68%

GENDER AND ACADEMIC PERFORMANCE IN SCIENCE

BUTIYE PRIMARY SCHOOL IN MOYALE

DISTRICT- KENYA

BY

WAKO KATELO

BED/ 15807/ 71/ DF

A RESEARCH REPORT SUBMITTED TO INSTITUTE OF

CONTINUING AND DISTANCE STUDIES IN PARTIAL

FULFILLMENT OF THE REQUIREMENT FOR THE

DEGREE BACHELOR OF EDUCATION

OF KAMPALA INTERNATIONAL

UNIVERSITY

APRIL 2010

DECLARATION

This project is my original work that has never been presented by anyone else for the award of Bachelor of education.

WAKO KATELO

Sign ....

Date .... 21|4|2010 ....

APPROVAL

This report has never been presented for examination with my approval as a supervisor

MR.MISAGO PAUL

Sign...

Date........21/04/2010...........................

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ABSTRACT

A persistent gender gap exists in science - based learning. This study dwells on the effect of gender on academic performance of boys and girls in science in post primary institutions in Kenya.

The study seeks to identify the factors that lead to poor performance and unbalanced gender representation in science — based subjects. The study employs both quantitative and qualitative techniques.

The quantitative techniques dealt with data and data analysis based on findings, while qualitative technique was based on un-quantifiable information based on findings.

The findings are expected to provide insight to causes of gender imbalance in science.

The findings are aimed at equipping all educational stakeholders with information for balanced learning in science, by both girls and boys

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CHAPTER ONE

INTRODUCTION

1.0 Background of the study

Issues of gender inequality and science have been under discussion for a tong time. Despite on going concern on the subject, the science remain heavily male dominated, with sciences demonstrating one of the most severe under representation of women.

In an increasingly scientific and technological world, society needs to encourage all people to learn and study science and technology of which science is a major contributor.

The masculine nature of and how that has affected women's participation it, has been the main issue over the years, which needs to be particularly addressed to give clear picture and practice of balanced gender appraisals.

With the introduction of a new curriculum to schools in *1997* which made a third science subject optional, Science has been on the rising trend suffering both under enrolment and general poor performance, especially among girls. This study ought to provide an opportunity to determine the possible dynamics of balanced performance in science among boys and girls.

1.1 Statement of the problem

It has been noted that lack of enough mentors in science has lead to wrought learning of the subject, which has led to "paper gravitates" without enough practical skills.

Quite a number of science graduates are good at theoretical explanations and written work at the expense of practical aspects.

This is why it is easier to find a person being very good in written science work such as solving of questions, but poor in practical project work, which is the basis of industrialization.

It is true that both scientific design and assembly are important in industry, as each depends on another, but "assembly" supersedes "design" as it brings forth the finished product which sustains life as the ultimate goal of the scientific discovery.

Both boys and girls are therefore eligible to equal participation in science as a means to alleviate the problem of inadequate personnel in the discovery and industrialization process

1.2 Theory.

This study was based on the theory of force concept inventory (by Laura McCullough)
Which states that context can affect science performance for both men and women; particular context in language portrayal of the masculine nature/theories of science, such as the use of gender to define botanical groupings and the use of sexual metaphors in botanical reproductions discourages the female participation in discovery work in science, which both boys and girls alike should be part and parcel.

The universe, part of which life is possible, is sustained by myriads of both natural and improved scientific dynamics for sustainability, which finds lots of applications in science. A number of the natural scientific phenomenons in the world of science have had both positive and negative environmental implications, that for decades, scientists have had several attempts to explain and manipulate for man and other animals suitability.

Discoveries made by scientists, such as: Kirchoff (1859) who invented the prism spectrometer for study of radiations from hot gases and solids, plank's quantum mechanics and Einstein's photoelectric effect (1905), Hinesburg's uncertainty

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principle on wave particle duality (1927), Sir Isaac Newton, Bohr and De-Broglie on mechanics and atomic physics among others, just to mention a few; all of who were men revealing gender imbalance in the discoveries.

It is clear that scientific innovations are the basis of our lives, comfort and defenses of which science is a major contributor. This modern ICT error has been possible due to Gate's discovery of the computer. About 99% of computer inventory works have been male dominated yet women also have equal opportunity of participation

n almost all the discovery cases sighted and beyond, gender imbalance has been a major noticeable thing.

KCPE examination statistics of the past years 1990-2006, for instance, have revealed that there has been a continued drop in numbers and gender balance of boys and girls taking science at standard 8, with continued diminishing results in science

The researcher intended to investigate the extent to which gender related factors have affected performance in physics in secondary schools, with the envisage of improving the balance —with reference to Butiye primary school as a case study.

1.3 Significance of the study.

The study would benefit the following disciplines:

1. The ministry of education would be able to plan, re-assess and re — organize the curriculum in a way that s gender inclusive.

2. The teachers would create a good gender-neutral assessment tools by improving on language portrayals and particular contexts.

3. The parents ought to create gender inclusive provision tools that will create balanced performance irrespective of the learners home- based background.

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4. The students would be able to employ study methods and habits that exclude gender biases to enhance better science performance in primary schools.

1.4 Objectives.

General objectives: this study sought to determine the causes of gender imbalance in science

Specific objectives: this study specifically sought to:

1. Establish the ratio of boys to girls taking science in primary schools

2. Investigate the frequency of dropout from science by boys and girls.

Determine the level of performance in science tests and examinations of boys in relation to girls.

1.5 Statement of null hypothesis

There is no significant relationship between gender and academic performance in science by primary's school students of Butiye primary School.

1.6 Limitations

There was lack of enough funds to administer the instruments; there was also delay w completion of questionnaires forms due to the tight program in the school.

The respondents had very little time to pay attention to the questionnaires. Despite the constraints, the research was carried out, that yielded the results, which have been presented in this book.

CHAPTER TWO

2.0 Review of related literature

This chapter covers various research findings concerning the relationship between active learning and level of performance in science (with special reference to gender effect). It highlights the important contributions that have been made in this area of study in relation to gender balance in science. Many research studies have been carried out concerning factors affecting gender and level of academic performance in science; these include:

Rennie and parker (1993) looking at context in science problems says, teachers can create good gender- neutral or gender- inclusive assessment tools by looking at language portrayal of stereotypes, and particular contexts;

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situations such as mathematics and science testing can cause the minority population to do more poorly. Science classes are male dominated and may be a university were chosen and tests were introduced in a way that didn't mention gender at all.

Ivie and Stowe- (2000) says in physics, it is encouraging that about 50% of high school physics students are young women although the advanced placement courses are still more heavily populated by men. But at the college level only 22% of physics bachelors are earned by women; and the number drops to 14% at doctoral level.

Ivie, Czujko and Stowe (2001) says, the worlds' percentage of women in physics is not much better: France has one of the highest levels with 27% of science PhDs being women Asian nations are lower in ranking with China at 13% and Japan 8% of PhDs in physics going to women

Nelson and Rogers (2004) asserted that in college women make up only 11% of assistant professors, 10% of associate professors and only 5% of full professors of physics meaning that young women have few role models and female mentors available in science

Bucket.al (2002) found that male and female student taking advanced placement test show a significant tendency to do better on questions in content areas favoring their gender. Men did better on question relating to war, politics and history, while women did better on arts and literature, religion and women's issues. This theoretical feeling affect choice of science as a discipline of study by women.

Neuschatz and Mcfarlin (2003) say teachers of science also illustrate gender discrepancy at the high school level, only 29% of science teacher being women.

Dr. Nora Berrah, Professor of science western Michigan University (May 7, 2007) says any one who has niece, daughter, sister, mother or spouse would want them to succeed without roadblocks and historic gender biases in science and related fields. Although women are at a disadvantage in many of the sciences, they are particularly scarce in science making only 13% of faculty of all ranks from 760 degree-granting science departments in the United States and 7.9% of faculty of all ranks at the major research universities.

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Gender discrepancies in the discoveries of atomic science on language portrayal started many years ago; Cohn (1996) talks of how the creators of second world war spoke of giving "birth" to the bombs and the babies were of course male: Fat man and little

Boy"; the language surrounding the creation of the bombs in the discoveries of atomic science was strictly sexual and favoring the masculine lectures were filled with Discussions of "vertical erector launchers, thrust- to weight ratios, soft lay downs, deep penetrations. " (Cohn, P. 189). These gender discrepancies discouraged women participation in the discovery work.

However taking keen look at the possible reasons of gender imbalance, the researchers in the above related literatures may have had no sufficient consideration of the other intrinsic and extrinsic factors such as attitude, other environmental and home based factors that may have led to imbalanced representation in science by women, which this study sought to investigate investigated.

CHAPTER THREE

RESEARCH METHODOLOGY.

3.0 Design.

The researcher used the case study design. This method was chosen because it aimed at collecting data in details on the extent to which gender affects students' performance at Butiye primary School.

3.1 Environments:

The study was conducted at Butiye primary School in Moyale district.

The school falls in the category of mixed boarding and day schools having both boys and girls, which the researcher targets in the case study.

its location borders moyale town and the surrounding villages; thus, it draws students from both the villages and the affluent groups in the well populated cosmopolitan town which provided the researcher with the required information about home based factors affecting gender balance in science performance.

Its nearness to town made it convenient for the researcher to obtain research tools such as research questionnaires, and cheap and quick means of transport that minimized on time wastages and loss of questionnaires, in case they would be sent through postal correspondences, since the researcher delivered and collected questionnaires himself.

3.2 Subjects/ Respondents.

The target population from which the study was carried out consisted of students of Butiye primary School. The students were from all the grades in the school selected by stratified random sampling.

The stratified random sampling was used so that all student respondents, both male and female, could be equally selected from the different grades according to their class size and gender representation.

3.3 Instrument.

A researcher-devised instrument through questionnaires was utilized to collect the data.

The questionnaire contained 10 questions quantified into the following:

Strongly agree (4 pts)

Agree (3 pts)

Disagree (2 pts)

Strongly disagree (1 pt)

3.4 Data collection procedures.

A letter was sent to the head teacher by the researcher asking for permission to administer questionnaires to the students.

Research assistants were used to deliver and administer the questionnaires to the subjects of the study. The head teacher was requested to help the researcher to get to the respondent female students through the physics head of department, while the career master got hold of the male students.

The research assistants I explained the purpose of the research and distributed the questionnaires to the respondents. In order to give enough time to the respondents to work on the questionnaires, the questionnaires were left with the respondents and collected two days later.

CHAPTER FOUR

4.0 Statistical treatment of data.

Data analysis was done by both quantitative and qualitative techniques. The quantitative technique showed the number of respondents, mean score and percentages. The qualitative technique was in the form of providing unquantifiable information from all the respondents.

4.1 Data analysis

4.2 Demographic information about target population

Table 1: The target population comprised of both boys and girls whose demographic distribution was as shown in the table below;

Class	5	6	7	8	Totals
Boys	35	58	68	40	201
Girls	40	40	61	33	174
Totals	75	98	129	73	375

The target population comprised of 375 students, 201 of whom where boys and 174 being girls. Sample size was determined from across the grades, based on the ratio of % of the population of both boys and girls.

4.3 Graphical analysis of target population

The demographic information of the target population was represented in a bar graph as shown below:

Figure 1: Demographic graph
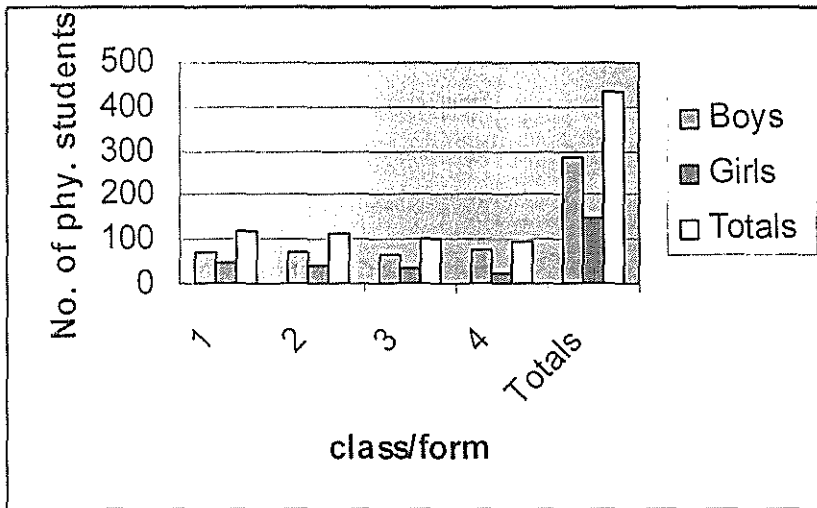
More boys than girls took science in the school with the least enrolment in form four. The number of girls and boys taking pupil at standard 5 and 6 are quite close, but the gap widens from standard 7 to class 8 as more girls than boys drop science

Table 2: Results on questions administered and returned by classs 5 and 6

QUESTION NO.	CLASS	SAMPLE SIZE	Strongly Agree (4)	Agree(3)	Disagree(2)	Strongly Disagree	Score Pts	% Score
1	1	30	20	6	3	1	105	88
	2	28	16	8	2	2	94	84
2	1	30	0	2	6	22	40	33
	2	28	1	2	8	17	43	38
3	1	30	17	9	2	2	101	84
	2	28	15	5	5	3	88	79
4	1	30	16	10	4	0	102	85
	2	28	14	12	1	1	95	85
5	1	30	19	7	2	2	103	86
	2	28	20	3	2	3	56	50
6	1	30	1	2	6	21	43	36
	2	28	0	1	9	18	39	35
7	1	30	13	6	5	6	86	72
	2	28	11	6	7	4	80	71
8	1	30	21	6	2	1	107	89
l	2	28	18	9 /	1	0	101	90
9	1	30	14	7	6	3	92	77
	2	28	11	9	4	4	83	74
10	1	30	7	8	6	9	73	61
	2	28	6	8	8	6	70	63

Table 3: Results on questions administered and returned by class 7 and 8

QUESTION NO.	Class	SAMPLE SIZE	Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree.	Score Pts	% Score
1	3	25	11	8	5	1	79	78
	4	24	9	12	3	0	78	81
2	3	25	1	4	13	7	46	46
	4	24	1	5	10	8	47	49
3	3	25	12	9	3	1	82	82
	4	24	8	14	2	1	79	82
4	3	25	6	16	3	0	78	78
	4	24	10	11	3	0	79	82
5	3	25	15	6	4	0	86	86
	4	24	19	4	1	0	90	94
6	3	25	0	1	12	12	39	39
	4	24	0	3	15	7	46	48
7	3	25	10	1	3	11	60	60
	4	24	9	2	10	3	65	68
8	3	25	14	6	3	2	82	82
	4	24	16	4	3	1	83	86
9	3	25	8	9	5	3	72	72
	4	24	6	11	6	1	70	73
10	3	25	5	7	8	5	62	62
	4	24	8	5	9	3	68	71

4.6. Summary of tables of results on questionnaires

Selected respondents from all the grades disagreed with the statement that more girls than boys take science at class 7 and 8. This is shown by the low % scores of 33%, 38%, 46% and 49% registered for the same questionnaire 2 by class 5,6, 7, and 8 respectively.

There was also general disagreement with questionnaire statement number 6 that more girls than boys attend science lessons frequently as shown by the very low % scores of 36%, 35%, 39% and 48% by class 5,6, 7 and 8 respectively, which meant that a number of girls boycott certain science lessons when most boys attend the lessons.

Most respondents agreed that number of students taking science in standard 7 and 8 are less than half those taking it at standard 7 and 8, meaning that quite a number of pupils especially girls drop science at the end of standard 7.

Most respondents agreed that science is the subject of mathematicians, meaning that students with good mathematics ability can manage science so easily. Majority of students agreed that students whose parents did well in science also perform well in science.

Table 4: Level of academic performance from Six KCPE results

Entry		GRADE												Score	Mean	% Score
		A		B+	B	B-	C+	C	C-	D+	D	D-	E			
		12		10	9	8	7	6	5	4	3	2	1			
B	52	0		2	6	15	21	6	0	2	0	0	0	396	7.62	64
G	29	0		1	0	2	10	6	0	3	2	3	2	158	5.45	45
B	51	1		7	2	7	13	11	4	0	3	3	0	345	6.76	56
G	23	0		0	0	3	6	4	1	5	2	1	1	124	5.39	45
B	38	0		1	8	10	7	1	0	2	4	1	1	273	7.18	60
G	28	0		0	1	2	6	5	4	2	5	1	0	164	5.86	49
B	53	2		1	7	3	10	16	9	1	0	3	0	353	6.66	56
G	15	1		2	2	1	0	1	1	1	2	4	0	94	6.27	52
B	50	3		0	5	19	8	5	6	0	1	2	0	367	7.34	61
G	07	1		0	2	1	0	0	0	1	1	1	0	47	6.71	56
B	42	1		2	8	7	12	3	1	0	2	1	1	320	7.62	64
G	11	1		3	0	2	1	0	1	0	1	2	0	77	7.00	58

Key: B - Boys, G- Girls

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Percentage pass was calculated from the formula mean score/12%

Entry records in science for 6 years back from 2006 shows that the number of girls have remained too low with the least number registered in 2005. Only 5 girls have been able to score grades A- and A against 17 boys over the 6 years period.

More girls than boys in KCPE examinations have scored poor grades of D- and E

There was general poor performance by girls across the years in national exams in science, as is depicted by low percentage passes especially in 2001, 2002 and 2003, while performance by boys have always remained reasonably high.

4.8 Graphical analysis of performance

Figure 2: The data above was translated graphically
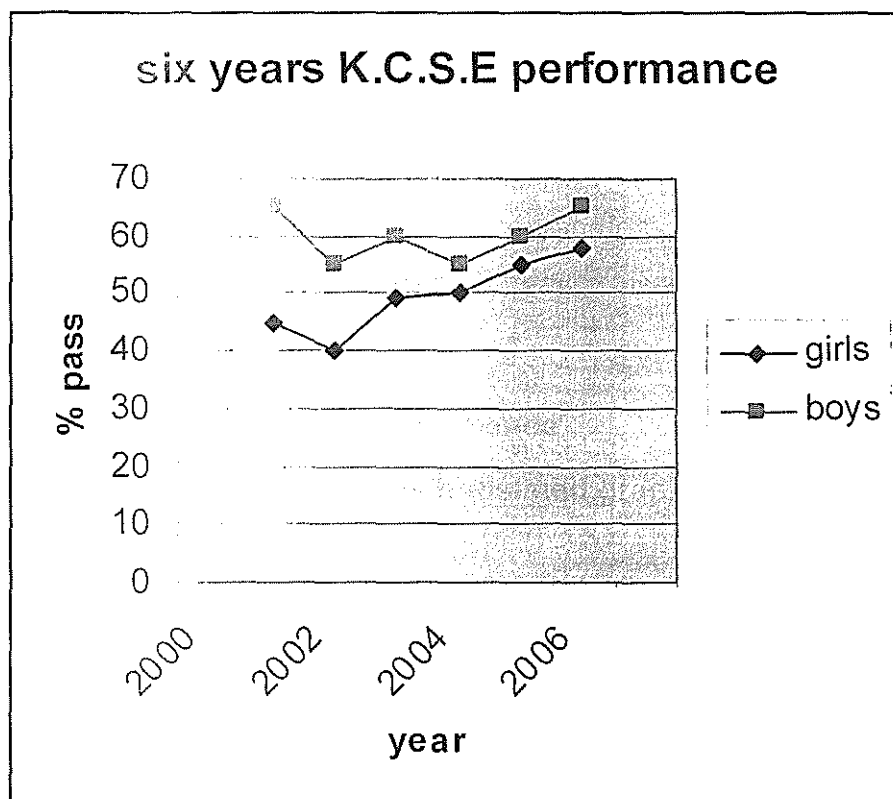
Performance of girls maintained a general low trend as opposed to that of boys which even though was fluctuating but was higher than that of girls

CHAPTER FIVE

5.0 Conclusion

The conclusion in this research work was based on quantitative and qualitative outcome of the actual data analysis.

The quantifiable analysis based on demographical data shows that more boys than girls take science at standard 5 and 6, with significant drop in number of girls taking science at standard 7 and 8;

More girls drop science after standard 7 than do the boys.

Boys performed better than girls in science.

The un-quantifiable analysis indicates that boys have more science mentors than girls and are thus better performers in science; there is also general poor attitude towards science by girls, who feel that science is best meant for boys more than girls.

5.1 Recommendations

(i)   There is need for school head — teachers to include gender — based assessment tools to eliminate the discrepancies.

(ii)   The educators ought to include gender sensitive instruments that excludes the imbalanced gender representation experienced in science

(iii)   The community needs to play gender-neutral role in advising and enhancing science learning in both boys and girls.

(iv)   The learners ought to have equal academic inspirations that are gender exclusive so that they perceive science as a subject-for-all, and not for a few.

(v)   Future researchers ought to include more advanced gender assessment tools for proper investigative, awareness and corrective measures in order to demystify gender based perception and representation, leading to poor performance in science.

Definition of terms *and* abbreviations.

For the purpose of this study, the following terms were defined operationally.

Academic performance; Referred to how well or bad one did in a subject in terms of grades scored eg. B+ and above was very good performance; C+ -B was good performance, D+-C were average grades, while E — D were poor grades.

Gender; Referred to male and female differences, characteristic of imbalance in academic strengths in schools and higher institutions of learning

Physics; Referred to one of the science subjects taught in secondary schools and higher institutions of learning that deals with matter in relation to energy of which the physical world is composed.

Abbreviations
K.C.P.E. Kenya Certificate of Secondary education

US. United States

WMU Women Mission Union

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APPENDENCES

APPENDIX A

QUESTIONNAIRES.

Dear Respondents.

This research is designed to investigate the effect of gender on academic performance of primary school pupils in science. This study is purely academic and you are requested to be honest in filling the questionnaires to ensure validity of the research work. Your responses will be treated with great confidentiality. Kindly answer all questions by ticking where appropriate Do not write your name on the questionnaire.

Class: standard *5* o 6 o 7 and *8*

:atement	Strongly agree *(4* pts)	Agree (3 pts)	Disagree (2 pts)	Strongly disagree *(1* pt)
here is balance in number of boys and girls king science.				
ore girls than boys take science orm 3 and 4				
ll students take science in standard and 8				
he number of students taking I science at tandard 7 and 8 are less ian halt of those taking it in standard 5 and 6				
The number of students who take science at CPE at standard 8 is only half those who pted for it at standard 7				
More girls than boys attend science lessons				
Science is the subject of mathematicians.				
Boys and girls are equal in performance in science at standard 5 and 6	(			
science topics are easy to understand				
pupils whose parents excelled in sciences performs well in science				

APPENDIX B

MAP OF RESEARCH ENVIRONMENT

A map of research environment was used to show location and nature of the research environment