STUDENTS PERCEPTION TOWARDS BIOLOGY AND INFLUENCE ON THE SUBJECT PERFORMANCE IN MOYALE BOYS SECONDARY SCHOOL MOYALE DISTRICT, KENYA.

BY

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A RESEARCH REPORT SUBMITTED TO THE INSTITUTE OF OPEN *AND DISTANCE LEARNING IN PARTIAL FULFILLMENT* OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE IN BACHELOR OF EDUCATION IN SCIENCE OF KAMPALA INTERNATIONAL UNIVERSITY

NOVEMBER, 2009

DECLARATION

I, **Boru Kupi Wario,** declare that this research project is my original work and has never been submitted for any academic award. Where the works of others have been cited acknowledgment has been made.

Signature.............................
Boru Kupi Wario

Date.............................

APPROVAL

I certify that the work submitted by this candidate was under my supervision. His work is ready for submission, to be evaluated for the award of a Bachelor of Education (Science)of Kampala International University.

Supervisor..........................

Ssekajugo Derrick

Date........26/08/09.........

DEDICATION

I dedicate this research project to my loving wife Qabale Gufu and dear parents Kea and Tume. The inspiration, vigour and enthusiasm came from them although weakness and flows are mine.

ACKNOWLEDGEMENT

I acknowledge my Supervisor for his continued support while I was writing this research project. I also acknowledge my colleagues at KIU who have supported me through out the course.

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ABSTRACT

The study was intended to determine the causes of students' perception towards the learning of biology and how it impacts on their performance. The study used both qualitative and quantitative research design. This enabled the researcher to obtain a better understanding of how student's perception of biology impacts on their performance.

Questionnaires and interview guides were used in the collection of data.

One of the main outcomes of the study is the confirmation it has provided that students perform well in biology at the secondary level. This study also aimed at determining the *challenges encountered by teachers when instructing biology. It was recommended in the* study that there was need for; using student-centered teaching approaches,using meaningful activities in their classrooms, and promoting conceptual understanding in *sciences* .

CHAPTER ONE;
INTRODUCTION

1.1 Back ground to the Study

Education from whatever perspective is viewed is aimed at preparing one for life and since it is supposed to prepare one for a better living, one must be certain on what he/she can achieve through it and from what discipline he/she can attain it. Scholars, according to Nwosu (1992) sometimes define psychology as the science of human behavior aimed at offering us organized, observable and reliable knowledge about how people think and behave, as well as why they behave in a particular way. And since the teaching-learning process also concern itself with the promotion of desirable behavior, education must draw some of its principle from psychology.

This entails having a good grasp of all theories that influence the teaching-learning process. Attitudes associated with science appear to affect students' participation in science as a subject and impact performance in science (Linn, 1992). An international assessment of nine-, and thirteen-year old students in twenty countries as reported by the International Assessment of Educational Progress (1992) revealed that positive attitudes toward science influence students' performance and consequently, enrolment. Further research examining psychological effects found that a student's self-concept of his ability to perform in science positively correlated with achievement (Oliver and Simpson, 1988).

Anxiety can be generated on the part of the educator if he is not certain of the prospect of his line of thought. It is therefore a key factor in any endeavour because it affects one's ability to endure, concentrate and perceive. It has been observed that many students biology and such fear is characterized by mass disenchantment among the students towards the subject. The end product is declining popularity of the subject over the years. According to Keeves and Morgenstern, (1992), students' perception towards the learning of chemistry makes them to lose interest in the sciences.

1.2 Statement of the Problem

Biology occupies a central position amongst the science subjects. It is a core subject for the medical sciences, textile technology agricultural science, synthetic Industry, printing technology, pharmacy, chemical engineering, to mention just a few. As important as the subject is and in spite of the effort of both the federal and state governments to encourage chemistry education, students still shun the subject (Jegede, 2003). In spite of the age long fear and its effects on the subject, researchers had done little or nothing on the basic psychological factors that could generate such anxiety.

1.3 Purpose of the Study

The main objective of the study was to find out the causes of students' perception towards the learning of biology and how it impacts on their performance.

1.4Objectives of the Study

1 Investigate the students perception towards learning and its impact on students performance.

2 Examine the challenges encountered by teachers in teaching biology.

2 Examine possible solutions to the challenges encountered by teachers teaching biology.

1.5 Research Questions

The research will seek to answer the following research questions:

1. What is the student's perception towards learning and its impact on student's performance?
2. What challenges are encountered by teachers in teaching biology?
3. What are the possible solutions to the challenges encountered by teachers teaching biology?

1.6 Scope of the Study

The scope of the study was conducted in Moyale Boys Secondary School, Moyale district, Kenya.

1.7 Significance of the study

The study will be significant to the Ministry of Education as it will help in evaluating how students perception of biology impact on their performance.

Schools will benefit from the research as they will be able to combat the challenges faced by teachers and pupils when teaching and studying biology.

The study will benefit other researchers who wish to carry out research on student's perception by providing insight.

CHAPTER TWO

LITRATURE REVIEW

2.0 Students perception towards biology and impact on performance

In the past fifteen years, there has been a momentous change in what we know about teaching and learning in the introductory calculus-based biology course. Beginning about 1980, research began to show that the traditional class leaves most students confused about the basic concepts of biology. Subsequent work extended those observations to other areas including students perception towards biology and how it impacts on performance. In studying student understanding of the basic concepts of biology, much has been revealed about what students know and how they learn. The crucial element is that students are not "blank slates." Their experience of the world (and of school) leads them to develop many concepts of their own about how the world functions. These concepts are often not easily matched with those that are being taught in biology courses, and students' previous conceptions may make it difficult for them to build the conclusions the teacher desires. However, it has been demonstrated that if this situation is taken into account, it is often possible to provide activities that induce most of the students to develop a good functional understanding of many of the basic concepts.

Success in finding ways to teach concepts is an excellent start (even though the successful methods are not yet widespread), but it does not solve all of our teaching problems with biology. We want our students to develop a robust knowledge structure, a complex of mutually supporting skills and attitudes, not just a patchwork of ideas (even if correct). We want them to develop a strong understanding of what science is and how to do it. We want them to develop the skills and confidence needed to do science themselves.

It is not only biology concepts that a student brings into the biology classroom. Each student, based on his or her own experiences, brings to the class a set of attitudes, beliefs, and assumptions about what sorts of things they will learn what skills will be required, and what they will be expected to do. In addition, their view of the nature of scientific information affects how they interpret what they hear. We focus on what we might call students' *cognitive expectations* - expectations about their understanding of the process of learning biology and the structure of biology knowledge rather than about the content of biology itself.

2.1 Challenges encountered by biology teachers on biology instruction

Our model of learning is a growth model rather than a knowledge-transfer model. It concentrates on what happens in the student, rather than what the teacher is doing. We therefore have chosen to focus our study on cognitive attitudes that have an effect on what it is students choose to do, such as whether they expect biology to be coherent or a loose collection of facts. Other issues, such as students' motivation, preferences, feelings about science and/or scientists, etc. are important but has been probed extensively elsewhere.

Although we don't often articulate them, most biology instructors have expectation-related goals for their students. In our secondary schools biology course for students and other scientists, it to get students to make connections, understand the limitations and conditions on the applicability of equations, build their physical intuition, bring their personal experience to bear on their problem solving, and see connections between classroom biology and the real world. We refer to this kind of learning goal a goal not listed in the course's syllabus or the textbook's table of contents as part of the course's "hidden curriculum." We are frustrated by the tendency many students have to seek "efficiency" to achieve a satisfactory grade with the least possible effort often with a severe unnoticed penalty on how much they learn. They may spend a large amount of time memorizing long lists of uninterrupted facts or performing algorithmic solutions to large numbers of problems without giving them any thought or trying to make sense of them. Although some students consider this efficient, it is only efficient in the short term. The knowledge thus gained is superficial, situation dependent, and quickly forgotten. The survey is one attempt to cast light on the hidden curriculum and on how student expectations are affected by instruction.

There are a number of studies of student expectations in science in the pre-college classroom that show that student attitudes towards their classroom activities and their beliefs about the nature of science and knowledge affect their learning. Studies by Carey, Linn, and others have demonstrated that many pre-college students have misconceptions both about science and about what they should be doing in a science class. Other studies at the pre-college level indicate some of the critical items that make up the relevant elements of a student's system of expectations and beliefs. For example, Songer and Linn studied students in middle schools and found that they could already categorize students as having beliefs about science that were either *dynamic* (science is understandable, interpretive, and integrated) or *static* (science knowledge is memorization-intensive, fixed, and not relevant to their everyday lives). Alan

Schoenfeld (1981); has described some very nice studies of the assumptions high schools students make about learning biology. He concludes that "Student's beliefs shape their behavior in ways that have extraordinarily powerful (and often negative) consequences."

Two important large scale studies that concern the general cognitive expectations of adult learners are those of Perry and Belenky et al (1999). (BGCT) Perry tracked the attitudes of Harvard and Radcliffe students throughout their college career. Belenky et al. tracked the views of women in a variety of social and economic circumstances. Both studies found evolution in the expectations of their subjects, especially in their attitudes about knowledge. Both studies frequently found their young adult subjects starting in a "binary" or "received knowledge" stage in which they expected everything to be true or false, good or evil, etc., and in which they expected to learn "the truth" from authorities. Both studies observed their subjects moving through a "relativist" or "subjective" stage (nothing is true or good, every view has equal value) to a "consciously constructivist" stage. In this last, most sophisticated stage, the subjects accepted that nothing can be perfectly known, and accepted their own personal role in deciding what views were most likely to be productive and useful for them.

Although these studies both focused on areas other than science, most professional scientists who teach at both the undergraduate and graduate levels will recognize a binary stage, in which students just want to be told the "right" answers, and a constructivist stage in which the student takes charge of building his or her own understanding. Consciously constructivist students carry out their own evaluation of an approach, equation, or result, and understand both the conditions of validity and the relation to fundamental physical principles. Students who want to become creative scientists will have to move from the binary to the constructivist stage.

An excellent introduction to the cognitive issues involved is given by Reif and Larkin (1997); who compare the spontaneous cognitive activities that occur naturally in everyday life with those required for learning science. They pinpoint differences and show how application of everyday cognitive expectations in a science class causes difficulties. Another excellent introduction to the cognitive literature on the difference between everyday and in-school cognitive expectations is the paper by Brown, Collins, and Duguid, (1979); who stress the artificiality of much typical school activity and discuss the value of cognitive apprenticeships.

All the above-cited works stress the importance of expectations in how teens and young adults make sense of their world and their learning. If inappropriate expectations play a role in the difficulties our students commonly have with introductory calculus-based physics, we need to find a way to track and document them.

International comparisons put national situations, contexts and educational choices in a wider perspective – a perspective from which one may better be able to see one's own situation and priorities with new eyes and with a more open mind for alternatives. In this way, the comparisons may open up the potential for greater variety and for possible inspiration from outside. But international comparisons may also have the opposite effect. They may – often indirectly or unintentionally – have the effect of restricting choices and of providing a pressure to harmonize science teaching towards universal standards for content as well as teaching methods and assessment. This kind of criticism may be raised against the large-scale studies by IEA (International Association for the Evaluation of Educational Achievement.) The most recent IEA-study is TIMSS (Third International Mathematics and Science Study, reported in for instance TIMSS (1996, 1997 and 1998)). Such studies do, of course, also provide a wealth of information that may be used for critical reflection.

In this regard student's perception towards biology and how it enhances performance has to be reviewed.

Smaller and less ambitious comparative studies may supplement the large-scale studies. Such studies may provide other sorts of information that may give clues and ideas for the improvement of science education. This report will present some results from a study of this kind, the SAS-study – "Science And Scientists".

Science curricula and textbooks in different countries have striking similarities. Science teachers from very different backgrounds easily feel at home when they open textbooks from other countries in the world, in rich as well as poor countries, in the West as well as in the East. Even when the letters or the script is unknown, like in Russian, Japanese, Chinese or Thai, science educators can often recognize the contents, examples and the organization of the material presented.

This similarity may be interpreted in different ways. Some people take this to be an indication of the universality of science; for them it demonstrates that science in independent of culture, or even "culture-free". Others will interpret the observed similarities in a different way. They will argue that this demonstrates that science curricula reflect a western domination of the contents of education across the world. They will say that western science curricula are exported and imposed on pupils in other countries. They will argue that the observed similarity and homogeneity demonstrates a kind of educational and cultural imperialism.

The issue of the possible universality and culture-independence of science as an *academic* discipline per se is an important philosophical debate, and the views differ. However, there seems to be a much greater consensus in the debate about *school* science. Regardless of philosophical positions, most educators would agree that school science cannot be "deduced" from the science in research and universities (whether this is labelled "western", "modern", "academic" or "real" science). Among educators there is broad agreement that each society has to construct their own science curricula to fit their own needs and their own purposes for schooling. Academic science is only one of the possible inputs in this process of selection and construction.

There is also broad agreement that all teaching should "build on" the *interests* and *experiences* of the child. In particular, everybody who subscribes to (some version of) educational constructivism will take such a stance for granted. For the educational contents to be meaningful for the learner, it must have some sort of relevance, and it must fit into the personal or societal context of the child.

Children's ideas about the nature of science, the personalities of scientists and the purpose and meaning of their activities may have different sources. They may emerge from the media and out-of-school influence, or they may arise from their encounter with school science and the science teachers. Some ideas may arise from their own culture and its prevailing world-views, ideologies, religious or other sorts of beliefs. These factors are of a more affective nature; they are related to feelings, ideals and values. They may influence the pupil's eagerness, motivation or interest to learn science. Maybe they are even more important than the "pure" cognitive factors.

Considerations like these are part of the rationale behind the study that is presented here. Debates over curricular contents and of curriculum emphasis (Roberts 1988) are important. However, they often take place on a general or theoretical level, based on generalisations and assumptions about different cultures. The discussion may be facilitated if one could refer to more concrete data and evidence. This is the basis for our research.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

The study used both qualitative and quantitative research design. This enabled the researcher to obtain a better understanding of how student's perception of biology impacts on their performance. The collection of comprehensive intensive data provided an in-depth study of how the Education Ministry, school administration and students.

3.2 Research Population

The populations to the study were students and teachers from Moyale Boys Secondary School, Moyale district, Kenya.

3.2.1 Sampling and Sampling Procedure

With regard to the above, the study employed stratified sampling,

Sampling as follows: -

Students – 40 of the sample suffice.

Teachers - 5 in the sample suffice.

3.3 Research Instruments

- **Questionnaire**

Primary data was collected by use of questionnaire, these will give a clear picture of the effects of post election violence and how it impacted on student's performance.

They were designed in both open and closed ended form.This method aimed at ensuring high proportion of responses and higher returns rate.

3.4 Research Procedure

The researcher had an introductory letter from the University and presented it to the area authority to obtain permission for the study. This gave the directive to the local administrators at grass root level for acceptance. After acceptance by the authorities the major task of collecting data will begin immediately.

3.5 Data Analysis

The information collected was analyzed and edited to create consistency and completeness. Questionnaires were edited for completeness and consistency across the respondents and to locate omissions. Information obtained from the research study was presented and analyzed using tables.

3.6 Limitation of the Study

In conducting this study, a number of challenges may be encountered, including:

Attitudes Towards the Exercise – Some respondents were unwilling to freely share the information (especially negative information). This was mainly true at the local level because of fear of not knowing whether the information could go to their superiors with repercussions.

Nevertheless, the researcher will try and overcome these limitations and collect sufficient and representative data to reach the conclusions made.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

In this chapter an attempt is made to interpret and explain the findings. Also key information enables to relate to the specific objectives and give a clear picture of the results.

4.1.1 Data Analysis and Processing

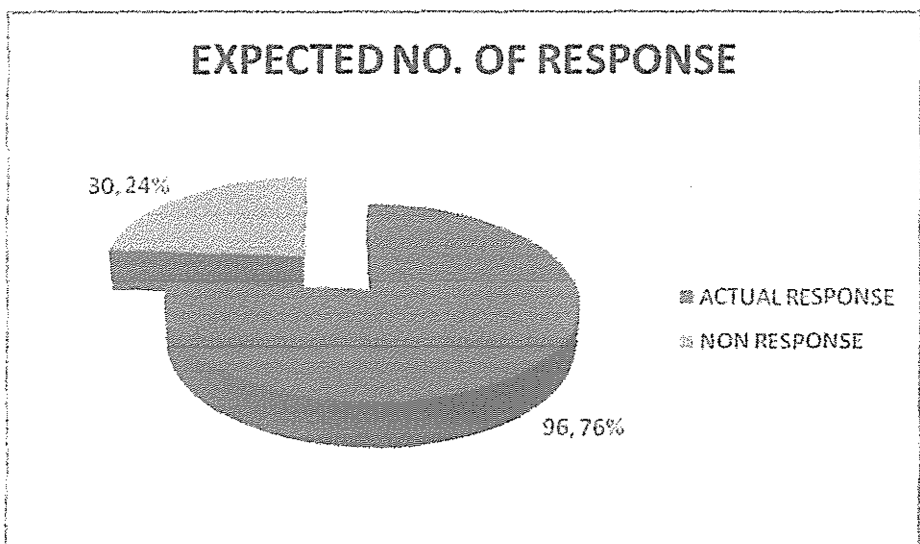
Chart 1 on response rate of the targeted sample

Source; primary data (2008)

Response Rate = <u>Actual response ×100</u>

Planned No of response

35/45 x 100 = 77 %



Source: primary data (2009)

From the above graph the expected number of respondents was 45 from the school. However 35 respondents representing 77% responded this was considered an adequate size of the sample suffice and the researcher continued and carried out the research.

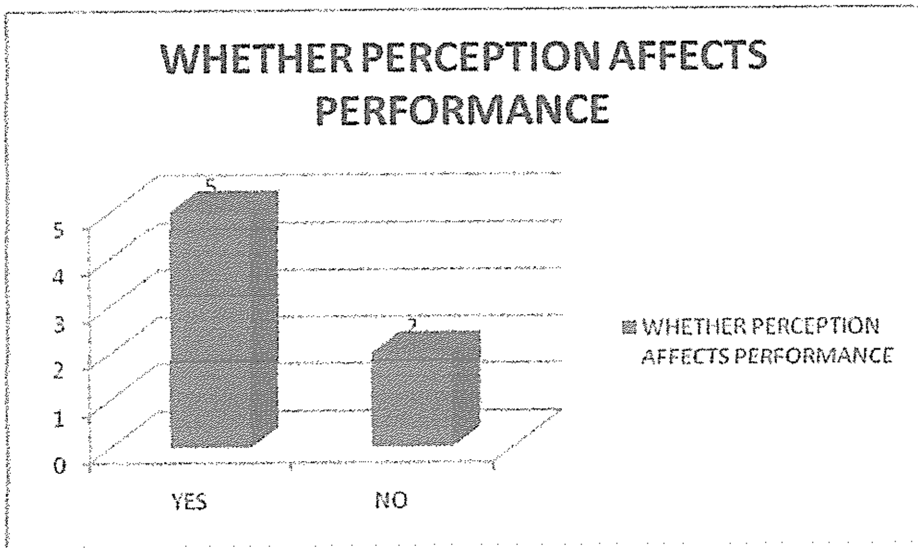
RESPONDENTS ANALYSIS

4.2 Research question one on what is the impact of students' perception on performance in biology.

4.2.1 Teachers response

Majority of response represented by 86 percent indicated that most students are affected by the teacher's qualifications, while 14 percent indicated that students are not affected by the teacher's quality.

Response as to whether students perception on biology affect performance

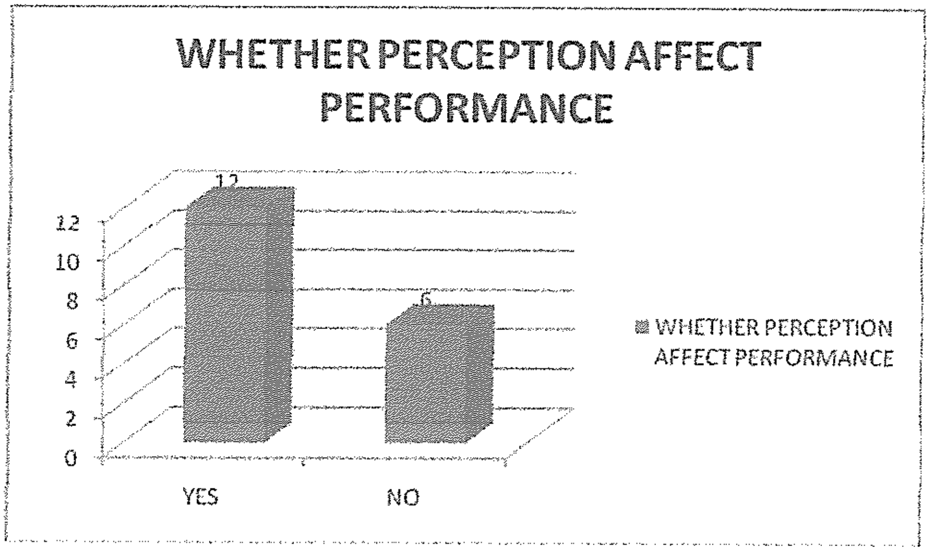


Source: primary data (2009)

4.2.2 Students response

Majority of the students response represented by 67 percent indicated that they were affected by biology perception, while 33 percent indicated that they were not affected by biology perception.

Response on whether teaching methods affect students' performance in biology



Source: primary data (2009)

4.3 research question two on whether any challenges faced by teachers teaching biology

4.3.1 Teachers response

57% of the respondents said that there were challenges faced by biology teachers the cited were students' perception, lack of interest, failure to understand biological concept. 43% of the respondents said that the teaching biology was not encountered by any challenges.

TABLE 4 on how whether biology teachers are faced by any challenges?

RESPONSE	FREQUENCY	PERCENTAGE
YES	4	57
NO	3	43
Total	7	**100**

Source: primary data (2009)

4.3.2 Students response

Out of the 18 respondents 56 percent of the students said that the teaching methods were not effective to change their perception of biology subjects while, 44percent said that the teaching methods were very effective and played a vital role in changing their perception towards biology.

TABLE 5 Responses to whether students had any challenges in learning biology.

RESPONSE	FREQUENCY	PERCENTAGE
Yes	10	56
No	8	44
Total	**18**	**100**

Source; primary data (2009)

56% of the respondents said that they had challenges in learning biology while 44% said that they had no challenges in learning biology.

4.4 Research questions three on whether challenges can be overcome.

4.4.1 Teachers response

Out of 7 respondents 60 percent said that biology challenges can be overcome, while 40 percent said the challenges cannot be overcome.

8 RESPONSE	FREQUENCY	PERCENTAGE
Yes	4	57
No	3	43
Total	7	**100**

Source: primary data (2009)

4.4.2 Students response

Majority of response represented by 76 percent indicated that most students see biology challenges can be overcome. While 24 percent indicated that they could not be overcome.

TABLE 7 responses on whether biology challenges can be overcome

RESPONSE	FREQUENCY	PERCENTAGE
YES	6	86
NO	1	14
Total	7	**100**

Source: primary data (2009)

86% percent of the respondents said that it was possible to overcome challenges

CHAPTER FIVE

5.0 DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter an attempt is made to discuss the findings and come up with conclusions and the recommendations there to.

5.2 Discussion and conclusions

The research findings were in line with those of Alan Schoenfeld (1981); who has described some very nice studies of the assumptions high schools students make about learning biology. He concludes that "Student's beliefs shape their behavior in ways that have extraordinarily powerful (and often negative) consequences. The students were seen to be affected by the beliefs about biology and therefore perception shaped their performance in biology.

The research findings agreed with those carried out by (Carey 1991), (Linn 1997) where they showed that students expectations did affect their perception towards biology. Studies of student expectations in science in the pre-college classroom that show that student attitudes towards their classroom activities and their beliefs about the nature of science and knowledge affect their learning. Studies by Carey, Linn, and others have demonstrated that many pre-college students have misconceptions both about science and about what they should be doing in a science class. Other studies at the pre-college level indicate some of the critical items that make up the relevant elements of a student's system of expectations and beliefs.

The research finding were also in agreement with Songer (1998) and Linn (1997) that have students have beliefs about science that were either *dynamic* (science is understandable, interpretive, and integrated) or *static* (science knowledge is memorization-intensive, fixed, and not relevant to their everyday lives)

One of the main outcomes of the study is the confirmation it has provided that students perform well in biology at the secondary level. The findings of boys perform well in biology at secondary level agree with those of Githua and Mwangi (2003) in Kenya, Afrassa (2002) in Ethiopia and other parts of Africa (Kogolla,Kisaka,& Waititu,2004) similar findings were also reported in other studies (Koller,Baumert,& Schnabel,2001).These findings, however, contradict those of Hanna(2003),Boaler (1997) and Vale,Forgasz,& Horne(2004).That students perception towards biology impacts negatively on their performance. The research finding found out that those students with negative perception towards biology performed poorly while those with a positive perception performed better.

This study also aimed at determining the challenges encountered by teachers when instructing biology. One of the findings of the present study relates to the method of teaching normally employed in the biology classrooms at secondary level in Kenya. The method was teacher-centered, and student's were passive and on the receiving end. This phenomenon reflected the lessons described by nunes and Bryant (Nunes&Bryant,1997),and the descriptions of secondary classes in Mauritius(Griffiths,1998,2000,2002).
It seems that insufficient opportunities are provided to be involved in their own learning, and emphasizes the procedures used for solving biology problems. It seems that the examination-driven curriculum in Kenya leads to a more teacher-centered curriculum.

Teachers were to be playing a fundamental role in influencing students learning of biology, as noted by Hanna&Nyhof-young (1995).They also helped student's to develop a positive attitude towards biology and motivate them towards the subject. The respect student's have for their teachers could be noted during the classroom observations and interviews. This supports the finding of Aldridge, Fraser and huang (Aldridge, Fraser, &Huang, 1999) concerning the respect student's had for their teacher in Taiwan.

It was also found that teachers were seen to be strict, and that student's appreciated the strictness, claiming that this helped them to have a disciplined class in which to learn biology. Evidence of this can be found in the transcripts of student's interviews.

Teachers were found to be acting as role models, were possessing sound leadership skills and were of helpful nature. However, there were teachers who had a gender bias in their own perception. As described by Elwood (Elwood, 1999), they tended to describe male students are talent in biology student's as being uncertain and not possessing enough faith in their own ability.
These findings were common for average and low performing biology students-findings which are in agreement with those of Tiedemann (2000). Cases where negative massages were sent to boys about their performance in biology by teachers were noted in the present study also.

Interestingly, parental interest and involvement in their children education is high in Kenya. The contributions of parents towards the children learning in biology as discussed. It was found that students are conscious of their parental aspirations and this plays an important role in their motivation towards education. It should also be noted that parents support towards education in Kenya is no longer gender-biased now-as it used to be. Parents believe in the power of education and the success of their children depends to a great extent on their educational; success. However, the way of attributing success and failure in biology to boys is still followed by the pattern as described by Raty et al. (2002) where the success of boys is attributed to talent.

Peers were found to be influential in a child's learning of sciences and, in some cases, in decisions to proceed further with other courses and the learning of sciences in general. This agrees to the findings of Opdenakker&Van Damme (2001), Sam&Ernest (1999) and Hoxby (2002).

Peer influence is not restricted to the classroom only or to school mates, but from a much larger group through private tuition. The practice of private tuition allows student's of different regions, colleges, cultures and social classes to be together and consequently to form a larger peer group. This study was restricted to the peer influence within the classroom towards the teaching and learning of mathematics.

A correlation coefficient of 0.336 between attitude towards mathematics and performance in the science test was noted in this study. However no gender difference in attitude towards science was observed. A positive attitude towards sciences and interest in the subject tends to motivate students into putting more effort into the subject, and consequently enhanced their science.

Achievements, concerning success or failure in science, it was found that students attributed success primarily to efforts-evidence coming from the transcripts of students interviews as discussed. These findings agreed with the findings of Mooney and Thornton (1999) but no apparent gender differences were noted – contracting the outcomes reports by Ernest (1994) and leder, forgasz and swolar (1996).it can be deduced that Kenya boys are different to Australian and English boys in this respect.

Prior ability in biology was found to play an important in the mathematics achievements of students as claimed by O'Connor and Miranda (2002).This is so because of the hierarchical nature of the subject-science concepts build on prior ones. This finding proved to be important as the way science is being taught at upper and lower secondary levels should be taken into account. There are cases of schools in Kenya where inexperienced teachers are being sent to lower secondary classes and the more qualified and experienced ones deal only with upper classes. The science concepts have to be learnt properly right from lower classes to ensure a solid base for the students to assist them in their learning of science subjects at each successive level.

A summary of these factors that impact on the science subjects performance of boys and girls in Kenya as identified through the present study.

Another factor, language, was found to also play a major role in the teaching and learning of sciences. It was revealed in this study that students were having problems tackling word problems or problems related to application to real life situations. Similar outcomes were highlighted in a study conducted by zevenbergen (2001).indeed, there is considerable debate related to the issue of language and education in Kenya

5.3 Recommendations

Implications of the Findings for Research and Theory

The most direct impact of this study will hopefully be in the classroom and will help teachers to use the findings, in particular;

1. using student-centered teaching approaches
2. using meaningful activities in their classrooms
3. promoting conceptual understanding in sciences
4. emphasizing process rather than product during problem-solving sessions
5. Promoting collaborative learning in science classes.
6. Helping students to develop a positive attitude towards sciences.
7. Motivating students in their learning of sciences.
8. Enhancing the science achievement of all students.
9. Promoting equity in education.

Teachers will have evidence on how different strategies can be incorporated with success into their regular classroom transactions and within their schedule of work. One teacher, who was a respondent of the study, stated that using cooperative learning and pupil-centered methods would be very time consuming and that teachers would face difficulties in completing syllabus As argued in the previous chapters, one of the main worries of teachers and parents is that syllabus should be thoughly completed. All that is required is readjustment.

5.4 Suggestions for Further Research

Due to funding and logistic limitations, this project was conducted as a pilot study that utilized a small sample size, relatively short time duration, and a convenience sampling technique. It is suggested that a follow-up study should be carried out over a longer time span (about 15 weeks of instruction), and that the study should use a much larger sample size, and if possible, adopt randomization procedures in sample composition. A sufficiently large sample would make it possible to include a sizeable number of male and female participants in the study such that more hypotheses could be built into the research design. For example, it would be interesting to investigate both the possible effect of gender on science performance, and a possible interaction effect between treatment (curriculum type) and gender.

Further studies on gender and sciences at secondary level should be conducted in relation to single sex and co-educational schools. An investigation of the attitudes towards sciences and the performance of boys and girls in single sex schools, as compared to those in co-education schools, could prove to be important.

This study has just touched upon relationship between culture and performance in sciences. Kenya is a multicultural country with a blend of different cultures and an in-depth study wherein the issue of gender and science in relation to ethnicity would be valued

REFERENCES

Abagi, O. 1999, Education for the Next Millennium in P. Kimuyu, M. Wagacha and O. Abagi (eds.) *Kenya's Strategic Policies for the 21st. Century*: Macro and Sectoral Choices, Nairobi, Institute of Policy Analysis & Research, 1999.

Abagi, O. et al. 1993 Household Factors as Determinants of School Participation of Girls in Kenya: The Case of Nairobi and Siaya District. Nairobi, African Academy of Sciences.

Banton, 1998, Economic Survey,1998, Nairobi, Spear printers.

Coclough, C. 1986 Primary Schooling and Economic Development, Washington World Bank Staff Working Paper No. 399

Horowitz, 1985, Reform Agenda for Education Sector in Kenya, Nairobi.

Horowitz, 1988, Reform Agenda for Education Sector in Kenya, Nairobi.

Platteau, 2000 Children and Women in Kenya: A Situation Analysis 2000 Nairobi, UNICEF Kenya Country Office.

Ministry of Education Science and Technology, 2003, Free Primary Education: Every Child in School. Nairobi.

Stewart, 2002, Totally Integrated Quality Education and Training TIQET: Report of the Commission of Inquiry into the System of Education in Kenya.Media plus.

Sifuna, D. N., 1990, Development of Education in Africa: The Kenyan Experience, Nairobi, Initiatives Ltd.

Sifuna, D. N. 2003 The Pastoralist Communities and Free Primary Education in Kenya: A Preliminary Survey, Nairobi, MoEST, and Action Aid-Kenya 2003.

Weinreich, 1973, African Education system, 1973, Nairobi.

Weinreich, 1978, African Education system, 1978, Nairobi.

APPENDICES

APPENDIX I

QUESTIONNAIRE

My name is BORU KUPI WARIO, a student from Kampala International University Institute of open and distance learning.

I am collecting data in relation to impact of student's perception towards biology and on performance of science subjects in Kenya, I request for your cooperation and I promise not to take much of your time.

Please note that we do not mention people's names to ensure privacy and confidentiality.

TICK WHERE APPROPRIATE

i) Do you like biology?

☐ Yes ☐ No

ii) Do you pass the subject?

☐ Yes No ☐

iii) Which science subject is your first choice?

Biology ☐

Chemistry ☐

Physics ☐

iv) Is biology teaching interesting at your school? …………………………………………

…………………………………………………………………………………………………

……………………………………………………………………………………………

iv) Do you believe student's perception affects the performance of biology subject in your school?

……

……

Does positive perception towards biology enhance better performance of students?

……………………………………………………………………………………………………..

……………………………………………………………………………………………………..

v) Do all topics in biology attract the same kind of perception towards biology?......

....

……………………………………………………………………………………………

vi) Is there a relationship between teachers and negative perception towards biology?

……

vii) What are possible solutions that can be done to enhance a positive attitude towards biology?...

……

………………………………………………………………………………………………….

viii) Are there any incentives in your school that are aimed at ensuring better performance of biology is maintained? ....

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THANKS

APPENDIX II

CURRICULUM VITAE

PERSONAL BACKGROUND

Name	**:**	Boru Kupi Warlo
Reg. no	**:**	BED/14814/62/DF
Age	**:**	30 Years
Gender	**:**	Male
Civil Status	**:**	Kenyan
Address	**:**	P.O BOX 22— 60700, Moyale
Date of birth	**:**	1978
Contact	**:**	+254 725 685 673

EDUCATIONAL BACKGROUND

College	**:**	Kenya science Teachers college
Secondary	**:**	Sololo Boys Secondary School
Elementary	**:**	Golole Primary School

RESEARCH EXPERIENCE

COURSE **:** Bachelor of Education Science

RESEARCH TITLE Students perception towards biology and influence on the subject *performance in Moyale boys secondary school Moyale District,* Kenya

APPENDIX III

MAP OF RESEARCH AREA