

**KAMPALA INTERNATIONAL UNIVERSITY**

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**POTENTIAL FOR PROGRESS IN SCIENCE SUBJECTS IN**

**KENYA SCHOOLS:**

**CASE STUDY OF PHYSICS PERFORMANCE IN MIRIRA**

**SECONDARY SCHOOL, MURANGA DISTRICT**

BY

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A RESEARCH REPORT SUBMITTED TO THE INSTITUTE OF OPEN AND  
DISTANCE LEARNING IN PARTIAL FULFILMENT OF THE AWARD OF  
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**AUGUST 2009**

## DECLARATION

I, GEORGE CHARAGU NJOROGI: BED/13404/61/DF

do declare that the information given in this research report is made by myself and has never been presented by any other person, for the award of Bachelor of Education

Signature:.....

Date:.....15<sup>TH</sup> AUGUST 2009

## APPROVAL

This is to certify that GEORGE CHARAGU NJORGE: BED/13404/61/DF  
has successfully completed her / his research report and now is ready for submission with my  
approval.

Signed:  .....

REV. ERICH KASIRYE

KIU SUPERVISOR

DATE:  .....

## **DEDICATION**

To my beloved WIFE, Mary Wangu Charagu and Children, Florence Wanjiku, Sospeter Njoroge, Ephantus Kareithi for their enormous support while I studied far from home.

## ACKNOWLEDGEMENT

I would like to thank the good Lord for giving me strength and courage to compile this research report because without Him I would not be able to accomplish anything.

Special thanks go to my supervisor, Rev. Erich Kasirye who was a good mentor and advisor during the compilation of this work. My appreciation also go out to the Administration of Kampala International University for their support during this exercise.

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May the Good Lord reward you abundantly.

## TABLE OF CONTENTS

TITLE	PAGE
Declaration .....	i
Approval .....	ii
Dedication.....	iii
Acknowledgement.....	iv
List of tables .....	vii
Defination of central terms and initials .....	viii
Abstract.....	ix
 CHAPTER ONE.....	 1
INTRODUCTION.....	1
1.1 Background to the study .....	1
1.2 Statement of the problem.....	3
1.3 Objectives of the study .....	3
1.3.1 General objectives .....	3
1.3.2 Specific objectives.....	3
1.4. Research questions .....	4
1.5 Scope .....	4
1.6 Significance of the study .....	4
1.7 Theoretical framework .....	4
CHAPTER TWO.....	7
LITERATURE REVIEW .....	7
2.0 Introduction .....	7
2.1 Review of related literature .....	7

CHAPTER THREE: METHODOLOGY.....	12
3.0 Introduction .....	12
3.1 Research design.....	12
3.2 Target population.....	12
3.3 Sample frame work.....	12
3.3.1 Sample size .....	12
3.3.2 Sample technique.....	12
3.3.3 Sample procedure .....	12
3.4 Methods of data collection .....	13
3.5: Statistical treatment of data .....	13
CHAPTER FOUR: DATA PRESENTATION, INTERPRETATION AND ANALYSIS .....	14
4.0 INTRODUCTION.....	14
4.1 SUMMARY OF QUESTIONNAIRE FINDINGS, INTERPRETATION AND.....	14
ANALYSIS .....	14
CHAPTER FIVE: SUMMARY AND RECOMMENDATIONS.....	20
5.0 Introduction .....	20
5.1 Summary.....	20
5.2 Recommendations: .....	22
5.2.1 Student's Attitude.....	22
5.2.2 Laboratory equipments.....	23
5.2.3 Textbooks ratio .....	23
5.2.4 Teacher's load .....	23
5.2.5 Methods of Evaluation/Assessment .....	23
BIBLIOGRAPHY .....	24
APPENDICES.....	25

## LIST OF TABLES

Table 1.1 Performances of the three science subjects in national examination from 2004 to 2007 in Mirira secondary.....	5
Table 1.2 Performances of D- And E grades in the three science subjects and entry in the year 2007 in Murang'a District .....	6
Table 4.1 Attitude of students towards Physics.....	14
Table 4.2 Readiness to drop Physics (Students).....	15
Table 4.3 Percentages of students who elect Physics.....	15
Table 4.4 Problems experienced when conducting practical sessions .....	16
Table 4.5 Availability of Laboratory facilities .....	17
Table 4.6 Availability of students textbook for Physics.....	18
Table 4.7: Any other Source of Physics textbooks.....	18
Table 4.8 Physics Textbooks ratio issued to students .....	19



## DEFINATION OF CENTRAL TERMS AND INITIALS

ATTITUDES:	Way of feeling, thinking or behaving. It is inward feeling expressed by behaviour.
EVALUATION:	To asses or form an idea of the amount, quality or value of something or somebody.
JICA:	Japan International Co-operation Agency.
K.C.S.E:	Kenya Certificate of Secondary Education.
SMASSE:	Strengthening of Mathematics and Sciences in Secondary Education.
T.S.C:	Teachers Service Commission.
PERFORMANCE:	Achievement in national examinations in relation to how successful it is , in general.
PHD:	Degree of Doctor of philosophy – the degree offered at the university.
8.4.4:	Education system:-Refers to the newly structured education system where the primary cycle has been increased from 7 to 8 years. Secondary was reduced from 6 to 4 years and minimum of university education increased from 3 to 4 years.

## ABSTRACT

This research is a case study designed to investigate the factors affecting student's performance in physics at Mirira secondary School in Kiharu Division, Murang'a District, in Central Province. The principle objective of this study was to look at the factors that influence student's poor performance in Mirira Secondary School. The results of this research will therefore fill the knowledge gaps on factors influencing achievement in physics which can also be a guide towards the other science subjects.

The targeted population was made up of 356 students, teachers and the supporting staff. The sample used was made up of 50 students three physics teachers and the school principal. Three questionnaires were designed, one for the students, one for the physics teachers and the other one for the principal. The questionnaires sought information on student's attitude towards physics, availability of laboratory equipments, textbook ratio, teachers' workload, and methods of evaluation. A descriptive analysis was used to analyse the data from the three groups of the respondents.

Research findings indicates that students in Mirira Secondary School have a negative attitudes towards physics, the school laboratory is not adequately equipped, physics textbooks ratio is inadequate, physics teachers are overburdened through loading, and the school lack a well monitored policy of evaluation. All these could have a bearing in determining the poor performance of physics in the school. Career guidance, practical oriented teaching methods, fieldtrips, science clubs, giving students easy tasks and good preparation of physics teachers can be used to change the negative attitudes of the students towards physics.

To provide adequate laboratory facilities more funds need to be allocated in school budgets, organize fund raising, borrowing essential equipments from the neighbouring schools and improvisation can ease the problem of laboratory equipments.

School library, school priorities, and fund raising or donations can solve the problem of textbook ratios. Teachers service commission or intervention of Board of Governors can solve the problem of teachers' load.

Finally the school should develop a well monitored evaluation policy under an internally appointed dean of studies.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the study

Poor performance in science is a common phenomenon. Nationally and even world-wide these subjects suffer a minority acceptance. In particular Physics remain a thorn in the flesh of many students.

In Kenya the current 8-4-4 system is geared towards making the beneficiaries become self reliance. This educational goal can be achieved through subjects which can enable form four graduates to formulate small scale projects to earn a living as well as increasing income per capital nationally. The major draw back here is that these subjects have never gone missing in the list of subjects worsened performed in the national examinations. The Kenya government has recognized the challenges faced in these subjects by giving teachers handling the subjects a special monthly allowance to motivate those who are still in colleges to train as science teachers thus increasing the personnel required in schools to meet the demand of this challenging field of study.

There is also major campaign country-wide by the Japan international co-operation agency (JICA) in conjunction with the Ministry of Education in trying to improve the performance in mathematics and sciences under the S.M.A.S.S.E (strengthening of mathematics and sciences in secondary education) programme. Initially, Kenyan and Japan counterparts visited nine pilot districts and conducted some baseline studies. The areas targeted were the teaching method, equipments and allocation of financial resources to the areas of mathematics and sciences in schools. The findings from this research led to the signing of a contract between the Kenyan and the Japanese Government, formation of the in-service unit for science teachers at Kenya science teachers college and the SMASSE PROJECT. The main purpose here is to strengthen the quality of mathematics and sciences education in secondary school of Kenya through in-service training of serving teachers in the selected districts called pilot district. On successful completion of the 'piloting' it was hoped the skills would be spread to

other districts in Kenya and beyond. The time and resources allocated to this campaign underscores the importance of science in the development of any country.

It is widely documented that science and technology play a central role in the modernization and growth of economic and social systems. Kenyan government, in particular has formulated a policy to make country industrialized by the year 2020. Attitude towards science and mathematics may frustrate the Government efforts to achieve this important goal for the country's economic growth.

Historically, science has been as a difficult area on the school curriculum and due to this many students have formed negative attitudes toward it and even shield away from it. Some form the negative attitude away before they enroll in secondary school. This is due to the opinions they get from their parents, older brothers and sisters, friends and sometimes teachers in their primary schools. At times these attitudes are acquired due to the teaching methods employed in the subjects.

The attitudes are displayed through verbal expressions such as "I hate sciences, sciences are difficult", Physics is stressing us" among others.

Despite all these bottlenecks a lot of efforts should be put in schools to promote the performance of science subjects, Physics in particular. The Jua kali sector might form the foundation of Kenyan industries which call for the expansion of scientific facilities in all learning institutions. It is believed that Physics skills are very much required in the Jua kali sector. If Kenya has therefore to become industrialized by the year 2020 a lot of potential is in

This important sector which also employs thousands of graduates from the tertiary colleges.

The cost of production in Kenyan Industries has increased either to power failure or cost of electricity in a country with the potential of even exporting power. This is due to lack of qualified personnel and those who are qualified are very few. Physics skills and knowledge is expected to be promoted in schools, to lower the cost of living of all Kenyans who depend on electricity directly or indirectly.

Most third world countries Kenya included has relied on external expertise in the field of aviation for decades. This field is up-to-date underutilized as there is no enough trained manpower even in the field of electronics which has reduced the world into a global village.

Physics could also revitalize the agricultural sector which forms the backbone of the Kenyan economy. Improved advanced agricultural equipment need to be developed locally to reduce the cost of production and create a good balance of trade. Technological advancement needs a lot of Physics and generally sciences and mathematics.

More advanced technology in Physics is also required to exploit nuclear energy as an alternative to hydroelectric power, geothermal, sun and wind power mostly used in third world countries.

## **1.2 Statement of the problem**

Despite the fact that Physics is very important in industrialization there has been poor performance which affects development in the country. Past research work on the performance of Physics has focused on the qualification of teachers, available library services, and motivation of students and teachers' attitudes towards Physics. However, very little attention has been accorded to the study on students' attitude towards Physics, inadequacy of laboratory facilities, text book ratio, workload of teachers and the methods of the evaluation. There is therefore no researched detailed guide on how to improve the performance of the subject.

## **1.3 Objectives of the study**

### **1.3.1 General objectives**

To determine the factors affecting performance of Physics subject

### **1.3.2 Specific objectives**

1. To investigate how the students attitude towards Physics influence their performance

2. To investigate challenges faced by students in learning of Physics
3. To determine the impact of school facilities on academic performance in Physics subject

#### **1.4. Research questions**

1. What effect does students' attitude have on performance in Physics?
2. What effect does inadequate laboratory equipment have on students' performance in Physics?
3. What effect does textbook ration have on students' performance in Physics?
4. What effect does teachers' workload have on performance in Physics?
5. What effect does methods of evaluation have on students' performance?

#### **1.5 Scope**

The study will be conducted at Mirira secondary school in Murang'a district targeting Physics pupils, Physics teachers and the school principal.

#### **1.6 Significance of the study**

To policy makers in education the study will help them to highlight the fundamental issues underlying the poor performance in Physics so as to device means of averting them.

The teacher shall gain the necessary information regarding how best to handle the Physics subject.

The results of this research will seek to fill the knowledge gaps on factors influencing achievements in Physics which can be used as a guide towards the other science subjects.

Also, being a case study it may be applicable to other institutions and thus alleviate the poor performance nationally.

#### **1.7 Theoretical framework**

Although it is common knowledge that students continue to perform poorly in Physics, it is rare that the public gets an insight into the gravity of the problem. About 85% of year 2000

form four candidates scored less than 25 per cent in the examination. And more than 60 per cent of the 172,522 candidates scored less than 10 per cent. The situation was worse for girls; only candidates scored above 75 per cent.

What is emerging from the report is that the bulk of our children leave without the foggiest idea about computing. Incidentally, good performance in Physics is the core parameters for transition to higher education levels or job placement. Anyone seeking admission to lucrative courses such as engineering, and architecture at the university must have superlative grades in Physics and mathematics.

Since fewer candidates do well in the subject, it means the admission criteria have to be towered so that more students can fill the available places. And herein lies the danger. We may be producing some professionals who lack the requisite background and skills for their chosen careers.

Although students continue to perform poorly in sciences and mathematics, Physics is the most affected subject in national examination in individual schools and even nationally as revealed by the tables below.

**TABLE 1.1 PERFORMANCES OF THE THREE SCIENCE SUBJECTS IN NATIONAL EXAMINATION FROM 2004 TO 2007 IN MIRIRA SECONDARY.**

SUBJECT	2007		2006		2005		2004		DISTRICT MEAN 2007	
PHYSICS	2.1714	D-	2.6190	D	2.900	D	2.9140	D	2.9197	D
CHEMISTRY	3.102	D	3.0910	D	3.0980	D	2.9130	D	2.8486	D
BIOLOGY	5.6207	C	3.2545	D	2.7450	D	2.4340	D-	4.0746	C-

It is evident from the table 1.1 that among the three science subjects Physics is the most affected in terms of the performance as the school mean grade for the four years is below the

district mean grade. Biology and Chemistry school performance are better than the district mean grade.

**TABLE 1.2 PERFORMANCES OF D- AND E GRADES IN THE THREE SCIENCE SUBJECTS AND ENTRY IN THE YEAR 2007 IN MURANG'A DISTRICT**

SUBJECT	ENTRY	NO. OF STUDENTS WHO SCORED D- AND E GRADES	PERCENTAGE
PHYSICS	2902	1391	47.93%
CHEMISTRY	7675	2726	35.52%
BIOLOGY	7618	1977	25.95%

For Physics there is less number of students who prefer the subjects as compared to the other two sciences subjects. There is also a substantial increase in those scoring the low grades of D-and E in Physics (47.935) as compared to Chemistry and Biology with 35.52% and 25.95% respectively.

The trend for those scoring the low grades cannot be allowed to continue. Urgent intervention measures need to be mounted to reverse the trend. There is therefore need to study the factors which may influence the poor performance of Physics in secondary schools, to create a good foundation for policy makers and other stakeholders to minimize the problem.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter deals with the literature review based upon factors that may seem to influence Physics performance in secondary schools. These factors are students' attitude towards the subject, availability of laboratory facilities, text book ratio among the students, teacher's work load, and methods of evaluation.

Every year whenever examinations results are released Physics has always been performed poorly. It is this aspect that many educationist and researchers have to spend sleepless nights to discover the root causes of this problem.

This chapter therefore forms the foundation upon which this research project was built by assisting the researcher to identify gaps in knowledge in the previous related studies.

#### **2.1 Review of related literature**

One of the major factors affecting the performance of our schools in sciences is the pupils attitude towards science subjects. Surveys carried out by the inspectors from the Ministry of Education shows that attitude towards science is one of the main causes of unsatisfactory performance in these subjects. According to the Kenya Science College report (1988) they identified fear of science subjects in educational institutions as one of the major causes of poor performance. The report went on to say that science subjects being slightly more demanding than other subjects offered end up being unpopular.

The report also says that teachers who have a negative attitude towards science may also make the pupils/students develop a negative attitude towards it.

A. Kens (1970) carried out research on the attitudes towards science and mathematics and wrote a report "review of education". He mentioned that students' attitude affect performance and mentioned ways in which students' attitude need to be changed in order to improve performance. He explained on how education needs to be reviewed or changed to suit circumstances.

Therefore there is a need to eradicate the negative attitude pupils have in science so as to improve its performance. Science teachers should help the pupils towards this end because as Steinkamp and Maehr (1983) says, increased achievement and improved attitudes towards science, which are desirable consequences of sciences education, are interrelated.

A lot of work has been done by various researchers to establish how attitudes influence performance in mathematics and sciences in general. Thus there is no specific research so far on how students' attitudes towards Physics in particular affect their performance.

The teaching of science is different from the teaching of other subjects because theoretical lessons must be accompanied by practical lessons if they have significance on the side of the learner. In order for learners to acquire the practical skills emphasized by the current system of education, a laboratory is necessary which is spacious and well equipped.

Studies in a number of African countries have found a strong association between resources and students' achievement. Considering the school science learning/teaching resources, the laboratory has for a long been given a central and distinctive role in education. Orodho in his PhD thesis (1996) noted that laboratory gives the students appreciation of the spirit and methods of science, promotes solving, analytic and provides students with some understanding of the nature of science.

Mosoko (1998) says that for successful teaching/learning of science a school needs a laboratory. She continues to say that the consequences of laboratory availability are the acquisition of science skills and concepts.

Richardson (1957) say that there is no adequate substitute for first hand experience in learning science and that learning through doing is possible only if there are many resources through which young people can have their experiences. He continues to say that the tables/benches should provide an adequate working area for each, supporting Mosoko who says that enough laboratory space means that the pupils have enough time in which they can learn the skills and concepts. She says that due to large in take of students in schools, the laboratory even if it's available and well equipped it is not used effectively.

Namasaka (1990) says that effective teaching of sciences (Physics in this case) requires physical facilities that will make it possible for learners to carry out experimental work or projects on their own with proper and well equipped laboratories is required. However a number of schools in our country do not have laboratories and therefore continue performing poorly in sciences.

Kipkulei (1991) says that schools with laboratories perform better than those which lack one. There is a need therefore for all schools to have a well equipped laboratory.

It is also important for a Physics teacher to have support staff in form of laboratory technician. This ensures that the experimental work to be under taken by the students is arranged by the technician in conjunction with the teacher.

Namasaka (1990) says that science teachers require support services from properly trained human resources in the form of laboratory assistants/technicians. He goes on to say that the laboratory, repair and maintain simple laboratory equipment.

With this kind of support the science teachers (Physics teachers in this case) would be left with the task of planning schemes of work, preparing lesson plans and trying out experiments to ascertain whether they work or not before they are carried by the students.

Although laboratory has been cited as an important requirement in effective teaching of sciences and Physics in particular by various research work done, very little has been done to establish the relationship between adequate laboratory facilities and the performance of Physics in various secondary schools in Kenya. This therefore leaves a knowledge gap which may be hindrances towards the improvement of Physics performance nationally.

Orodho (1996) also noted that textbooks availability has been shown to be consistently related to achievement in less industrialized countries. He went on to say that learning requires a lot of reading for the learner to develop broad based information in the specific field of study. In supporting this idea Richardson (1957) underscores the importance school libraries to act as a resource centre as well as developing a reading culture which is important in discoveries especially in sciences. For these textbooks to be effective it is very important to find out the relationship between the Physics textbooks ratio and the performance as very little has been done on this particular area.

In order for science to be taught effectively a science teacher need to be well equipped. However, in our country we have a multiplicity problems arising from shortage of teachers and also their devotion to work. Shortage of qualified science teachers has forced the government to hire untrained teachers. The shortage of science teachers has been with us even with the past system of education.

Professor Eshiwani (1994) in his journal, the teaching of science and mathematics in Kenya secondary schools, identifies among other factors, shortage of teachers as a cause for poor performance, saying that some schools even “use teachers with low foundation in science since they have no alternatives”. This in most cases may lead to high loading denying the learners individual attention from teachers. Teachers teaching Physics find themselves with no alternatives but to teach a second subject, thus unable to make Physics practical oriented as they have limited time to prepare practical sessions. Teachers’ load may therefore have a negative influence towards the performance.

Results of an educational investment to the government, society and the school may take long to be realized. The school may only realize its objectives at the end of each educational level which take years. It is therefore important to evaluate students to get a feedback of the effectiveness of teaching so that necessary action can be taken promptly.

Washton (1967) in his book teaching science creatively in secondary schools emphasized the importance of assessment in stages. He went on and said that learners should be evaluated continuously to ascertain whether the concepts taught are understood, to allow the teachers to decide on whether to change their teaching methods or the content taught. He said that assessment is the only surest way of determining whether learning is going on. He went ahead and said that sciences which are practically oriented should also be assessed through practicals to cultivate the development of scientific skills. Richardson (1957) cemented the idea of assessments by emphasizing the importance of increasing the frequency of evaluation in learning as a continuous process.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter deals with the methodology part of research. Among others it specifies research design, research environment, respondent, instruments, statistical treatment of data and data collection procedures.

#### **3.1 Research design**

The study employed both employ both qualitative and quantitative design to investigate the factors influencing performance of Physics at mirira secondary school.

#### **3.2 Target population**

The study targeted a population of three hundred and fifty six (356) students and twelve teachers.

#### **3.3 Sample frame work**

##### **3.3.1 Sample size**

For the students a sample of fifty students was obtained from the form twos, threes and fours using stratified sampling techniques, the school being a mixed day school. The form ones were not involved as they had not been exposed o the subjects in question for a considerable time to respond conclusively.

The three Physics teachers and the school principal were also be involved in the study.

##### **3.3.2 Sample technique**

The researcher chose the number of boys and girls to use in each form according to their ratios.

##### **3.3.3 Sample procedure**

The students were grouped in two groups of twenty five students each.

### **3.4 Methods of data collection**

The researcher sent an introductory letter to the school principal for permission to conduct the study in the school premises utilizing the staff and the learners. After that the questionnaires were be distributed to the respondents.

### **3.5: Statistical treatment of data**

The data was obtained from the three types of questionnaires designed for the data collection. The data was then be compiled as percentages and tabulated for each factor investigated independently.

A descriptive method was used to analyse the data make conclusions and finally the recommendations.

## CHAPTER FOUR

### DATA PRESENTATION, INTERPRETATION AND ANALYSIS

#### 4.0 INTRODUCTION

This chapter deals with the presentation of the results obtained from the questionnaires designed to collect data from the school principal, the 3 physics teachers and a sample of 50 students.

#### 4.1 SUMMARY OF QUESTIONNAIRE FINDINGS, INTERPRETATION AND ANALYSIS

4.1.1 Attitudes towards a given subject may determine the concentration of the students in class during the learning-teaching process, thus affecting the performance of the subject in question. The results below were obtained from the three questionnaires.

(i) Do you like physics?

☐ No      ☐ Not much      ☐ very much

**Table 4.1 Attitude of students towards physics**

	No. of students	%
No	25	50%
Not much	15	30%
Very much	10	20%

The results from the table 4.1 indicates that 50% of the students do not like physics, 30% like it to a certain degree and 10 % of the students like it very much.

(ii) Given an option of dropping physics as a subject would you go a head and drop it?



☐ Yes ☐ No

**Table 4.2 Readiness to drop physics (students)**

	No. of Students	%
Yes	35	70%
No	15	30%

From the table 70% of the students are in agreement that they can drop physics given a chance while 30% indicate that they cannot drop physics as a subject.

(iii) How many students elect physics in form three if it is elective in your school?

☐ Less than 30% ☐ 50% ☐ More than 50%

**Table 4.3 Percentages of students who elect physics**

	Number of teachers	%
Less than 30%	2	67%
50%	1	33%
More than 50%	0	0

From the table results indicate that 2 teachers out of the three concur that less than 30% of the students elect physics in form three while one teacher is of the opinion that 50% of the students prefer electing physics as one of the 2 compulsory science subjects in form three.

The school principal also indicated that considering the performance of physics in the school in national examinations most students don't prefer physics as compared to the other science subject namely chemistry and biology.

4.1.2 Physics like any other science subject is practical oriented. Thus

theoretical lessons must be accompanied by practical lessons if they have to significance on the side of the learner. Practical lessons help to demystify what may look abstract to the students/learners. Most schools have a special room they call laboratory but lack of adequate facilities required for demonstration or students practical. The following are results obtained from the questionnaires used to establish whether Nyamweru secondary school laboratory has adequate facilities for physics practical The following are results obtained from the questionnaires used to establish whether Nyamweru secondary school has adequate facilities for physics practicals.

#### From the principal's questionnaire

- (i) Is the laboratory well equipped with the necessary facilities?  
☐ Partially      ☐ No facilities      ☐ Very much equipped

The principal is in agreement that the laboratory is partially equipped and therefore lack some major facilities required in learning/teaching process.

#### From the physics teachers questionnaires

- (i) Do you experience any problems when conducting practical sessions in terms of laboratory facilities?  
☐ Yes      ☐ Not much      ☐ No

**Table 4.4 Problems experienced when conducting practical sessions**

	No. of teachers	%
Yes	3	100%
Not much	0	0%
No	0	%

From the results on the table above all the three physics teachers indicate that they experience problems when conducting practical sessions as there are no enough laboratory facilities.

From the students' questionnaires.

(iii) Is the school laboratory equipped with the facilities you normally require in physics practical?

☐ Very few      ☐ Enough      ☐ More than enough

**Table 4.5 Availability of laboratory facilities**

	No. of students	%
Very few	37	74%
Enough	11	22%
More than enough	2	4%

From the above 74% of the students are in agreement That school laboratory is not well equipped with the facilities required for physics practicals. 22% of the students indicate that there are enough facilities while 4% of the opinion that the facilities are more than enough.

4.1.3 In the 8-4-4 system of Education in Kenya learners are supposed to cover a variety of subjects which according to the goals of education should prepare them to be self reliance. The teachers and the students are therefore expected to cope with the overloaded curriculum. Teachers therefore are not able to cover most of the content in their respective subjects in class work. A lot of work is left to the students to cover on their own during their free time in terms of assignments, exercises and projects. To achieve this ambitious objectives students are therefore expected to have enough textbooks to compliment what they acquire from the teachers during the normal lessons. The textbook ratio among the students is an important factor for a better performance in national examination. In particular questionnaires were designed to establish the physics text book ratio among the students in Nyamweru secondary school.

**From the students' questionnaire:-**

(i) Do you have your own physics textbook?

☐ Yes ☐ No ☐ We share

**Table 4.6 Availability of students textbook for physics**

	No. of students	%
Yes	7	14%
No	14	28%
We share	29	58%

From the results above 58% of the students indicate that they share the few physics textbooks available, 28% are in agreement that they lack any, while 14 % of the students portray that they have their own physics textbook.

Where else within the school do you get other physics textbooks?

☐ Library ☐ From the teachers ☐ No where else

11

**Table 4.7: Any other source of physics textbooks**

	No. of students	%
Library	0	0%
From the teachers	8	16%
No where else	42	84%

The results above indicate that 84% of the students don't have any other source of physics textbooks, 16% obtain them from the physics teachers while none from the library.

**From the physics teachers' questionnaire**

(ii) What is the physics textbooks ratio issued to the students

☐ One each ☐ one to two ☐ Very few

**Table 4.8     Physics textbooks ratio issued to students**

	No. of students	%
One each	0	0%
One to two	0	0%
One among four	1	33%

## CHAPTER FIVE

### SUMMARY AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter deals with the analysis of the results findings obtained from the respondents and recommend the various ways of solving the problems addressed in the study, to improve the performance of Physics in Mirira secondary school and by the extension the whole country.

#### 5.1 Summary

It is evident from the findings that most students have a negative attitude towards Physics. More than 50 per cent of the Students sample used in the study were clear in pointing out that they don't like Physics as a subject. In fact, 70 per cent were in agreement that they can drop Physics given a chance to do so. The negative attitude towards Physics is underscored by the fact that 67 per cent of the students in form threes and fours who have already elected between Physics and chemistry, prefer the latter. Biology is compulsory for all. The students as school policy. Some students form the negative attitude way before they enroll in secondary school. This is due to the opinions they get from their parents, older brothers and sisters, friends and sometimes teachers in their primary schools. The attitudes are displayed through verbal expressions such as "I hate science", "Physics is difficult", "Physics is stressing us" just to mention a few. The principal noted that the school Physics performance in national examinations may have contributed a lot to the negative attitudes of the students towards the subject. The poor performance is also reflected nationally.

Mirira secondary school laboratory is not well equipped with facilities required for Physics practicals. The principal was very quick to point out the same sentiments arguing that the school lack adequate funds to completely equip the laboratory. The Physics teachers normally experiences serious problems when organizing for practical sessions due to lack of enough facilities. More than 70 per cent of the students complain that, at times they are forced to

forego some practical sessions as necessary laboratory facilities are inadequate and at times totally lacking. Teachers are in most cases forced to use demonstration methods in case where class experiment would have been useful to students. Physics like any other science subject is practical oriented. Thus theoretical lessons must be accompanied by practical sessions to have significance on the side of the students. Some Physics concepts are so abstract that they demand to be taught practically. There are also certain scientific skills like observation, measurement, recording, analyzing, drawing conclusion, handling of apparatus which must be acquired in a laboratory situation. The school laboratory should therefore be well equipped with the necessary facilities and equipments to be able to perform its central role in teaching-learning situation. It is important to note that we learn and remember 80 per cent of what we practically do.

There are not enough Physics text books in Mirira secondary to cater for the students' population. Most students lack their own copy and are therefore forced to share the few which are there according to the Physics teachers. It is also evident that the school lacks a library which could have worked as an alternative source of information in situation where textbooks are not enough. Teachers therefore find themselves in a situation of sharing the textbooks they have with the students as the only available alternative. This makes it almost impossible for the teachers to give assignment to the students. Further reading for the students is also not possible. Considering the overloaded curriculum where teachers are only supposed to guide the students for further reading, students in Mirira end up learning very little.

Assignment, exercises and projects which are supposed to assist in syllabus coverage cannot be used.

All the three Physics teachers have a load of over 20 lessons per week each. This is because, they teach other subjects like mathematics and chemistry besides Physics which just like any other science subject require a lot of preparations. The teacher is supposed to rehearse practicals before they are conducted by the students. Thus if a teacher is to effectively use practical oriented teaching methods especially in situation where there is no laboratory assistance, then he or she needs ample time to prepare. In Mirira the situation is worsened by

lack of a well equipped laboratory where the teacher has to improvise where possible to avoid situations where practicals are rarely carried out.

On the issue of evaluation the school has a policy a minimum of two formative, examination in a term according to the principal, but, there is no mechanism put in place to monitor the situation. This is evident due to the fact 78 per cent of the students indicates that they only sit for one Physics examination in a term which in most cases is end of term examination. The majority of the students also shows that they are rarely given other assignments. One of the three Physics teachers is in agreement that one Physics examination is given in a term. It is therefore clear that there is inadequate assessment in the school which might be one of the major cause of poor performance of Physics in the school. Without a proper assessment methods students are likely to relax a lot within the term and only become busy towards the end of the term. Teachers therefore lack a pointer of whether concepts learnt are understood. Thus there is need to streamline assessment to get the desired feedback as early as possible so that necessary action can be taken.

## **5.2 Recommendations:**

### **5.2.1 Student's Attitude**

- (a) Career guidance is required to show the students the importance of Physics in the job market and its applications in various professions.
- (b) Practical oriented teaching methods should be used to make students actively involved in learning process. This will make the subject more interesting.
- (c) Organizing field trips to the factories/industries, research laboratory where students can appreciate the enormous application of the subject in real life situations. The personnel in those areas can act as role models to the students.
- (d) Giving students tasks which are able to attend to as this will motivate them and develop confidence.
- (e) Physics teachers should prepare well, have mastery of content and make the subject more interesting. Thus act as good as role models to the students.
- (f) Use science club to involve the students to become innovative.



### **5.2.2 Laboratory equipments**

- (a) Administrator (Principal) and managers (Board of governors) should allocate more funds towards purchasing of laboratory equipments.
- (b) Organize fund raising or seek for donors assistance to equip the laboratory.
- (c) Physics teachers should improvise laboratory equipments where necessary.
- (d) Borrowing essential laboratory equipments from the neighbouring schools for use or organize with the particular school to use their laboratory with the students when they are not in need of it.

### **5.2.3 Textbooks ratio**

- (a) The principal should be sensitized to prioritise in availing of the textbooks for learning.
- (b) Convert one room into a school library where the few copies of textbooks acquired can be kept to be available for more students.
- (c) Seek for donations of textbooks or organize a fund raising to purchase more copies.

### **5.2.4 Teacher's load**

- (a) The principal should liaise with the Teachers Service Commission (T.S.C) to post more Physics teachers to the school to ease the problem of loading.
- (b) The school can employ another Physics teacher through the B.O.G as more teachers are expected from the T.S.C.

### **5.2.5 Methods of Evaluation/Assessment**

- (a) Develop a well monitored school policy on evaluation. Monthly test are the most effective.
- (b) Internal appointment of dean of studies to facilitate evaluation.
- (c) Time tabling of the continuous assessment test(CATs) for monitoring purposes

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## APPENDICES

### APPENDIX A

#### QUESTIONNAIRE FOR THE STUDENTS:

The main objective of this study is to collect data on factors which influence performance in Physics. The results of this research will therefore try to fill knowledge gaps which can be used as a guide towards the other science subject. The information given will only be for the purpose of the research and not in any other way.

1. Do you like Physics?  
☐ No    ☐ Not much    ☐ Very much
2. Given an option of dropping Physics as a subject would you go ahead and drop it?  
☐ Yes    ☐ No
3. Is the school laboratory equipped with the facilities you normally require in Physics practical?  
☐ Very few    ☐ Enough    ☐ More than enough
4. Do you have your own Physics textbook?  
☐ Yes    ☐ No    ☐ We share
5. Where else within the school do you get other Physics textbook?  
☐ Library    ☐ From the teachers    ☐ No where else
6. How many Physics examinations do you sit for within a term?  
☐ None    ☐ One    ☐ Two    ☐ More than two
7. Are you normally given other assignments?  
☐ None    ☐ Rarely    ☐ A lot

## APPENDIX B

### QUESTIONNAIRE FOR THE PHYSICS TEACHERS

The main objective of this study is gather information on factors which affect the performance of Physics. The results of this research will try to fill the knowledge gaps which can be used as a guide towards the other science subjects. The information given will only be used for the purpose of the research and not in any other way.

1. How many students elect Physics in form three if it is elective in your school?  
☐ Less than 30%    ☐ 50%    ☐ More than 50%
2. Do you experience any problems when conducting practical sessions in-terms of Laboratory facilities?  
☐ Yes    ☐ Not much    ☐ No
3. What is the Physics textbook ratio issued to students?  
☐ one each    ☐ one to two    ☐ one among four    ☐ Very few
4. What is your work load per week?  
☐ Less than ten    ☐ Between 10 and 20 lessons    ☐ More than 20 lessons
5. Do you teach any other subject?  
☐ Yes    ☐ No
6. How many continuous assessments tests do you give to the students within the term?  
☐ None    ☐ One    ☐ Two    ☐ More than two.

## APPENDIX C

### QUESTIONNAIRE FOR THE PRINCIPAL

The main objective of this study is to investigate factors which are likely to influence the performance of Physics. The results of this study will therefore try to fill knowledge gaps which can be used as a guide towards the other science subjects. The information given will only be used for the purpose of the research and not in any other way.

1. Considering the performance of Physics in your school do you encourage students to take Physics?

☐ Yes      ☐ To some extent      ☐ No

2. Is the laboratory well equipped with necessary facilities?

☐ Partially      ☐ No facilities      ☐ Very much equipped

3. Are there enough Physics textbooks for the students?

☐ Very few      ☐ Adequate      ☐ More than required

4. How many Physics teachers are there in school?

☐ None      ☐ One      ☐ Two      ☐ More than two

5. Do they handle any other subject?

☐ Yes      ☐ No

6. What is their workload(lessons) per week?

☐ Less than ten      ☐ Between 10 and 20      ☐ More than 20

7. Is there a school policy stating the number of formative examination to be given within a Term?

☐ Yes      ☐ No

8. How many within a term?

☐ None      ☐ one      ☐ Two      ☐ More than two

## APPENDIX 1: TRANSMITTAL LETTER



**KAMPALA  
INTERNATIONAL  
UNIVERSITY**

Kampala Road, Kampala  
P.O. Box 20093, Uganda  
Tel: +256-41-2663137  
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Website: [www.kiu.ac.ug](http://www.kiu.ac.ug)

### OFFICE OF THE DIRECTOR INSTITUTE OF OPEN AND DISTANCE LEARNING (IODL)

DATE: . . . . .

TO WHOM IT MAY CONCERN:

Dear Sir/Madam,

RE: INTRODUCTION LETTER FOR MS/MRS/MR . . . . .

The above named is our student in Institute of Open and Distance Learning (IODL), pursuing a Diploma/Bachelors degree in Education.


He/She wishes to carry out a research in your Organization on:

Case Study: . . . . .

The research is a requirement for the award of a Diploma/Bachelors degree in Education

Any assistance accorded to her regarding research will be highly appreciated.

Yours faithfully,

  
MR. MUHWEZI, JOSEPH  
HEAD, IN-SERVICE