SURVEY ON GENDER AND ACADEMIC PERFORMANCE IN SECONDARY SCHOOLS IN KENYA

JANE NABIKI KASHU

UNIVERSITY OF NAIROBI

DEPARTMENT OF PYSCHOLOGY

2014

A Research Project Submitted In Partial Fulfillment for the Requirement of the Degree of Masters in Education in Measurement and Evaluation

DECLARATION

This research project is my original work and has never been submitted for examination or award in any other University.

_____Date: _____

JANE NABIKI KASHU

E58/73173/2009

This research project has been submitted for examination with my approval as the University Supervisor.

_____ Date: ___/___/____

DR. KAREN T. ODHIAMBO

Supervisor,

Department of Psychology

University of Nairobi

DEDICATION

I thank God and dedicate this research paper to Him for enabling its completion.

I heartily dedicate this paper to my parents, the late Samuel Olouasa Kashu and mother Lilian Mpaire Kashu who valued and still value education even though they did not get the opportunity to receive it themselves. To my sons Esmond Leiyan Olouasa and Edward Kasaine Olouasa who urged me on when it seemed like I was going to give up. I am finally here through God's grace.

I would also like to dedicate this research paper to my only daughter Cynthia Sirintai Olouasa who held my hand throughout the course period. Thank God we are going to graduate together with our Master's degrees. How beautiful it is!

Finally, the study is due to the unending grace of God.

ACKNOWLEDGEMENT

I acknowledge my supervisor Dr. Karen T. Odhiambo without whose guidance and support this research paper would not have been accomplished. She literally came for me from my office and told me I must go on with the course. I really appreciated that and I thank her for everything.

My utmost gratitude goes to the Kenya National Examinations Council for sponsoring me fully to pursue this course and making it possible by granting me access to the results data base which was the source of all my research data.

I would like to acknowledge the contribution made towards data collection by Kennedy Abuje.

ABSTRACT

The research sort to determine gender disparities looking at academic performance. This arose from the predominant view held that boys have always performed better than girls more so in Sciences and Mathematics. The study contrasted performance within a five year period, and across the top twenty best performing schools.

The study was based on the Kenya Certificate of Secondary Education (KCSE) examination results obtained as secondary data from the Kenya National examinations Council. The results show that boys are still scoring higher than girls in overall performance and across subjects.
Students at this level naturally comprise both boys and girls and all are expected to undertake the standard KCSE examination. This introduces the aspect of gender in education. Gender refers to the economic, social, political and cultural attributes and opportunities, associated with being either male or female. Both sexes undertake the same examination and are thus judged on the different outcomes. *The debate on gender in education has most of the times had to do with access rather than issues of performance differences. Studies done elsewhere in the world show that there is a marked difference in performance between boys and girls.*

This study is a quantitative comparative study (comparing the performance of boys and girls) in the overall mean scores and in individual subjects in a period of five years (2007-2011). Further comparison is done between different school categories to ascertain whether the gender disparity does exist at such levels. The data came from the Kenya National Examinations Council KCSE examination results data base. The target population (sampling frame) for the study was all candidates in the secondary schools in Kenya who have sat for the KCSE examination in the years 2007-2011.

This study was carried to compare the academic performance between boys and girls in the Kenya Certificate of Secondary Education (KCSE) across a period of five years (2007-2011). The study was driven by trends that arise when gender trends are raised in education. In most, if not all cases, the boys performs higher than girls, more so in Mathematics and Sciences. The case was the same in the given study. The survey involved a total of ***1,643,458 students*****.** This allowed concrete conclusions. Further performance also varied across top performing schools, where boys still did better than girls'. The only exception was between boys and girls in private schools where there was no significant difference in their overall performance.

The study raises a challenge in that, advantages created for girls in education seems not to give advantage to girls. Further as the world moves to new dispensations of the 21st Century and Climate Change crisis, the education fraternity is still struggling with issues of the past for example (performance, access, retention, lack of resources) while a new paradigm shift is required. This should put education fraternity on alert. The situation is worse for girls. This is indeed a looming crisis for educators in the society.

There is need to urgently address issues that will take education to another level and adapt measures that will ensure equity in performance for all, an education that will ensure change that reviews the past, adapts the present and pre-empts the future. The focus of this change should be gender and academic performance.

Key words: *Gender; Education; Academic Performance; KCSE; Boys; Girls*

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

ACT	The American College Test
CAT	Continuous Assessment Test
EFA	Education for All
ESD	Education for Sustainable Development
GAD	Gender and Development
IAT	International Aptitude Test
IEEA	International Association for Evaluation of Educational Achievement
KCSE	Kenya Certificate of Secondary Education
KNEC	Kenya National Examinations Council
MDG	Millennium Development Goals
NEP	North Eastern Province
OECD	The Organization for Economic Co-operation and Development
PISA	Programme for International Student Achievement
SAT	Scholastic Aptitude Test
TIMSS	Trends in International Mathematics and Science Study
UNESCO	United Nations Educational Scientific and Cultural Organization
UNICEF	United Nations International Children Emergency Fund
WAD	Women and Development
WHO	World Health Organization
WID	Women in Development

LIST OF TABLES

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the study

Gender related disparities have characterized Kenya education system at the national level, between and at regional level and at all levels of education from primary to university in favour of males. This has been in the form of better performance in favor of boys at all levels (UNESCO, 2003; Republic of Kenya 2007; Mondoh and Mujidi, 2006). Over the years, the top one hundred candidates at national, provincial, county, district level has been dominated by male candidates. It's only in a few districts where the performance has been in favour of girls' (KNEC, 2011).

Academic performance or achievement is the mark and determinant of a student's success (or lack of) and future. This is especially true in Kenya and in the rest of the world especially developing countries that have adopted education as the main route to development. Academic achievement or performance is the outcome of education, the extent to which a student, teacher or institution has achieved their educational goals. It is commonly measured by examinations or continuous assessment tests. In educational institutions, success is measured by academic performance, or how well a student meets standards set out by local government and the institution itself.

In the educational, there are at least three reasons for studying gender differences. These include identifying the source of inequalities, fostering average performance and improving our understanding of how students learn (OECD, 2009). The OECD report further notes that, in the

past few decades the interest by researchers to study gender differentiation in education was fuelled by a perceived lack of interest and success of girls in a number of areas of schooling – notably mathematics and the physical sciences. In more recent times there has been a focus on the lack of engagement and success of boys, especially in the area of reading. Education policy makers have to be aware of the differences in academic performance between the sexes so as to ensure the success of any subsequent policies in achieving quality education and equity.

Gender equity means fairness of treatment for women and men, boys and girls, according to their respective needs. This may include equal treatment or treatment that is different but which is considered equivalent in terms of rights, benefits, obligations and opportunities. This is according to IFAD (2014). In education, this means the recognition by policy makers and educators of the inherent differences of both girls and boys in terms of ability and circumstances and acting accordingly to ensure that no one is left behind or is disadvantaged.The imperative for gender equity can be seen in a number of lights. Firstly there is a moral reason to ensure that one of the sexes is not disadvantaged compared to the other. The disadvantage may be the end result of many years of treatment based on culture, religion and tradition. The second imperative to raising the performance of one of the sexes to be similar to the other is the concomitant increase in economic and social benefits that this will bring.

Education has been described as the wealth of knowledge acquired by an individual after studying particular subject matter or experiencing life lessons that provide an understanding of something. Education requires instruction of some sort from an individual or composed literature. The most common forms of education result from years of schooling that

incorporates studies of a variety of subjects (UNESCO, 2012). This kind of education is the basis of this research. Specifically, it will be education at the secondary school level. The issues of gender in education have been and are still evolving. Conscious efforts have been made towards gaining gender equality in education by ensuring that every child regardless of gender is in school. Below is a review of some of the efforts to see to this gender equality.

Eliminating differences in education between boys and girls has been a priority of development organizations and the international community for many years. One of the Millennium Development Goals (MDGs) targets is to "eliminate gender disparity in primary and secondary education, preferably by "2005", and in all levels of education no later than "2015". This has been echoed by institutions like the United Nations and the World Bank. According to the World Bank, there is no investment more effective for achieving development goals than educating girls. Equality of educational opportunities between men and women is also acknowledged in the Universal Declaration of Human Rights of 1948. It has been suggested that educating girls and achieving the MDG goal on gender equity will lead to a range of improved outcomes for developing countries (Schultz, 2002), including higher economic growth (Abu- Ghaida and Klasen, 2004).

The benefits of education for girls can be explained by the effect education have on girls' achievement. Educated girls acquire and use new personal, social and economic behaviours that in turn affect societal change (Moulton, 1997). As such gender becomes a crucial factor in deciding who goes to school and for how long (Psacharopoulos and Woodhall, 1985). Before parents make the decision, considerations are taken concerning family priorities. In most cases,

girls are more disadvantaged by factors operating within the home and school than boys. They include socio-cultural and economic considerations for example, parental level of education, occupation, family size, traditional division of labour, early marriages and negative perception by parents regarding girls' education.

Summers (1992), asserts that girls' education empowers women to bring about necessary changes and helps to break through the vicious cycle of poverty and deprivation. He concludes that once all the benefits are recognized, the investment in education of girls may well be the highest return investment available in the developing world. Salisbury and Riddell (2000) in their research in Britain argue that women can and do achieve academically as well as men. She asserts that this 'gender divide' in formal education has been caused by issues such as bias in assessment, differential access to the curriculum as well as attitudinal predisposition, peer group pressure and family socialization pattern. In Kenya, gender issues that affect their performance include social, cultural and religious beliefs, attitudes and practices, poverty, child labour, poor learning environment, lack of role models, curriculum pedagogy and learners' attitudes, among others (Kimani *et al.*, 2011).

The stated issues affecting the various genders more so the girl's has resulted in the need to carry out such a study. Much as it is based on gender (male: female), focus will be on how the girl is affected as well as the extent of the performance among boys variably.

1.2 Statement of the problem

The recognition of the importance of educating girls has been stated by many. The literature show that countries specifically Kenya still has a long way to go in terms of improved outcomes and higher economic growth, more so academic performance. There is need to emphasize on new approaches to educating girls such as those stated by Moulton(1997) of personal – self, social and economic behaviors that will influence performance and social change. Factors operating in the home and school. Programmes that target girls need to be reviewed and revamped. Further issues arising such as bias in assessment, and classroom practices that marginalize girls while learning need to be explored further. This is because these issues despite being addressed over time have continued to plague the educational system. The gender divide that arise must be explored more so due to the social, economic and political effect on the gender affected which over the years has been the female gender.

To do this, there is need to determine specific aspect that arise by looking at critical categories of educational dispensation and uniqueness regarding gender performance in education. It's important to move away from general statements to determine exactly where the divide lies and begins. So trends and specifics of what is predominant about gender and performance needed to be explored. Issues of region, groups, and categories of performance needed to be analysed to narrow into the challenges as to why disparities have continued.

Gender issues are ever so crucial more so as the world paradigm change even as we begin to re-evaluate human circumstances within the framework of "21st Century", "Climate Change", "Terrorism" issues that are already redefining education, pedagogy, curriculum, the learner and

assessment practices. There is need to review the past concerns and trends so as to determine the present with a view of charting the course towards redefining educating of the future. This study intends to do just that by contributing towards better understanding of gender within the frame of a critical outcome in education; that is, academic performance. More studies are required that seek sources of inequality, fostering of average performance and improving understanding on how different genders learn.

1.3 Objectives of the study

The objectives of this study were:

1. To determine the trends in academic performance between boys and girls over a five year period (2007-2011);
2. To examine the overall disparities between the performance of girls and boys across subjects;
3. To examine the disparities between the performance of girls and boys across subjects in the different school categories; public schools: (national, provincial and district) and private;
4. To identify social and cultural factors that affect academic performance.

1.4 Research Question

What are the academic gender disparities in different school categories from 2007-2011?

1.5 Significance of the Study

The study will be of use to educators in determining the issues that have created “gender divide” in academic performance over time differently leading to more strategic approach to reducing this divide. The Ministry of Education would be able to review their policies on gender education more so girls’ education, classroom learning practices, more so pedagogy and assessment in most affected areas can be highlighted and made available to schools more so the teacher. Further the community can be better informed as well as the legislature so as to rally and advocate for the change desired.

1.6 Assumptions of the study

The study was based on the following assumptions:

a) The researcher would have access to the Kenya National Examinations Council data base to collect the data needed for the study.
b) That the data in the data base would be valid, complete, reliable and sufficient enough for a thorough analysis to allow for conclusive findings.

1.7 Operational Definition of Terms

Below is a definition of the terms that appear frequently in this research report:

Education: The process of receiving or giving systematic instruction, especially at a school or university: a course of education.

Examination: This is a test that is offered to students or pupils who have gone through a specified course of study to assess their level of attainment of the expected learning competencies.

Academic Performance: This is the mark and determinant of a student's success (or lack of) and future.

Gender: This is the economic, social, political and cultural attributes and opportunities, associated with being either male or female.

National examinations: These are examinations that are managed and administered by state run institutions to students countrywide who have studied an agreed upon curriculum.

Examination Board: This refers to a body charged with the responsibility of offering national examinations in a country and in Kenya it is the Kenya National Examinations Council.

Kenya Certificate of Secondary Education: This is a document issued by the Kenya National Examinations Council showing results obtained by a particular candidate in the secondary education.

CHAPTER TWO

2.0: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature on gender and academic performance. It highlights studies done regarding this topic, tries to conceptualize academic performance, education and gender trends over the years, strategies that have been put in place to increase gender equality in education and the pertinent issue of education for sustainable development. It further presents the theoretical and the conceptual frameworks that define this study.

2.2 Related Studies

There have been a number of studies that have been carried out in relation to the topic of study. In this section, literature on gender issues in education and academic performance will be reviewed. One of the most often researched areas related to gender in education is the issue of sex differences, i.e. comparing male and female characteristics and performance. When dealing with the issue of gender and education, it is important to define what gender is and separate it from sex. The need for this differentiation is the implication of the innate in academic performance which is linked to the biology of a person and its effect on human behavior and outcome. The term sex refers to the biological and physiological characteristics that define men and women (WHO, 2014). The biological perspective on sex differences and cognitive performance considers social factors to be trivial or subordinate to biological factors like brain structure. Several researches assert that males have larger average brain sizes than females and therefore, would be expected to have higher average IQs. Proponents of this view include Allik *et al.,* (1999). Mackintosh (1998), on the other hand, claims that there is no sex difference in

general intelligence. The term gender on the other hand refers to the economic, social, political and cultural attributes and opportunities, associated with being male and female. Additionally, all societies have implicit conceptions of gender, or stereotypes, which they use to differentiate the treatment of girls and boys (Global Monitoring Report, 2002). Accordingly, while women in most societies take primary responsibility for caring for the family, men tend to be associated with the work outside the home. Swainson (1995) notes that, the assignment of roles and development of skills is defined socially and culturally on the basis of sex. From an early age, children develop behavior that is appropriate to their sex roles by limitation of parents and other role models.

Such back ground literature will inform this study since it will be comparing academic performance of both girls and boys based on the same examinations.

2.2.1 The development and evolution of gender

The gender perspective looks at the impact of gender on people's opportunities, social roles and interactions. Gender defines traits forged throughout the history of social relations. Gender differences are social constructs, inculcated on the basis of a specific society's particular perceptions of the physical differences and the assumed tastes, tendencies and capabilities of men and women. Gender relations are accordingly defined as the specific mechanisms whereby different cultures determine the functions and responsibilities of each sex. They also determine access to material resources, such as land, credit and training, and more ephemeral resources, such as power. The implications for everyday life are many, and include the division of labour, the responsibilities of family members inside and outside the home, education and opportunities for professional advancement and a voice in policy-making (Economic and Social Development

Department, 2001). For so long when discussing gender issues, the focus has been on women and their subordination to men in all aspects of life.

This view gave rise to the feminist movement and feminism theories as a way of explaining the sources of these issues facing women in society. The main point feminists have stressed about gender inequality is that it is not an individual matter, but is deeply ingrained in the structure of societies (Lorber, 2001). The author further identifies three gender reform feminisms which can be used to better understand gender differences. They are: liberal, Marxist and Socialist and development feminisms. Theoretically, liberal feminism claims that gender differences are not based in biology, and therefore women and men are not all that different but their common humanity supersedes their procreative differentiation. If women and men are not different, then they should not be treated differently under the law. Women should have the same rights as men and the same educational and work opportunities. This can be achieved through affirmative action which calls for aggressively seeking out qualified people to redress the gender and ethnic imbalance. Asalatha *et al.* (2009) also add that central to liberal feminism was the idea that women's disadvantages stem from stereotyped customary expectations held by men and internalized by women, and promoted through various agencies of socialization. Marxist and socialist feminisms severely criticize the family as a source of women's oppression and exploitation. Development feminism made an important theoretical contribution in equating women's status with control of economic resources. Development feminism addresses the political issue of women's rights versus national and cultural traditions (Lorber, 2001).

As these feminism theories continued developing and the role of women in development was coming to the forefront more and more, changes were taking place in the development field. The

last century was marked by a remarkable though gradual shift in the way women were perceived within the development policy, namely from the stature of victims and passive objects to that of independent agents. To better explain this shift, three schools of thought on gender and development are identified: Women in Development (WID), Women and Development (WAD) and Gender and Development (Asalatha *et al.*, 2009).

2.2.2 Women in Development (WID)

The Women in Development approach calls for greater attention to women in development policy and practice, and emphasizes the need to integrate them into the development process. The WID perspective evolved in the early 1970s from a 'liberal' feminist framework and was particularly influential in North America. It was a reaction to women being seen as passive beneficiaries of development. It marked an important corrective, highlighting the fact that women need to be integrated into development processes as active agents if efficient and effective development is to be achieved. Women's significant productive contribution was made visible, although their reproductive role was downplayed. Women's subordination was seen in terms of their exclusion from the market sphere, and limited access to and control over resources. Women's 'problem' was therefore diagnosed as insufficient participation in a benign development process, through an oversight on behalf of policymakers. The WID approach was also closely linked with the modernization paradigm (Asalatha *et al.,* 2009). It was based on a politics of access.

According to Miller and Razavi (1995), there were two main formative influences on WID. The first formative influence on WID was the resurgence of the women's movement in Northern

countries in the 1970s. In addition to the WID agenda, there was the simultaneous effort by liberal feminists to get equal rights, employment, equity and citizenship for women in the United States. The liberal feminist approach has been very important globally, and was critical in determining the language of political strategy used by WID advocates. The second formative influence on WID was the emerging body of research on women in developing countries and especially Ester Boserup's 1970 Women's Role in Economic Development research report. From the perspective of the WID movement, the importance of this report was that it challenged the assumptions of the welfare approach and highlighted women's importance to the agricultural economy. The report also legitimized efforts to influence development policy with a combined argument for justice and efficiency. Boserup's work thus provided the intellectual underpinning for WID arguments. Instead of characterizing women as needy beneficiaries, WID arguments represent women as productive members of society.

Miller and Razavi (1995) also add that Boserup challenged the conventional wisdom that women were less productive and therefore unentitled to a share of scarce development resources. Women can thus be seen as a missing link in development, a hitherto undervalued economic resource in the development process (Tinker, 1990 in Miller and Razavi, 1995). It was therefore argued that if women were brought into the productive sphere more fully, not only would they make a positive contribution to development, but they would also be able to improve their status vis-à-vis men.

2.2.3 Women and Development

However, Alasatha *et al.* (2009) add that out of the disillusionment with the explanatory limitations of modernization theory that stood as the basis of WID arose a new movement, Women and Development (WAD), based on neo-Marxist feminism, in the second half of the 1970s. It also draws some of its theoretical base from dependency theory, which, in opposition to the optimistic claims of modernization theory, maintained that the failure of Third World states to achieve adequate and sustainable levels of development resulted from their dependence on the advanced capitalist world.

In essence, the WAD approach begins from the position that women always have been an integral part of development processes in a global system of exploitation and inequality, and it is from this perspective that we need to examine why women had not benefited from the development strategies of the past decades, that is, by questioning the sources and nature of women's subordination and oppression. Both the Marxist and liberal feminists share the view that structures of production determine the inferior status of women; while the liberals solely focus on technological change as the causal mechanism, the Marxists consider its impact on class differentiation also (Jaquette, 1982).

2.2.4 Gender and Development

WID and WAD approaches just focused on women; not in relation to men and by the late 1970s, some of those working in the field of development were questioning the adequacy of focusing on women in isolation, which seemed to be a dominant feature of the WID approach. This approach and the resulting policies have been to some extent successful in improving women’s economic

condition but have been much less effective in improving women's social and economic power relative to men in development contexts (Miller and Razav, 1995; Asalatha *et al.,* 2009). The concern over this problem led to a consensus to reform the WID, with arguments for approaches informed by a gender analysis of social relations (Kabeer 1994) and aspiration for the ultimate empowerment of women (Moser 1989); hence the shift to Gender Analysis in Development or simply Gender and Development (GAD) in the 1980s. It challenged the WID focus on women in isolation, seeing women's 'real' problem as the imbalance of power between women and men. GAD approaches generally aim to meet both women's practical gender needs and more strategic gender needs, by challenging existing divisions of labour or power relations (Baden and Reeves, 2000).

The GAD approach focuses on the socially constructed basis of differences between men and women and emphasizes the need to challenge existing gender roles and relations and recognizes the significance of redistributing power in social relations. Therefore, the focus is on gender rather than women. The focus on 'gender' rather than 'women' was influenced by the feminist writers such as Oakley (1972) and Rubin (1975), who were worried about the general way of perceiving the problems of women in terms of their sex, their biological difference from men, rather than in terms of their gender, the social relationship between men and women, where women have been systematically subordinated. This new focus on gender rather than women makes it critical to look not only at the category 'women' – since that is only half the story – but at women in relation to men, and the way in which relations between these categories are socially constructed (Moser, 1993).

GAD draws its theoretical roots from the strands of socialist feminism that challenged the orthodox Marxist assertion that only class analysis could explain women's oppression, and has complemented the modernization theory by linking the relations of production to the relations of reproduction and by taking into account all aspects of women's lives (Jaquette 1982).

2.2.5 Gender in Education

In most societies, men and women differ in the activities they undertake, in access to and control of resources, and in participation in decision-making. In most societies, women as a group have less access than men to resources, opportunities and decision-making (Desprez-Bouanchaud *et al.,* 1987). With any discussion of gender, issues of equality arise. In most cases when one talks of gender equality (or inequality), the focus is usually on the disadvantaged girls. And hence most strategies are geared towards increasing opportunities for girls and women. A worrying trend has however started arising where the boy child is now falling behind the girl child in different aspects of life. According to UNESCO's EFA Global Monitoring Report 2003/04, 'gender equality' refers to the notion of boys and girls experiencing the same advantages or disadvantages in attending school, delivery and teaching methods, curricula, and academic orientation, and producing equal learning achievement and subsequent life opportunities. The concept of gender equality may also be taken to primarily refer to the full equality of men and women, boys and girls to enjoy the complete range of political, economic, civil, social and cultural rights, with no one being denied access to these rights, or deprived of them, because of their sex.

Other factors such as socio-economic differences, ethnic origin and language intersect with gender to influence educational performance and indeed, Sammons (1995) found that such social factors are more influential as students grow older. Obstacles to high academic performance include poverty, family size and parents in unskilled or low skilled employment, while enhancements include higher social class level, being a girl and having educated parents. Other factors that also affect academic performance include: the location of the school (rural vs. urban), early domestic responsibilities, retrogressive cultural practices and health. This is according to Onsomu *et al.*, 2005. Some of the major factors include domestic chores, biased upbringings that portray boys as superior to girls in all aspects of maturation, poor school environments and insensitive teaching methods that disregard the students' needs (FAWE, 2003b).

In most developing countries gender differentials in education appear to be more pronounced both in terms of participation and internal efficiency and in cognitive performance with girls being the most affected (Onsomu *et al* 2005). In addition according to the authors, in Kenya, there has been growing discontent along gender lines on boys performing better than girls, especially in science-oriented courses with gender and socioeconomic factors being some of the major factors affecting learning achievements in education.

According to Kiteto (2000), it is clear from examination performance of girls and boys and also from the few classroom research studies done that all manner of gendered identities are constructed in the classroom. Therefore, issues of gender in education cannot be righted by simply getting the enrolment figures right i.e. equal for boys and girls. This study therefore goes beyond gender issues of access to education to the actual academic performance once students

are in school. Research shows that the problems connected with girls' school participation and performance in Kenya differs from region to region, and between different groups of people. Therefore, this study is a comparative study based not only on gender, but also different regions in the country and in different subjects in a bid to evaluate the gender differentiation in academic performance. Gender thus represents the independent variable in the study.

2.2.6 Gender based Discrimination in Education

Gender-based discrimination in education is both a cause and a consequence of deep-rooted disparities in society. Poverty, geographical isolation, ethnic background, disability, traditional attitudes about their status and role all undermine the ability of women and girls to exercise their rights. Harmful practices such as early marriage and pregnancy, gender-based violence, and discriminatory education laws, policies, content and practices still prevent millions of girls from enrolling, completing and benefiting from education (UNESCO 2012).

Some of the key issues in gender and education as at now include:

- education is a human right;
- education for girls and boys is a key to development progress;
- moving from equality of opportunity to equality of outcomes in education (performance);
- tapping the transformative power of education.

The focus of this study is on point three; moving beyond access to education and focusing on performance once the students are in school.

2.2.7 Academic Performance and Gender

According to the OECD (2009) an analysis of the (Trends in international Mathematics and Science study) TIMSS countries (of which Kenya was not included), in terms of performance, international assessments of primary school students show significant gender differences in reading in favor of girls. On the other hand, there are few gender differences apparent in Mathematics and Science. At the secondary school level, girls had higher average achievement than boys in both Mathematics and Science. Graduation rates are also higher for girls in these countries. Are these findings also reflective of Kenya? And what of the performance differences in the other subjects? And if the findings are different, what does that say about the country's education system?

The study will be basing its evaluation on the national examination results in the Kenya Certificate of Secondary Education for a period of five years starting from 2007-2011. The focus will be gender differentiation in these results. Academic performance thus represents the dependent variable in the study.

2.2.8 Learning environment

A major factor that is closely linked to gender and that affects academic performance is the learning environment. Learning cannot occur without physical and psychosocial safety and security in the classroom, in the school and schoolyard, and on the way to and from school. This requires that safe, secure, private and sanitary facilities are available and accessible, with separate provision for girls and boys. It also requires policies and procedures to protect girls and boys from intimidation, harassment, sexual abuse and other forms of physical or mental violence,

as well as policies and procedures to ensure safe reporting and follow-up of gender based harassment (including bullying of boys). Girls and boys need equal access to safe places in which to play and socialize. Studies show that a school environment that is not conducive to effective learning, may lead to underachievement which results to repetition, a precursor for dropout (Chimombo, 2000).

The learning environment therefore has a direct impact on academic performance and is especially interrelated with gender. This is because boys and girls require some specific facilities and amenities at school to enable them concentrate and perform well. This is especially true for girls whose school attendance is hindered or informed by availability of basic sanitation facilities. Lack of these affects not only their attendance but also their academic performance.

2.2.9 Strategies for Gender Equality in Education

Over the years and especially in the 20th Century, conscious efforts have been made towards achieving gender equality in education at the global level and in individual country level. This was necessitated by the view that women can and do contribute to development and hence their education was necessary to achieve this development. Below is a highlight of the various efforts and initiatives geared towards gender equality in education at the global and country level.

Universal declaration of human rights, 1948, Article 26 states that: everyone has the right to education. Education shall be free at least at the elementary and fundamental stages. This elementary education shall be compulsory. The UN Convention on the rights of the child- 20th November, 1989 which is a derivative of Article 26 redefines the rights of the child and views

the child as a human being. Education for All (EFA) declaration which was drafted in Jomtien, Thailand in 1990 had several goals which included:

- the need to ensure that by 2015, all children particularly girls and children living under difficult circumstances together with those belonging to ethnic minorities should have access to and complete free and compulsory primary education of good quality;
- the need to eliminate gender disparities in primary education by 2005 and achieve gender equality in education by 2015 with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality.

Kenya Vision 2030

Kenya Vision 2030 is the country's new development blueprint covering the period 2008 to 2030. It aims to transform Kenya into a newly industrializing, "middle-income country providing a high quality life to all its citizens by the year 2030". The Vision is based on three pillars: the economic, the social and the political pillar. The education goal is under the social strategy of the Vision 2030 which focuses on investing in the people of Kenya. Under this strategy, there are key social sectors that are the focus areas. Education and training is one such sector. According to the Vision 2030, under education and training strategies, Kenya will provide globally competitive quality education, training and research to her citizens for development and enhanced individual well-being. The overall goal for 2012 was to reduce illiteracy by increasing access to education, improving the transition rate from primary to secondary schools, and raising the quality and relevance of education. Other goals included the integration of all special needs education into learning and training institutions, achieving an 80% adult literacy rate, increasing

the school enrolment rate to 95% and increasing the transition rates to technical institutions and universities from 3% to 8% by 2012.

Kenya's Education Act 2013

In Kenya, basic education is considered to be the first twelve years of education. This means that it spans the primary and secondary school years. This is stipulated in the Koech Report of 1999. An education Act was passed in 2013 which maps out the direction of the education sector in the country. According to the Act, the provision of basic education shall be guided by the following values and principles:

(a) the right of every child to free and compulsory basic education;

(b) equitable access for the youth to basic education and equal access to education or institutions.

The above strategies were meant to increase access and achieve equality in education and are mostly at the policy level. There is no explicit focus on academic performance as the focus has been first and foremost to ensure that all children of school going age are in school.

Sustainable development and education

Sustainability and sustainable development are buzz words in the development arena. There are different ways that development agencies and governments go about achieving this sustainability in their initiatives. Education is one of the ways of approaching this kind of development.

Education for Sustainable Development (ESD) decade- 2005-2015

ESD has become an important element of environmental policy making and sustainable development. Chapter 36 of the Earth Summit of 1992, which is called 'Promoting Education, Public Awareness and Training', defines the four thrusts of ESD as stated below:

- improving access to quality basic education;
- reorienting existing education to address sustainability;
- increasing public understanding and awareness of sustainability;
- providing training for all sectors of the economy.

All these strategies are geared towards ensuring everybody has equal access to education. There has been a degree of success but now the focus is or should be on the quality of this education and the outcome of this education. Has gender equality been achieved in academic performance?

The Gender Disparity in Education

Research has attempted to draw a sub-regional picture. FAWE (2001) carried out cross-country comparisons of entries for Ghana, Tanzania, Cameroon and Uganda. The patterns of gender differences showed more boys than girls are in school, and boys achieving at higher levels compared to the girls. The entry data of the sub-regional study shows that proportions of girls ranged from 37% in Ghana to 44% in Tanzania, and there were lower percentages of girls attaining excellent, credit and pass levels compared with boys.

Kakonge's research (2000) analyses the Kenya Certificate of Secondary Education (KCSE) data for 1990-1996. The data show that at both national and provincial levels the averages of examination scores for boys were higher than those of girls over the entire research period. A

very striking deviation from this pattern was observed in girls' entries in Central Province in 1996, where girls' representation in fourth form was higher than that of boys, a situation rarely found in the research literature. The same research showed that boys attained higher average mean scores at national level than did girls throughout the seven-year period. The exception was in languages, where attainment was generally gender balanced. The Nairobi pattern differed from the "normal" pattern found in the research literature on gender differences, because girls' attainment in Nairobi exceeded that of boys in 1995 and 1996 and the gender gap was increasing. Thus in the case of Kenya, it is not possible to argue that girls are disadvantaged in all regions in the country.

The findings from this research, which show that Nairobi and Central provinces have more girl-positive patterns of attainment and participation, respectively, point to the likelihood of more depressed girls' attainment or entries in other provinces, given the national picture. In particular, the situation of girls is suspected to be worst in NEP, considering the NEP districts' rating in the national league tables. This study will help in ascertaining whether the situation has changed in the close to 16 years since this study was done and hence an indicator of whether the interventions mentioned above have made a difference or not.

2.2.10 Programming Girl Education

Gender specific programming has recently emerged over the past decade as an increasingly important issue. Advocates of gender-specific programming note that girls differ developmentally from boys. This implies that there is need to approach girls' education in a slightly different manner that answers to their specific needs at different stages of development.

This will not only impact how they turn out later in life, but also their academic performance and outcome.

Gender-specific programming goes beyond simply focusing on girls. It represents a concentrated effort to assist all girls in positive girl development. It takes into account the developmental needs of girls at adolescence, a critical stage for gender identity formation. It nurtures and reinforces "femininity" as a positive identity with inherent strength. It provides girls with decision making and life skills as well as helping them recognize the dangers and risks that girls face because of gender (OJJDP; Office of Juvenile Justice and Deliquency Prevention 1998).

2.2.11 Gender Equality and Assessment in Learning Achievement

In order to move beyond parity we must focus more on gender equality in learning outcomes and in the effects of school resources, ‘understanding the reasons for differences in student performance might be considered the first step for designing effective educational policies to address quality and equity concerns’ (Nguyen and Griffin, 2011). It has been argued that recent shifts in teaching approaches may have increased gender differences in achievement and that ‘because of the differences in how girls and boys learn, it can be difficult to create educational environments that are suitable for both groups’ (Zuze and Reddy, 2011). It is therefore crucial that we have a clear understanding of the factors influencing student achievement. In terms of improving this understanding the development and use of proficiency levels alongside mean scores are important (Zuze and Reddy, 2011). They provide greater insight into the nature of the gender differences and ‘may facilitate differentiated teaching to meet the needs of male and female students’ (Nguyen and Griffin, 2011).

Student level variables (Zuze and Reddy, 2011; Nguyen and Griffin, 2011) are also of great concern as gender differences are often more marked in certain population subgroups such as in rural communities or children from low scoio-economic backgrounds and must be analyzed in conjunction with school level variables (Zuze and Reddy, 2011; Nguyen and Griffin, 2011) and the findings used to direct future interventions and policies. Current findings suggest that male students need extra support to cope with the transition between primary and secondary school (Nguyen and Griffin, 2011) and that in South Africa boys and girls benefit equally from the provision of school libraries. Future research on gender difference should go beyond comparing outcomes and should focus more on the learning process with the aim of linking the results to teacher professional development and teaching interventions (Nguyen and Griffin, 2011).

The feminist mission of promoting the rights and the empowerment of women and girls and challenging their oppression is often portrayed as being un-African and a threat to the construction of African masculinities. Gender research however has the 'potential to increase the shift of emphasis in feminist scholarship away from women *per se* to gender relations (men and women)' (Chege and Sakurai, 2011), thus allowing it to contribute more freely to the discussion on the social construction of masculinities and femininities in a relational manner.

Feminist gender research now has the 'theoretical and conceptual tools for enhancing gender equality and eradicating women's subordination that is founded on research-based knowledge' (Chege and Sakurai, 2011). Effective feminist gender research uses a bottom-up, participatory approach which empowers both men and women and involves 'doing research with the people'. By centering the research around boys' educational experiences the researchers are 'employing

feminist thought in a critical light that raises awareness of the possibilities of sidelining boys (men in the making) in a social process that may result in their future subordination in society ' (Chege and Sakurai, 2011).

2.2.12 Kenya's Affirmative Action on Girls' Education

The Kenyan government took up the gender issue very positively in 2007 and issued a ministerial policy document: The Gender Policy to formalize the rights of girl- gender issues in education in order to achieve Education for all by 2015. The Government of Kenya is a signatory to international protocols relating to education and human rights of women and girls, including the Universal Declaration on Human Rights (1948), Convention on the Elimination of all Discrimination against Women [CEDAW] (1979) and the Convention on the Rights of the child [CRE] (1989). All these documents reiterate the need to eliminate all forms of discrimination, enhance the right to education, and promote girl-gender equality particularly in education. The Government of Kenya developed strategies and implemented a variety of initiatives to address girls Education. Girl- gender issues are addressed in all programmes like The National Plan of Action on EFA 2003 -2015, the Report of the Education Sector Review 2003, the Ministry of Education Strategic Plan (2006 – 2011) and service Charter, Sessional Paper No. 1 of 2005, and the Kenya Education Sector Support Programme (KESSP) 2005 – 2010.

The Ministry of Education established a National Task force for Gender and Education, a Ministerial Task force on Girls' Education, and a Gender Desk. (Republic of Kenya, 2007). In order to address girls' challenges at secondary education level, the Ministry implemented the

following strategies among others**:** expansion of boarding facilities for girls; affirmative action in bursary allocation for secondary schools; appointment of qualified girls education managers; gender – balanced intake of pre-service teacher trainees; gender responsive deployment of teachers; re-admission of girls who become pregnant while in school; gender parity- based recruitment and deployment of teachers and Managers; engendering of the curriculum; capacity building for school managers, teachers and quality assurance officers on gender issues; gender sensitization, advocacy and Mainstreaming HIV and AIDS education in the Secondary curriculum (Republic of Kenya, 2007).

Secondary education caters for primary school leavers in the 14- 18 year group. The students are exposed to four years of in and out of school experiences in a broad curriculum that culminates in the performance of the 'O' Level Examination. It creates a country's human resource base at a level higher than primary. Secondary school education makes learners proficient in both academic and some applied subjects. The ultimate purpose of this segment of the basic education is to fulfill the objective of providing equal opportunities to every individual up to a minimum of twelve years in school (Koech Report, 1999).

2.2.13 Gender and Performance accross Subjects

According to the Scholastic Aptitude Test (SAT), an international Test, originating from USA, a larger percentage of male students score within the top three distribution categories. In the top two categories, the ratio of males to females is 2:1. As with SAT scores, questions arise as to why girls do not achieve high scores in the same proportion as males. One research study by the American College Test (ACT) reports that, when other variables such as high school grade point

average, course taking, and student self-perceptions are controlled for race/ethnicity or gender explained only 1% to 2% of the additional variance over and above the other variables considered. These findings can be interpreted to underscore the minimal role that gender plays in explaining mathematics achievement (Noble *et al.,* 1999).

Similar to the findings of Jacobs *et al.* (2002), ACT results suggest that for both boys and girls, mathematics grades fall over the course of junior high and high school. Young women achieve at comparable or higher levels in mathematics as men, but their interest especially for the high achieving girls, are the same or lower than boys. ACT results also, suggest that for young men in higher-level mathematics tracks, mathematics interest is much more strongly related to mathematics school grades than for young women in the same mathematics **ESD** courses. Indeed, interest in mathematics courses or mathematics-related activities remain flat across the junior high and high school years for women who are in the higher level mathematics courses.

This research suggested that in order to encourage more women into Mathematics, Science, and Information Technology fields, interventions need to be designed that focus not on the academic achievement of women but in how to make Mathematics and Science-related occupations more interesting for young, high achieving women. This type of intervention should start early in the academic careers for these adolescents and young women; the study found that the lack of interest in mathematics begins earlier than the junior high school years and never improve.

Research also shows that males also perform better in mathematical achievement tests than girls. However, gender differences do not apply to all aspects of mathematical skill. Boys and girls do

equally well in basic mathematics knowledge, and girls actually have better computational skills. Performance in mathematical reasoning and geometry shows the greatest difference (Fennema *et.al.,* 1999). Males also display greater confidence in their mathematics skills, which is a strong predictor of mathematics performance (Casey, 2003).

The poorer mathematical reasoning skills exhibited by many adolescent girls have several educational implications. Beginning at age 12, girls begin to like mathematics and science less and to like language arts and social studies more than do boys (Sadker & Sadker, 1994). They also do not expect to do as well in these subjects and attribute their failures to lack of ability (Eccles *et al.,* 1999). By high school, girls self-select out of higher-level, "academic-track" mathematics and science courses, such as calculus and chemistry. One of the long-term consequences of these choices is that girls lack the prerequisite high school mathematics and science courses necessary to pursue certain majors in college (e.g., engineering, computer science). Consequently, the number of women who pursue advanced degrees in these fields is significantly reduced (Halpern, 2004).

Some researchers, on the one hand, argue that the gender gap in mathematics is biologically driven. Selected research shows that prenatal hormones circulating in the brain encourage differential development in the hemispheres of male and female foetuses (Berenbaum, Korman, & Leveroni, 1995). Others believe intelligence has its roots in genetics (Plomin, 1999). There is evidence, however, that socio-cultural factors may influence girls' attitudes toward mathematics and science. For example, parents tend to view mathematics as more important for sons and language arts and social studies as more important for daughters (Andre *et.al.,* 1999). Parents are

more likely to encourage their sons to take advanced high school courses in chemistry, mathematics, and physics and have higher expectations for their success (Wigfield *et.al.* 2000). Teacher characteristics and the classroom environment also have been identified as contributors to this gender gap. Unfortunately, many girls report being passed over in classroom discussions, not encouraged by the teacher, and made to feel stupid (Sadker & Sadker, 1994). Classroom environments can be made to feel more "girl-friendly" by incorporating low levels of competition, public drill, and practice, high levels of teacher attention, hands-on activities, female role models, same-sex cooperative learning communities and non-sexist books and materials (Evans *et al.* 1995).

Fortunately, sex differences in mathematical reasoning have begun to decline and girls enrolments are up in mathematics and science courses (Campbell *et al.* 2000; Freeman, 2004). Programmes designed to interest girls in mathesmati and science and that demonstrate how this knowledge will allow them to help others appear to be working. The most comprehensive reviews of the research in the area of gender differences have shown very few true differences between mathematics and verbal abilities between men and women (Halpern, 2000). In fact, the research has shown only two gender differences in specific sub-areas of spatial and verbal abilities, three-dimensional mental rotation (favouring men), and speech production (favouring women). Other research has also shown a decline in the differences between the genders in the past few decades on standardized test, suggesting that the more exposure that women are getting to mathematics and science classes, the better their scores. Lately some researchers are questioning whether gender differences still exist in academic achievement; many researchers

are still finding differences in performance as well as general interest in areas related to mathematics and science.

Work by Eccles *et al.* (1997) found that gender differences in enrolment in advanced mathematics courses in high school are mediated by gender differences in expectations for success in mathematics and physics and perceived value of competence in mathematics. Jacobs *et al.* (2002) found that self-concept of ability and task value in mathematics decline for both genders between first and twelfth grades with no real difference between girls and boys trajectories over time. In fact, by the twelfth grade, girls valued mathematics more than boys when controlling for self-concept of ability in mathematics.

It is argued that even though women have made great strides in the law, medical, and social science professions, very few can be found in graduate programmes or professions in Mathematics, Computer Science, Physics, Engineering or Information Technology jobs (Eccles *et al.,* 2002). Many ideas have been put forth on why high achieving women may not be entering these professions including discrimination, gender-typed socialization, and self-concept of ability in these areas, and the value and interest that women have in these professions (Eccles *et al.,* 2002).

2.2.14 Factors contributing to gender disparity in academic performance

There are many school related factors that influence the performance of girls. Learch (2003)'s focused on the ways in which curriculum disadvantages girls. He cites these factors as negatively influencing girls participation in school; Teaching styles which favor boys such as lessons which

focus on memorizing abstract facts as opposed to open ended and process-oriented tasks which favour girls, boys dominance in classroom interaction which marginalizes girls participation in classes, subject choice with girls opting or being encouraged to opt for “feminine” subjects such as languages, history and literature while boys go for the so called “hard” subjects like mathematics, science and technology, assessment styles, which according to research favour boys such as multi- choice questions whereas girls are known to excel in coursework, marker bias which gives boys higher marks and teachers’ low expectations of girls, coupled with girls’ low self-esteem and self-concept. Further, Ayoo (2002), Machyo (1995), Umbima (1993) and Young (1985) observe that learning among children occurs through modeling which is determined by relations in terms of sex as cherished by parents, teachers and fellow children.

This view is supported by UNESCO (2003) whose report *Gender and Education for All* stated that some teachers portrayed negative or stereotype attitudes about academic potential of girls; that there are few girls’ teacher role models and counselors for girls; unequal access to textbooks or writing materials and that girls are harassed by their male classmates. This report also supports findings by Kakonge’s (2000) study that had a component that examined teachers' thinking or level of reflection on gender gaps in education and particularly in science subjects. The analysis showed that a majority of teachers had perceptions of girls and science that were gender stereotyped and traditional. A smaller cluster of teachers, however, had quite girl-friendly perceptions. Thus studies emanating from the Kenyan context show that textbook, curricula and teachers may be important factors contributing to gender gaps in education at the moment.

This culminates in low completion rates such that national completion rate in Kenya in 2004 was 91.5% for boys and 87.5% percent for girls, registering a gap of 4% in favour of boys in

secondary schools (Republic of Kenya, 2007). This builds a case scenario of low enrolment, retention and completion rate for girls; a case resulting partly from harsh school curriculum on girls. This scenario replicates itself in the performance at Kenya Certificate of Secondary Education (KCSE) examination which has improved steadily for boys who often tend to perform generally better than girls in key subjects such as English, Mathematics, Biology, Physics and Chemistry. Girls are generally more adept than boys in languages and humanities (Republic of Kenya, 2007). Girls from low socio-economic backgrounds in more remote areas continue to be the most deprived in terms of basic education. Parental motivation and societal pressures are critical factors for achieving EFA goals, "in this context, community, as well as family needs (including social and economic."

2.2.15 Curriculum

Higher barriers for girls set by harsh curricula affects girls. Kwesiga (2002), puts a very strong case against restrictive school curriculum. In Uganda, she says, the Biological Sciences like Home Science are grouped under Cultural subjects and are denied the academic treatment in most schools and are branded as girls only subjects. Many girls' schools do not offer Technical and Applied Science subjects as they are regarded as boys' subjects. There are not enough teachers in these subjects. Business Studies subject was designed for girls, but it's not offered in many poor schools as they do not have the capital to buy typewriters or computers and pay the teachers. Owing to poor and lax grouping of the subjects, many girls tended to choose Arts and Humanities based subjects. Most new girls' schools offered less practical subjects owing to lack of adequate facilities, instead of offering pure Science, they offered General Science. Lack of scholastic materials and facilities hampered performance of girls at O-level, especially in the

mathematics, sciences and technical subjects. The types of secondary schools are not conducive to high aspirations by girls. In Niger, (UNICEF, 2004) reports that girls and boys have equal access to school, but girls continue to be at a distinct disadvantage due to inappropriate and restrictive curriculum, coupled with the widespread belief that school teaches girls modern ways which are in conflict with local behavioral norms.

Negative attitudes towards the abilities of girls are deeply embedded in all cultures and education for domesticity is the norm. In Malawi, for example, some subservient cultural practices such as kneeling to parents and elders are carried out in the schools by girls only. Subordinate status is impressed upon girls and this is reflected in the structure of schools. Girl-gender bias in schools is often found in teaching pedagogy, subject streaming, teachers' expectations, instructional materials and curriculum content. In Britain, heterosexualized femininity is shaping the landscape of schooling, education and training for the girls gender. An examination of subjects chosen by girls and males, reveals girls are over presented in 'traditional caring-based courses and under-represented on higher status courses (Salisbury and Riddell, 2000).

2.2.16 Gender and students' choice of subjects in secondary schools.

Students choose particular subject because they believe they are good at it and have a good chance of passing in the examination. The more subjects a student performs well in, the higher the mean score of that student. This perception is reinforced by the girls' estimation of their own ability and the relative difficulty of the subject. Some subjects, such as Physics and Foreign Languages are considered to be more difficult. It's been argued that few girls study Physics because they are less confident than boys of their own ability and less likely to choose

difficult subjects. For example, in early childhood, aspects of play, encouraging boys to play with cars is thought to reinforce male interest in Science and Technology; peer-group pressure further influences girl's attitude to what are 'boys' subjects and 'girls' subjects and creates situations in which it is very difficult for individuals not to conform to the norm for their gender. However, a popular female teacher may provide a positive role model which encourages girls to take a particular subject (Salisbury and Riddell, 2000). Understanding this influence of gender on the choice of subjects by students is linked to the understanding of overall performance and why for example, the 'hard' subjects are more often than not deemed to be more suitable for boys and are chosen by more boys than girls. The optional subjects like Home Science are chosen more by girls and they perform better at it than boys. Boys perform better in the compulsory subjects like mathematics and some sciences which are categorized as 'hard' subjects. This performance in the different subjects is what determines a student's mean score. Whether this is also true of the KCSE subject specific performances or not is what this study is seeking to determine.

2.2.17 Inadequate school Facilities

Inadequate school facilities lead to other shortcomings, the major one being increased failure and class repetition rates, leading to high drop-out rates for girls (Kwesiga 2000). Inadequate school facilities in Zambia and Malawi force many students to sit on the floor in very crowded classrooms, typically with a learner to teacher ratio of 60:1. Girls find it hard to study while squatting on the floor. Girls from poor families frequently stay away from school during menstruation due to lack of sanitary protection. They are often too embarrassed to explain their absences to the teachers. In Kenya, Girl Child Network organization has partnered with the

Ministry of Education to supply sanitary pads to girls in slums and remote rural schools. Indeed, many schools totally lack sanitary facilities in both urban and rural areas and this affects girls more than boys.

2.2.18 Lack of Positive Role Models for Girls.

Research in Malawi shows that school girls lack female role models in science and mathematics subjects and this affects their skills, interest and attainment in these subjects. The ratio of women teachers in mathematics and science in most African countries is particularly low because so few women with the necessary science and mathematics' background get on to teacher training programmes. In Education Management, girls have few role models to emulate. For example, in Zambia, out of 200 senior education officers in post in 1992, only 17 were women. The Zambian provinces with a high proportion of women teachers have high completion rates for girls. The positive impact of female head teachers on girls is considered stronger than that of female teachers (Kelly, 1994) The Ugandan education system has very few role-models to effectively motivate the girls to aspire for higher education. The teachers are not encouraging. The existing official system for careers guidance and counseling at secondary level is inadequate, rendering girls more ill equipped than boys, (Kwesiga, 2002).

2.2.19 Socio-cultural and economic factors affecting student attendance in school

All societies have implicit conceptions of gender, or stereotypes, which they use to differentiate the treatment of girls and boys (Global Monitoring Report, 2002). Accordingly, while women in most societies take primary responsibility for caring for the family, men tend to be associated with the work outside the home. Swainson (1995) notes that the assignment of roles and

development of skills are defined socially and culturally on the basis of sex. From an early age, children develop behaviour that is appropriate to their sex roles by limitation of parents and other role models.

Further, Ayoo (2002), Machyo (1995), Umbima (1993) and Young (1985) observe that learning among children occurs through modeling which is determined by relations in terms of sex as cherished by parents, teachers and fellow children. Swainson (1995) argues that girls, for example, in rural areas possibly experience some kind of alienation in view of the many overlapping relationships within as well as outside the family.

According to Eshiwani (1985) some preference persists for educating boys, reflecting traditional limitations on women's roles, customary patrilineal inheritance systems and perceptions that boys will have greater prospects for modern sector employment. Moreover, in rural areas, the opportunity cost to parents of educating girls seems higher. Consequently, the gender roles that a society assigns to its children will have a determining effect on their future such as schooling, labour force participation and status in relationships.

However, in Ethiopia, household duties are a primary reason for keeping boys out of school (King and Hill, 1993) while a higher endowment of livestock showed negative effects on enrolment in Botswana (Chernichovsky, 1985). On the other hand, Walters and Briggs (1993) found a higher probability of school enrolment for children from households who owned land.
As in other developing countries, children in Kenya are engaged in domestic chores, often to the detriment of their education (Kadenyi and Kamuyu, 2006; Chepchieng and Kiboss, 2004;

FAWE, 2003a; Ayoo, 2002). In their study on the influence of family socio-economic status and gender on students' academic performance in Baringo district secondary schools, Chepchieng and Kiboss (2004) found that lack of time for study among girls could be attributed to involvement in domestic chores. In contrast, boys were left with a lot of time to study thus were likely to have an edge over girls' school work. In view of this finding, this study was an attempt to establish whether there was any gender difference in the influence of domestic chores on students' academic achievement in mixed day secondary schools in Mosocho Division.

Odaga and Heneveld (1995) conducted another study on factors influencing girls' schooling in Sub-Saharan Africa. The findings of the study revealed that socio-economic and socio-cultural factors such as high opportunity cost of girl's education, direct cost of schooling on girls, initiations, and religion affected girl's education and performance. The findings of the study also revealed other factors such as school environmental factors (e.g. teachers' attitudes, learning materials, pregnancy, sexual harassment and the distance to school.) and political and institutional factors (e.g. financing and management of education sector, political instability and limited effect of women in development initiatives.

Nzomo, Kariuki and Guantai (2001), for instance, established a positive correlation between the socio-economic status of Standard Six pupils and the level of their learning achievements in Kenya. The results show that as the socio-economic status of the sample pupils improved, the mean scores in the learning achievement also tended to increase. Families with higher socio-economic status had the ability to provide their children with necessary facilities and materials pertinent in improving performance. School location was also another key factor influencing

learning achievement. Pupils in urban settings obtained higher mean scores in narrative, expository and documentary dimensions focused on during the study as compared to their counterparts in rural schools.

Studies done elsewhere show that a school environment that is not conducive to effective learning may lead to under-achievement which results to repetition, a precursor for dropout (Chimombo, 2000). This study argues that repetition has harmful effects on students' self-esteem and attitude towards schooling and this increases likelihood of dropping out of school. The study observes that teachers' attitude, behavior and teaching practices have significant implications for girls persistence and academic performance. Societal beliefs, which teachers bring to the classroom, also have profound implications on learning achievements.

Chimombo (2000) observes that cultural beliefs that look at girls as having less ability than boys if brought to the classroom may lead to marginalization of girls and further demotivate them in their academic performance. In assessing the impact of related socio-economic factors in Malawi, the study concludes that inadequate provision and conditions of facilities like toilets has negative effects on girl student persistence in school.

2.3 Conclusion

The literature reviewed so far points to the fact that, there still exist differences in academic performance between boys and girls across the globe. However, the differences are varied in nature of disciplines from one country to another; for instance where as in most parts of Europe,

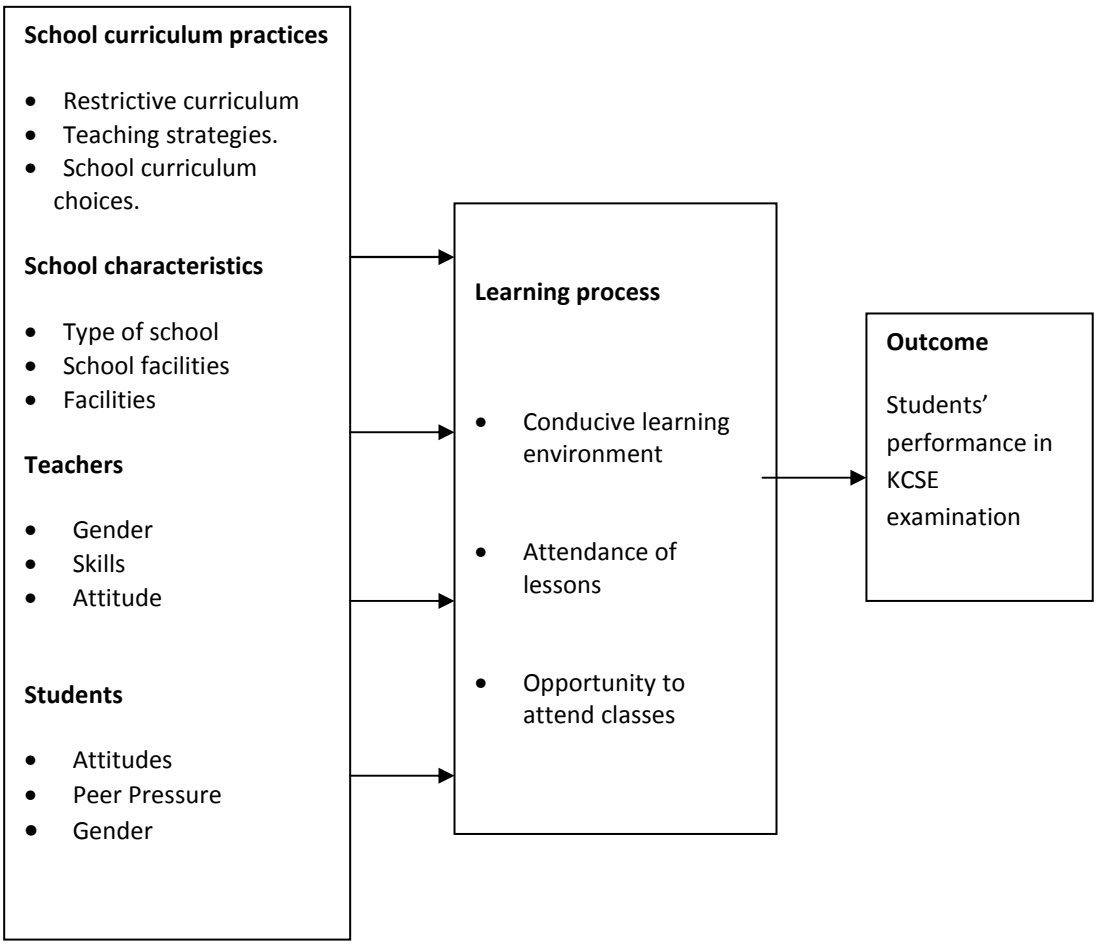
America and Asia girls perform better in languages than boys, the situation is different in most parts of Africa where boys perform better than girls.

It has also been noted that the school category in terms of boys only, girls only and co-ed schools has impact on the performance of girls. The differences are also varied when schools are categorized in terms of National, Provincial and district schools i.e. the difference is less at national but widens towards district schools to the disadvantage of girls.

2.5 Conceptual Framework

Based on the two variables of gender and academic performance of which gender is the independent variable while academic performance is the dependent variable, the conceptual framework below diagrammatically illustrates their relationship. The indicators are based on the discussions above that link gender and academic performance.

Figure: 1 Framework of Interrelated school curriculum Factors influencing students' performance in school



Source: Researcher's own conceptualization

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This section discusses the methodology that was used in the study. It focuses on the research design, sample population, target population, research instruments, validity and reliability of instruments. It also discusses data collection procedures for data analysis.

3.2 Research design

The research design that was employed in this study was survey method which Ogula (1999) defines as a research study in which data are collected from the members of a sample, for the purpose of estimating one or more population parameters. It was preferred because it was systematic in data collection and described and reported the way things were because they described specific characteristics of a large group of persons. It allowed the researcher to investigate relationship between the two variables, gender and academic achievement.

A quantitative methodology was used. Aliaga and Gunderson (2000), describe quantitative research methods as: 'Explaining phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics)'. The research was purely numerical based, using raw scores from the Kenya National Examinations Council. The data was analyzed using a statistical software program specifically- Statistical Package for Social Sciences- SPSS.

The main concern of a quantitative approach, however, is that the measurement must be reliable, valid, and generalizable in its clear prediction of cause and effect (Cassell & Symon, 1994). Quantitative research is based upon formulating the research hypotheses and verifying them empirically on a specific set of data (Frankfort-Nachmias & Nachmias, 1992).

Quantitative method has several strengths which include enabling the researcher to state the research problem in very specific and set terms and clearly and precisely specify both the independent and the dependent variables under investigation (Frankfort-Nachmias & Nachmias, 1992). The researcher will also be able to achieve high levels of reliability of gathered data due to controlled observations, laboratory experiments, mass surveys, or other forms of research manipulations (Balsley, 1970) and eliminate or minimize subjectivity of judgment (Kealey & Protheroe, 1996);

3.3 Population and the Sample

3.3.1 Examination results, Kenya Certificate of Secondary Education (KCSE) as found in the KNEC database (raw data)

3.3.2 Secondary Data from Literature books as well as journals.

3.4 Data Collection Procedures

The researcher sought permission from the Kenya National Examinations Council to access the KNEC database. The nature and sources of data collected from KNEC comprised of examination results for KCSE candidates for the years 2007 to 2011. This is summarized in the table below.

Table 1: Summary of entries in Gender for the five years under study (2007- 2011)

YEAR	2007	2008	2009	2010	2011	Grand Total
GIRLS	126,112	135,244	148,578	155,098	177,191	**742,223**
BOYS	150,127	159,252	178,616	192,233	221,007	**901,232**
TOTAL	**276,239**	**294,496**	**327,194**	**347,331**	**398,198**	**1,643,458**

3.5 Data Analysis Techniques

After data collection, the researcher cross-examined the data to ascertain accuracy, completeness and uniformity. The data was then analyzed and interpreted to provide meaningful and final results. Since there are two variables under study and the aim of the research was to determine the extent to which gender influences academic performance, descriptive statistics were used to analyze the data. The researcher presented the data in frequency and percentage tables. Significance test was also carried out. The researcher used Statistical Package for Social Sciences (SPSS) and MS Excel to analyze the data.

3.6 Validity and Reliability

Internal validity is the confidence that we can place in the cause and effect relationship in a study (Shuttleworth, 2009). The question that validity seeks to answer is; "Could there be an alternative cause, or causes, that explain my observations and results?" (Shuttleworth, 2009). Being a 'Public National' examination that is used for certification, that is designed using measurement approach theories, the validity and reliability was assumed.

Table 2: Data needs table

Research question	Data needs	Type of Data	Data sources	Instruments	Data analysis
What has been the trend in the overall academic performance between boys and girls over the five years (2007-2011) in KCSE?	KCSE overall results for girls from 2007-2011	Quantitative	KNEC database	Rec 2	Descriptive analysis
	KCSE overall results for boys from 2007-2011	Quantitative	KNEC database	Rec 2	
What are the gender disparities in the academic performance in different subjects?	Mathematics	Quantitative	KNEC database	Rec 3	Descriptive analysis
	Languages	Quantitative	KNEC database	Rec 3	
	Sciences	Quantitative	KNEC database	Rec 3	
	Arts	Quantitative	KNEC database	Rec 3	
	Technical Subjects	Quantitative	KNEC database	Rec 3	
What are the academic gender disparities in different school categories from 2007-2011	Public schools : National (boys & girls) performance	Quantitative	KNEC Database	Rec 4	Descriptive analysis
	Provincial schools (boys & girls) performance	Quantitative	KNEC Database	Rec 4	
	District schools (boys & girls) performance	Quantitative	KNEC Database	Rec 4	
	Private schools (boys & girls) performance	Quantitative	KNEC Database	Rec 4	
	How these characteristics affect academic performance	Qualitative	Journal articles, books	Rec 4	

Source: Researcher's own conceptualization

CHAPTER FOUR

4.0: RESEARCH FINDINGS

4.1 Introduction

This chapter focuses on the findings of the study and includes a description of the results of the data collection exercise. The chapter is composed of the following sections:

1) trends in academic performance between boys and girls in the a five year period;
2) disparities between the performance of girls and boys across subjects;
3) disparities between the performance of girls and boys across all subjects in the different school categories (Public Schools: National, Provincial, District) and Private.

4.2 The Findings

Below is a presentation of the research findings in graphs and tables.

4.2.1 Overall Academic Performance Across the Five years (2007-2011) per Subject by Gender

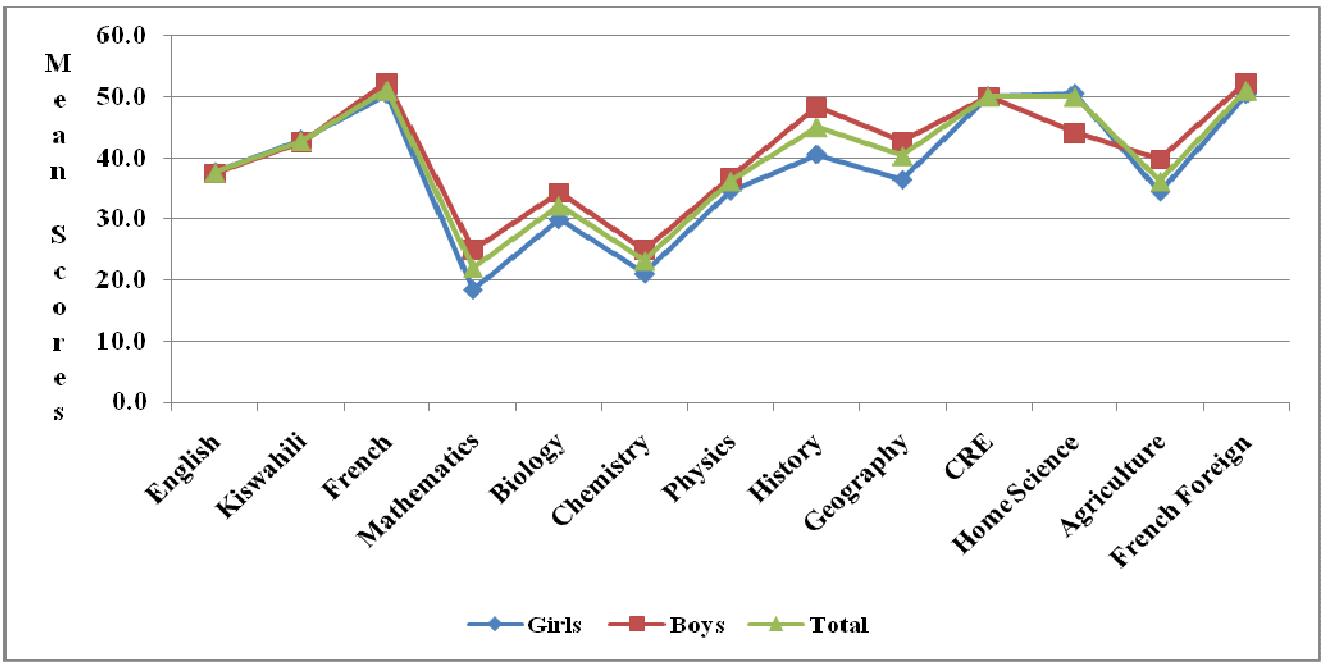
Table 3: Overall Academic Performance: Mean, Standard Deviation and Variance per subject by gender across the five years (2007-2011).

Subjects	Girls			Boys			Total		
	Mean	Std. Dev.	Variance	Mean	Std. Dev.	Variance	Mean	Std. Dev.	Variance
English	*37.76*	*2.41*	*5.79*	*37.50*	*2.57*	*6.60*	*37.61*	*2.49*	*6.19*
Kiswahili	*43.09*	*4.73*	*22.33*	*42.58*	*4.98*	*24.77*	*42.81*	*4.85*	*23.54*
French	*50.46*	*4.39*	*19.28*	*52.34*	*4.67*	*21.76*	*51.09*	*4.42*	*19.54*
Mathematics	*18.45*	*2.01*	*4.02*	*24.92*	*1.89*	*3.58*	*22.00*	*1.95*	*3.82*
Biology	*29.94*	*5.38*	*28.92*	*34.31*	*6.13*	*37.52*	*32.23*	*5.75*	*33.12*
Chemistry	*21.08*	*2.12*	*4.50*	*24.89*	*2.80*	*7.85*	*23.16*	*2.48*	*6.16*
Physics	*34.62*	*3.36*	*11.27*	*36.85*	*3.71*	*13.79*	*36.23*	*3.59*	*12.88*
History	*40.60*	*3.73*	*13.93*	*48.27*	*4.18*	*17.46*	*45.08*	*3.97*	*15.73*
Geography	*36.46*	*3.99*	*15.89*	*42.69*	*4.28*	*18.29*	*40.38*	*4.02*	*16.20*
CRE	*50.19*	*7.40*	*54.75*	*50.08*	*7.50*	*56.26*	*50.14*	*7.44*	*55.38*
Home Science	*50.58*	*3.39*	*11.46*	*44.07*	*3.38*	*11.44*	*50.08*	*3.39*	*11.48*
Agriculture	*34.50*	*3.95*	*15.64*	*39.73*	*4.22*	*17.77*	*36.19*	*6.07*	*36.84*

The table above summarises the overall KCSE performance in all schools. The standard deviation of the sample for all the subjects ranged between 2.01 and 7.40 among the girls while it was 1.89 and 7.50 among boys, which can be described as an extreme range. The standard deviation for all the subjects ranged between 1.95 and 7.44. For all the subjects the mean ranged between 18.45 and 50.58 among girls (for which Mathematics scored lowest while Home Science scored highest). Among boys in all the subjects the mean ranged between 24.89 and

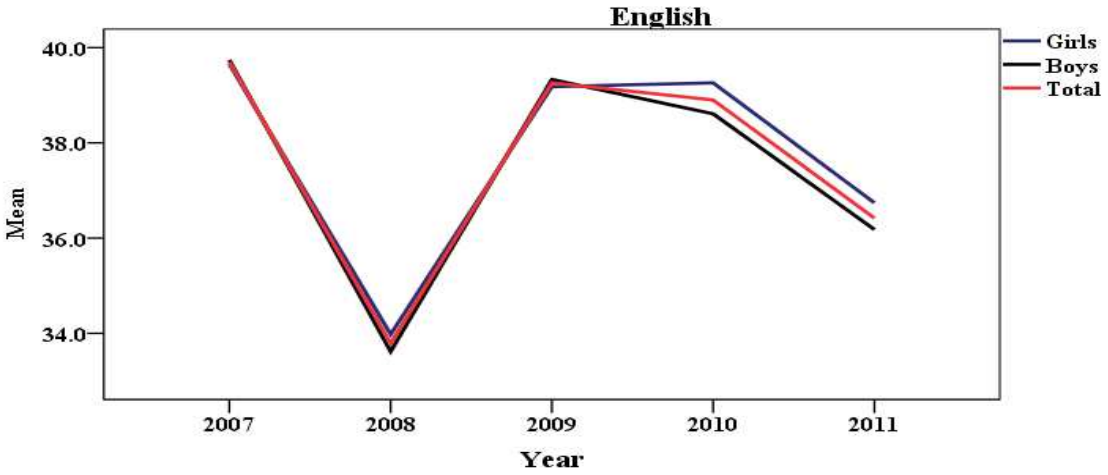
52.34 (for which Mathematics scored lowest while French scored highest). In the overall totals means of all the twelve subjects ranged between 22.00 and 51.09. Mathematics was the lowest and French scored the highest. This is also evident as shown in graphs 1 to 13.

Graph 1: Overall Academic Performance: Means Scores per subject by gender across the five years (2007-2011)

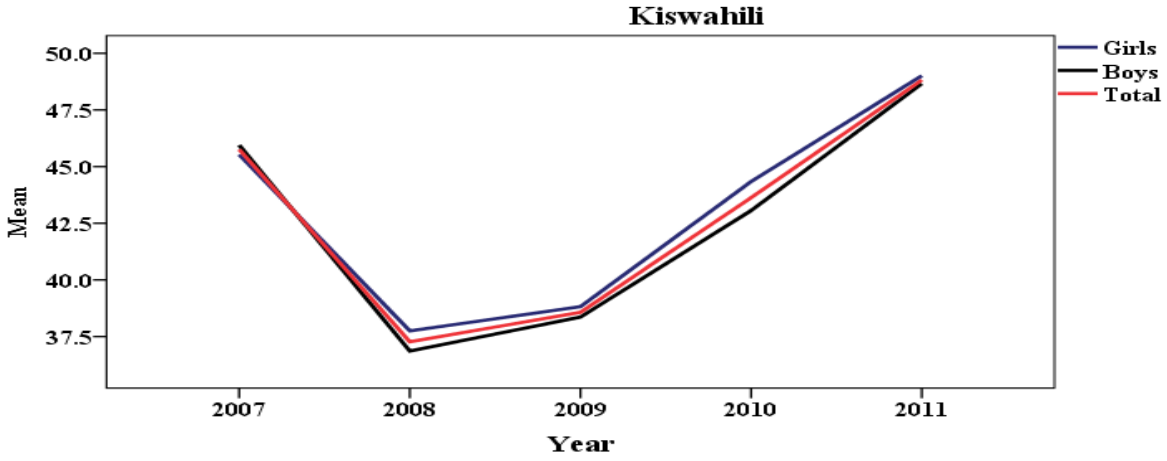


The overall performance across the subjects during the 5 year period shows that both girls and boys performed almost equally in English, Kiswahili, French and CRE. Boys performed well in Chemistry, Biology and History & Government while girls performed better in Home Science. During the 5 year period, among the five subject clusters, boys performed well in Mathematics, Science and Arts subjects. Girls scored slightly better than boys in Technical subjects while both boys and girls were almost at par in Language subjects.

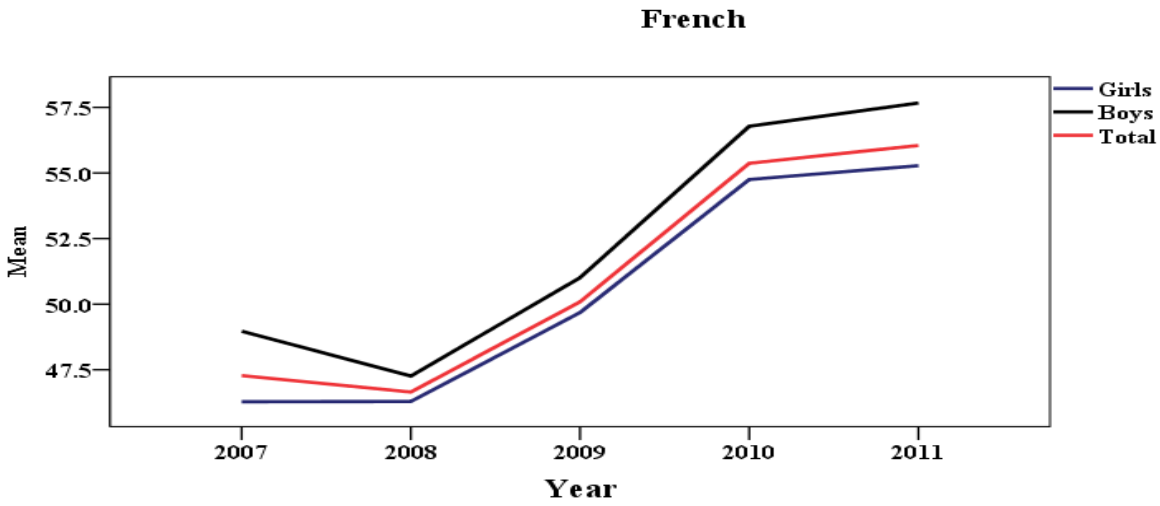
Graph 2: Overall Academic Performance: Means Scores for *English* by gender across the five years (2007-2011)



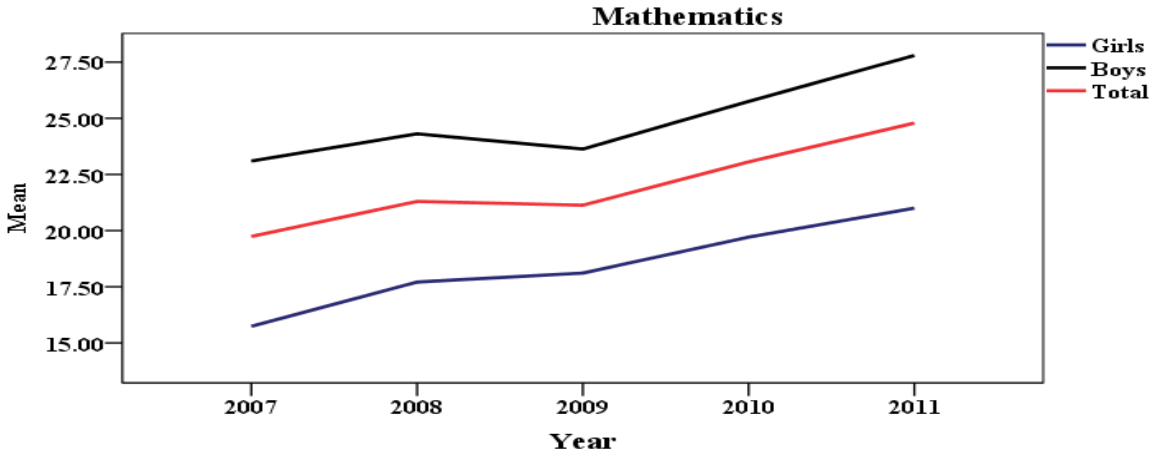
Graph 3: Overall Academic Performance: Means Scores for *Kiswahili* by gender across the five years (2007-2011)



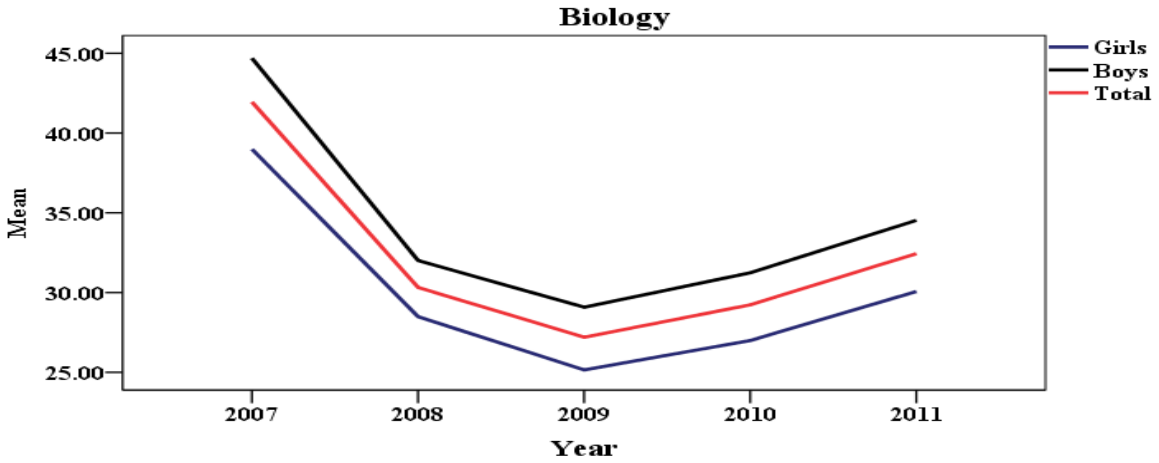
Graph 4: Overall Academic Performance: Means Scores for *French* by gender across the five years (2007-2011)



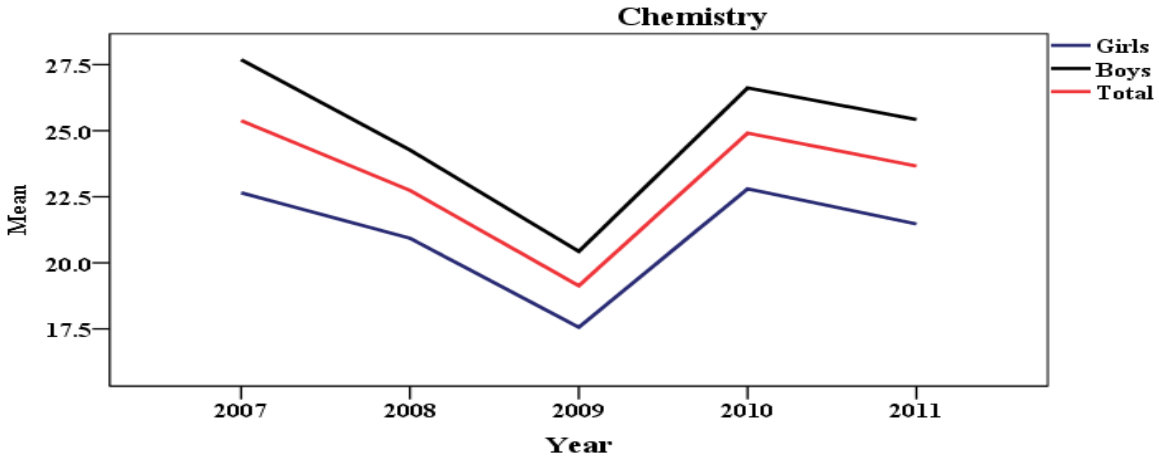
Graph 5: Overall Academic Performance: Means Scores for *Mathematics* by gender across the five years (2007-2011)



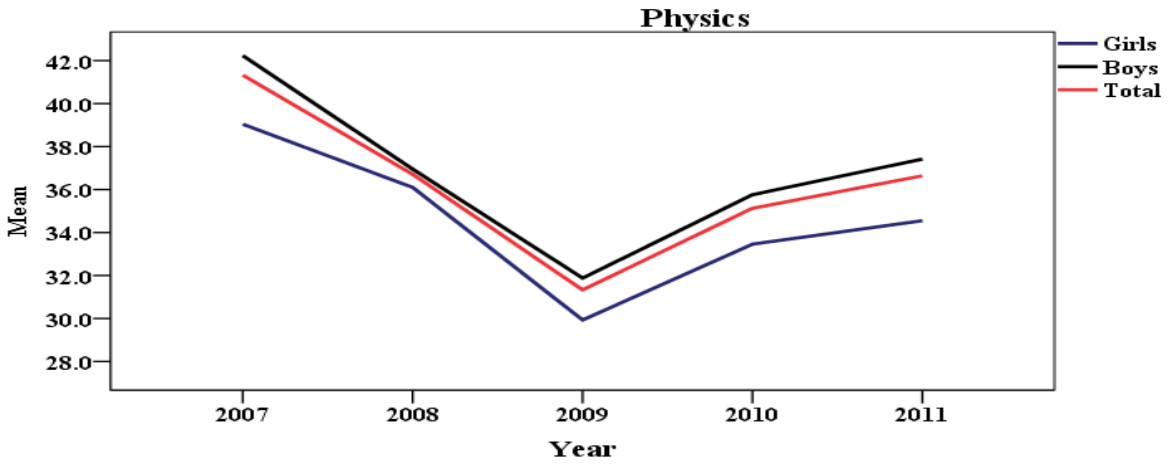
Graph 6: Overall Academic Performance: Means Scores for *Biology* by gender across the five years (2007-2011)



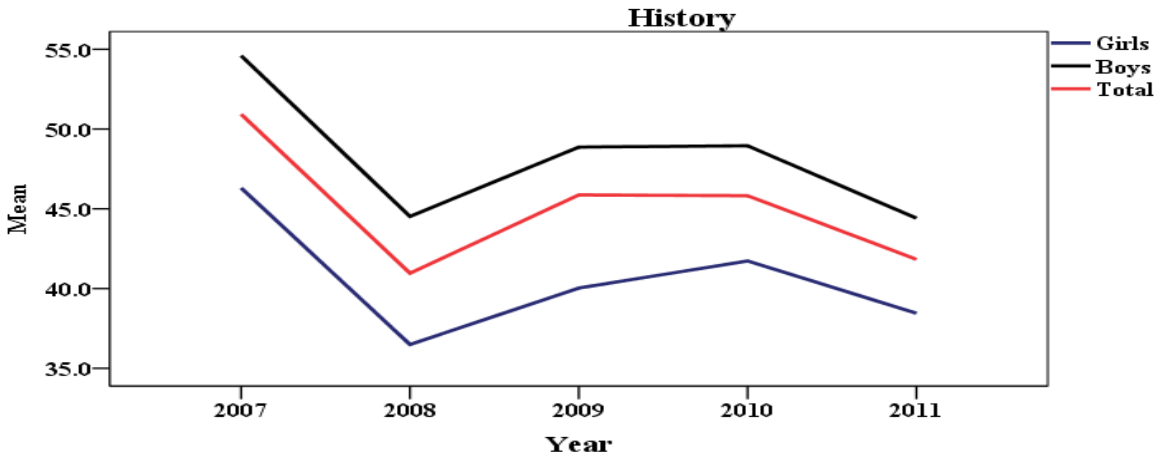
Graph 7: Overall Academic Performance: Means Scores for *Chemistry* by gender across the five years (2007-2011)



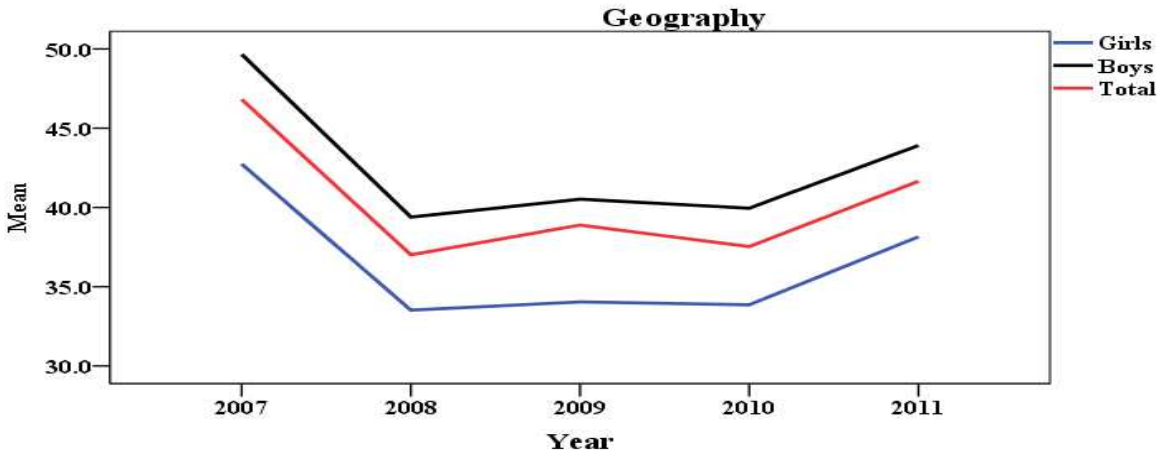
Graph 8: Overall Academic Performance: Means Scores for *Physics* by gender across the five years (2007-2011)



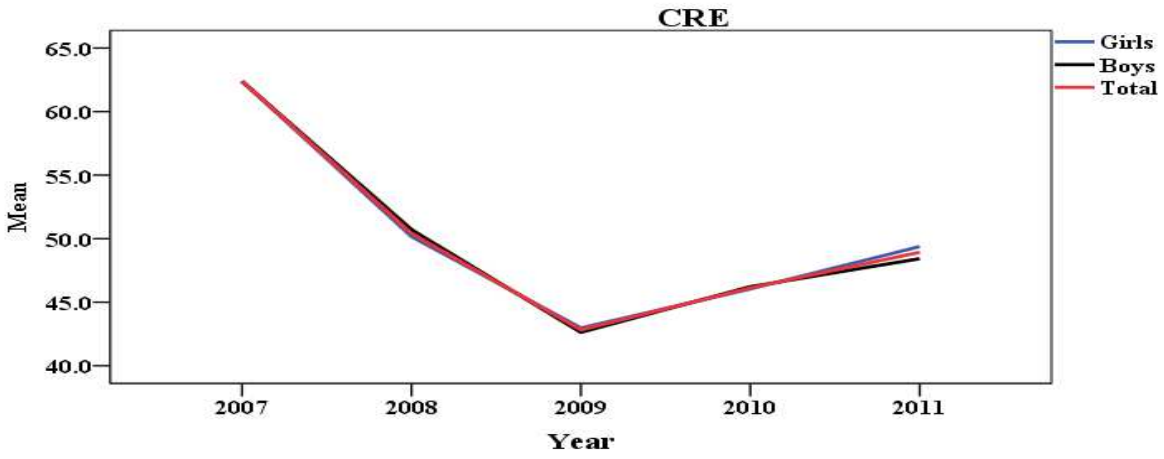
Graph 9: Overall Academic Performance: Means Scores for *History & Government* by gender across the five years (2007-2011)



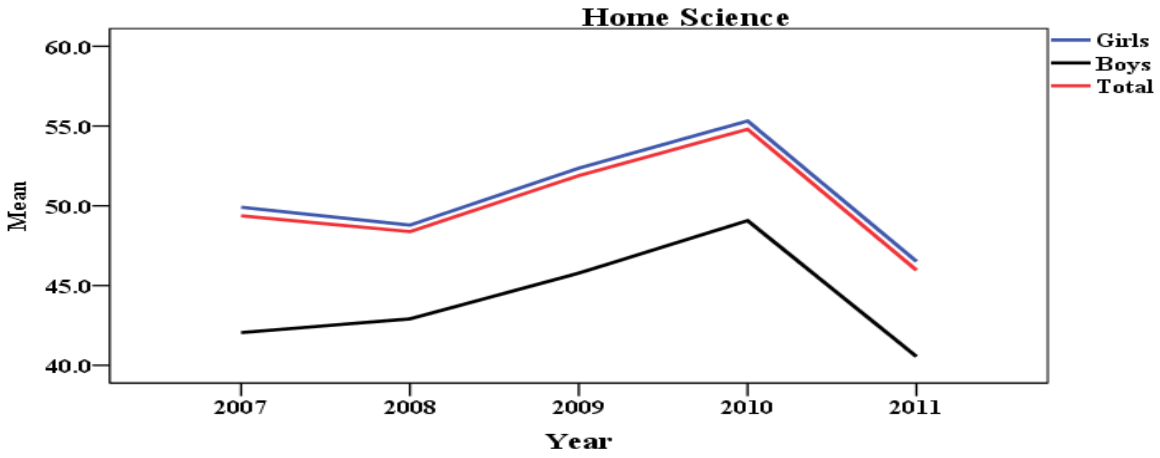
Graph 10: Overall Academic Performance: Means Scores for *Geography* by gender across the five years (2007-2011)



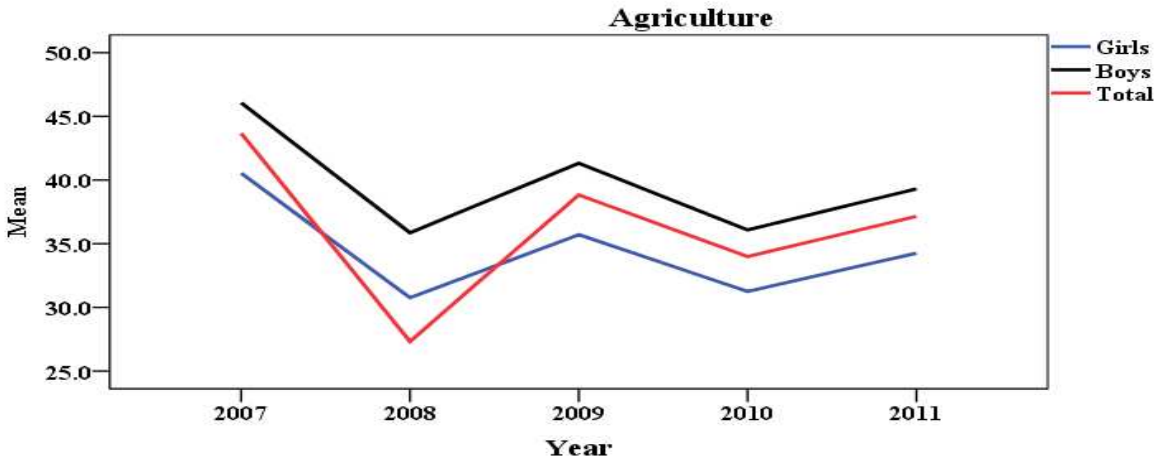
Graph 11: Overall Academic Performance: Means Scores for *CRE* by gender across the five years (2007-2011)



Graph 12: Overall Academic Performance: Means Scores for *Home science* by gender across the five years (2007-2011)



Graph 13: Overall Academic Performance: Means Scores for *Agriculture* by gender across the five years (2007-2011)



4.2.2 Top Twenty High Achieving public schools: (National, Provincial and district)

Below are the tables and graphs that show the findings on the performance of public schools in all three categories.

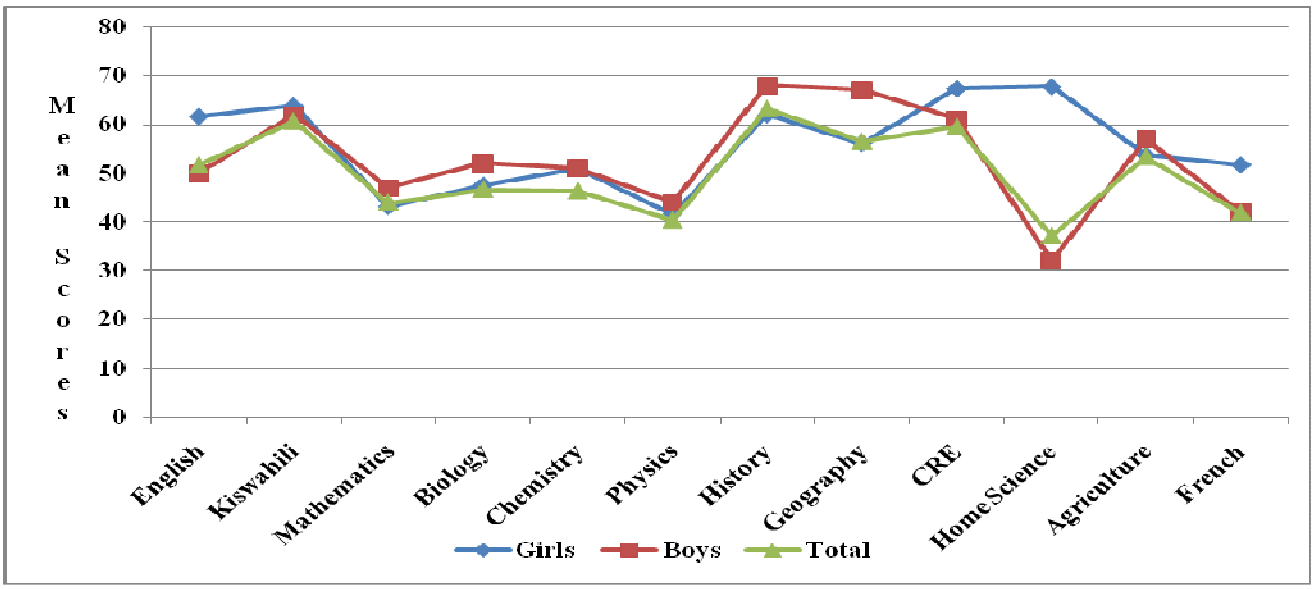
Table 4: Top Twenty High Achieving public schools: Mean, Standard Deviation and Variance per Subject, by gender across the five years (2007-2011)

Subject	Girls			Boys			Total		
	Mean	Std. Dev.	Variance	Mean	Std. Dev.	Variance	Mean	Std. Dev.	Variance
English	*61.66*	*9.12*	*83.17*	*50.09*	*20.12*	*403.89*	*51.66*	*19.04*	*362.67*
Kiswahili	*63.86*	*13.85*	*191.87*	*62.06*	*19.09*	*359.33*	*60.72*	*18.11*	*328.07*
Mathematics	*43.09*	*15.56*	*242.18*	*47.22*	*16.42*	*249.14*	*43.97*	*15.91*	*253.03*
Biology	*47.48*	*11.49*	*132.12*	*52.08*	*14.11*	*204.72*	*46.73*	*14.40*	*207.22*
Chemistry	*50.99*	*13.78*	*189.92*	*51.01*	*14.37*	*191.79*	*46.38*	*14.04*	*197.15*
Physics	*41.59*	*14.46*	*209.17*	*44.04*	*12.12*	*153.25*	*40.41*	*13.55*	*183.51*
History	*62.02*	*9.14*	*83.61*	*68.11*	*10.06*	*92.06*	*63.27*	*10.26*	*105.30*
Geography	*56.16*	*17.21*	*296.03*	*67.01*	*15.55*	*225.09*	*56.55*	*18.75*	*351.70*
CRE	*67.38*	*13.78*	*189.80*	*61.03*	*19.48*	*362.56*	*59.52*	*19.51*	*380.56*
Home Science	*67.77*	*12.21*	*149.17*	*32.05*	*23.33*	*517.93*	*37.18*	*27.19*	*739.47*
Agriculture	*53.69*	*11.28*	*127.19*	*57.21*	*11.31*	*118.13*	*53.36*	*12.12*	*146.96*
French	*51.69*	*19.16*	*367.05*	*42.65*	*31.19*	*990.08*	*41.91*	*31.01*	*961.58*

In the high performing public schools according to the above table, the standard deviation of the sample for all the subjects ranged between 9.12 and 19.16 among the girls while it was 10 and 31 among boys, which can be described as an extreme range. For all the subjects the mean ranged between 41.59 and 67.77 among girls (for which Physics scored lowest while Home Science scored highest). Among boys in all the subjects, the mean ranged between 32 and 68 (for which Home Science scored lowest while History scored highest). The standard deviation for all the

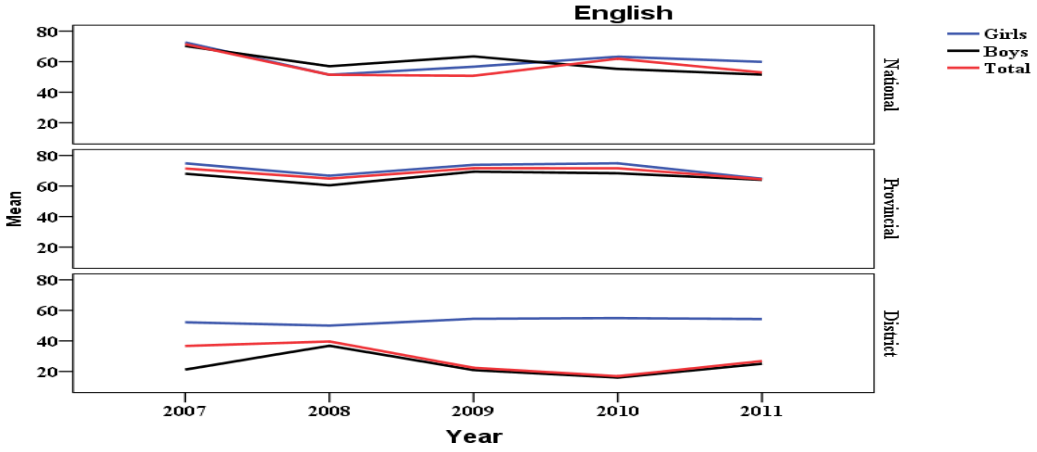
subjects ranged between 10.26 and 31.04. In the overall totals means of all the twelve subjects ranged between 40.41 and 63.27 Physics was the lowest and History scored the highest. This is also evident as shown in graphs 14 to 26.

Graph 14: Top Twenty High Achieving public schools: Means Scores per subject by gender across the five years (2007-2011)

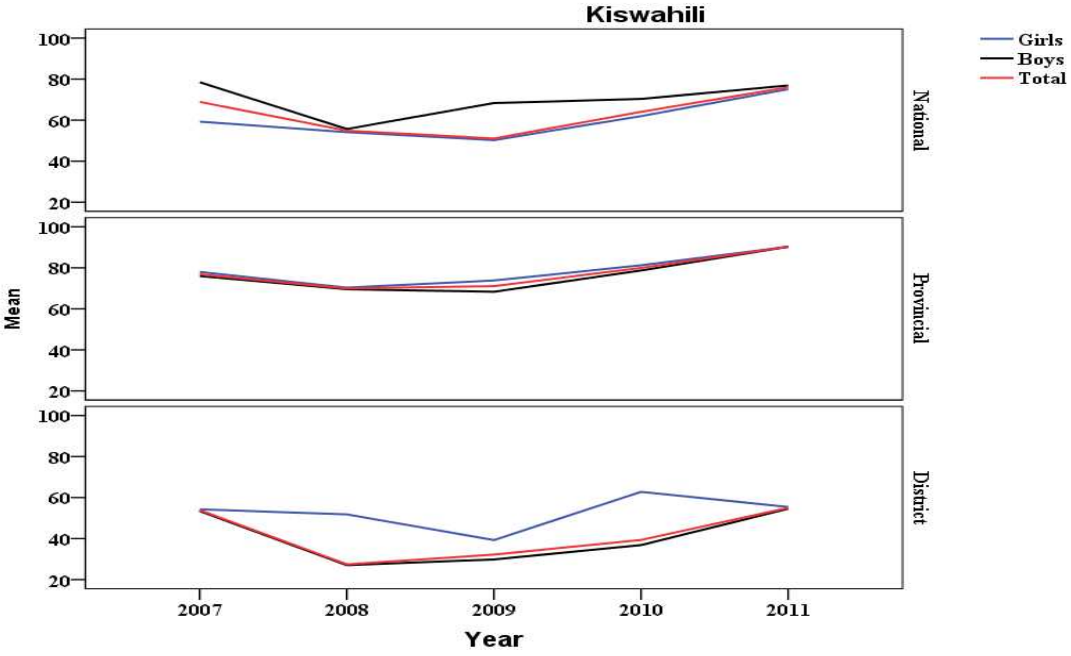


The graph above shows the mean scores across all the public schools (National, Provincial and District). There are variations between boys and girls apart from in Kiswahili and Chemistry where both performed equally. In the case of Home Science, boys performed poorly than girls. This may be attributed to the perception that this is a girls' subject.

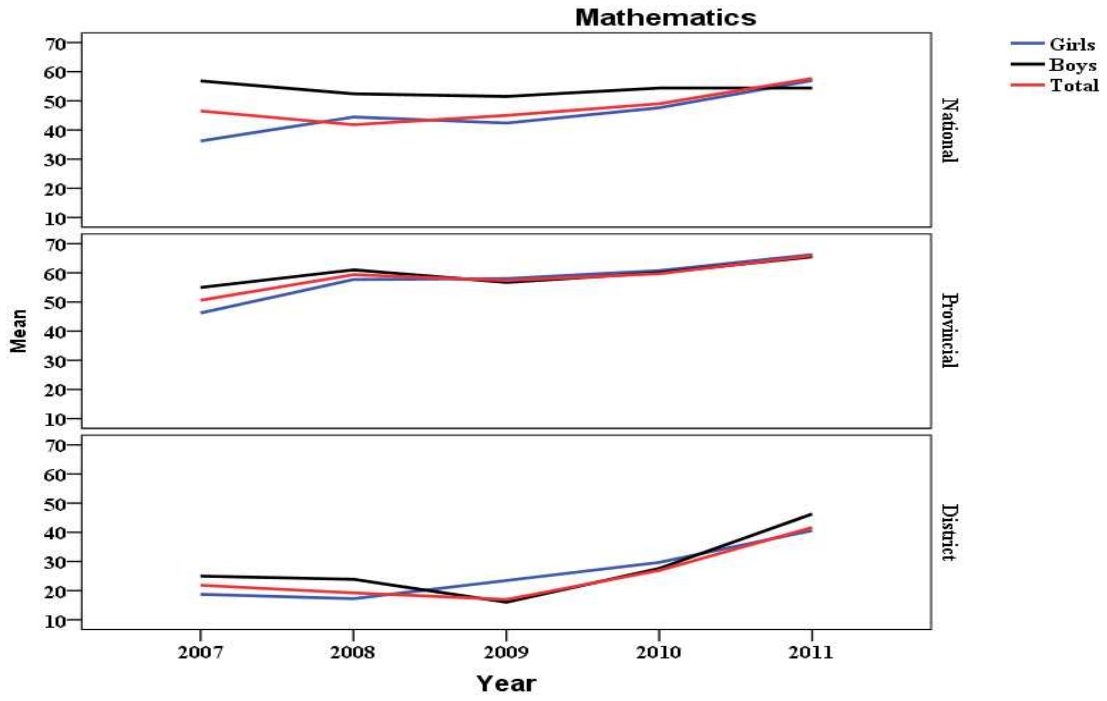
Graph 15: Top Twenty High Achieving public schools: Means Scores for *English* by gender across the five years (2007-2011)



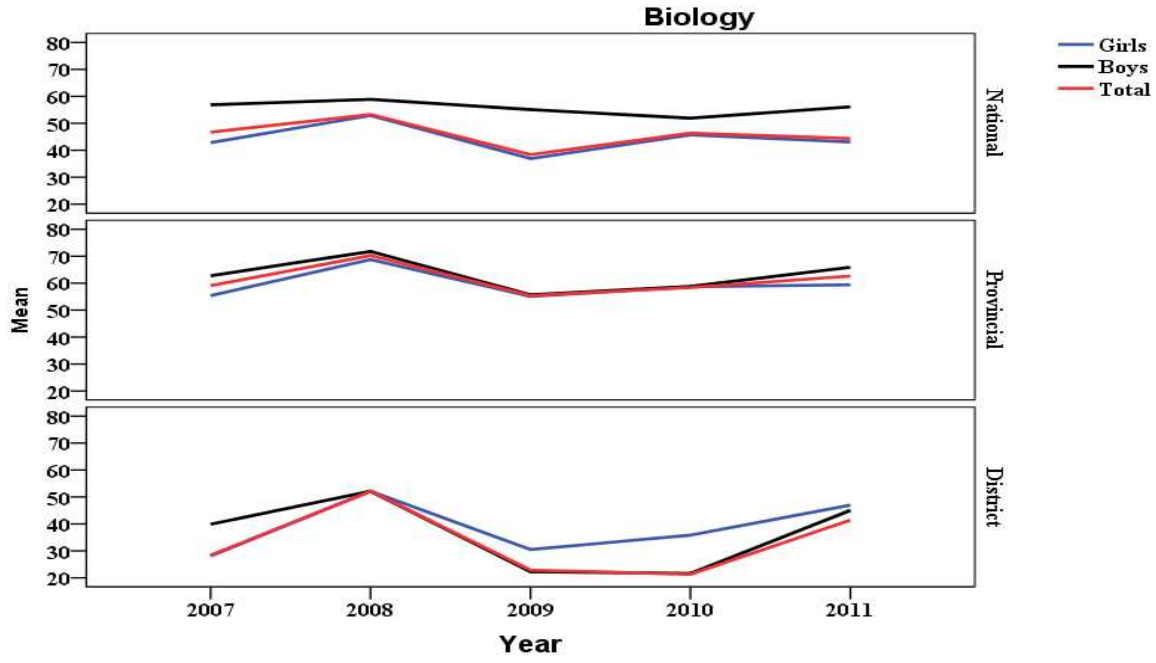
Graph 16: Top Twenty High Achieving public schools: Means Scores for *Kiswahili* by gender across the five years (2007-2011)



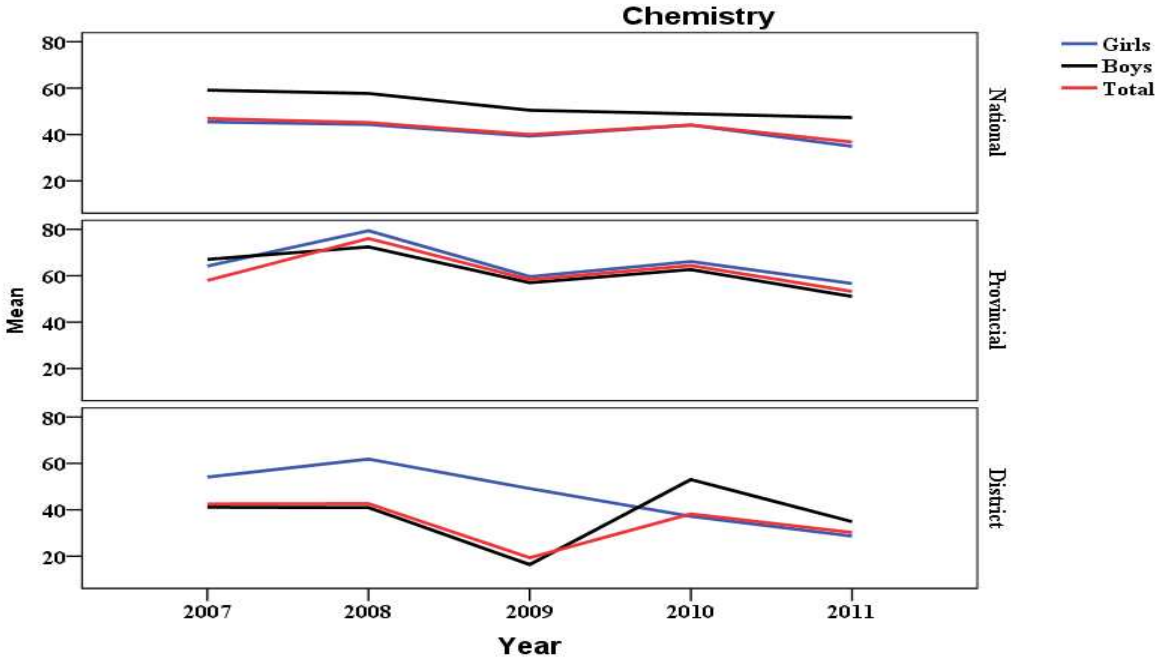
Graph 17: Top Twenty High Achieving public schools: Means Scores for *Mathematics* by gender across the five years (2007-2011)



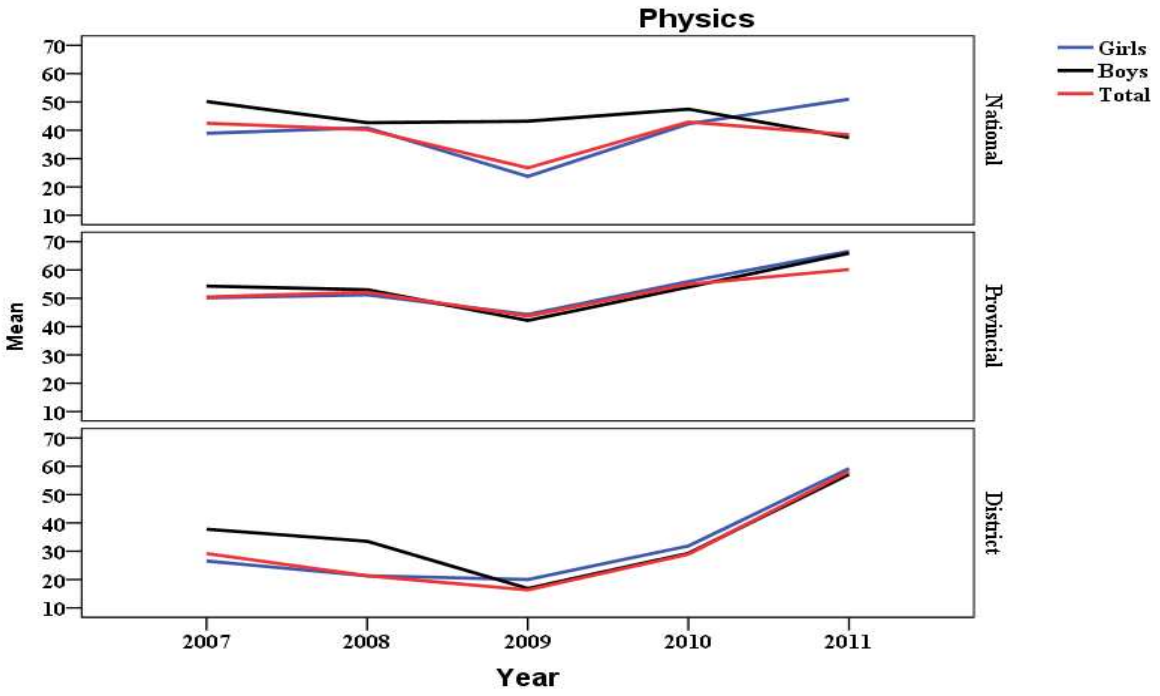
Graph 18: Top Twenty High Achieving public schools: Means Scores for *Biology* by gender across the five years (2007-2011)



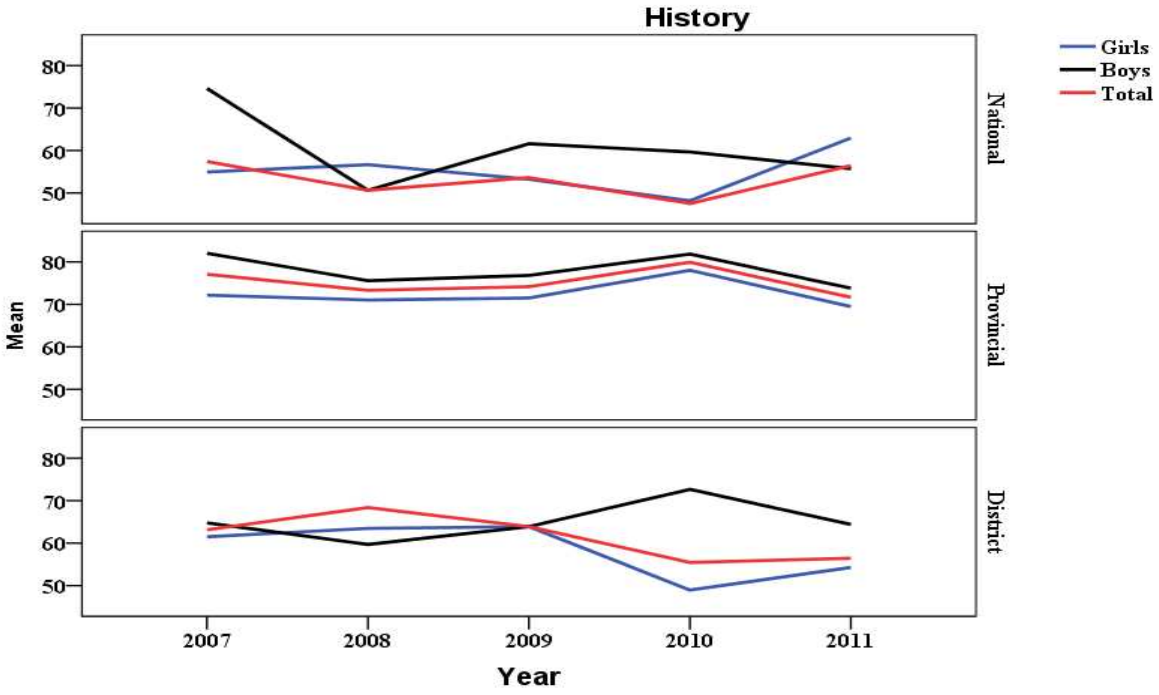
Graph 19: Top Twenty High Achieving public schools: Means Scores for *Chemistry* by gender across the five years (2007-2011)



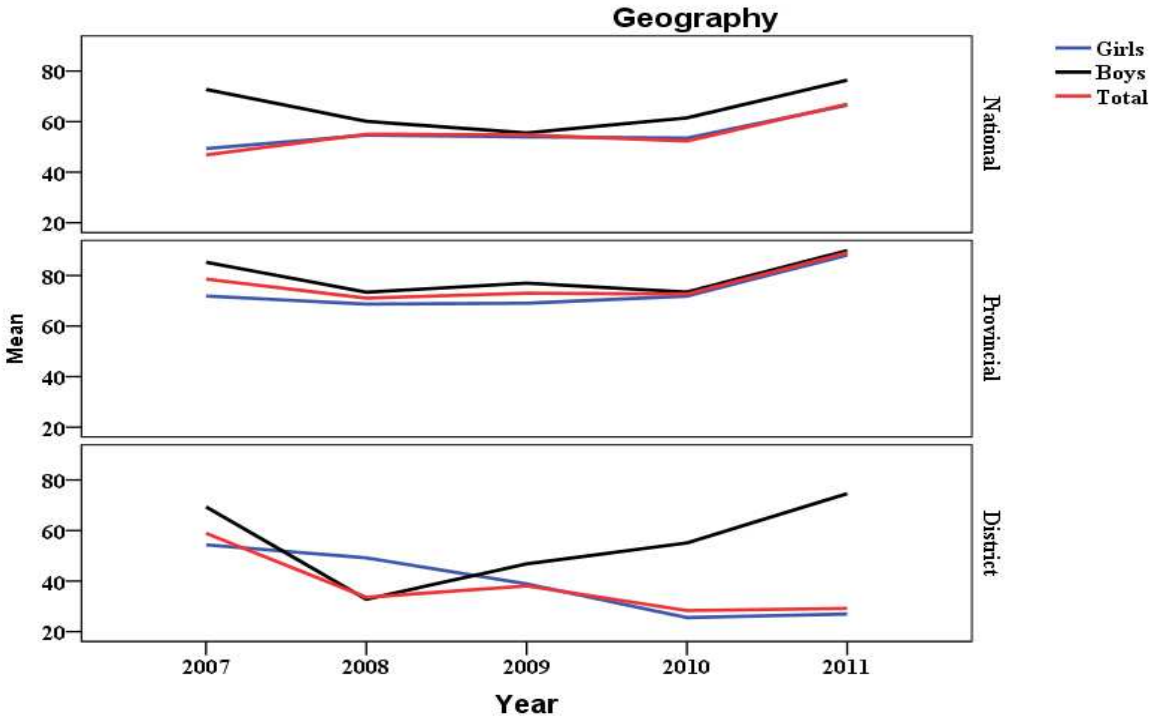
Graph 20: Top Twenty High Achieving public schools: Means Scores for *Physics* by gender across the five years (2007-2011)



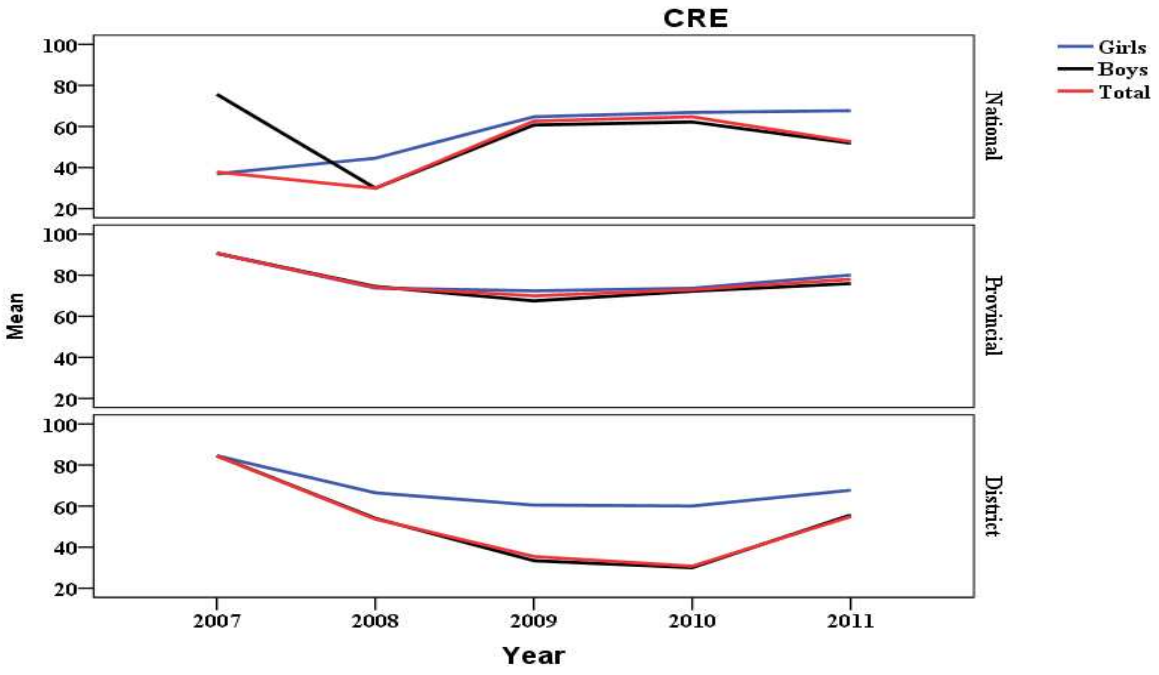
Graph 21: Top Twenty High Achieving public schools: Means Scores for *History & Government* by gender across the five years (2007-2011)



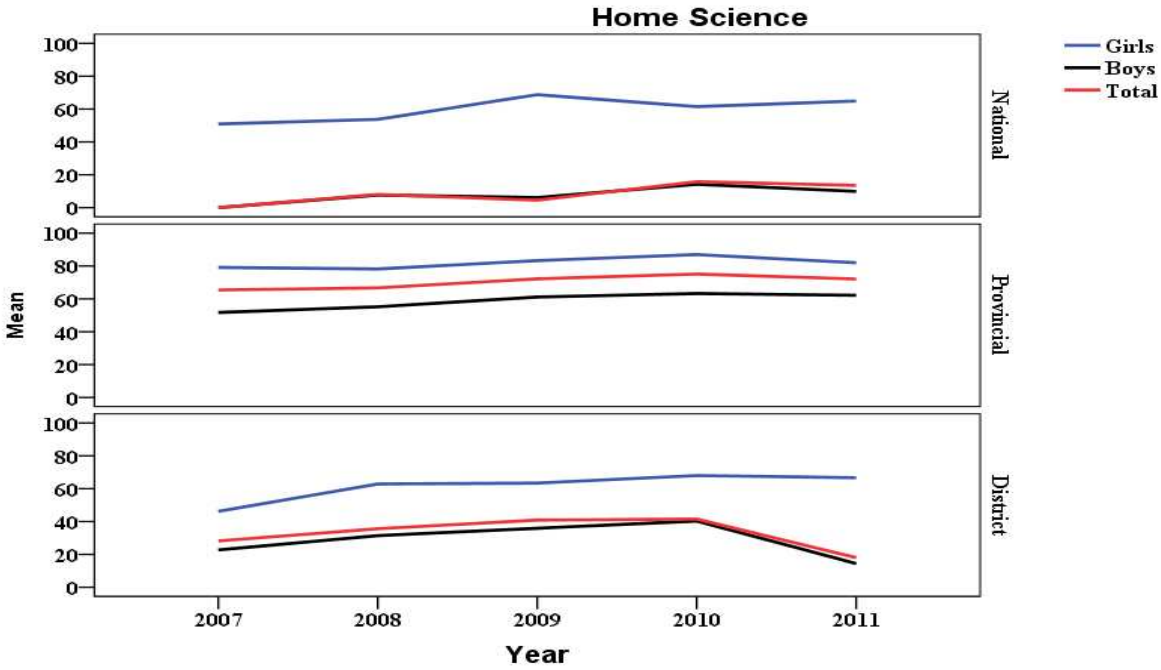
Graph 22: Top Twenty High Achieving public schools: Means Scores for *Geography* by gender across the five years (2007-2011)



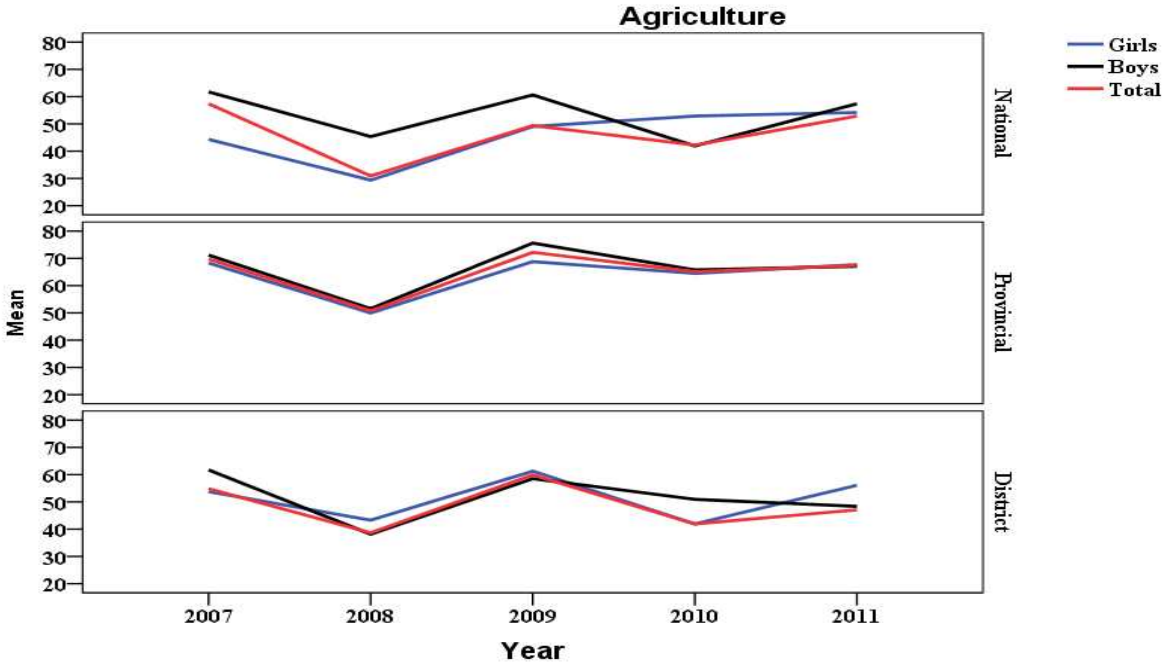
Graph 23: Top Twenty High Achieving public schools: Means Scores for *CRE* by gender across the five years (2007-2011)



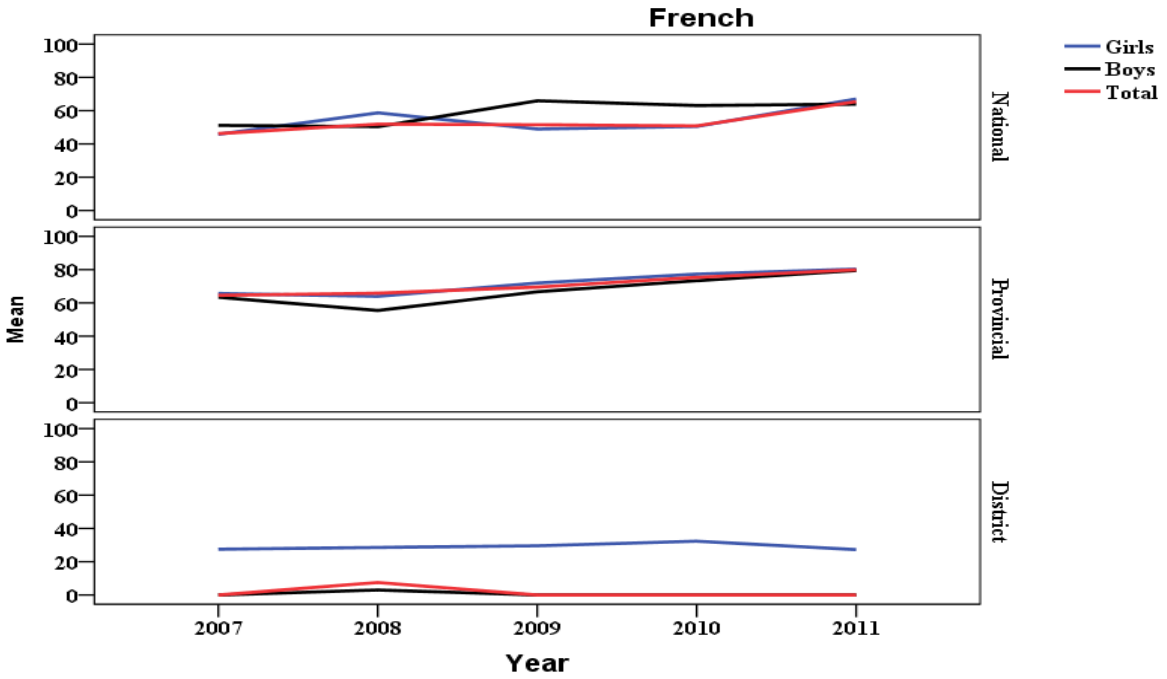
Graph 24: Top Twenty High Achieving public schools: Means Scores for *Home Science* by gender across the five years (2007-2011)



Graph 25: Top Twenty High Achieving public schools: Means Scores for *Agriculture* by gender across the five years (2007-2011)



Graph 26: Top Twenty High Achieving public schools: Means Scores for *French* by gender across the five years (2007-2011)



4.2.3 Top Twenty High Achieving Private schools

The findings below show the performance of private schools in graphs and tables.

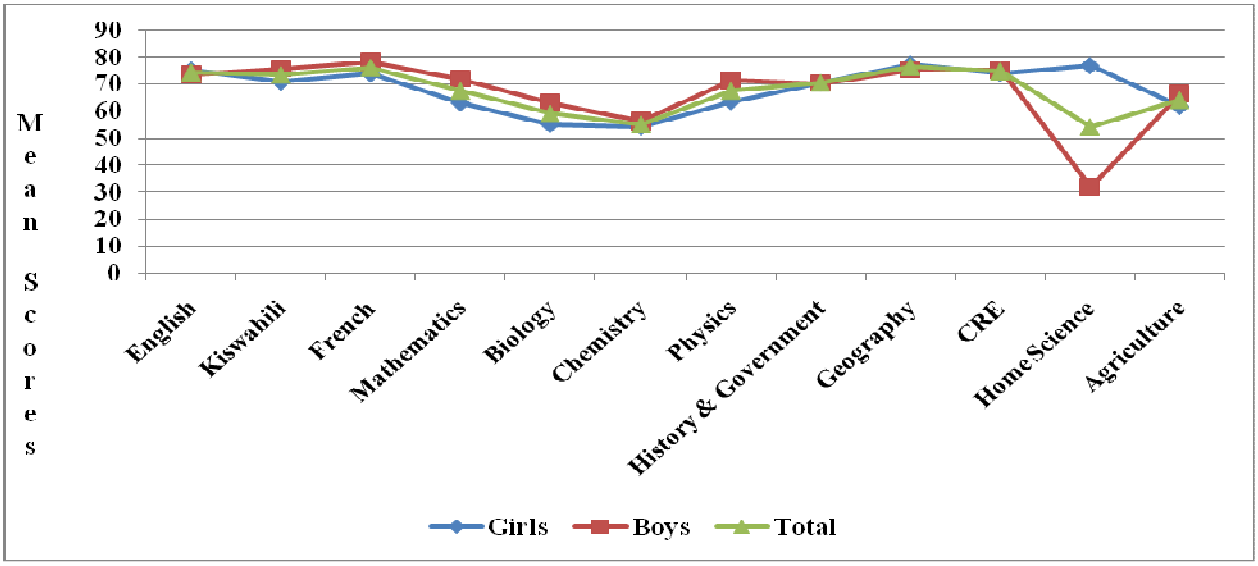
Table 5: Top Twenty High Achieving Private schools: Mean, Standard Deviation and Variance per Subject by gender across the five years (2007-2011)

Year & Subjects		Girls			Boys			Total		
		Mean	Std. Dev.	Variance	Mean	Std. Dev.	Variance	Mean	Std. Dev.	Variance
Subject	English	*75.00*	*6.63*	*43.97*	*73.71*	*4.83*	*23.36*	*74.36*	*4.94*	*24.44*
	Kiswahili	*70.79*	*3.11*	*9.70*	*75.94*	*8.84*	*78.11*	*73.37*	*5.32*	*28.35*
	French	*73.75*	*4.20*	*17.64*	*78.43*	*7.30*	*53.24*	*76.09*	*4.88*	*23.80*
	Mathematics	*62.98*	*6.70*	*44.92*	*72.16*	*3.90*	*15.21*	*67.57*	*4.68*	*21.86*
	Biology	*55.08*	*4.93*	*24.26*	*63.25*	*6.75*	*45.63*	*59.17*	*4.22*	*17.83*
	Chemistry	*54.12*	*6.91*	*47.73*	*56.42*	*5.67*	*32.19*	*55.27*	*6.12*	*37.45*
	Physics	*63.49*	*8.68*	*75.31*	*71.65*	*4.09*	*16.70*	*67.57*	*6.16*	*37.96*
	History & Government	*70.38*	*4.64*	*21.49*	*70.54*	*12.13*	*147.21*	*70.46*	*7.31*	*53.42*
	Geography	*77.30*	*7.54*	*56.79*	*75.58*	*11.04*	*121.80*	*76.44*	*5.83*	*34.01*
	CRE	*73.99*	*8.09*	*65.44*	*75.49*	*7.30*	*53.26*	*74.74*	*7.52*	*56.52*
	Home Science	*76.79*	*4.67*	*21.77*	*31.97*	*29.75*	*885.09*	*54.38*	*13.74*	*188.79*
	Agriculture	*61.68*	*8.53*	*72.84*	*66.65*	*7.30*	*53.25*	*64.17*	*7.81*	*61.01*

In the high performing private schools, the standard deviation for all the subjects ranged between 2.01 and 7.40 among the girls while it was 1.89 and 7.50 among boys, which can be described as an extreme range. The standard deviation for all the subjects ranged between 1.95 and 7.44. For all the subjects the mean ranged between 18.45 and 50.58 among girls (for which Mathematics scored lowest while Home Science scored highest). Among boys in all the subjects the mean ranged between 24.89 and 52.34 (for which Mathematics scored lowest while French scored highest). In the overall totals means of all the twelve subjects ranged between 22.00 and 51.09. Mathematics was the lowest and French scored the highest.

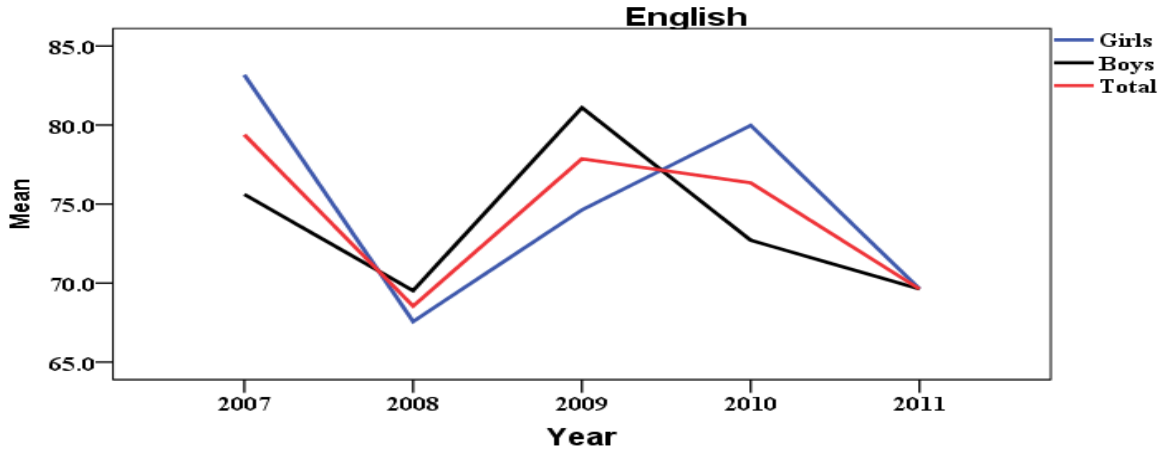
This is also evident as shown in graphs 27 to 39 as illustrated below.

Graph 27: Top Twenty High Achieving Private Schools: Mean, Standard Deviation and Variance per Subject by Gender across the five years (2007- 2011)

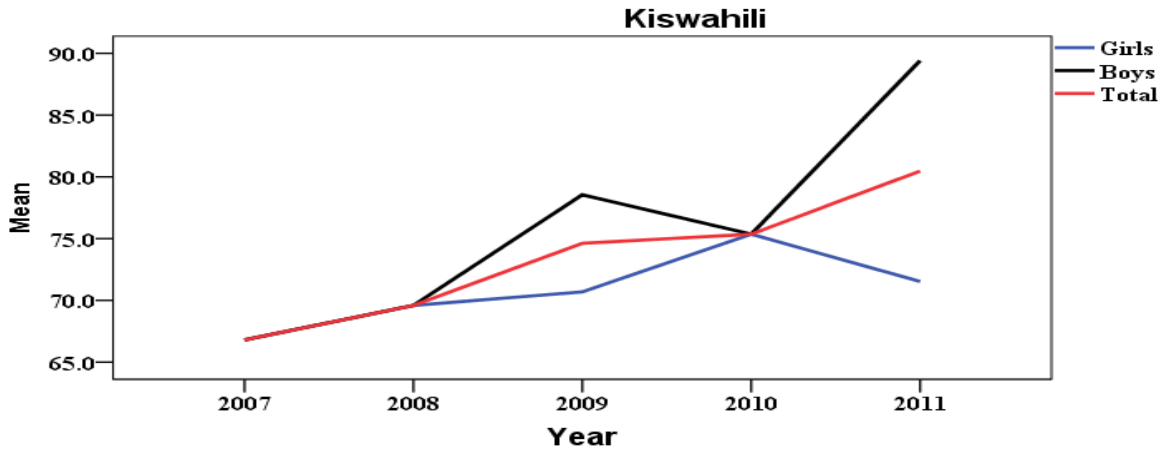


In the private schools, boys and girls performed almost equally in English, Chemistry, History & Government and Geography. In Home Science, girls performed quite well with a mean score of 7.

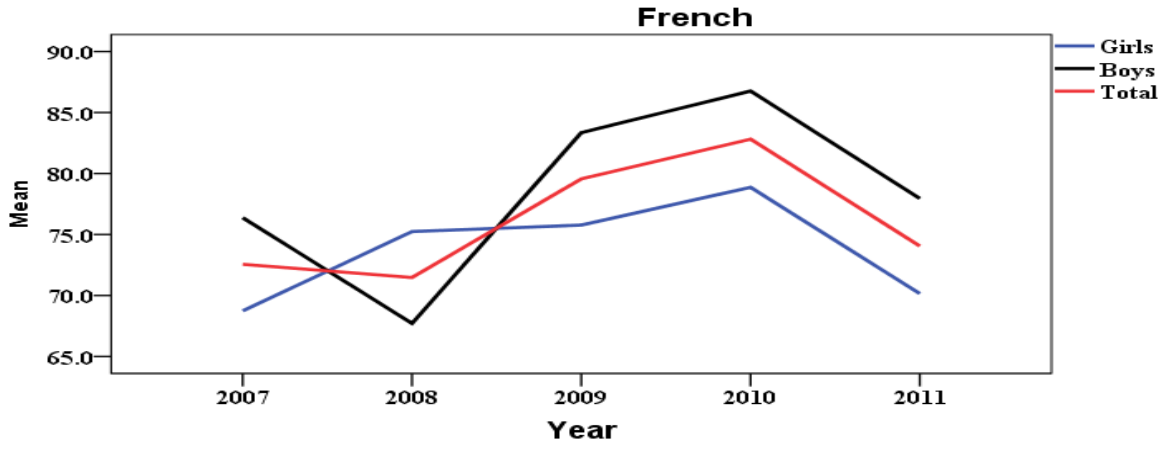
Graph 28: Top Twenty High Achieving Private Schools: Means Scores for *English* by gender across the five years (2007-2011)



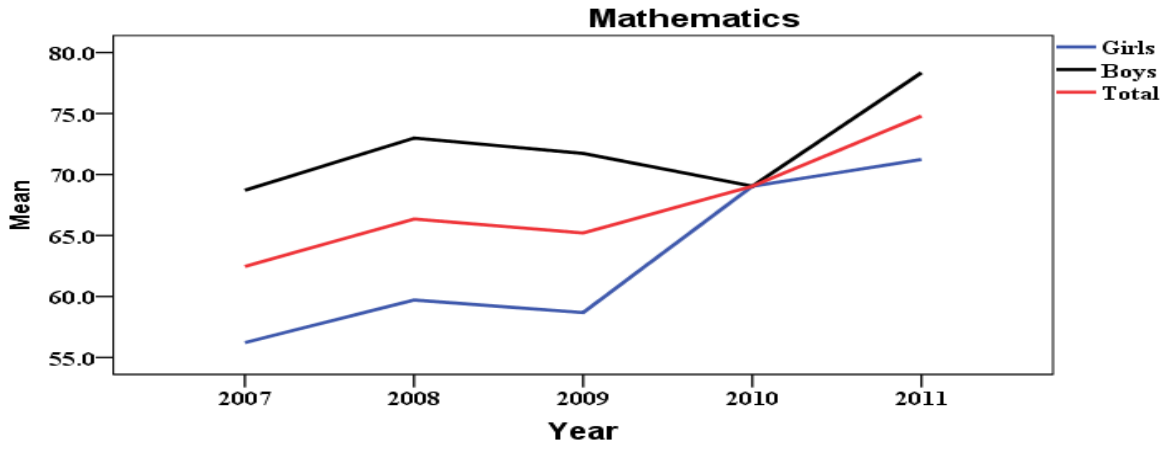
Graph 29: Top Twenty High Achieving Private Schools: Means Scores for *Kiswahili* by gender across the five years (2007-2011)



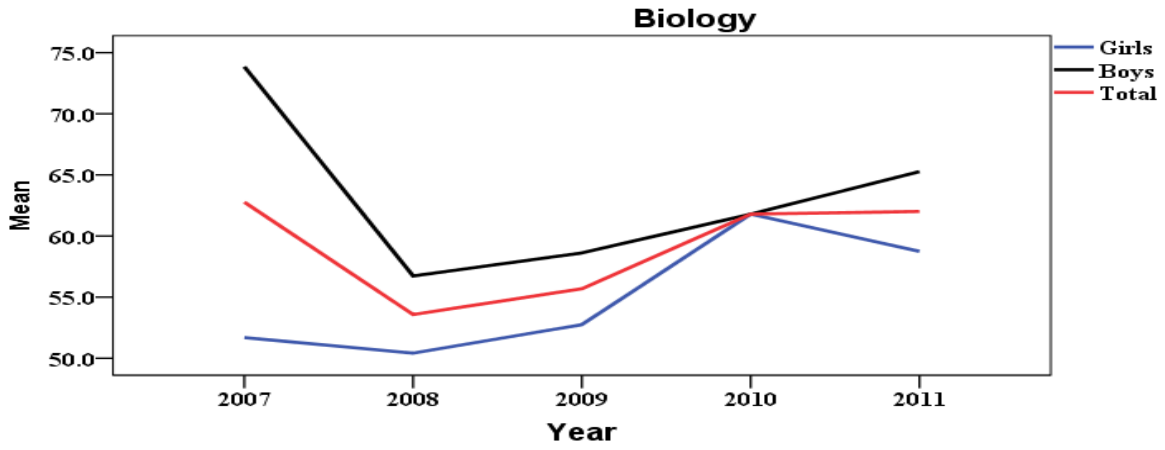
Graph 30: Top Twenty High Achieving Private Schools: Means Scores for *French* by gender across the five years (2007-2011)



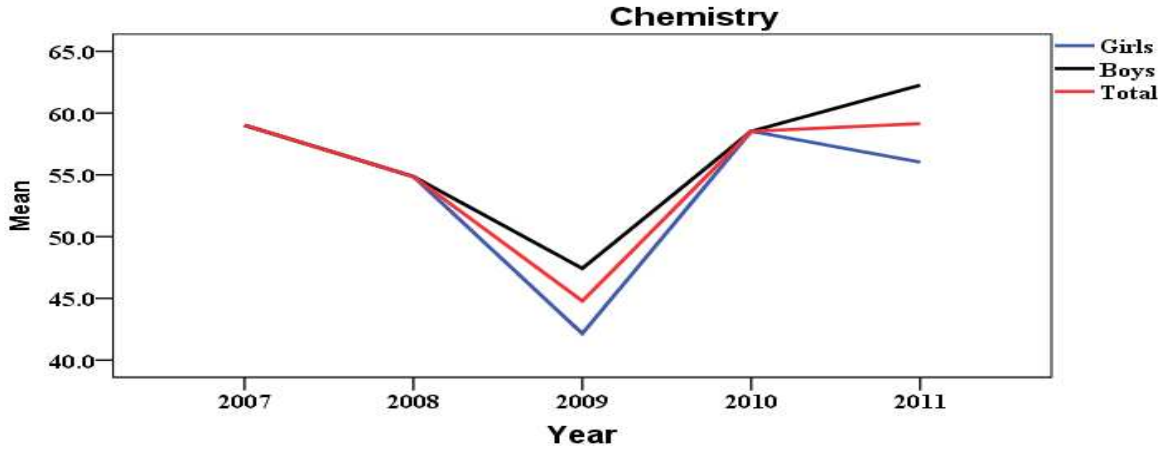
Graph 31: Top Twenty High Achieving Private Schools: Means Scores for *Mathematics* by gender across the five years (2007-2011)



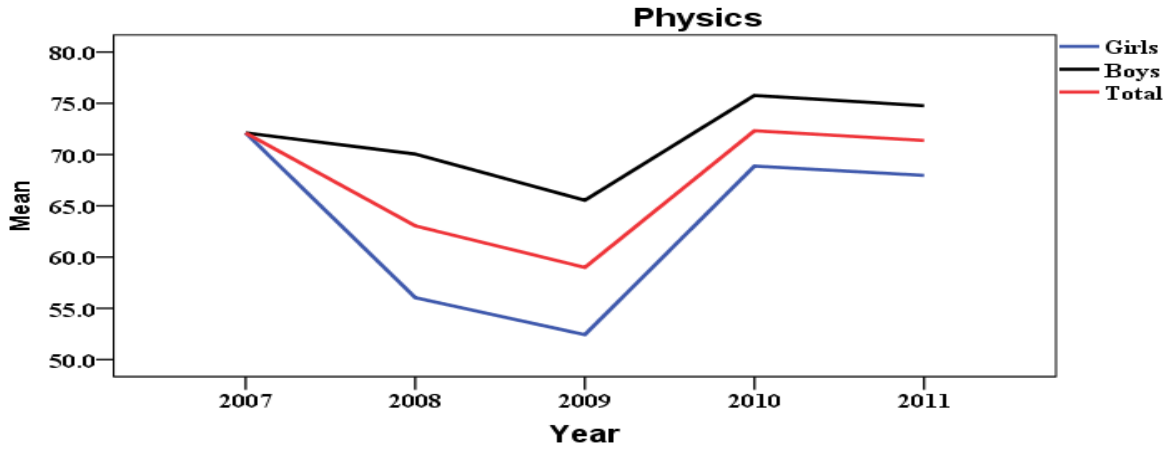
Graph 32: Top Twenty High Achieving Private Schools: Means Scores for *Biology* by gender across the five years (2007-2011)



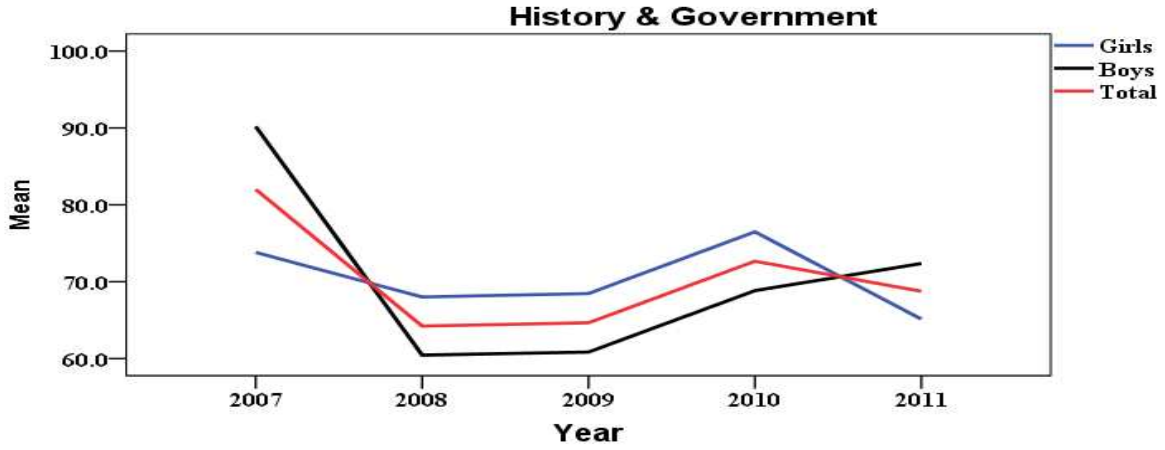
Graph 33: Top Twenty High Achieving Private Schools: Means Scores for *Chemistry* by gender across the five years (2007-2011)



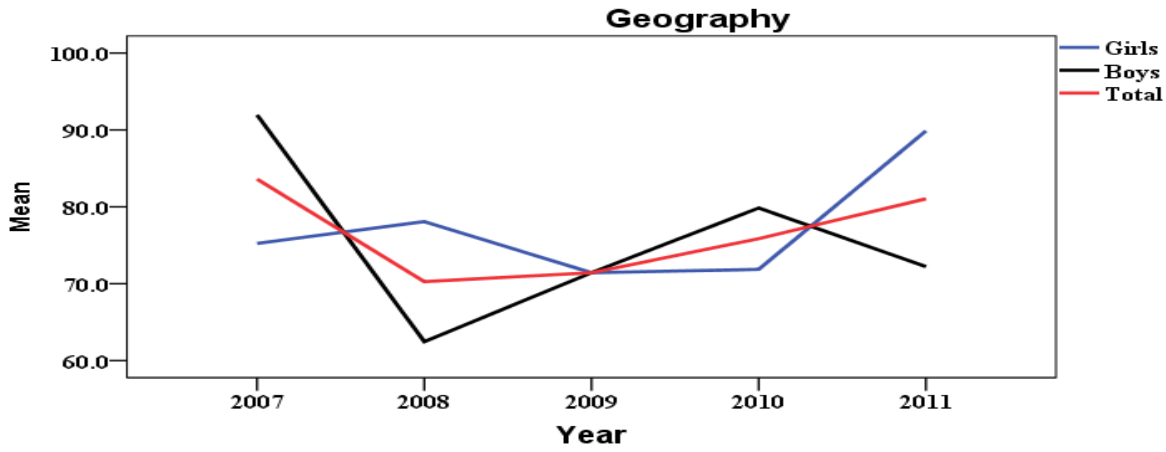
Graph 34: Top Twenty High Achieving Private Schools: Means Scores for *Physics* by gender across the five years (2007-2011)



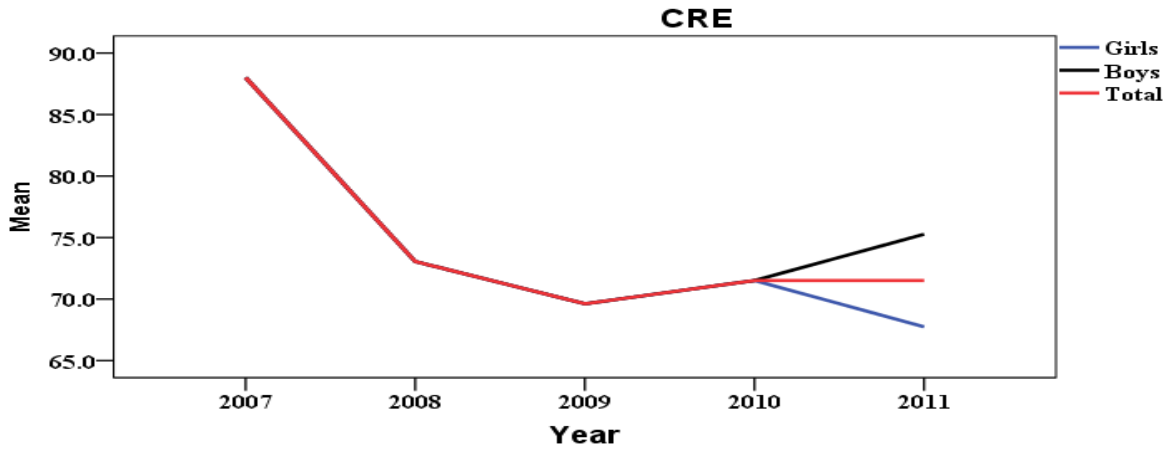
Graph 35: Top Twenty High Achieving Private Schools: Means Scores for *History & Government* by gender across the five years (2007-2011)



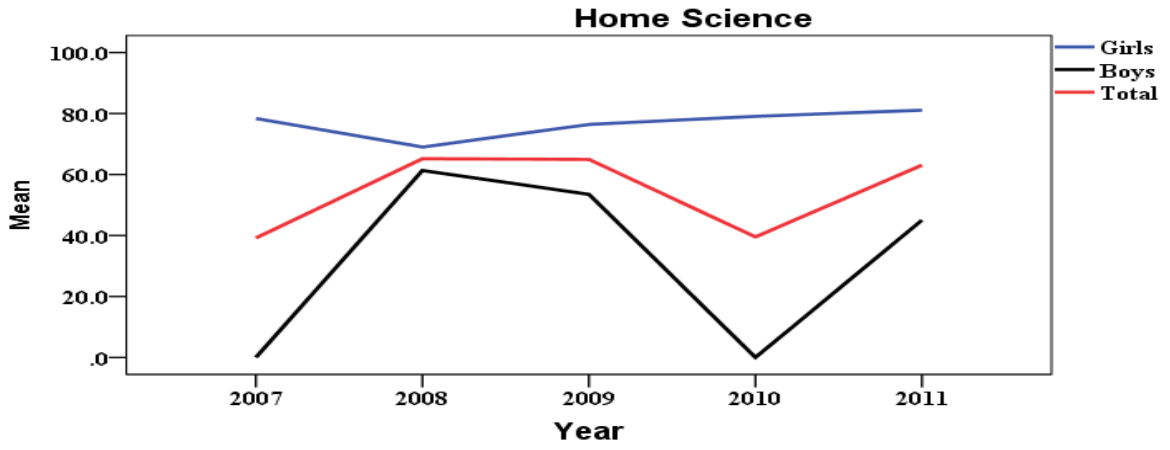
Graph 36: Top Twenty High Achieving Private Schools: Means Scores for *Geography* by gender across the five years (2007-2011)



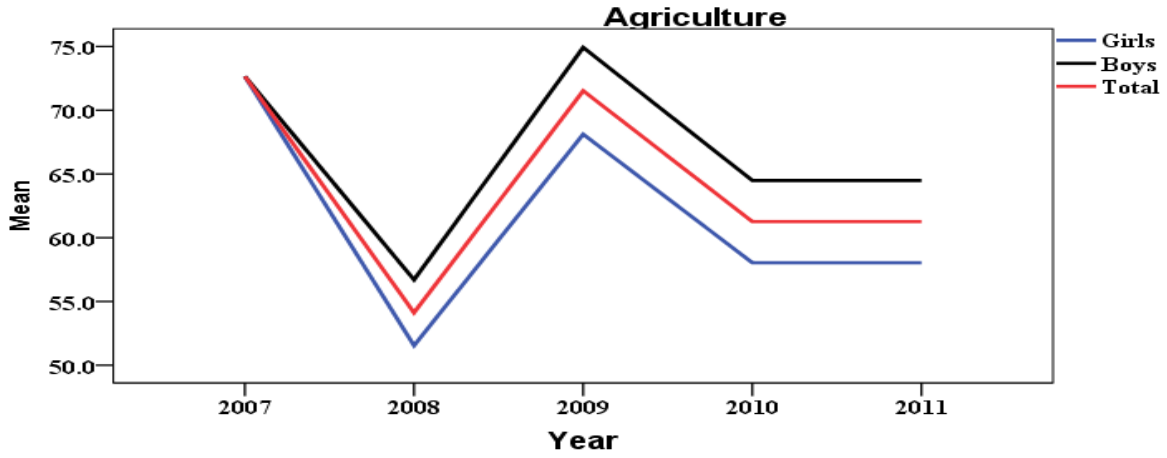
Graph 37: Top Twenty High Achieving Private Schools: Means Scores for *CRE*t by gender across the five years (2007-2011)



Graph 38: Top Twenty High Achieving Private Schools: Means Scores for *Home Science* by gender across the five years (2007-2011)



Graph 39: Top Twenty High Achieving Private Schools: Means Scores for *Agriculture* by gender across the five years (2007-2011)



4.2.4 Most frequent top twenty public schools per subject by gender across the five years (2007-2011)

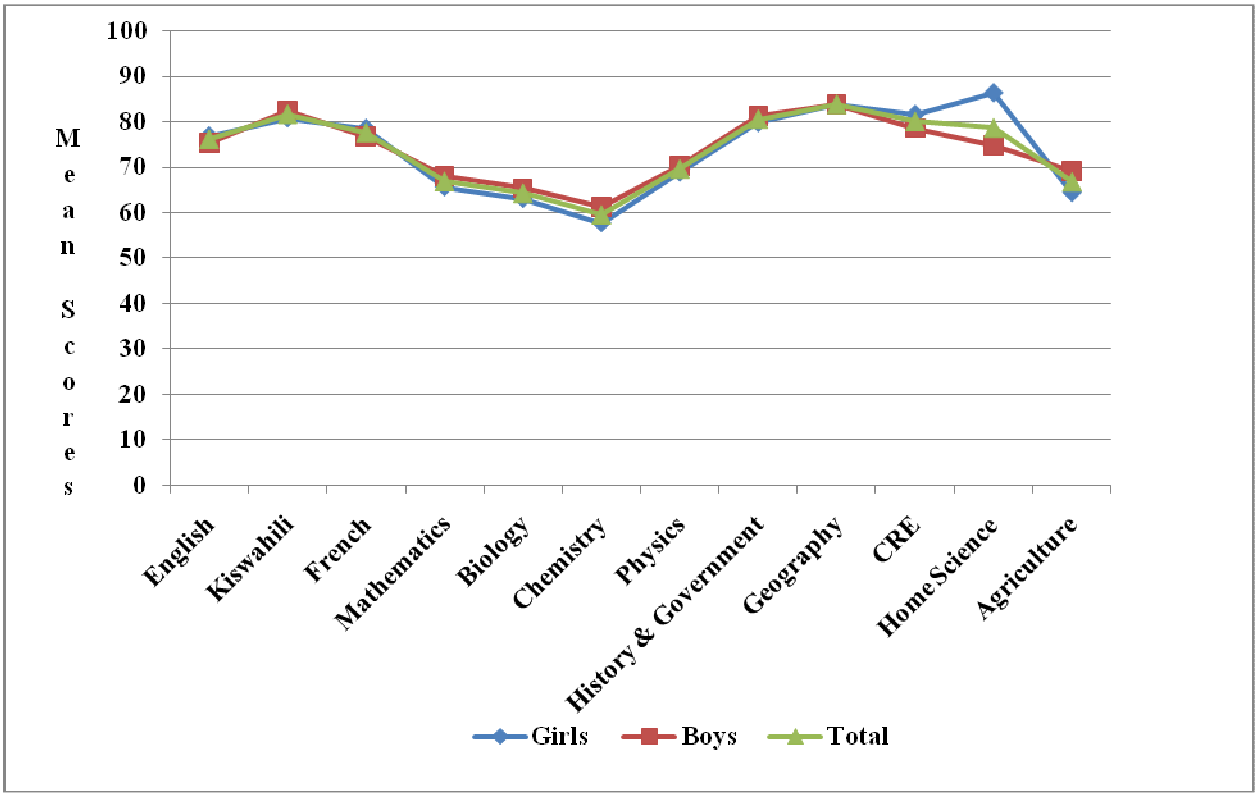
Table 6: Most frequent top twenty public schools: Mean, Standard Deviation and Variance per Subjects by gender across the five years (2007-2011)

Subject	Girls			Boys			Total		
	Mean	Std. Dev.	Variance	Mean	Std. Dev.	Variance	Mean	Std. Dev.	Variance
English	*76.78*	*5.17*	*26.76*	*75.37*	*5.78*	*33.44*	*76.17*	*4.61*	*21.25*
Kiswahili	*80.83*	*5.74*	*32.97*	*82.50*	*4.81*	*23.18*	*81.67*	*4.96*	*24.59*
French	*78.45*	*7.65*	*58.53*	*76.83*	*5.38*	*28.98*	*77.64*	*5.77*	*33.28*
Mathematics	*65.61*	*5.75*	*33.06*	*68.11*	*2.37*	*5.62*	*66.86*	*3.40*	*11.55*
Biology	*63.04*	*3.08*	*9.46*	*65.44*	*1.89*	*3.56*	*64.24*	*1.95*	*3.79*
Chemistry	*57.64*	*5.91*	*34.88*	*61.29*	*6.80*	*46.31*	*59.46*	*5.70*	*32.46*
Physics	*68.85*	*4.38*	*19.16*	*70.29*	*3.92*	*15.34*	*69.57*	*3.83*	*14.65*
History & Government	*79.79*	*4.04*	*16.30*	*81.22*	*6.03*	*36.31*	*80.56*	*4.86*	*23.63*
Geography	*83.88*	*9.60*	*92.26*	*83.83*	*6.55*	*42.90*	*83.85*	*6.41*	*41.05*
CRE	*81.54*	*8.76*	*76.68*	*78.56*	*11.27*	*126.96*	*80.06*	*9.88*	*97.65*
Home Science	*86.34*	*2.44*	*5.97*	*74.72*	*8.48*	*71.95*	*78.63*	*4.76*	*22.63*
Agriculture	*64.33*	*9.81*	*96.23*	*69.14*	*7.84*	*61.53*	*66.73*	*8.58*	*73.59*

In the most frequent public schools, the standard deviation for all the subjects ranged between 2.01 and 7.40 among the girls while it was 1.89 and 7.50 among boys, which can be described as

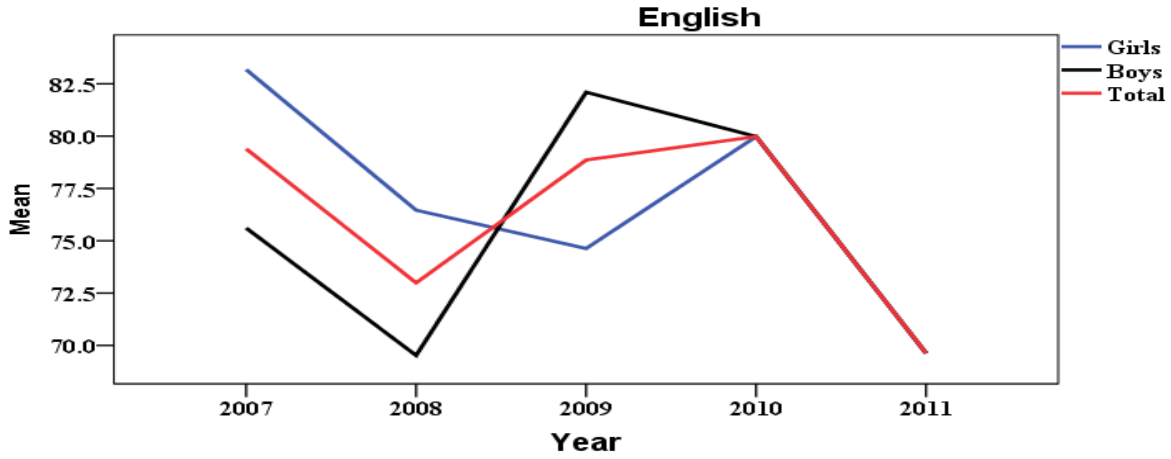
an extreme range. The standard deviation for all the subjects ranged between 1.95 and 7.44. For all the subjects the mean ranged between 18.45 and 50.58 among girls (for which Mathematics scored lowest while Home Science scored highest). Among boys in all the subjects the mean ranged between 24.89 and 52.34 (for which Mathematics scored lowest while French scored highest). In the overall total means of all the twelve subjects ranged between 22.00 and 51.09. Mathematics was the lowest and French scored the highest. This is also evident as shown in graphs 40 to 52.

Graph 40: Most frequent top twenty Public schools: Mean Scores for public schools per subject by gender across the five years (2007-2011)

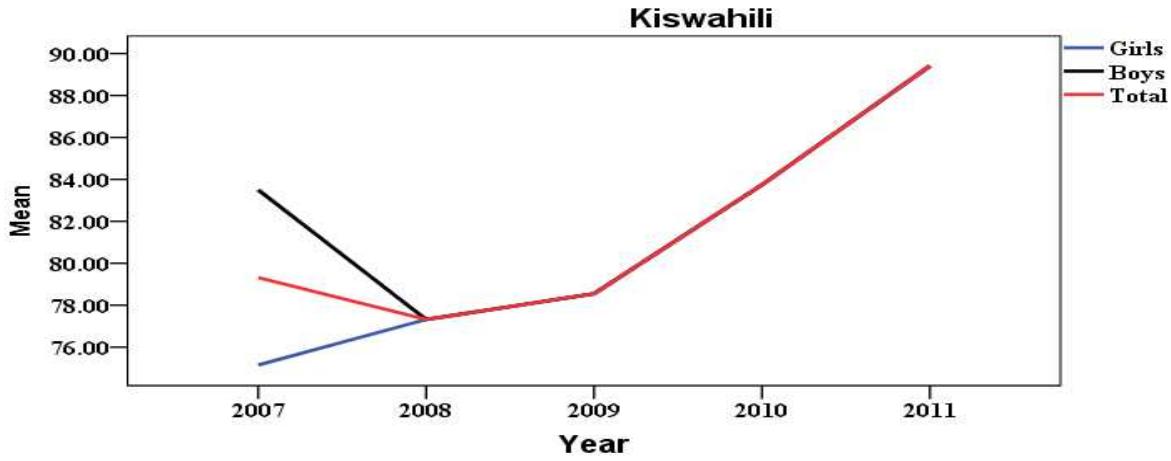


Among the most frequent public schools in the last five years (2007-2011) per subject cluster per gender, there were insignificant variations across all subjects apart from Home Science.

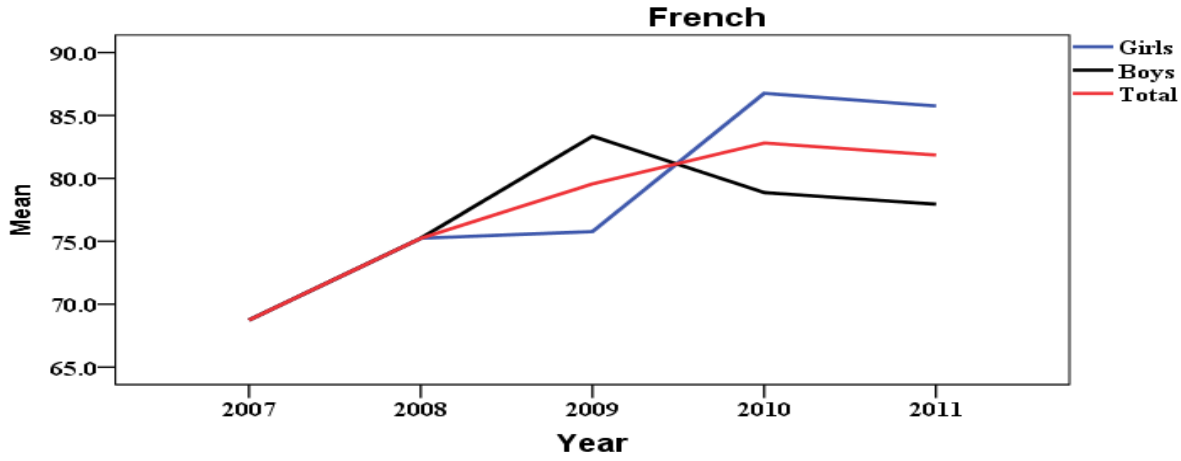
Graph 41: Most frequent top twenty Public schools: Means Scores for *English* by gender across the five years (2007-2011)



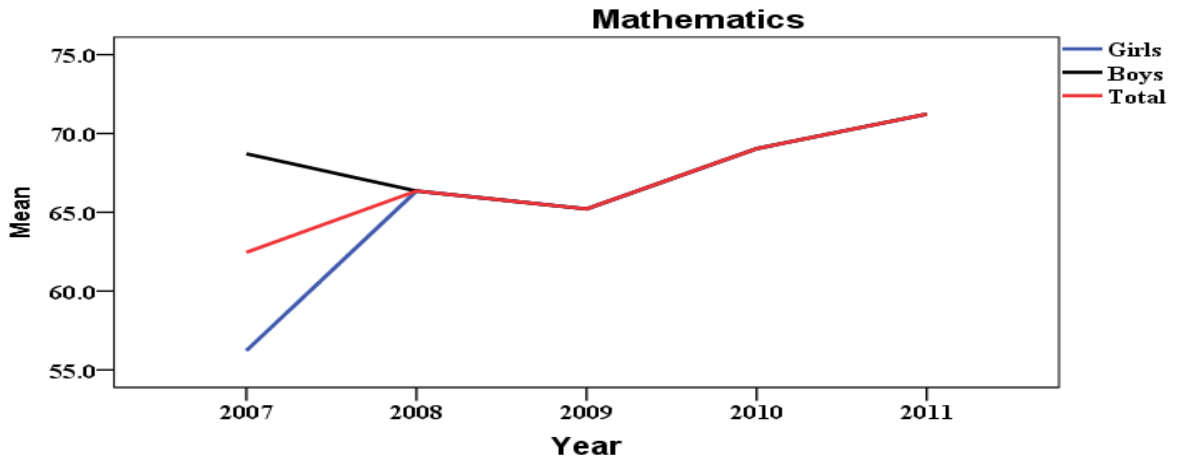
Graph 42: Most frequent top twenty Public schools: Means Scores for *Kiswahili* by gender across the five years (2007-2011)



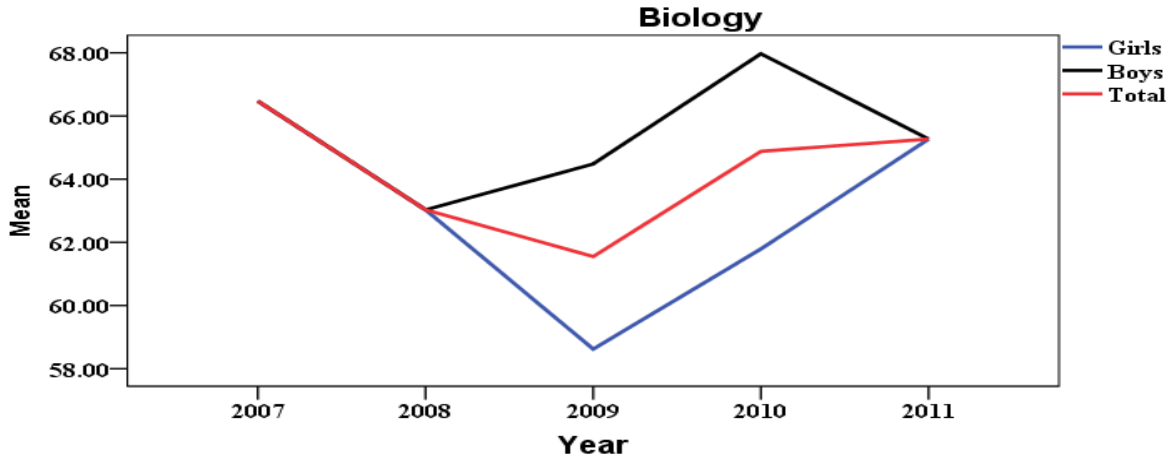
Graph 43: Most frequent top twenty Public schools: Means Scores for *French* by gender across the five years (2007-2011).



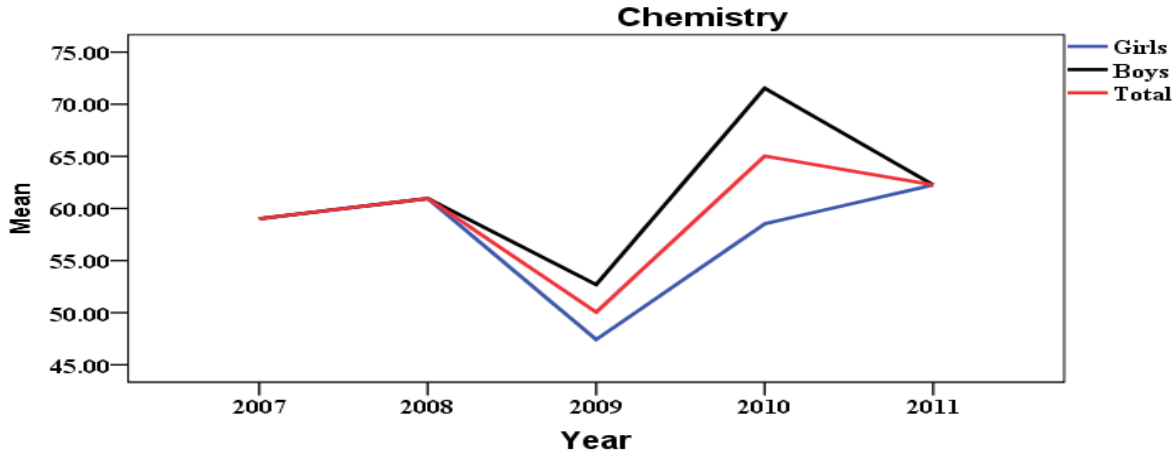
Graph 44: Most frequent top twenty Public schools: Means Scores for *Mathematics* by gender across the five years (2007-2011)



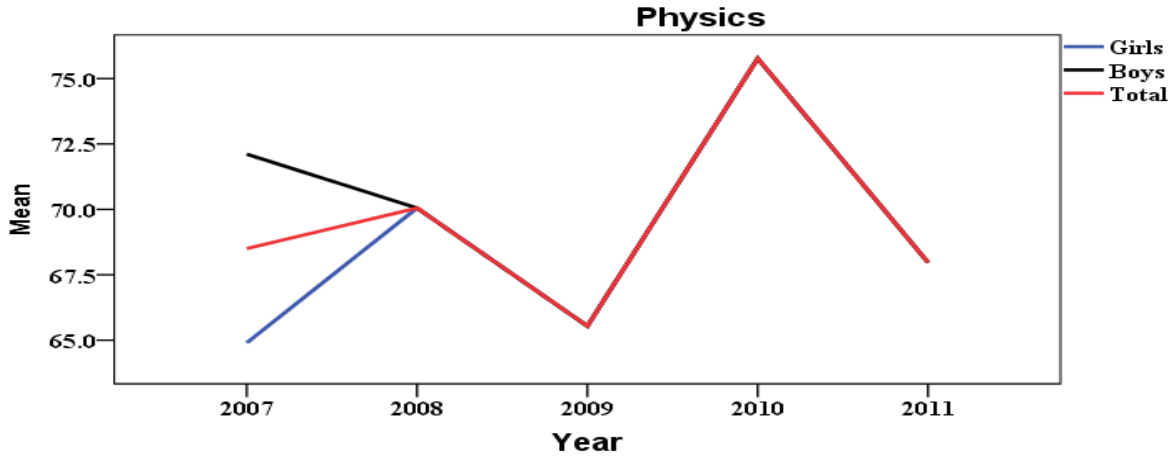
Graph 45: Most frequent top twenty Public schools: Means Scores for *Biology* by gender across the five years (2007-2011)



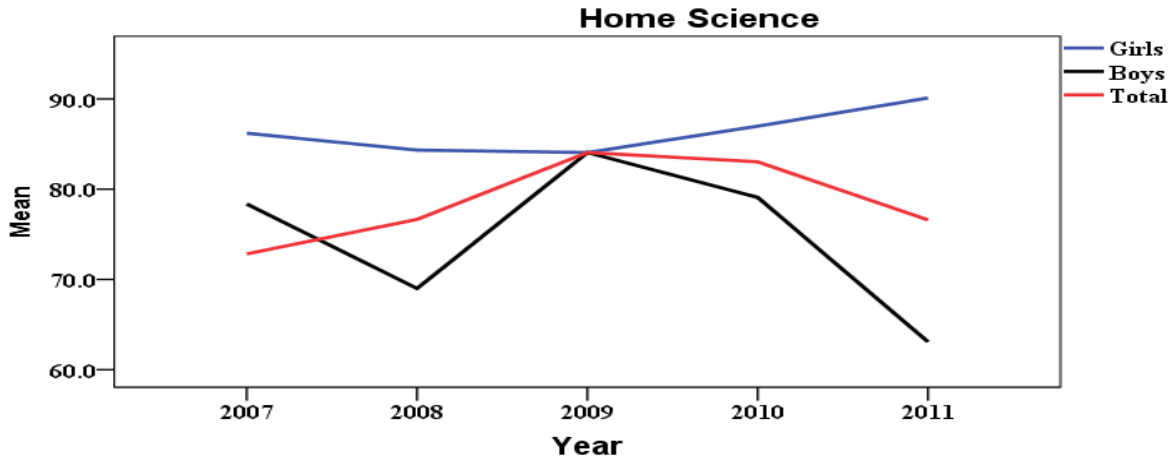
Graph 46: Most frequent top twenty Public schools: Means Scores for *Chemistry* by gender across the five years (2007-2011)



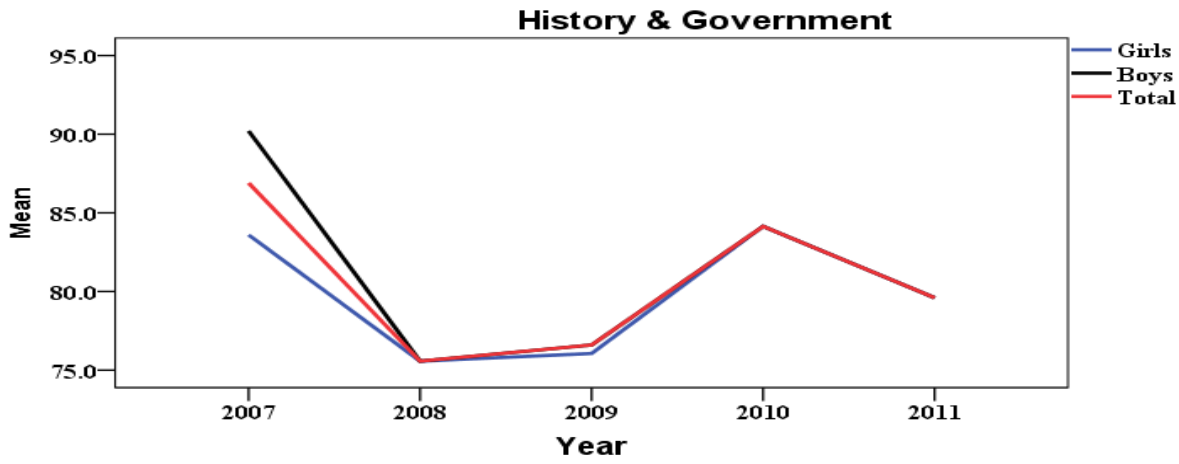
Graph 47: Most frequent top twenty Public schools: Means Scores for *Physics* by gender across the five years (2007-2011)



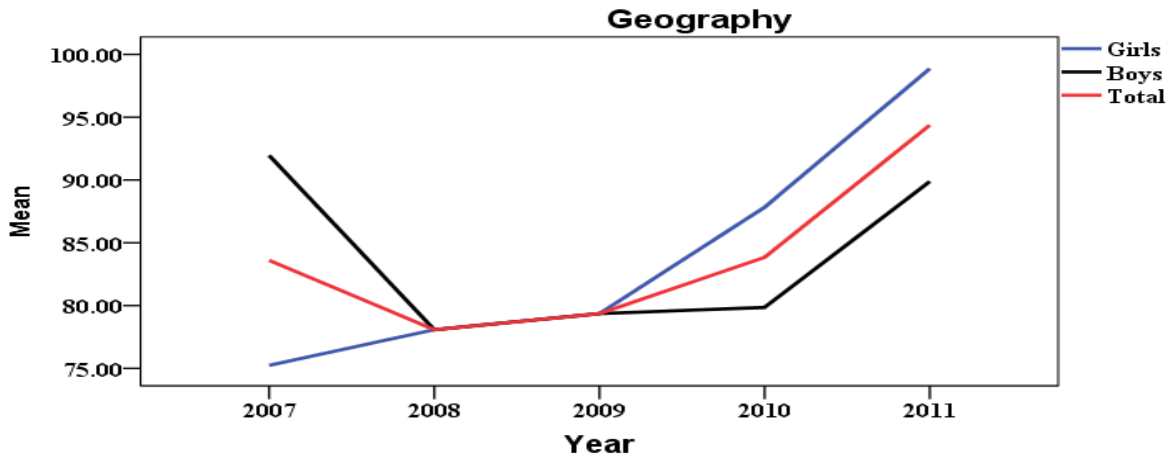
Graph 48: Most frequent top twenty Public schools: Means Scores for *Home Science* by gender across the five years (2007-2011)



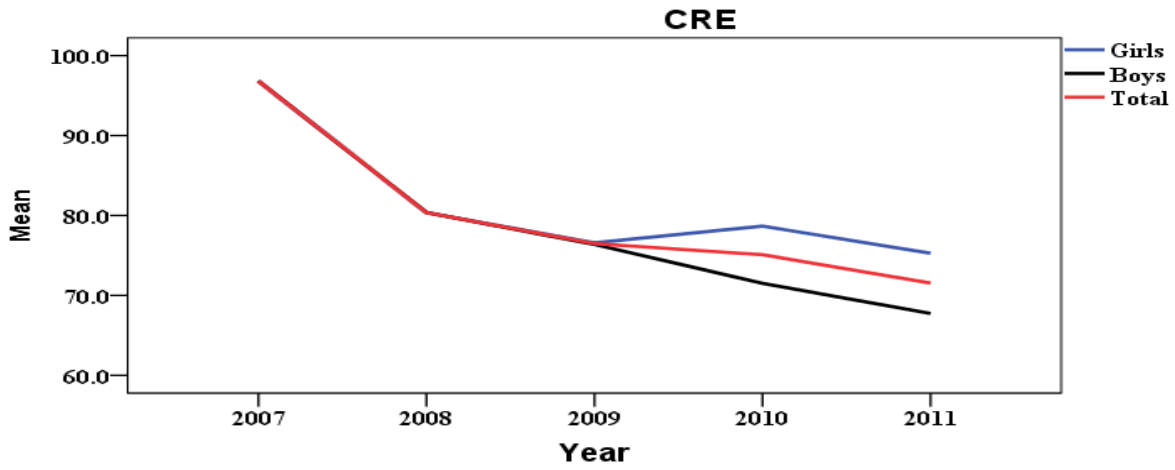
Graph 49: Most frequent top twenty Public schools: Means Scores for *History and Government* by gender across the five years (2007-2011)



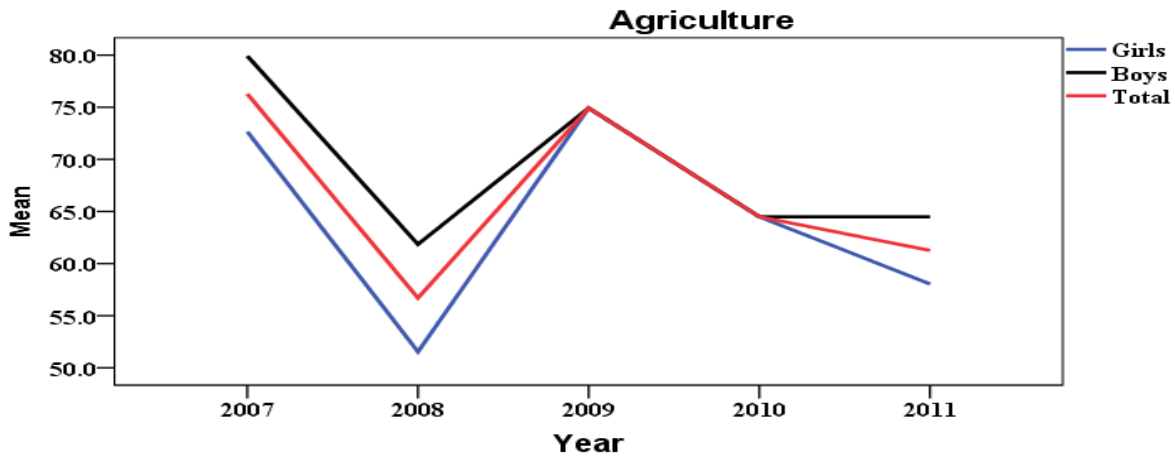
Graph 50: Most frequent top twenty Public schools: Means Scores for *Geography* by gender across the five years (2007-2011)



Graph 51: Most frequent top twenty Public schools: Means Scores for *CRE* by gender across the five years (2007-2011)



Graph 52: Most frequent top twenty Public schools: Means Scores for *Agriculture* by gender across the five years (2007-2011)



4.2.5 Most frequent top twenty private schools per subject by gender across the five years (2007-2011)

Below is a summary of the findings on this category of schools in the time period under study.

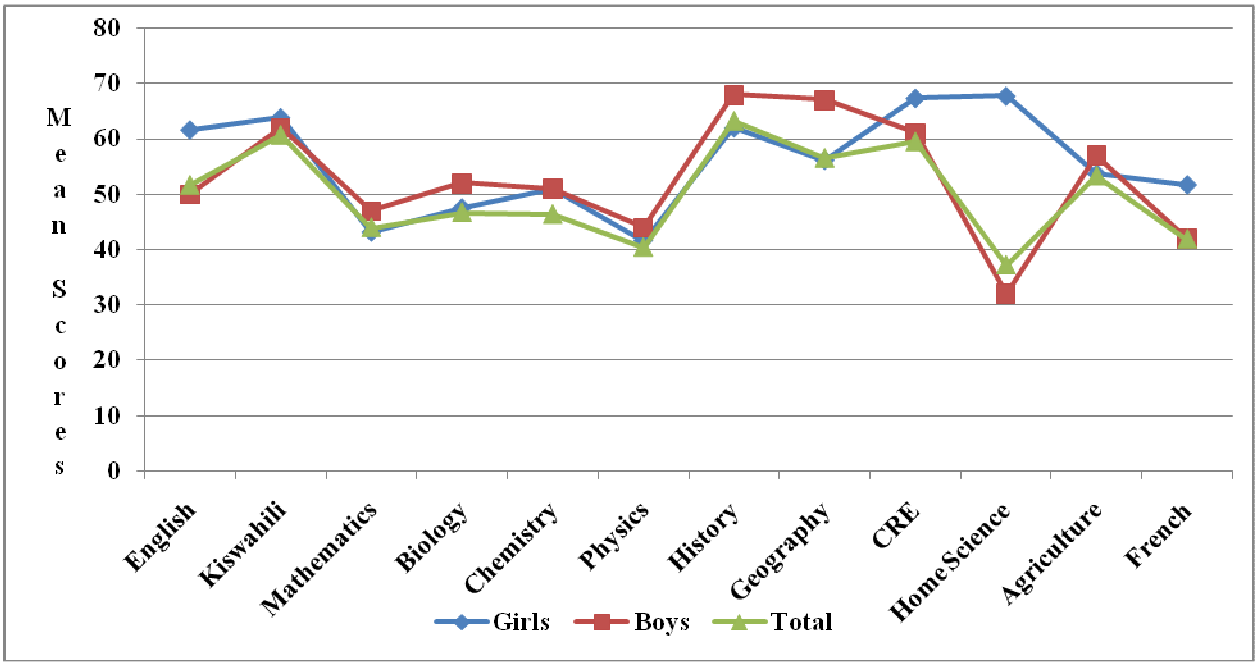
Table 7: Most frequent top twenty private schools: Means and standard deviations per subject by gender across the five years (2007-2011)

Subject	Girls		Male		Total	
	Mean	SD	Mean	SD	Mean	SD
English	*65.23*	*1.44*	*64.77*	*3.68*	*65.56*	*2.14*
Kiswahili	*67.19*	*6.06*	*72.38*	*7.09*	*70.36*	*5.90*
French	*55.12*	*9.17*	*41.97*	*8.04*	*43.54*	*9.17*
Mathematics	*46.60*	*6.71*	*59.48*	*2.73*	*54.40*	*5.14*
Biology	*52.25*	*5.96*	*60.66*	*7.92*	*55.42*	*6.15*
Chemistry	*44.24*	*5.05*	*51.55*	*6.74*	*47.23*	*5.20*
Physics	*60.91*	*6.64*	*67.79*	*7.87*	*63.05*	*7.79*
History & Government	*67.71*	*5.72*	*72.55*	*8.54*	*71.17*	*6.82*
Geography	*66.68*	*7.08*	*72.35*	*9.72*	*69.51*	*8.25*
CRE	*73.49*	*9.04*	*73.18*	*10.04*	*71.63*	*5.96*
Home Science	*69.01*	*3.13*	*6.97*	*4.64*	*8.18*	*5.49*
Agriculture	*57.91*	*7.45*	*62.25*	*10.07*	*60.08*	*8.71*

In the most frequent private schools among the top 20 schools (Table 7), the standard deviation for all the subjects ranged between 1.44 and 9.14 among the girls while it was 2.73 and 10.07 among boys, which can be described as an extreme range. The standard deviation for all the subjects ranged between 2.14 and 9.17. For all the subjects the mean ranged between 44.24 and 73.49 among girls (for which Chemistry scored lowest while CRE scored highest). Among boys in all the subjects the mean ranged between 41.97 and 73.18 (for which French scored lowest

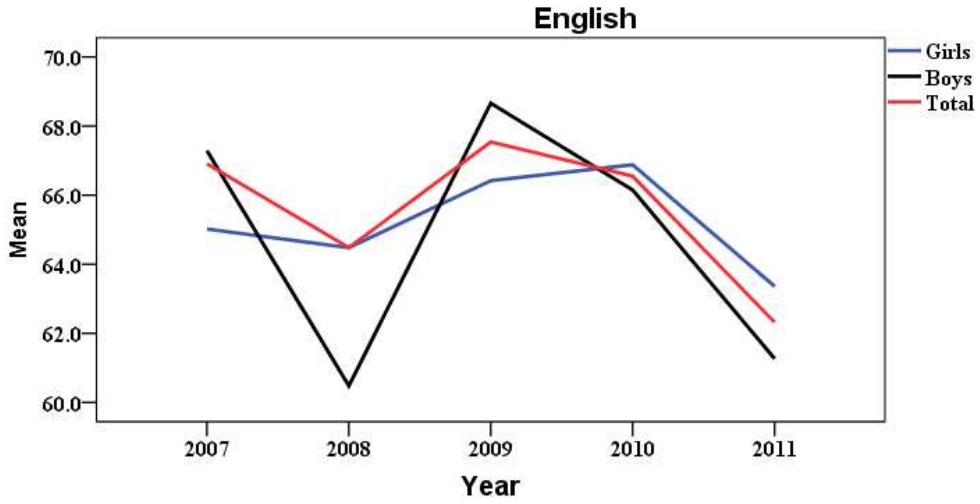
while CRE scored highest). In the overall totals means of all the twelve subjects ranged between 8.18 and 71.63. Home Science was the lowest and CRE scored the highest. This is also evident as shown in graphs 53 to 65.

Graph 53: Most frequent top twenty private schools: Mean Scores per subject by gender across the five years (2007-2011)

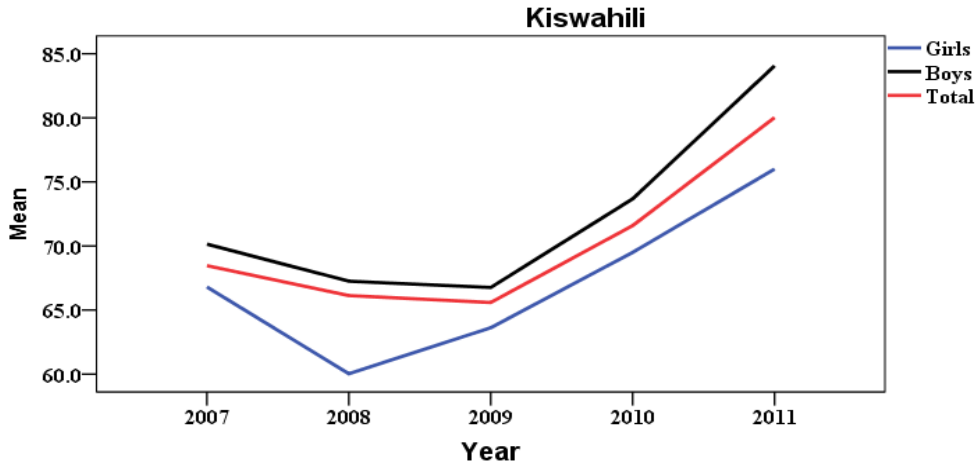


The Graph 53 above shows the variations between mean scores across all the subjects in the most frequent private schools during the period 2007 to 2011, where CRE performance was almost equal between boys and girls. In the case of Home Science, boys performed poorly compared to girls.

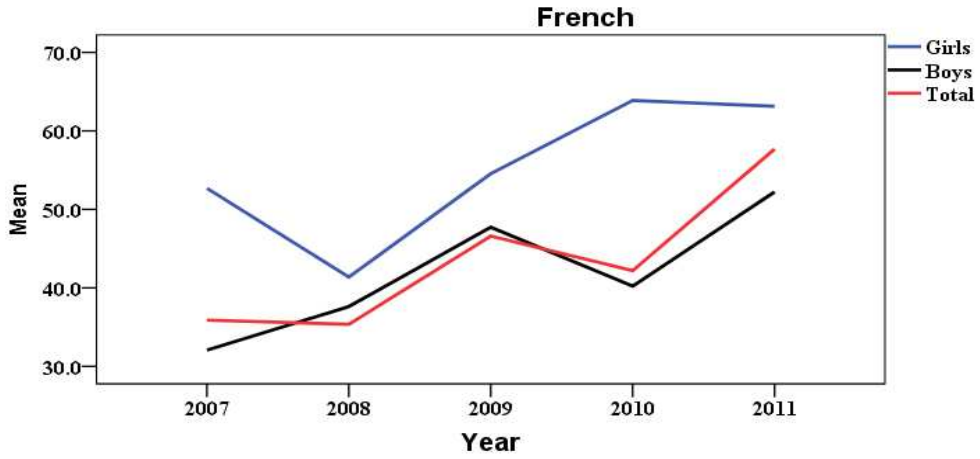
Graph 54: Most frequent top twenty private schools: Means Scores for *English* by gender across the five years (2007-2011)



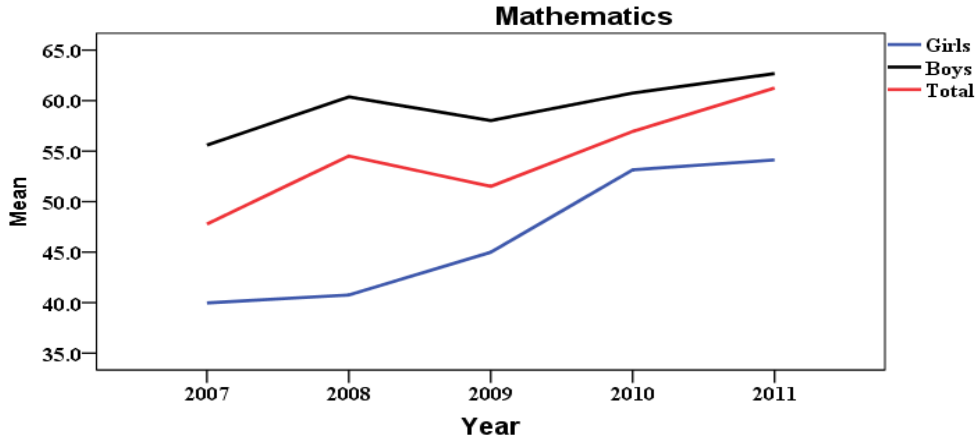
Graph 55: Most frequent top twenty private schools: Means Scores for *Kiswahili* by gender across the five years (2007-2011)



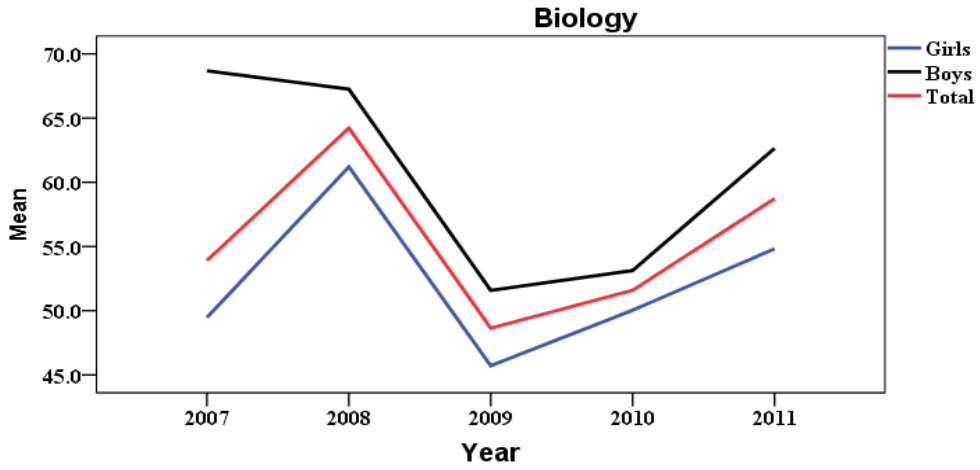
Graph 56: Most frequent top twenty private schools: Means Scores for *French* by gender across the five years (2007-2011)



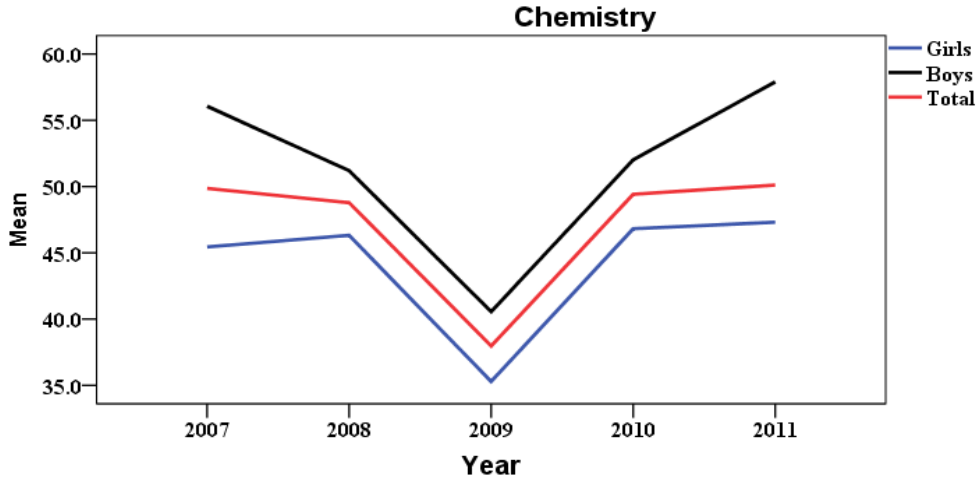
Graph 57: Most frequent top twenty private schools: Means Scores for *Mathematics* by gender across the five years (2007-2011)



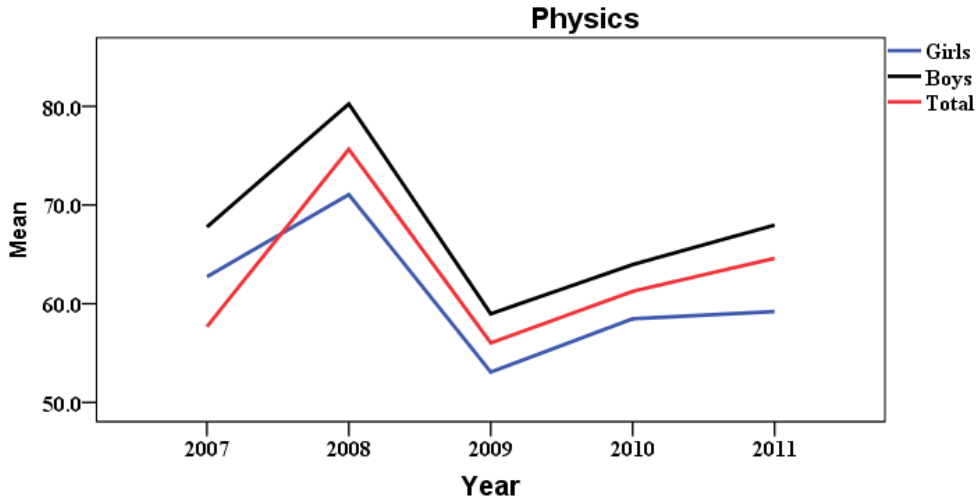
Graph 58: Most frequent top twenty private schools: Means Scores for *Biology* by gender across the five years (2007-2011)



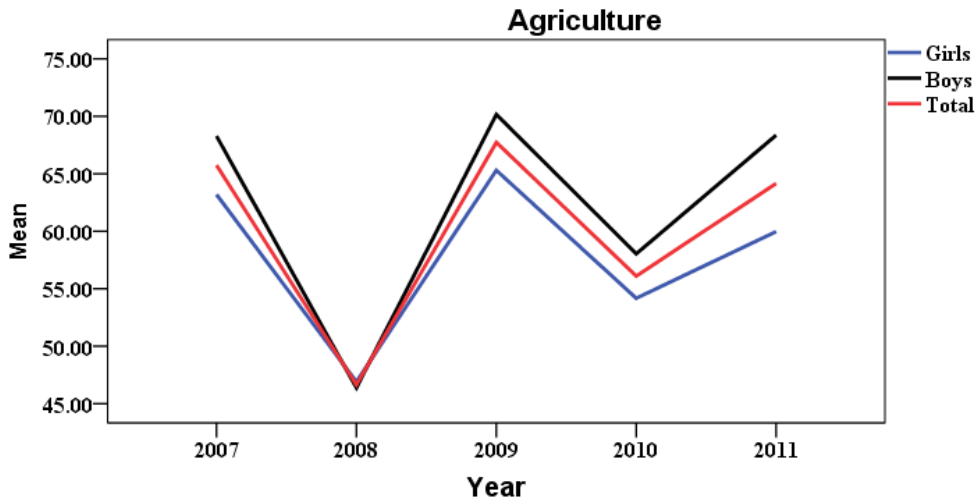
Graph 59: Most frequent top twenty private schools: Means Scores for *Chemistry* by gender across the five years (2007-2011)



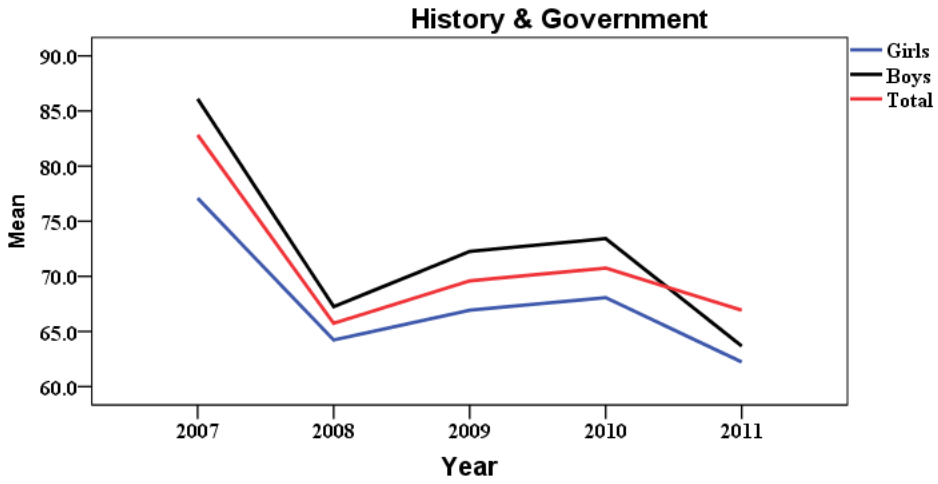
Graph 60: Most frequent top twenty private schools: Means Scores for *Physics* by gender across the five years (2007-2011)



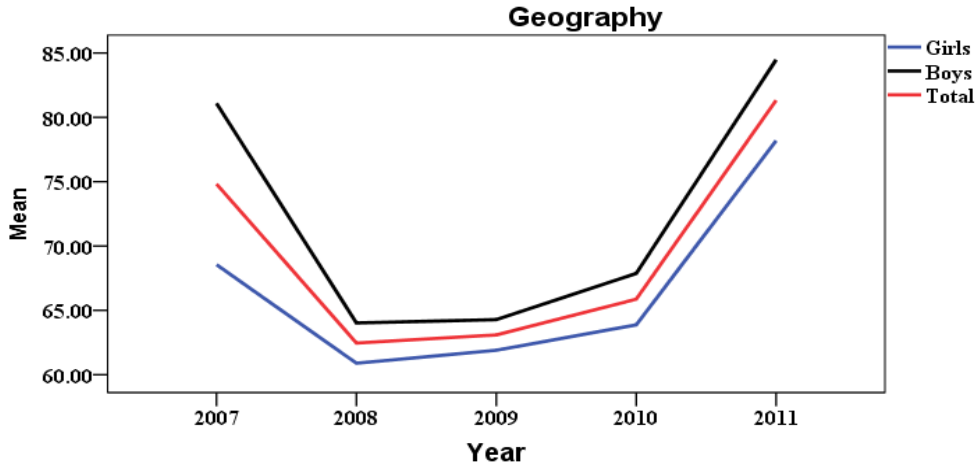
Graph 61: Most frequent top twenty private schools: Means Scores for *Agriculture* by gender across the five years (2007-2011)



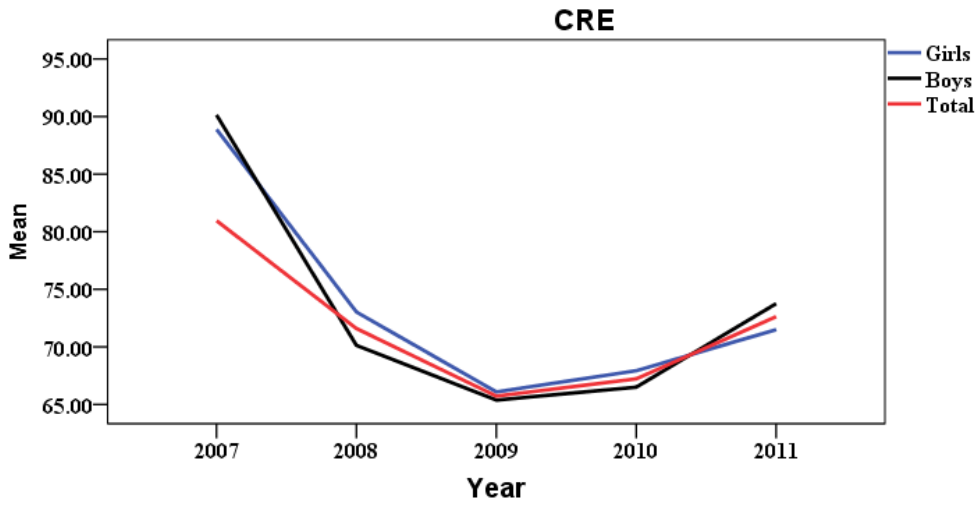
Graph 62: Most frequent top twenty private schools: Means Scores for *History and Government* by gender across the five years (2007-2011)



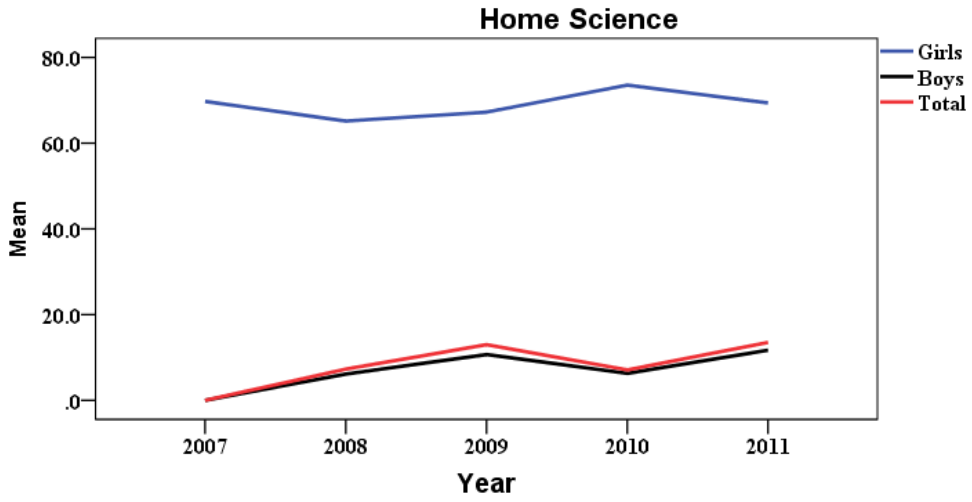
Graph 63: Most frequent top twenty private schools: Means Scores for *Geography* by gender across the five years (2007-2011)



Graph 64: Most frequent top twenty private schools: Means Scores for *CRE* by gender across the five years (2007-2011)



Graph 65: Most frequent top twenty private schools: Means Scores for *Home science* by gender across the five years (2007-2011)



In comparing the means highlighted above, between the different school categories, in terms of performance, a T test was done. Table 7 provides a summary of the findings on this. Significance differences were also carried out with other variations such as overall scores, across the subjects,

with top performing schools and across the subject areas gendered. Correlations are also highlighted

Table 8: Significance (p) of difference between means

Significance (p) of difference between means for overall Academic Performance per Subject by gender across the five years (2007-2011)				
	Girls (Mean=38.32)	**Male (Mean=40.81)**	**Total (Mean=39.85)**	**Overall Total (Mean=39.56)**
Girls		***.0001***	***.0012***	***.0014***
Male	***.0001***		***.0072***	***.0000***
Total	***.0012***	***.0072***		***.0000***
Overall Total	***.0014***	***.0000***	***.0000***	

Top Twenty High Achieving Private schools per Subject by Gender Across the Five years (2007-2011)			
	Girls (Mean=67.94)	**Male (Mean=67.65)**	**Total (Mean=67.79)**
Girls		***0.314***	***0.000***
Male	***0.314***		***0.000***
Total	***0.000***	***0.000***	

Top Twenty High Achieving public schools: (National, Provincial and district) per Subject by Gender Across the Five years (2007-2011)			
	Girls (Mean=55.61)	**Male (Mean=52.76)**	**Total (Mean=50.13)**
Girls		***0.000***	***0.000***
Male	***0.000***		***0.000***
Total	***0.000***	***0.000***	

Most frequent top twenty private schools per subject by gender across the five years (2007-2011)			
	Girls (Mean=60.52)	**Male (Mean=58.82)**	**Total (Mean=56.67)**
Girls		*0.057*	***0.018***
Male	*0.057*		***0.000***
Total	***0.018***	***0.000***	
Most frequent top twenty public schools per subject by gender across the five years (2007-2011)			
	Girls (Mean=73.92)	**Male (Mean=73.94)**	**Total (Mean=73.78)**
Girls		***.000***	***.000***
Male	***.000***		***.000***
Total	***.000***	***.000***	

T-test was done to compare whether there was significant mean differences between girls and boys and their total and overall totals. The overall mean score performance between girls and male for the years 2007 to 2011 with reference to summary of KCSE was significant ($p \leq 0.01$ and $p \leq 0.05$ levels) in both totals and overall totals.

When comparing the means difference between high performing private schools among girls and male, there was no significant difference (p=0.314) but only in their total performance (p=0.000). But in high performing public schools, there was strong significant level between Girls and male (p=0.000) mean scores and also in their total performance (p=0.000).

The mean scores among Girls and males in most frequent private school in the last five years was not significant (p=0.057) as compared to their total mean score between girls and male (p<0.018 and p<0.000) respectively. When the same was tested among girls and male in most frequent public school in the last five years, there was a very high significance in their total performance (p<0.000 and p<0.000) respectively.

In general, there was no significant difference between any means of subjects between girls and boys (Table 6) as observed. There was significant (from p<0.05 to highly significant p<0.001) differences between means of subjects within girls and boys. This was observed among all high performing private schools, high performing public schools, most frequent private school and most frequent public school in the five years (2007-2011).

Table 9: Significance (p) for Overall Performance per subject by gender across the five years (2007-2011)

Mean per Subject		Significance (p)	
Subject	**Overall Total**	**Boys**	**Girls**
English	***37.6290***	***0.00960***	***0.00620***
Kiswahili	***42.8340***	***0.05780***	***0.00900***
French	***51.3970***	***0.03380***	***0.04560***
Mathematics	***21.6860***	***0.09180***	***0.04540***
Biology	***32.1250***	***0.03120***	***0.09380***
Chemistry	***22.9840***	***0.08860***	***0.08120***
Physics	***35.7320***	***0.08480***	***0.06160***
History	***44.4360***	***0.02700***	***0.06020***
Geography	***39.5740***	***0.06860***	***0.04620***
CRE	***50.1350***	***0.00760***	***0.01940***
Home Science	***47.3250***	***0.07210***	***0.05780***
Agriculture	***37.1150***	***0.07260***	***0.05040***
Total	***38.5810***	***0.08505***	***0.03115***

		Mean Square	Sig.
Girls	**Between Subjects**	***567.454***	***.000***
Boys	**Between Subjects**	***389.478***	***.000***
Overall Total	**Between Subjects**	***458.690***	***.000***

T-test was done to compare whether there was significant overall mean score differences between girls and boys between subjects. The overall mean score performance in different subjects between girls and boys for the years 2007 to 2011 with reference to summary of KCSE was significant ($p \leq 0.01$ and $p \leq 0.05$ levels). The above table shows that there was no significant difference in the overall total scores among boys and girls in all the subjects as observed. This was observed as a summary of high performing private schools and high performing public schools in the five years (2007-2011).

Table 10: Significance (p) for Overall Top Twenty High Achieving schools per subject by Gender across five years (2007-2011)

Mean per subject		**Significance (p)**	
Subject	**Overall Total**	**Girls**	**Boys**
English	***74.3560***	***0.09980***	***0.07140***
Kiswahili	***73.3680***	***0.07940***	***0.09420***
French	***76.0920***	***0.07540***	***0.04300***
Mathematics	***67.5700***	***0.09760***	***0.01640***
Biology	***59.1650***	***0.07180***	***0.02520***
Chemistry	***55.2680***	***0.01180***	***0.04180***
Physics	***67.5670***	***0.04860***	***0.06480***
History & Government	***70.4620***	***0.03800***	***0.05440***
Geography	***76.4410***	***0.02980***	***0.05840***
CRE	***74.7390***	***0.09860***	***0.04920***
Home Science	***54.3820***	***0.07900***	***0.09740***
Agriculture	***64.1670***	***0.06800***	***0.06540***

Mean per subject		Significance (p)	
Subject	**Overall Total**	**Girls**	**Boys**
English	***74.3560***	***0.09980***	***0.07140***
Kiswahili	***73.3680***	***0.07940***	***0.09420***
French	***76.0920***	***0.07540***	***0.04300***
Mathematics	***67.5700***	***0.09760***	***0.01640***
Biology	***59.1650***	***0.07180***	***0.02520***
Chemistry	***55.2680***	***0.01180***	***0.04180***
Physics	***67.5670***	***0.04860***	***0.06480***
History & Government	***70.4620***	***0.03800***	***0.05440***
Geography	***76.4410***	***0.02980***	***0.05840***
CRE	***74.7390***	***0.09860***	***0.04920***
Home Science	***54.3820***	***0.07900***	***0.09740***
Agriculture	***64.1670***	***0.06800***	***0.06540***
Total	***67.7981***	***0.09448***	***0.06513***

Also a T-test was done to compare whether there was significant overall mean score differences between girls and boys between subjects. The overall mean score performance in different subjects between girls and boys for the years 2007 to 2011 with reference to summary of KCSE was significant ($p \leq 0.01$ and $p \leq 0.05$ levels). The table above shows that there was no significant difference in the overall total scores among boys and girls in all the subjects as observed. This was observed as a summary of all schools which included high performing private schools, high performing public schools, most frequent private school and most frequent public school in the five years (2007-2011).

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter presents the research findings drawn from the Kenya National Examinations Council Data base on KCSE examination performance from 2007-2011. This chapter is divided into four sub-topics as guided by the research questions. These research questions had to do with the factors affecting the performance of girls in the KCSE examination, the overall gender trend in academic performance, an analysis of the disparities between boys and girls in academic performances across subjects and across different school categories and finally; an analysis of the influence of gender on academic performance.

5.1.1 Objective One: To determine the trends in academic performance between boys and girls across the five years (2007 - 2011)

It was found that the *overall performance* of boys was higher than that of girls in the KCSE examination in the years 2007-2011. In the period under study, boys performed better in Mathematics, Science and Arts subjects. Girls scored higher than boys in Technical subjects such as Home Science. Interestingly boys did better than girls in language subjects.

5.1.2 Objective Two: To examine the overall disparities between the performance of girls and boys across subjects.

The research findings show that the overall performance across the subjects during the five year period under study (2007-2011) was fair for both boys and girls though boys did better in science subjects compared to girls who excelled in Home Science. This may be because this subject is

taken as a girls' subject. Boys performed better in numeracy, science and in some arts subjects with a significant correlation of between 0.01 and 0.05 levels among girls and boys when compared to the mean scores of their total scores in the summary of KCSE performance 2007-2011. Today's gender gap in education often focuses on the advantage boys have over girls in science and mathematics, but fails to recognize the falling behind of boys to girls in literacy.

For example, girls tend to perform worse in mathematical and scientific subjects, thus leading them to be ill-equipped to pursue these careers in higher education. This can further be seen in the educational system discriminating towards girls through course-taking, especially in high school. This is important because course-taking represents a large gender gap in what courses boys and girls take, which leads to different educational and occupational paths between them.

This study revealed that there are differences in achievement in chemistry and biology among the different categories of schools as well as gender. Generally boys performed better than girls in the two science subjects. In chemistry, the boys had an average mean score of 51.55 while girls had 42.24 revealing a disparity index of 9.31. In biology, boys posted a good performance by averaging at 60.66 while girls only managed to realize 52.25 leading to a disparity index of 8.41. These findings therefore agree with those of Chipman, Brush and Wilson, 1985; Fennema, 1984; Linn and Hyde, 1989; Oakes, 1990; Lee and Burkam, 1996 which showed that males outperform girls on science achievement tests. The findings also conform to those of the Second International Science Study (SISS) and Third International Mathematics and Science Study (TIMSS) which revealed that sex differences were found in every subject area in the written science achievement tests and the sex difference favored boys.

The variance particularly in different subjects revealed that boys outperformed girls and had a larger variance. The results are also in harmony with those of a study carried out in Uganda which showed that generally the trend of academic excellence indicated that boys perform better than girls. The findings of this study show that, with constant underachievement of girls in the science subjects, the women are bound to be constantly under-represented in the science fields. This observation from the study agrees with and reinforces the studies which show that women have not attained educational equity in many African countries and they are systematically under-represented in scientific and technical disciplines (Adams and Kruppenbach, 1986 as cited in Frazier, 1999).

In this study, the findings are similar to those of other studies (Warangal, 1997; Agenda, 1989) who found that girls have more negative attitude towards mathematics and science. Wasanga (1997) found that the majority of girls found science subjects difficult and they perceived science subjects to be more useful to boys. Similarly, Aghenta, (1989) found that perceived difficulties of science occupations was a significant factor preventing girls from entering Science, Technology and Mathematics (STM) fields.

5.1.3 Objective three: To examine the disparities between the performance of girls and boys across all subjects in the different school categories; public schools (national, provincial and district) and private.

This study also examined the kinds of schools that produce top KCSE performance. Schools were explored so as to establish whether a public or private education has any connection to the quality of achievement or education output. The findings show that in private schools, boys and girls performed almost equally in English, Chemistry, History and Government and Geography. In Home Science, girls performed quite well with a mean score of 76.76 compared to boys 31.97.

In fact, the mean scores show that girls have met or exceeded the reading performance of boys across public and private schools. The literacy gap in KCSE is equivalent to boys being developmentally two years behind the average girl in reading and writing. These findings have spanned across the globe as the International Association for Evaluation of Educational Achievement (IEA) found gender to be the most powerful predictor of performance in a study of 14 countries. The trend was the same in subject clusters boys performing well in almost all clusters apart from technical subjects where girls scored had a mean score of 69.24 compared to boys 49.31. Boys typically take longer to learn than girls do, although they excel over girls when it comes to "information retrieval and work-related literacy tasks".

In high performing private schools there was a strong correlation between girls, boys and total performance and also between boys and specific subject performance. This was also evident in boys, total subjects and subject categories. There was no correlation between girls, boys and subjects categories. It is important, therefore, for the schools and teachers to provide the appropriate activities to highlight boys' and girls' strengths in different subjects and properly support their weaknesses. Also, boys tend to read less than girls in their free time. This could play a role in the fact that girls typically "comprehend narrative and expository texts better than boys do" (Tapscott, 2009).

Regarding the public schools (National, Provincial and District), there are variations in performance between each school category. This may be attributed to the fact that good performance may be linked to availability of sufficient science facilities, frequent practice by students and sustained interest. There must therefore be concerted effort among all stakeholders

to address the problem of deplorable performance among boys and girls. Policy strategies in education point to the establishing and equipping of school facilities in all secondary schools to encourage schools to give prominence to all subjects. This study reveals that such a policy has been more theoretical than practical as a number of the schools have poor performance among girls. To put vision 2030 on course, the issues of provision of facilities in schools ought to be revisited particularly in recently established schools, most of which are co-educational, rely on Subsidized Secondary Education Funds and meet the educational needs of students from low socio-economic status. Such students need the quality life articulated in vision 2030 which can be brought about through industrialization and innovation.

5.1.4 Objective Four: To identify the social and cultural factors that affect performance of boys and girls in KCSE.

According to the Global Monitoring Report, (2002), all societies have implicit conceptions of gender, or stereotypes, which they use to differentiate the treatment of girls and boys. In education, the factors that can explain the differentiated performance between the two genders in the KCSE examination can be categorized into: School curriculum practices (restrictive curriculum, teaching strategies, and school curriculum choices), school characteristics (type of school, school facilities, and facilities), teachers (gender, skills, and attitude) and students (attitudes, peer pressure, gender). These factors focus on the school environment only and they influence the learning environment and its conductivity for average performance for both boys and girls. Other factors beyond the school environment include the economic and socio-cultural factors of the school communities and of the students. Historically, when it comes to formal education, girls have always been at a disadvantage when it comes to issues of family economics

and socio-cultural practices that discourage girls from attending and remaining in school and competing with boys side by side. The focus of this study however is only on the factors relating to the school environment.

Girls are believed and also have the self-belief that they cannot excel in hard subjects like the sciences and mathematics and opt for the 'simpler' subjects which they figure would give them greater examination passing chances. It's been argued that few girls study Physics because they are less confident than boys of their own ability and less likely to choose difficult subjects; the attitudes and expectations of parents, families and peer groups reinforce stereotypes of appropriate subjects for girls and boys. In regard to teacher related factors, teachers' attitudes and expectations may feed sex-stereotype attitudes to certain subjects and in most cases this attitude in regard to girls' innate abilities and potential is negative.

As in other developing countries, children in Kenya are engaged in domestic chores. In their study on the influence of family socio-economic status and gender on students' academic performance in Baringo district secondary schools, Chepchieng and Kiboss (2004) found that lack of time for study among girls could be attributed to involvement in domestic chores. In contrast, boys were left with a lot of time to study thus were likely to have an edge over girls' school work. These factors are a summary of the different influences on academic performance. They also indicate that whatever the factor, the issue of gender arises and in most cases, girls are at a disadvantage.

5.2: Conclusion

This study was carried to compare the academic performance between boys and girls in the Kenya Certificate of Secondary Education (KCSE) across a period of five years (2007-2011). The study was driven by trends that arise when gender trends are raised in education. In most, if not all cases, the boys performs higher than girls, more so in Mathematics and Sciences. The case was the same in the given study. The survey involved a total of ***1,643,458 students*.** This allowed concrete conclusions. Further performance also varied across top performing schools, where boys still did better than girls'. The only exception was between boys and girls in private schools where there was no significant difference in their overall performance.

The study raises a challenge in that, advantages created for girls in education seems not to give advantage to girls. Further as the world moves to new dispensations of the 21st Century and Climate Change crisis, the education fraternity is still struggling with issues of the past for example (performance, access, retention, lack of resources) while a new paradigm shift is required. This should put education fraternity on alert. The situation is worse for girls. This is indeed a looming crisis for educators in the society.

There is need to urgently address issues that will take education to another level and adapt measures that will ensure equity in performance for all, an education that will ensure change that reviews the past, adapts the present and pre-empts the future. The focus of this change should be gender and academic performance.

5.3 Recommendations.

5.3.1 The study recommends the following for further research:

a) Longitudinal survey to be conducted on Kenya to establish why performance in mathematics and sciences for girls decline as they tend towards adolescence;

b) Finally, to better understand the reasons for the differential academic performance between the boys and girls, a study on the other factors that determine the differences in academic performance beside gender should be conducted. This includes the social cultural factors, school categorization and teacher-related factors among others.

5.3.2 Classroom factors

a) Teaching styles and assessment forms should be reviewed to meet gender preferred learning and be guided by researched approaches such as modelling for pre-school age.

5.3.3 Subject Areas

a) Desire interventions in Mathematics and Sciences as well as Information Technology interventions designs that focus on how to make their related occupations more interesting for young high achievers among girls and women (vis-a-vis more academic achievement interventions).

b) Target areas in Mathematics that show greatest divide (vis-a-vis blanket uniform interventions) so as to increase pre-requisite skills lacking in later learning and thus increase not only participation but performance.

5.3.4 The learner (more so girls')

a) To come up with awareness around discrimination, gender- typed socialization and self concept more so at the development transition stages.

REFERENCES

Abu Ghaida, D. & Stephan, K. (2004). The economic and human development costs of missing the millennium development goal on gender equity. World Bank Working Paper. Report No. 29710.

Allik, J., Must, O., & Lynn, R. (1999). Sex differences in general intelligence among high school graduates: some results from Estonia. Personality and Individual Differences, 26, 1137–1141.

Andre T, Whigham M, Hendrickson A, Chambers S. (1999) Competency beliefs, positive affect, and gender stereotypes of elementary students and their parents about science versus other school subjects. *Journal of Research in Science Teaching. 1999;36:719–747.*

Asalatha, B.P., Ponnuswamy, B. and Vijayamohanan, P.N. (2009). Women in Development-Dissecting the Discourse. Found in http://mpra.ub.uni-muenchen.de/13119/

Ayoo, S.J., (2002). Factors affecting students performance in Kenya certificate of secondary education in Public Secondary Schools in Maseno Division. Unpublished M.Ed. Thesis, University of Nairobi, Nairobi.

Baden, S. and Reeves, H. (2000) Gender and Development: Concepts and Definitions

Berenbaum, S. A., Korman, K., and Leveroni, C. (1995). Early hormones and sex differences in cognitive abilities. Learning and Individual Differences, 7(4), 303-321.

Burns, N. & Grove, S.(1993).The practice of nursing research conduct, critique and utilization. 2nd edition. Philadelphia: WB Saunders, 779.

Campbell, J. R., Voelkl, K. E., & Donohue, P. L. (2000) Report in brief: NAEP 1996 trends in academic progress, National Center for Education Statistics, NCES 97–986r.

Casey, B. (2003) Mathematics problem-solving adventures: A language-arts based supplementary series for early childhood that focuses on spatial sense. In D. Clement, J. Sarama and M. A. Dibaise (eds.) *Engaging Young Children in Mathematics Education.* Mahwah, NJ: Lawrence Erlbaum Associates

Cassell, C., & Symon, G. (1994). Qualitative research in work contexts. In C. Cassell, & G. Symon (Eds.), Qualitative methods in organizational research (pp. 1-13). Thousand Oaks, CA: Sage Publications.

Chege, F.; Sakurai, R. (2011). Feminist research and boys' schooling: Gender equality and construction of African masculinities: An example of study of Africa-Asia university dialogue network. Unpublished

Chepchieng, M.C. and J.K. Kiboss (2004). Influence of family socio-economic status and gender on students' academic performance: A study of Baringo District Secondary Schools. J. Edu. Hum. Resour., 2(2): 50-61.

Chernichovsky, D., (1985). Socio-economic and demographic aspects of school enrolment and attendance in Rural Botswana. Econ. Dev. Cult. Change, 33: 319-332.

Chimombo J. (2000). Classroom, School and Home Factors thet Negatively Affect Girls Education in Malawi. Centre for Education Research and Training

Desprez-Bouanchaud, A., Doolaege, J. & Ruprecht, L., (1987). Guidelines on gender-neutral language. Paris: UNESCO.

Economic and Social Development Department. (2001). Agricultural Censuses and Gender Considerations. Found in http://www.fao.org/docrep/003/x2919e/x2919e04.htm

Ebenuwa-Okoh, E. E. (2010) "Influence of Age, Financial Status, and Gender on Academic Performance among Undergraduates". *Department of Counselling Psychology, Delta State University, Abraka, Nigeria, J Psychology, 1 (2): 99-103 (2010)*

Eccles, J. S., Lord, S. E., Roeser, R. W., Barber, B. L., & Jozefowicz, D. M. (1997). The association of school transitions in early adolescence with developmental trajectories through high school. In J. Schulenberg & J. Maggs & K. Hurrelmann (Eds.), *Health risks and devleopmental transitions during adolescence* (pp. 283-320). New York: Cambridge University Press

Epstein, D., Elwood, J., Hey, V., & Maw J. (Eds.). (1998). Failing boys? Issues in gender and achievement. Buckingham: Open University Press. Journal. 21(4), pp. 465-485.

Eshiwani, G.S., (1985). Women's access to higher education in Kenya. A study of opportunities and attainment in science and mathematics education. J. Eastern Afr. Res. Dev., 15: 91-110

Evans, M.A., Whigham, M. & Wang, M.C. (1995). The effect of a role model project upon the attitudes of ninthgrade science students. Journal of Research in Science Teaching, 32(2) 195-204.

FAWE, (2003a). Girls' Education at the Grassroots: Communities as Agents of Change. FAWE, Nairobi, 11(4).

FAWE, (2003b). Girls, voices: Thumbs-up for SMT studies. FAWE, Nairobi, 11(3).

Fennema, E., Sowder, J., & Carpenter, T. P. (1999). Creating classrooms that promote understanding. In E. Fennema & T. Romberg (Eds.), *Mathematics classrooms that promote understanding* (pp. 185-200). Mahwah, NJ: Lawrence Erlbaum Associates

Frankfort-Nachmias, C., & Nachmias, D. (1992). Research methods in the social sciences (4th Ed.). New York: St. Martin's Press.

Fuller, B., Haiyan H., and Conrad W. S. (1994). "When girls learn more than boys: The influence of time in school and pedagogy in Botswana classrooms." Comparative Education Review 35, 2: 274–294

Global Monitoring Report, (2002). Gender and Education for All: The Leap to Equality. Retrieved from: http//www.paho.org/Eng/AD/GE/PDF, (Access on: December 19, 2005).

Gordon, R. (1995). Causes of girls= academic under-achievement: The influence of teachers= attitudes and expectations on the academic performance of secondary school girls: University of Zimbabwe: Human Resources Research Centre Occasional Paper (8)1:1-75.

Gordon, R. (1993). 'Causes of Girls' Academic Underachievement: The Influence of Teachers' Atitudes and Expectations on the Academic Performance of Secondary Schol Girls', SIDA, Harare.

Halpern, D. F. (2000) Sex Differences in Cognitive Abilities (3rd Ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Heneveld L. (1995). Gender Differences in College Stress, Academic motivation and career intent during adolescence. A paper presented at the meeting of the society for Research on Adolescence, Washington DC.

Hillman, K., & Rothman, S. (2003). Gender differences in educational and labour market outcomes. Melbourne: Australian Council for Educational Research.

Hyde, Karin A.L. and Esme Kadzamira. (1994). "Girls' attainment in basic literacy and education project: Knowledge, attitudes and practices pilot survey." Final report. Zomba: Centre for Social Research, University of Malawi.

IFAD (2014). Gender Glossary. Found in: http://www.ifad.org/gender/glossary.htm

Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self competence and values: Gender and domain differences across grades one through twelve. *Child Development, 73* (2), 509-527.

Jaquette, Jane S. (1982) 'Women and Modernization Theory: A Decade of feminist Criticism,' *World Politics* (January), Vol. 34, Number 2: 267-284.

Kabeer N. (1994), Reversed realities: gender hierarchies in development thought. London, Verso.

Kadenyi, M.M. and M.E. Kamunyu, (2006). Challenges facing women in tertiary institutions: A case of eldoret municipality. The Educator, 1(1): 121-1218.

Kelly, M.J. (1994). A Situation Analysis of Girl Child Education in Zambia, A report for UNICEF, Lusaka.

Kimani, E., Mugenda, O., Maina, L., and Wainaina, M. (2011) Challenges facing female learners in various levels of education in Kenya

King, E.M. and M.A. Hill, (1993). Women's Education in Developing Countries: Barriers, Benefits and Policies. World Bank, Washington DC.

Kiteto, C. (2000) Gender gaps in Africa. Egerton University, Kenya.

Koech, D. K. (1999), *Report on the commission of inquiry into the education system of Kenya: Totally Integrated Quality Education and Training (TIQET).* Government Press

Kwesiga C. J. (2002) Women‟s Access to Higher Education in Africa: Uganda‟s Experience. Kampala: Fountain Publishers Ltd.

Kealey, D.J., & Protheroe, D.R. (1996). The effectiveness of cross-cultural training for expatriates: An assessment of the literature on the issue. International Journal of Intercultural Relations, 20(2), 141-165.

Linver, M.R., Davis-Kean, P., & Eccles, J.E.(2002). Influences of Gender on Academic Achievement. Presented at the biennial meetings of the Society for Research on Adolescence, New Orleans, LA

Lorber, J. (2001). The Variety of Feminisms and their Contribution to Gender Equality

Shuttleworth, M. (2009). *Internal Validity*. Found in: http://explorable.com/internal-validity McGraw Hill.

Machyo, C.N., (1995). Social and cultural factors in the career and educational plans of young Kenyan women. Unpublished M.Ed. Thesis, University of New Brunswick, New Brunswick.

Mackintosh, N. J. (1998). Reply to Lynn. Journal of Biosocial Science, 30, 533–539.

Miller, Carol, And Shahra Razavi (1995). Gender Mainstreaming: A study on the Efforts by UNDP, the World Bank and the ILO to institutionalize Gender Issues, Occasional Paper 4 UNRISD: Geneva.

Mizuno, K.; Kobayashi, M. (2011). Promoting gender equality through education: A case of JICA technical cooperation for girls' education in Yemen. Unpublished.

Moser, Caroline O. N. (1989) 'Gender planning in the Third world: Meeting Practical and Strategic Gender needs', *World Development* Vol. 17, No. 11:1799-1825.

Moulton J (1997). Formal and Non- Formal Education and empowered behaviors. "A review of the Research Literature" Washington D.C USAID/AFR/SD.

Nguyen, C.; Griffin (2011). Gender differences in student achievement in Vietnam: Findings from the 2007 National Survey of Student Achievement. Unpublished

Noble, J., Davenport, M., Schiel, J., & Pommerich, M. (1999). High School Academic and Noncognitive Variables Related to the ACT Scores of Racial/Ethnic and Gender Groups (99-9 [50299960]). Iowa City: ACT, Inc.

Nzomo J., Kariuki, M. W. and Guantai, L. (2001). The quality of education: Some policy suggestions based on a survey of schools. UNESCO-IIEP

Oakley, A. (1972) Sex, Gender and Society, London: Temple Smith.

OECD, (2009). Equally prepared for life? How 15-year-old boys and girls perform in school. Found in: http://www.oecd.org/pisa/pisaproducts/42843625.pdf

Onsomu, E. N., Kosimbei, G. and Ngware, M. W. (2005). Impact of Gender and Socio-economic Factors on Primary Education Performance in Kenya: Empirical Evidence. Found in: http://www.sacmeq.org/sites/default/files/sacmeq/research/Papers%20from%20the%202005%20International%20Invitational%20Educational%20Policy%20Research%20Conference/onsumu.pdf

Onsomu, E. (2006). Impact of gender and socio-economic factors on learning achievements in primary schools in Kenya: empirical evidence Kenya institute for public policy.

Odaga .O and Heneveld, W. (1995).Girls and Schools in Sub-Saharan Africa. From Analysis to Action. World Bank Technical Paper No 298, Africa Technical Department Series, World Bank, Washington.

Pearson, J. (2008). "Gender, Education and." Blackwell Encyclopedia of Sociology. Ritzer, George (Ed). Blackwell Publishing, 2007. Blackwell Reference Online.

Perkins, R., Kleiner, B., Roey, S., & Brown, J. (2004). The High School Transcript Study: A decade of change in curricula and achievement, 1990–2000 (Report No. NCES 2004455).Washington, DC: U.S.D

Plomin, R. (1999). Genetic research on general cognitive ability as a model for mild mental retardation. International Review of Psychiatry, 11, 34–36.

Praat, A. (1999). Gender differences in student achievement and in rates of participation in the school sector, 1986–1997: a summary report. The Research Bulletin, 10, 1–11

Psacharopoulos G, Woodhall M (1985). Education and Development: An Analysis of Investment Choice. Washington D.C: World Bank.

Republic of Kenya (2005). Sessional paper No.1 of 2005 on Education, Training and Research. Nairobi: Kenya Government Printers

Republic of Kenya, (2007). Gender Policy in Education. Ministry of Education, Nairobi.

Riddell, S. and Salisbury, J. (Eds) (2000) *Gender, Policy and Educational Change: Shifting Agendas in the UK and Europe* Taylor and Francis

Rubin, G (1975) '"The traffic in women"; notes on the "political economy" of sex' in R, Reiter (Ed.) Towards an Anthropology of Women: 157-210. New York: Monthly Review Press.

Sadker, M. & Sadker, D. (1994). Failing at Fairness: How American's Schools Cheat Girls. New York: Charles Scribner's Sons.

Sammons, P., (1995). Gender, ethnic and socio-economic differences in attainment and progress: A longitudinal analysis of student achievement over 9 years. British Educational Research Journal. 21(4), pp. 465-485.

Schultz T.P. (2002), "Why Governments Should Invest More to Educate Girls," World Development, Volume 30, Issue 2, February 2002, Pages 207-225.

Summers, Lawrence H.(1994) Investing in all the people: educating women in developing countries. Washington:World Bank

Swainson, N., (1995). Redressing Gender Inequalities in Education: A Review of Constraints and Priorities in Malawi, Zambia and Zimbabwe. Unpublished Research Paper

Umbima, J., (1993). The girl child worker. Paper Presented at the Girl Child National Conference at Nyeri, Kenya.

UNESCO. (2003). EFA Global Monitoring Report 2003/4. Gender and education for all: the leap to equality. Paris: UNESCO.

UNESCO (2006). "Education for All Global Monitoring Report 2006". Nairobi.

UNESCO (2012). Gender and Education. Found in: http://www.unesco.org/new/en/education/themes/leadingtheinternationalagenda/gend er-andeducation/

UNICEF, (2004). The State of the World's Children 2005: Childhood Under Threat. UNICEF, New York.

Walters, P.B. and C.M. Briggs, (1993). Family economy, child labour and schooling: Evidence from early twentieth - century south. Am. Sociol. Rev., 58(2): 163-181.

Wamahiu, S. P. (1999). The status of girls Education in Africa: An Overview under the Theme: "Achievement." Forum for African women educationalists.

Wanjiku, M. (1994). "The Road to Empowerment. Nairobi FEMNET

WHO, (2014). Gender, Women and Health. Found in: http://www.who.int/gender/whatisgender/en/

Wigfield, A., & Eccles, J. (2000). Expectancy-value theory of achievement motivation. Contemporary Educational Psychology, 25(1), 68-81

World Bank. (1996b). Leveling The Playing Field: Giving girls an equal chance for basic education: Washington D.C: The World Bank.

William M.K. Trochim (2006) from the webpage of http://www.socialresearchmethods.net/kb/statdesc.php

Young, P.M., (1985). The influence of the parents on the educational and occupational decision making of their children: Reducing sex role stereotyping in vocational education. Eric Document Reproduction Service No. ED 277813.

Zuze, L.; Reddy, V. (2011). School resources and the gender literacy gap in South African schools. Unpublished.

APPENDIX: Approval letter to collect data from the Kenya National Examinations Council