, demands, not who they are as people or how they feel about themselves in general (Zimmerman, 1995). Efficacy beliefs are multidimensional rather than a single disposition. Consequently, efficacy beliefs are linked to different domains of functioning. Thus efficacy beliefs for science may differ from efficacy beliefs for English composition or artistic production. Because of the continuing problem of the under representation of woman in scientific and technical fields, much of this research has focused on the power of science self-efficacy to predict choice of and achievement and persistence in scientific technical college majors.

Research indicates that gender and gender role beliefs influence the selection of high school science courses, which in turn influence science self-efficacy and science achievement in college (Hackett, 1985). Since its initial introduction, the concept of self efficacy has gained increasing importance as a significant variable for the prediction of individual behavior (Bandura, 1997, 1982). Research supports proposition that self-efficacy will influence the choice of whether to engage in a task, the effort extended in performing it, and the persistence shown in accomplishing it (Bandura, 1977; Boufford - Bouchard, 1990; Locke and Layman, 1990) and as well as the standards of the performance (Bandura, 1986; Wood and Locke, 1987; Robertson and Sadri; 1993; More, 1994). Studies on students' expectations have

indicated that there is an influence on the students' academic performance (Hargreaves, 1972; Bophy and Grood, 1974). Results revealed that females are superior to males on verbal abilities and other kinds of linguistic skills. This difference was attributed to the lateralization of male and female brains (Buffery and Gray, 1972). The left side of girls' brain develops earlier giving them relative linguistic superiority whereas boys' left side of the brain develops later and instead retains a right side cerebral dominance giving them greater competence in spatial related activities.

Several studies have investigated female students' choices of courses and self-efficacy has turned out to be a critical predictor (Betz and Hackett, 1983). In a study among sixth grade and ninth grade Norwegian students, (Skaalvik and Rankin 1994) found that boys had higher Mathematical self-concept and self-perceived Mathematical skill than girls. Other studies have shown greater gender differences in levels of self-efficacy expectations with regard to computing (Miura, 1987; Vasil, Hesketh and Podd, 1987).

Research has shown that by the end of high school boys perform better than girls in Mathematics, whereas there are less gender differences in elementary and middle school (March, 1989; Skaalvik, 1990). In a meta-analysis investigating gender differences in achievements at Mathematics, (Hyde, Fennemma and Lamon 1990) discovered that in secondary school, boys out-performed girls in this area of problem solving. Although most of the research supports males supposed superiority in Mathematics, some studies now report that women's performance is actually at par with men's and that gender differences in Mathematics are decreasing (March, 1989). In a study of high school Mathematics students, (Miller and Associates 1996) found that females had lower perceived ability levels in Mathematics than males. Low Mathematical self-efficacy and inadequate high school Mathematics preparation, are both present more often in females than in males and lower

aspirations for future study in scientific and technical fields (Lapan, Boggs and Movril, 1989).

Girls' capabilities are undermined by sex-role stereotypes in our culture intimidating that females are not as able as males, especially in such disciplines as Mathematics and Science (Bandura, 1986, 1997). Another contributing factor could be the lower level of expectations that parents, teachers and counselors often hold for girls, which can discourage further study in scientific and technical fields (Bandura, 1997, AAUW, 1999). Although girls' academic performance and Science enrolments increased during the recent past and even exceeded boys in Biology and Chemistry, boys still enrolled more often in Physics and higher level science courses than girls (AAUW, 1999). Confidence is strongly correlated to students' continuing in their studies. In addition, males display more positive attitudes towards Science subjects than females. If females perceive their abilities to be low in Mathematics and Science, a whole technological sector of highly esteemed, high-paying careers may become off-limits to them. Low Mathematical self-efficacy and inadequate high school Mathematics preparation, both areas present more often in females than in males, lower aspiration for future study in the scientific and technical fields.

Research by Galphin et al (2003) found that the mean score for girls in computer self-efficacy was slightly higher than for boys (111% versus 109%). The mean score for girls at coeducation schools (108%) was lower than that for girls at the single sex school (114.5%). They found out that there was no significant difference between the scores of the boys and either subset of the girls. There was a significant difference in scores of two subsets of girls.

Research carried out in South Africa has demonstrated possible factors for low participation by women, include self-efficacy. Self-efficacy is important as it influences the choice of

activities by an individual, the amount of effort they will expend on a task and how long they will persevere in stressful situations to complete the task (Bandura, 1977).

A study carried out by Eshiwani (1985) reported gender differences in Mathematics at high school level. Despite the importance attached to Mathematics and the Science subjects, its performances have shown gender disparities. Boys tend to perform better than girls in Mathematics at secondary school level (Eshiwani, 1985, 1987).

A study carried out by Motari (2007) reported significant gender differences in the academic performance in Mathematics and Sciences when considered separately. However, there was a significant relationship between the students' self-efficacy and academic performance in Mathematics and Sciences (Motari, 2007).

Girls' performance in sciences in Kisii central District is poor compare to boys The teachers are encouraged to motivate the girl so that they can equally do well in Science in order to compete in equally in career opportunities (DEO office).The study is designed to find out determinants of Girls performance in sciences in Nyatieko Zone Kisii Central District.

3.1. Attitude and performance of Girls in sciences

Literature on gender difference in attitude, traditional belief of a woman as a wife and mother in relation to performance in sciences was reviewed as bellow.

3 .1.2 Gender difference in attitude and performance of girls in sciences

The development of knowledge and skills in the area of science is becoming necessary for all students. The scientific skills are important for individual and the nation to enable it to compete in the global market.

Moffat (1992) found that gender difference in attitude towards science existed in the education process. This is observed in differential course enrolment. Hardesty (1992) also noticed that there were lower female science achievement scores and fewer females in science achievement scores and in related careers. Fewer female students than male are choosing to take elective science classes.

Investigations have been reported on differences and similarities between boys and girls concerning perception and attitude towards science and achievement in sciences. According to Fensham (1980) physical science is perceived as being tough, hard and analytical. This leads to the development of the image that science is more masculine. He adds that this is reflected in teachers and students way of participation. Kull (1982) designed and carried out a study to determine the impact of student attitudes towards sciences. The sample size constituted of 450 eighth grade students in New York Junior High School. These students were presented and post tested in their scientific attitude for the results. Positive attitude for most of the students were observed. Further it was noted that there was greater interest in science for boys than girls.

Akinmade (1982) focused on perception and attitude of high school students towards science courses in sub-urban school of Michigan. The sample size was 217 ninth grade students. From the Findings of the study boys were significantly more interested in manipulation of laboratory equipment and materials than the girls.

In a study of secondary and college students selected from 7 state secondary schools and one federal college in Nigeria, Aghenta (1989) found that perceived difficulties of science occupations was a significant factor in preventing girls from entering scientific fields.

Lee and Lockheed (1990) conducted a study on perceived ability and gender difference in achievement in sciences. A total of 1012 students enrolled in a single-sex and mixed-sex secondary schools from ten Southern States in Nigeria. From the studies they found that perceived ability positively related to higher achievement in a subject and this was more in male students compared to the female students.

The attitude that one holds towards a subject appears to be a powerful predictor of achievement in the respective fields. A prior positive attitude towards a subject, the development of a positive attitude towards a subject by a teacher or a strong positive attitude towards science all appear to play a critical role in whether a girl will persist or drop out the scientific pipeline(Mordi, 1991).

Sabellah ,M (2010)conducted a study on the relationship between attitude and academic performance on chemistry in secondary a case of Kisii central and her study revealed that the students' attitude towards chemistry are generally neutral and that accounts for the dismal performance in chemistry. There are differences in gender attitude towards the subject and male students perform better than female students. Type and category of school also play a role in the attitude a student holds towards chemistry and this at the end affects the overall performance.

There also exists gender difference in attitude towards science and this directly impacts achievement in the area hence the study aims to find determinants of girls' performance in science subjects in public secondary schools in Nyatieko Zone, Kisii central District.

3.1. 3Traditional belief of a woman as a wife and mother

This traditional belief still prevails in society. Hence the attitude that it is more beneficial to formally educate a boy than a girl and those girls only need to be educated and trained in

house chores to prepare them for marriage still persists. Stereotypes are engrained so early; parents may try to minimize the effects of stereotypes by employing their own treatments. For example, a recent study found that although mothers talk to female babies more, sex differences exist in the type of talk presented to female babies in relation to that presented to male babies. Mothers were shown to engage in more science learning and literacy related talk with male babies than female babies (Tenenbaum, Snow, Roach, & Kurland, 2005). These early experiences of science talk may affect the developmental course of babies depending on the gendered experiences they were exposed to by their parents early in life. Parents may begin to break down stereotypes by being conscious of and adjusting the amount of science talk they give their female babies as a means of developing an early interest in science. Other studies have implicated early interest in science as a key factor in pursuing a science, math, or technology related career (Packard and Nguyen, 2003). In this way, parent interventions are a first step toward increasing girls' confidence and satisfaction with science by preventing belief in stereotypes.

Stereotypes are also compounded by the expectations of parents later in life. For parents, stereotypes are so engrained that they may consciously or unconsciously hold different expectations for their children depending on gender. The influence of mothers' support was not found to be significant in a study concerning factors affecting pursuit of a technology-related career. However, the support of the father was found to be a key factor in this choice (Adya & Kaiser, 2005). And the Large families at times face problems in educating their children. When faced with economic hardship, a great number of parents, even those aware of the importance of girls' education, are forced to educate boys at the expense of girls. It is still argued that the man is the "bread winner" and hence boys need more education than girls who will get married and will have a man take care of them. Some parents send their girls to school later in the school term when they have acquired some money but because the girls

have missed out so much by then, they do poorly and eventually drop-out of school. Thus the study will investigate the determinants of girls' performance in sciences in public secondary schools in Nyatieko Zone Kisii Central District.

4 .1 Family Background and Performance of Girls in sciences

In family background the literature on parent level of education and family income level in relation to performance was reviewed as below.

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4. I .2 Parent level of education

Level of parent education also related to the expectations of girls in science. A 2006 study showed that parental education level was a predictor of science grades and activities of girls. The authors speculated that this might be due to "differential expectations" of more educated parents who expect boys to take science courses but allow girls more freedom to choose whether or not to take science courses (Simpkins, Davis-Kean, & Eccles, 2006).

A number of reasons are put forward for the link between parental education, retention and performance in school. Some researchers indicate that non-educated parents cannot provide the support or often do not appreciate the benefits of schooling (Juneja, 2001; Pryor & Ampiah, 2003). There is evidence that the gender and education level of the parent can influence which child is more likely to access and remain in school for longer. Often it is the mother's educational level in particular which is seen to have an effect on access (Ainsworth et al, 2005). But this varies in certain contexts. Brown and Park's (2002:) research on China indicates that for each additional year of a father's education, the probability of his child dropping out of school falls by 12-14%. And Cardoso and Verner's (2007:) research on Brazil claims that the 'schooling level of the mother does not have a significant impact on the probability that the teenager will drop out of school'. Al Samarrai and Peasgood's (1998)

research in Tanzania suggests that the father's education has a greater influence on boys' primary schooling; and the mother's on girls'. While a married mother's primary education can increase the probability of girls enrolling in primary school by 9.7% and secondary by 17.6%, it has no significant effect on the enrolment of boys. They claim that educated mothers giving preference to girls' schooling, implies that 'mothers have a relatively stronger preference for their daughters' education and that their education affords them either increased household decision-making power or increased economic status'

4.1.3 Family income level

Both statistical data and empirical research suggest that children from better off households are more likely to remain in school, whilst those who are poorer are more likely never to have attended, or to drop out once they have enrolled. For example, Brown and Park's research in rural China (2002) saw poor and credit constrained Children three times more likely than other children to drop out of primary school. Colclough et al (2000) describe the links between wealth and school retention in more detail amongst those out-of-school, the mean wealth index for school drop-outs was generally higher than for those who had never enrolled children at school were, on average, from better-off households than those who had dropped out, who were, in turn, from richer backgrounds than school-age children who had never enrolled (Colclough et al, 2000) Poor households tend to have lower demand for schooling than richer households: whatever the benefits of schooling, the costs, for them, are more difficult to meet than is the case for richer households (Colclough et al, 2000) India indicated that the income of the father was linked to the continuity or discontinuity of the child in school with the fathers of most drop outs not employed. If income levels are low, children may be called on to supplement the household's income, either through wage-earning employment themselves or taking on additional tasks to free up other household members for

work. This is more apparent as children get older and the opportunity cost of their time increases. Research indicates links with household income, gender and dropping out. For example, Fuller and Laing (1999 cited in Grant & Hallman, 2006) found an association with a family's financial strength, measured by level of household expenditure and access to credit, and the likelihood a daughter will remain in school in South Africa. Kadzamira and Rose (2003) indicate that when the cost of schooling is too high for households in Malawi, it is often girls from poorest households who are less likely to attend. Conversely, Glick and Sahn's (2000) research in Guinea indicates that when household income increases, there is greater investment in girls schooling, with no significant impact on that of boys

5.1 School Factors and Performance of Girls in Sciences

School factors that determine performance in sciences like repetition versus promotion and School Fees and Indirect Costs of Schooling their literature was reviewed as below

5. 1.2. Repetition versus Promotion

Repetition is the practice of making learners who have not fully mastered the curriculum or achieved a certain academic standard repeat the academic year. While automatic promotion is the act of allowing these same children to continue to the next year of study with the rest of their peer group despite not having met the minimum required standards. Various studies have looked at the benefits and non benefits of repetition versus promotion from one grade to another, within the context of schooling performance and retention. Schools in many countries require that students successfully complete a grade before allowing them to gain access to the higher grade. With situations where absences and temporary withdrawals are high, and quality levels low, repetition rates in many countries are high. For example Kane (2004, drawing on UNESCO, 2002)states that in over half of all African countries, more than

one in ten students repeat at least one grade of primary school. There are added difficulties with this. Children repeating (especially if they were late entrants too) extend the age range in a particular grade; if children repeat more than once this may be problematic. The lack of progression might lead some parents, guardians and children to question whether they should remain in school.

This seems particularly the case for girls, where research by Brock and Cammish (1997) in Sierra Leone and Vanuatu, indicates that girls who needed to repeat would often be withdrawn from school instead, whereas boys might be more likely to repeat. Kane (2004) describes how boys repeat more than girls, with boys having a higher student performance.

Studies indicate a correlation between repetition and educational exclusion based on research findings in two communities in Ethiopia, Rose and Al Samarrai (2001) state: Repetition may also be a deterrent to completion. If children have to repeat a grade they will be older before they reach the last grade of primary school, which again increases the opportunity cost of their time and increases the chances of girls withdrawing when they reach puberty. Furthermore, a large proportion of children repeat in early grades, Ackers et al (2001) describe how in Kenya low transition rates between standards 6 and 7 and between form 3 and 4 are partly explained because schools discourage weaker students from taking the Kenya Certificate in Primary Education (KCPE) exam and Kenya Certificate Secondary Education (KCSE) in order to protect the school's image. This means 'weaker' students either repeat or are pushed out of schooling.

While repetition might be promoted as a means to support the educational achievement of students, its consequence might have the opposing effect as they make students more so. Girls to have low self-esteem and motivation and can give them the perspective that they are failures or bad students. Also students repeat the same materials that they have already

studied, usually with the same teacher, which can decrease motivation and it does not address the reasons behind low performance so may not improve the performance of students significantly.

5.1.3. School Fees and Indirect Costs of Schooling

Research indicates that direct and indirect schooling costs are important factors in whether children enroll in and attend school (Dachi & Garrett, 2003). While research on this often relates to access per se, there is also some research which indicates that the costs of schooling, including fees, is a central reason for dropping out (Rose & AlSamarrai, 2001). Colclough et al (2000) carried out quantitative survey research and qualitative interview-based research with educational stakeholders (community members, parents, teachers, pupils, etc.) in sample communities in Ethiopia and Guinea in order to identify information about the constraints affecting the participation and performance of girls and boys in school, particularly in rural areas. In the field surveys, an inability to pay the direct costs of schooling was found to be one of the most important causes of non-attendance in both countries, with those dropping out most frequently citing a lack of money to pay for school expenses as an important reason for dropping out. In interviews, parents in Ethiopia often talked about difficulties in paying school fees, especially prior to harvest the ability to buy exercise books, pens and the necessary clothing for school also influenced whether children could enroll or were withdrawn from the first grade (Rose & Al Samarrai, 2001). Some described their children dropping out after enrolment, because they could not meet the direct costs of schooling. Additional costs e.g. registration payments, gaining copies of birth certificates (for registration), textbooks and uniform costs, were all indirect costs many parents in Guinea found difficult to meet. Not only do school fees lead to under-enrolment and drop out, they also limit attendance at school (Mukudi, 2004) and lead to temporary

withdrawals. Research indicates children may be locked out of schools if they cannot pay schooling fees (Obasi, 2000; Ackers et al, 2001 cited in Mukudi, 2004). In Boyle et al's (2002) research in some areas of Uganda and Zambia, the inability to pay school fees meant children withdrawing from school for periods of time, however temporarily. Schooling costs may link with gendered patterns of access, with households in some cases less willing to pay fees for girls' education. For example, Brown and Park's(2002) research in rural China indicates that an inability to pay school fees had led to the decision to drop out for 47% of girls, but only 33% boys in primary school; in junior secondary high fees was cited for half the girls, but only 8% of the boys. While many educational systems require children to pay fees to attend school, some countries have adopted fee free systems. While this may ease problems of drop out resulting from schooling costs, indirect costs and quality issues may increase. South Africa has recently introduced a system where schools in the lowest quintile are allowed to become 'fee-free'. By 2005, 3 million pupils 7,000 primary and secondary schools had already or were in the process of becoming, fee free (Rose & Al Samarrai, 2001.)

2.7 Theoretical framework

The theoretical framework used is developed from the connectionism theory advanced by Thorndike. It is a general theory of learning for both animals and humans. This learning theory represents the original stimulus- response framework of behavioral learning theory. According to the theory, learning is the result of associations formed between stimuli and responses. Such associations or habits become strengthened or weakened by the nature and frequency of the stimulus-response pairings. Therefore learning requires both practice and rewards .Transfer of learning occurs because of previously encountered situations.

Thorndike developed a theory of learning from the results of his experiments with animals (cats) in a puzzle-box (Gross, 1996). In his experiment, the cats were to operate a latch,

which could automatically cause the door to spring open. Each time they managed to escape, there was a piece of fish for them, which were visible from inside the puzzle box. Each time after eating the fish, the cats were put straight back in the box and the whole process was repeated.

The findings of this experiment would be generalized to human beings. In a problem situation which the learner wants to overcome, the learner tries a number of possible responses and whichever is rewarding is gradually stamped in. The learner connects this response to problem solution and is likely to be repeated whenever such situation recurs, hence the theory of connectivism (Hilgard and Bower, 1974).

Thorndike identified three major laws in the theory namely; readiness, exercise, and effect which subsumes the construct attitude. Readiness is an accessory principle, which characterizes the circumstances under which a learner tends to be satisfied or annoyed. Such circumstances include the ease or difficulty of carrying out the task. In relation to this study, if the students are assigned difficult tasks beyond their abilities, they may develop negative attitude towards the subject and vice versa.

According to Thorndike, exercise refers to strengthening of connections with practice and the weakening of connections or forgetting when practice or use is discontinued. Sciences are practical oriented subjects. When the learners are taught theoretically without any practical work, the subjects may become difficult and abstract. Thus their performance may be drastically affected. When they are exposed to practical work, the subjects may be interesting and understandable since they can observe how various processes take place practically and relate the practical aspects with theory making the subjects to be real to the students.

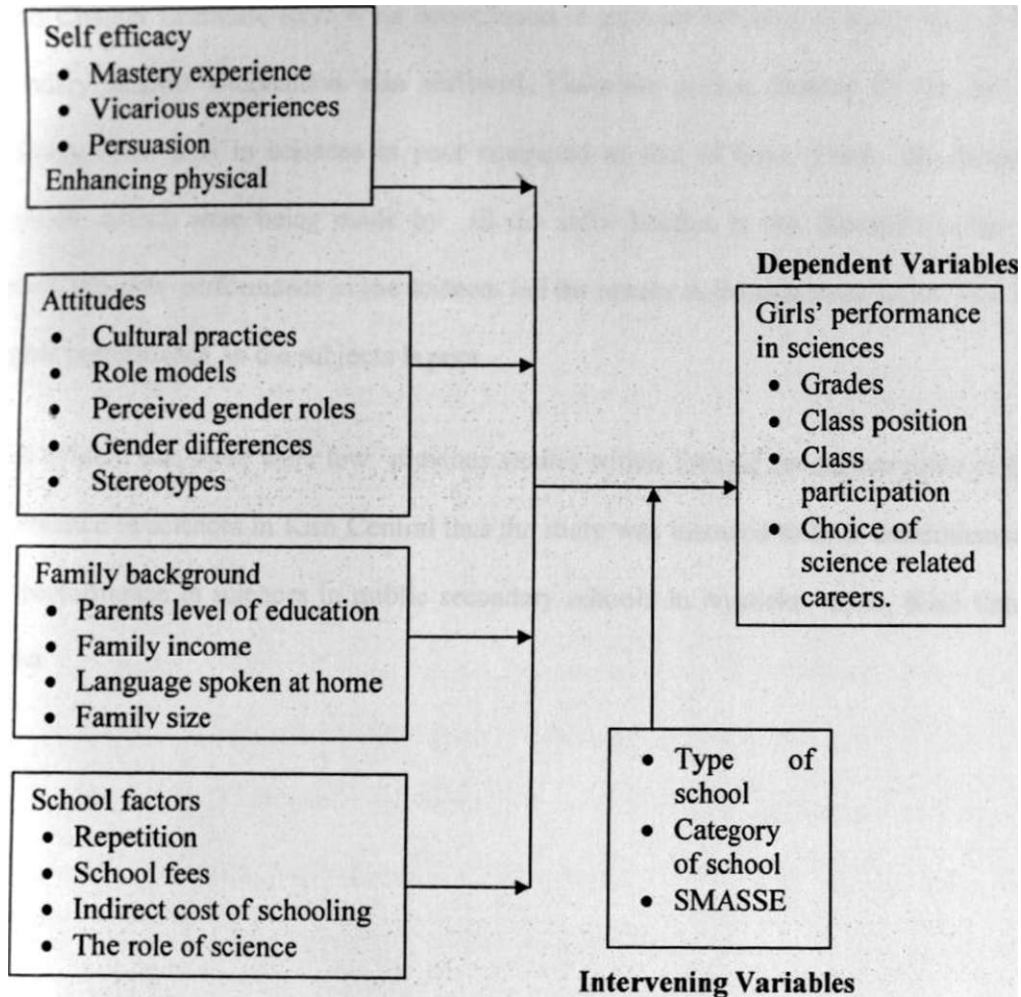
During evaluation, if the learners score well and they are motivated, then their attitude towards the subjects may be positive. But if the examinations set are difficult and the learners perform poorly, their effort may be de-motivated leading to the development of negative attitude towards the subjects. The attitude not only determines what the person will do but also what will satisfy, how well she will perform a given task, and judges reinforces or punishes her own performance accordingly.

This theory predicts that one's own standards, expectations and aspirations that are acquired in the process of socialization would affect his learning. Consequently, a student with a negative attitude towards a subject could be more satisfied with low scores than a student with positive or favorable attitude towards the subject. On the basis of this theory therefore, the study will examine determinants of Girls performance in science subjects in public secondary schools in Nyatieko Zone in Kisii Central District

2.8 Conceptual Framework

This section presents a conceptual framework that shows the interplay among, self efficacy, attitude, family background, school factors and social extracurricular and out of school factors as the independent variables Girls performance in sciences as dependent variable (measured by Performance in examinations, grades, class position, class participation and choice of science related careers) and Intervening variables (represented by strengthening of mathematics and science in secondary education (SMASSE) project and type and category of school).

Independent Variables



The conceptual framework above guided this study and is based on the preliminary knowledge on literature review. The assumption in the framework is that the girls performance in sciences is influenced by self-efficacy, attitude, family backgrounds school factors and extracurricular factors. Grades, class position, class participation .choice of science related careers as well as performance in examinations, in turn determine the overall girls performance in sciences in secondary schools in Nyatieko , Kisii central District.

2.10 Summary of Literature Review and research gap

In this Chapter Literature Review on determinants of girls performance in sciences in public secondary schools intervention was reviewed. Literature review pointed to the fact the performance of girls in sciences is poor compared to that of boys. From the literature reviewed efforts were being made by all the stake holders in the education sector to improve the girls performance in the sciences but the results in the past years show that still the girls performance in the subjects is poor.

It was evident that there were few previous studies which focused on determinants of girls performance in sciences in Kisii Central thus the study was intended to find determinants of girls performance in sciences in public secondary schools in Nyatieko zone, Kisii Central District

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the research methodology for the study. That is research design, location of the study, target population, sampling techniques, research instrument, validity and reliability of the research instrument, data collection procedures, data analysis and the types of variables and measurement scales that were employed in the research study.

3.2 The research design

The study adopted an *ex-post facto* design. This is the research in which the investigator selects rather than manipulates the independent variables. Inference about the relationship among the variables is made without direct intervention from the variations of independent and dependent variables (Kerlinger, 1983). This implies that the investigator observed the dependent variable and retrospectively studied the independent variable for its possible effect on the dependent variables. This design was used because there was no manipulation of variables as the phenomenon under investigation had already taken place and academic performance is affected by a multiplicity of factors making it impossible to directly control all the independent variables that are likely to confound the findings (i.e. the independent variables are self efficacy, attitudes, family background, school factors, and extracurricular and out of school factors). The researcher was therefore concerned with the situation as it was. Data was obtained from girl students in forms three and four on the determinants of girls' performance in sciences in public secondary schools in Nyatieko Zone of Kisii Central District.

3.3 Target Population

This is the entire group of individuals, events or objects having common observable characteristics. The study targeted all girls in form three and four in Nyatieko Zone in the seven public secondary schools. According to the records in the schools, there were 480 girls in forms three and four in the schools as at the time of this study. These formed the study's target population.

3.4 Sample Selection and Sample Size

The sample size for this study was drawn from the total target population of 480 girls from the seven schools in the Nyatieko Zone in Kisii Central District. Random sampling technique was used to sample 241 actual participants in the study from the 480 Girls in the target population as shown in Krejcie and Morgan's sample size table and the sampling equation bellow. (Krejcie and Morgan, 1970)

$$s = \frac{X^2 NP}{(1 - P) + d^2 (N-1) + X^2 P (1 - P)}$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level(3.841).

N - the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d= the degree of accuracy expressed as a proportion (.05). (For target population that is less than 10,000.)

3.5 Data Collection Instruments

The data collection instruments which were used in this study were questionnaires. A set of questionnaires containing both structured and unstructured questions were used for the study to collect primary data. The study preferred the use of questionnaires because of the simplicity in their administration, scoring of items and analysis of the collected data. The questionnaires were divided into sections and were developed based on the research objectives in order to capture relevant information. The girls were expected to provide information on their self efficacy, attitude, family background, and school factors. The Questionnaire had close-ended and open ended questions which allowed the respondents the opportunity to give more insight of the research problem and also facilitated consistency of responses among the respondents. Data collection was done by the researcher.

3.5.1 Validity of Research Instruments

Validity refers to the quality that a procedure or instrument or tool used in research is accurate, correct, true, and meaningful and right. To enhance validity in this study content related validity of the questionnaire on schedule was determined by the help of experts (such as the research supervisor). The supervisor gave guidance which ensured that the instrument was well constructed, and that it addressed the information sought by the research objectives. The researcher used the questionnaires so as to ensure data collected was meaningful and appropriate for the study.

3.5.2 Reliability of Research Instruments

Mugenda and Mugenda, (2003) defines reliability of an instrument as the degree of consistency with which it measures a variable. It is concerned with estimates of the degree to which a research instrument yields consistent results or data after repeated trials. The questionnaire combined both open-ended and close-ended questions. This allowed the respondents to have an opportunity to give more insight of the research problem which in turn facilitated consistency of responses among the respondents. A pretest was also done during the pilot study that was conducted through a pre-test which was carried out in one *i.*

school in Getembe Zone in Kisii central which is the neighboring zone. Piloting helped improve on the questionnaires and further enhanced the validity and reliability of this research instrument. The research instrument was thoroughly cross-checked by the researcher with the guidance of the research supervisor further enhancing consistency of the questionnaire.

3.6 Data collection Procedure

A letter of identification from the University of Nairobi was obtained from the Extra - Mural Centre which was used to obtain a research permit from the National Council of Science and Technology. Permission was sought from the relevant authorities prior to the commencement of the study. The researcher reported to the relevant authority before proceeding to the field. Such authorities included the District Education Office and the school head teachers in Nyatieko Zone prior to collection of data from the target population. A letter of transmittal introduced the researcher to the respondents and assured them of total confidentiality of their responses. In this study, data was collected through drop and pick method where the questionnaires were dropped in the schools and were picked the next day.

3.7 Data analysis

After the questionnaires had been administered and collected from the respondents, the raw data collected was organized systematically so as to facilitate analysis. Data collected was checked for consistency and then coded with regard to the type and source. Data was analyzed and interpreted both quantitatively and qualitatively in light of the research objectives. Analysis of data was conducted with the aid of the Statistical Package for Social Sciences (SPSS) version 20 software for windows and Microsoft Excel 2007 computer software. Qualitative statistical techniques were used to describe and summarize data. Data was analyzed for descriptive statistics (frequencies mean, and Percentage). The analyzed data was presented in the form of tables and graphs.

3.8 Ethical consideration

Ethics involves the study of right and wrong conduct (Dooley, 2007). This study ensured that the respondents will be assured of the confidentiality of the information they provided. Permission was sought from the relevant authorities prior to the commencement of the study. The study informed the respondents of the purpose of the study and gave them a written assurance that data collected would be used only for research purposes and that strict confidentiality will be observed. To increase the degree of confidence among the respondents, no personal identification details were required for the purpose of the questionnaires. The sources of data and other information for literature review were acknowledged effectively, in this study.

3.9 Operational Definition of Variables

This section presents the dependent and independent variables, the associated indicators and how they were measured. The data collection instruments were outlined and the scales of

measurement represented. The techniques that were used for the analysis of data also were laid down. Both the independent and dependent variables were operationalized as shown in Table 3.2.

Table 3.2: Operationalization Table

Objective	Variable	Indicator	Measurement Scale	Data Collection Method	Data Analysis
1. Establish the extent to which self efficacy determines Girls performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District	Independent variable Self efficacy Dependent variable Girls performance	High Medium Low	Ordinal	Structured Questionnaire	Descriptive Statistics
2. Assess how attitude determines Girls performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District:	Independent variable Attitude Dependent variable Girls performance	Number of Girls taking all the 3 sciences	Ratio	structured Questionnaire	Descriptive Statistics
3. Investigate how family background determines Girls performance in Sciences in public secondary schools in Nyatieko Zone, Kisii Central District;	Independent variable Family background Dependent variable Girls performance	Students background	Nominal	Structured Questionnaire	Descriptive Statistics
4. Examine how school factors determines Girls performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District;	Independent variable School factors Dependent variable Girls performance	School environment	Nominal	Structured Questionnaire	Descriptive Statistics

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents findings of the study that will be presented using tables and graphs. The chapter is presented under subheadings which include: Questionnaire return rate, general characteristics of the respondents, the influence of self efficacy on girls performance in sciences; the influence of attitude on girls performance in sciences; the influence of family background on girls performance in sciences; the influence of school factors on girls performance in sciences and influence of extracurricular activities on girls performance in sciences. The sections present the study findings in accordance to the study objectives. Interpretation of the findings is also done in this section.

4.2 Questionnaire Return Rate

A total of 241 questionnaires were distributed to 241 girls in forms three and four and 221 completed questionnaires were received. This presented 91.7% return rate and was considered a good response when using the questionnaire method as suggested by Peil (2005).

4.3 General Characteristics of the Respondents

Findings on the general characteristics of the respondents are as given in these sections below.

4.3.1 Age of the respondents

The findings on the age of the respondents are given in table 4. 3.1 below.

Table 4.3.1: Age characteristics of the respondents

Age	Frequency	Percentage
12- 14	6	2.7
15- 17	52	23.5
18 - 20	100	45.2
21 and Above	63	28.5
Total	221	100

The results showed that most of the respondents, 100 were between the ages of 18 to 20 years. This is the average age of most girls in forms three and four as has it been indicated by previous studies on girls' performance in secondary schools. However it can also be noted that there are girls who are between the ages of 12 to 14 representing the smallest percentage of 2.7 percent and are six in number

4.3.2 Duration in Secondary School of the Respondents

The findings on the duration the respondents had spent in secondary school are as provided in Table 4.3.2 below.

Table 4.3.2: Years Respondents have been in Secondary School

Years	Frequency	Percentage
2-3	136	61.5
4-5	80	36.2
Over 5	5	2.3
Total	221	100

The findings in Table 4.2 above reveal that the majority of the respondents 136 have been in high school for two to three years. This was represented by 61.5 % of the respondents. Respondents representing 36.2% indicated that they had been in secondary school for four to five years are 80 in number, while 2.3% been in high school for over than 5 years. The results are consistent with the fact that most of the girls have not repeated any form in school.

4.3.4 Number of Sciences Taken by the Respondents

The result showing the number of sciences done by the respondents is as given in Table 4.3 below.

Table 4.3.4: Number of sciences done by the respondents

Number	Frequency	Percentage
2	200	90.5
3	21	9.5
Total	221	100

The findings showed that most of the respondents 200 in number represented by 90.5 percent take two sciences while 21 take the three sciences. These results are consistent with the findings of Bandura (1994) who noted in his study that most girls shy away from the science subjects. It was also noted that even those taking the two subjects do so since the subjects are compulsory in the schools as required by the curriculum.

4.3.5 How the respondents rate their performance in sciences

Another item in the questionnaire required the respondents to rate their performance in the sciences. The results of respondents are as given in Table 4.2.4 below.

Table 4.3.5, How the respondents rate their performance

Grade	Frequency	Percentage
A	14	6.34
B	31	14.03
C	98	44.34
D	67	30.32
E	11	4.98
Total	221	100

The findings shows that 98 of the respondents rated their performance on grade C, 67 of the respondents rated their performance on grade D, 31 of the respondents rated their performance on grade B, 13 of the respondents rated their performance on grade A and 11 of the respondents rated their performance on grade E. It was noted that most of the respondents 176 rate their performance in grade C and below indicating that most score below average in the sciences.

4.4. Information on Self Efficacy and performance of girls in sciences.

To meet the first objective, the respondents were asked to indicate the extent of how certain factors relating to their self efficacy have influenced their performance in sciences. The results are as shown in the Table 4.5 below.

Table 4.4: Self Efficacy and performance of girls in sciences.

Factor	To a very great extent	To a great extent	To a moderate extent	To a small extent	To no extent	Ifi	ZfiWi	SfiWi / Ifi
Weight (w)	5	4	3	2	1			
Mastering of new concepts in sciences	136	6	25	0	0	221	779	3.53
Figuring out of difficult tasks in sciences	101	87	23	8	2	221	940	4.30
Confidence in answering of questions in class	98	100	20	3	0	221	956	4.33
Teachers comments on your performance in sciences	87	107	2	20	5	221	914	4.14
Average								4.10

The findings revealed that from the various factors measuring self efficacy, confidence in answering questions in class was ranked as the most important factor in enhancing the performance in sciences with 198 of the respondents agreeing to a great extent. This was indicated by a weighted average of 4.33 which averagely was to a great extent. This was followed by figuring out of difficult tasks in sciences with a weighted average of 4.30 and 188 of the respondents agreed to a great extent. The respondents rated mastering of new concepts in sciences as the selfefficacy factor that influences their performance in sciences to the least extent with 142 of the respondents agreeing to a great extent. This was indicated by a weighted average of 3.53.

On average, the results showed that the respondents rated self efficacy as a very important factor in determining their performance in the sciences. This was shown by the mean of the weighted average of 4.10 which showed that the respondents on average agreed that self efficacy influences their performance to a great extent.

4.5 Information on attitude and performance of girls in science subjects.

The second objective was to find out the significance of attitude of the respondents on the performance of the respondents. Seven attitude measurements were collated into a questionnaire and the respondents asked to indicate the significance of each in their performance in the sciences. The results are shown in Table 4.5 below.

Table 4.5: Attitude and performance of girls in sciences.

View	Not significant	Least significant	Moderately significant	Very Significant	Most significant	Xfi	EfiWi	XfiWi / £ fi
YWeights[w]	1	2	3	4	5			
Sciences are enjoyable subjects	0	0	13	98	110	221	345	1.56
The work in sciences easy	0	1	57	121	42	221	459	2.08
It is easy to understand the concepts	0	3	130	68	21	221	302	1.37
Practical's in sciences are easy to rvrfonTi	10	21	98	43	49	221	561	2.55
Sciences are useful in life	136	81	4	0	0	221	1016	4.60
Sciences should be optional	107	97	3	19	0	221	970	4.39
Sciences should be done by boys	40	38	101	42	0	221	739	3.34

Findings from the table above revealed that the view that science subjects as useful in life was rated as the most significant in determining their performance in the sciences. This was indicated by the weighted average of 4.60 which was at the level of most significant. These results were in contrast with those of Eshiwani (1998) who noted in his study that the view that sciences are subjects to be done by boys was the most significant in determining the performance by the girls. The view that sciences should be optional was rated second in terms of the respondents attitudes in determining their performance in the sciences with a weighted average of 4.39. The respondents rated the view that it is easy to understand concepts in sciences as the least significant in determining their performance in the sciences with a weighted average of 1.37.

In general, attitude was given a mean weighted average of 2.84 which showed that the respondents regarded attitude as moderately significant in determining their performance in sciences.

4.6 Family Background and performance of girls in sciences

The third objective was to find out the significance of the family background of the respondents on the performance of the respondents in the sciences. Four family background measurements were collated into a questionnaire and the respondents asked to indicate the significance of each in their performance in the sciences. The results are shown in Table 4.7 below.

Table 4.6: Family Background and performance of girls in sciences.

I Family background factor	Most significant	Very significant	Moderately significant	Least significant	Not significant	If.	IfiWi	Ifiw, /If,
Weights[w]	5	4	3	2	1			

Family size	31	102	42	40	6	221	775	3.51
Parents level of education	136	42	0	38	5	221	929	4.20
Family income level	99	102	0	20	0	221	943	4.27
Language spoken at home	87	43	1	90	0	221	790	3.57

Findings from the table above revealed that family income level was rated as the most significant family background factor in determining their performance in the sciences. This was indicated by the weighted average of 4.27 which was at the level of most significant. This may be due to the fact that sciences require students to have enough resources which may be a challenge if the level of income is low. These results were in agreement with those of (Colclough et al, 2000) who noted in their study that the level of family income was significant in determining the performance by the girls in the sciences. The parents' level of education was rated as the second most significant family background factor that will influence the girls' performance in sciences at a weighted average of 4.20. The respondents rated family size as the least significant in determining their performance in the sciences with a weighted average of 3.51.

In general, family background was given a mean weighted average of 3.90 which showed that the respondents regarded it as very significant in determining their performance in sciences.

4.7 School Factors and performance of girls in sciences.

The final objective was to find out the significance of school factors on the performance of the respondents in science subjects. Four school factors were collated into a questionnaire and

the respondents asked to indicate the significance of each in their performance in the sciences. The results are shown in Table 4.8 below.

Table 4.7 School factors and performance of girls in sciences.

View <i>t</i>	Not significant	Least significant	Moderately significant	Very Significant	Most significant	Ifi	IfiWi	Ifiw, /Ifi
Weights[wJ	1	2	3	4	5			
Repetition of classes	10	17	13	68	113	221	920	4.16
Availability of Science facilities	5	12	27	80	97	221	915	4.14
Availability of enough science teacher	0	3	56	79	83	221	905	4.10
Time- tabling of science subjects	10	21	98	43	49	221	561	2.55

The findings from the table above shows that repetition of classes as weighted mean of 4.16.

Implying that most of the respondents agreed that repetition affects their performance in sciences. Availability of sciences facilities as weighted mean of 4.14 implying that most of the correspondents agreed that availability of science facilities determines the performance of respondents in sciences. Availability of enough science teacher as a weighted mean of 4.10 Implying that it also determines the respondents performance in sciences and Time-tabling of science subjects as a weighted mean of 2.55 Implying that it does not affect the respondents performance in sciences. In general, school factors were given a mean weighted average of

3.74 which showed that the respondents regarded it as significant in determining their performance in sciences.

4.8 Summary

From the findings on average, the results from the respondents showed that self efficacy as a very important factor in determining performance of girls in the sciences. This was shown by the mean of the weighted average of 4.10 Attitude was given a mean weighted average of 2.84 which showed that the respondents regarded attitude as moderately significant in determining their performance in sciences. Family background was given a mean weighted average of 3.90 which showed that the respondents regarded it as very significant in determining their performance in sciences and school factors were given a mean weighted average of 3.74 which showed that the respondents regarded it as significant in determining their performance in sciences.

CHAPTER FIVE
SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION AND
RECOMMENDATIONS

5.1 INTRODUCTION

This chapter comprises of a summary of the study findings, discussions of findings, conclusions of the study, recommendations made to the study, suggestions for further research and the study's contribution to the existing body of knowledge on the determinants of girls performance in sciences in public secondary schools in Nyatieko Zone Kisii District Kisii county.

5.2 SUMMARY OF FINDINGS

The study set out to investigate the determinants of Girls performance in sciences in public secondary school students in Nyatieko Zone, Kisii Central District. To achieve these four objectives were addressed. The first objective was to establish the extent to which self efficacy determines girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District. The findings indicated that confidence in answering questions which had a weighted average of 4.33, figuring out of difficult tasks that had a weighted average of 4.30, teachers comments on performance in sciences that had a weighted average of 4.14, and mastering of new concepts in sciences that also had a weighted mean of 3.53 are concepts of self-efficacy that determine performance in the sciences. Self-efficacy had a mean of the weighted average of 4.10 which showed that the respondents agreed that self efficacy influences their performance to a great extent.

Secondly the study endeavored to assess how attitude determines girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District .The findings showed that the girls view science subjects as useful in life as it had a mean weighted of 4.60 although they feel that it is not easy to understand concepts in sciences as it had a weighted mean of 1.37 Thus from the findings, the respondents regarded attitude as moderately

significant in determining their performance in sciences with a an average weighted mean of 2.84.

The third objective was to investigate how family background determines girls' performance in Sciences in public secondary schools in Nyatieko Zone, Kisii Central District .The findings indicated that family income level determines the girls performance in sciences as it was weighted with an average mean of 4.27 due to the fact that sciences require students to have enough resources which may be a challenge if the level of income is low also the parents' level of education influence the girls' performance in sciences as it had a weighted mean of 4.20, and the family size to impacts the performance of girls in sciences as it was weighted with an average mean of 3.51 , the respondents regarded family background as significant factor that determines their performance in sciences with an average of 3.90 .

The fourth objective was to examine how school factors determine girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District; the findings shows that repetition of a particular class affect their performance in sciences it had a weighted mean of 4.16 as it lowered the respondents self esteem, science facilities like laboratory influence their performance in sciences they were weighted with a mean of 4.14 and science teachers to influence girls performance in the subjects the factor was rated with a weighted mean of 4.10 they are the ones who act as motivators and guides in the subjects they teach It was found that school factors also determine the girls performance in sciences.

5.3 Conclusions

Based on the first objective it was concluded that self-efficacy is important as it helps determine life choices, it motivates, and it helps in dealing with failures and setbacks in life it can be developed over time and those with low self-efficacy perform dismally in the sciences. The second objective which was to find out the significance of attitude of the respondents on the performance concluded that attitude was moderately significant in determining

performance in sciences. From the third objective of the study on the influence of family background of the respondents on the performance in the sciences it was concluded that the family size, Parents level of education and family income level determine performance of girls in sciences. The last objective which accessed the significance of school factors on the performance of the girls in sciences concluded that repetition of classes; availability of Science facilities and availability of enough science teachers determine the performance in the subjects

5.4 Recommendations

On self-efficacy the girls can be motivated to develop it over time as it determines their performance in the sciences.

Concerning girls' attitude on the sciences the teachers and parents should encourage the girls on the importance of the subjects as they are useful in solving day to day problems thus change their perception towards the subjects as difficult.

The schools should have enough science teachers, the laboratories should have the apparatus and reagents needed when performing science experiments and repetition of students in certain classes to be discouraged

There is need for parents to be advised on the importance of having children that they can fully support in education and other needs that determine their performance in school.

5.5 Suggestions for further research.

The study was a cross sectional survey based on a small sample taken from Nyatieko Zone in Kisii District that focused on public Secondary Schools and so may limit generalization of the results. This study recommends therefore a similar study but to use longitudinal survey on a large sample obtained from other Districts of the country

A Study should be done to establish relations in performance of girls in single school and those in mixed schools.

There is need to study factors influencing moving of most Secondary schools from mixed to single sex high schools.

5.6 Contribution to the body of Knowledge

This section presents the study's contribution to existing knowledge in Table 5.1

Table 5.1 The study's contribution to Knowledge.

Objectives

Establish the extent to which self efficacy determines girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District;

Assess how attitude determines girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District'

Investigate how family background determines girls' performance in Sciences in public secondary schools in Nyatieko Zone, Kisii Central District;

Examine how school factors determine girls' performance in Sciences in public secondary schools in Nyatieko zone, Kisii Central District;

Contribution to knowledge

Self-efficacy is important as it helps determine life choices, it motivates, and it helps in dealing with failures and setbacks in life it can be developed over time and those with low self-efficacy perform dismally in the sciences

Attitude of the students on the sciences is significant in determining performance in sciences.

Family background of the students influences performance in the sciences through Parents level of education and family income level

School factors determine the performance of the girls in sciences.

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APPENDIX 2:

APPENDIX 1:

INTRODUCTORY LETTER TO THE RESPONDENT

Department of Extra Mural Studies,

University of Nairobi,

Kisii Center.

Dear Sir/Madam,

RE: LETTER OF INTRODUCTION

I am a postgraduate student at University of Nairobi and I intend to carry out a research study on determinants of girls performance in sciences in public secondary schools in Nyatieko zone, Kisii central District .You have been selected to be a participant in the study and your co-operation will be highly appreciated, as the success of the study depends on it.

There is a questionnaire attached in which you are requested to give your honest opinion about determinants of girls performance in science subjects. There is no correct or wrong answer, your response will be considered as it is. Be assured that any information given will be treated with strict confidentiality and is to be used for the purpose of this research only.

I look forward to your assistance.

Yours faithfully,

Mary Nyanduko Nyaundi

APPENDIX 2:

Questionnaire for the students

The researcher is a student of the University of Nairobi, undertaking Masters of Arts degree in Project Planning and Management. The purpose of this questionnaire is to obtain information that is relevant to the research study; determinants of girls performance in science subjects in public secondary schools in Nyatieko zone , Kisii Central District Please, note that all your responses will be treated with maximum CONFIDENTIALITY. Be free to give your opinions, it is not an examination. There is no right or wrong answer. Your opinions will only be used purely for academic purposes.

PART A: Background information

Tick (V) as appropriate

1. How old are you? 12-14 Years [] 15-17 Years [] 18-20 Years []

Above 21 Years []

2. How long have you been in high school?

2-3 years [] 4-5 years [] Over 5 years []

3. How many sciences do you take?

2 [] 1 [] 3 []

4. How do you rate your performance in sciences.

[A] [B] [C] [D] [E]

PART B: Information on self efficacy

Indicate in the scale below the extent to which the factors stated influence your performances in sciences

Factor	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
Weights	1	2	3	4	5
Mastering of new concepts in sciences					
Figuring out of difficult tasks in sciences					
Confidence in answering of questions in class					
Teachers comments on your performance in sciences					

PART C: Information on attitude of the student on sciences.

Indicate in the scale below the level of your view on sciences

View	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Sciences are enjoyable subjects					
The work in sciences easy					
It is easy to understand the concepts and terms used in sciences					
Practical's in sciences are easy to do					
Sciences are useful in life					
Sciences should be optional					
Sciences should be done by _boys_					

PART D: Information on Family Background

Indicate in the scale the extent to which the stated family background factors influence performance in sciences.

Family background factor	Strongly Agree.1	Agree.2	Neither agree nor disagree .3	Disagree.4	Strongly disagree .5
Family size					
Parents level of education					
Family income level					
Language spoken at home					

PART E: Information on school factors

Indicate in the scale the extent to which the stated school factors influence your performance in sciences.

View	Not significant	Least significant	Moderately significant	Very Significant	Most significant
Weights[w]	1	2	3	4	5
Repetition of classes					
Availability of Science facilities					
Availability of enough science teacher					
Time-tabling of science subjects					

Thank you for your co-operation.

APPENDIX 2:

Table 3. 1: Sample size table

N- n	N - n	N - n	N - n	N - n
10- 10	100- 80	280 - 162	800 - 260	2800-338
15 - 14	110 - 86	290 - 165	850-265	3000-341
20 - 19	120- 92	300 - 169	900 - 269	3500-346
25 - 24	130- 97	320 - 175	950-274	4000-351
30 - 28	140- 103	340 - 181	1000 -278	4500-354
35 - 32	150 - 108	360 - 186	1100-285	5000-357
40 - 36	160- 113	380 - 191	1200-291	6000-361
45 - 40	170- 118	400 - 196	1300 -297	7000 - 364
50 - 44	180 - 123	420 - 201	1400 - 302	8000-367
55 - 48	190- 127	440 - 205	0-306	9000 - 368
60 - 52	200- 132	460 - 210	1600 -310	10000-370
65 - 56	210- 136	480 - 241	1700-313	15000-375
70 - 59	220- 140	500 - 217	1800 -317	20000 - 377
75 - 63	230- 144	550 - 226	1900 -320	30000 - 379
80 - 66	240- 148	600 - 234	2000 - 322	40000-380
85 - 70	250- 152	650 - 242	2200 - 327	50000-381
90 - 73	260- 155	700 - 248	2400-331	75000-382
95 - 76	270- 159	750 - 254	2600 - 335	100000 -384

Note.—N is population size.

n- is sample size.

Source: Krejcie & Morgan. 1970 sample size table.



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Our Ref:

NCST/RCD/14/012/1377

Date:

9^h October 2012

Mary Nyanduko Nyaundi
University of Nairobi
P.O.Box 30197-00100
Nairobi.

RE: RESEARCH AUTHORIZATION

Following **your** application for authority dated **24th September, 2012** to carry out research on **"Determinants of girls performance in sciences in public secondary schools in Nyatioko Zone, Kisii Central District, Kisii County"** I am pleased to inform you that you have been authorized to undertake research in **Kisii Central District** for a period ending **31st December, 2012.**

You are advised to report to the **District Commissioner and the District Education Officer, Kisii Central 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.

A handwritten signature in black ink, appearing to read 'M. K. Rugutt'.

DR M.K. RUGUTT, Ph.D. HSC.
DEPUTY COUNCIL SECRETARY

• » c ^{HI}

Copy to:

The District Commissioner
The District Education Officer
Kisii Central District.

