

**STUDENTS BACKGROUND AND PERFORMANCE**

**IN CHEMISTRY OF KIHUMBU-INI SECONDARY SCHOOL**

**THIKA DISTRICT**

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## DECLARATION

This project is my original work and has not been submitted for any other study program in any university

.....

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14<sup>TH</sup> AUG 2008

DATE

## Acknowledgement

I take this opportunity to point out that the work of producing project documentation is time consuming and quite involving, therefore it needs the input of many people that is why I acknowledge the people through whose input has made it possible the production of this project.

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## Dedication

I dedicate this project work to my family members who have provided an all round support as I undertake my studies.

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## CHAPTER ONE

### 1.1. INTRODUCTION

### 1.2. BACKGROUND INFORMATION:

Kihumbu-ini Secondary School is situated in Thika District, Kihumbu-ini education zone. It is a three-streamed school with a student's population of about four hundred and fifty students. According to the Kenya National Examinations Council regulations and syllabus, the main objectives of Secondary School Chemistry can be summarized as follows:

- (a) To equip learners with adequate knowledge in Chemistry for further education and for training.
- (b) To equip learners with adequate knowledge and skills to solve problems in everyday life.
- (c) To equip learners with skills and knowledge and apply them for technical and industrial development.

However, despite various recommendations made by various educational committee, there has been persistent poor students performance in Chemistry at Secondary school level. For example performance in Chemistry at Kihumbu-ini secondary school has been poor during the last four years.

**Table 1.1. – Students Performance in Chemistry at Kihumbu-ini Secondary School 2003-2006.**

YEAR	2003	2004	2005	2006
MEAN SCORE	2.99	3.01	2.17	2.16
MEAN GRADE	D	D	D-	D-

## **SOURCE**

Kihumbu-ini Secondary School staff meeting's minutes year 2005-2006. Most of the other subjects had recorded mean grade D+ (D Plus) and above except Physics and Mathematics.

Chemistry, according to K.I.E. Chemistry textbook two; first edition; is the study of properties, composition and behaviour of matter; therefore it contributes a lot to man's work of understanding and manipulation of materials surrounding him to suit him. Kenya is for industrialization by the year 2020 therefore Chemistry is bound to play a vital role in industrialization process.

The low performance in Chemistry by students who are the future for industrialization means that the process will involve importation of labor. This is a problem and therefore a lot of research need to be done to find the causes of the poor student performance in K.C.S.E. and then find the possible remedies.

Many scholars have studied the problem in different schools. This study is aimed at relating their findings with those from Kihumbu-ini Secondary School. However, most of our scholars have studied the problem at district levels and this means they use very small samples of the population. The study targeted bigger samples to come up with a more detailed response from the School Chemistry students population and the Chemistry teachers.

### **1.3 PROBLEM STATEMENT**

The students' performance in Chemistry in K.C.S.E. has been poor for the last four years at Kihumbu-ini Secondary School. The causes of this, had never been studied or investigated , and therefore the researcher to study them.



#### **1.4 PURPOSE OF THE STUDY**

The purpose of this study is to investigate the causes of students poor performance in Chemistry in Kihumbu-ini Secondary School. The findings would help in making recommendations which would help in improving the students performance in Chemistry in K.C.S.E. in the school and other schools which could be experiencing similar problems.

#### **1.5 OBJECTIVES OF THE STUDY**

The following specific objectives will guide the researcher in this research.

- (i) To determine if the available facilities were being effectively used in the teaching/  
Learning process in Chemistry.
- (ii) To determine the students' attitudes towards Chemistry.
- (ii) To determine if the school is well equipped with facilities for Chemistry  
Teaching/learning.

#### **NULL HYPOTHESIS**

There is no significant relationship between the students background an their performance in Chemistry.

#### **1.6 SIGNIFICANCE OF THE STUDY**

The study would contribute to the advancement of knowledge about Chemistry in the school and other schools in the following ways:

- (a) It would enlighten Chemistry teachers on some barriers in their profession.
- (b) It would enlighten the school(s) administration on the adequacy of the laboratory facilities.

## **1.7 RESEARCH ASSUMPTIONS**

The guiding research assumptions were:

- (i) Students were always in School.
- (ii) The method of data collection was valid and formed the representative sample of the real situation.
- (iii) Students attitudes towards Chemistry could affect the students' performance in Chemistry.
- (iv) The students were not handicapped in any way.
- (v) The students were average learners.
- (vi) The students had qualified Chemistry teachers.
- (vii) No wrong information was given.

## **1.8. LIMITATIONS**

- (a) The study was limited to a smaller sample of the population due to time factor.
- (b) Tight school programs which may hinder data collection.
- (c) The data collection and conclusion will be limited to K.C.S.E. results of 2003 to 2006
- (d) There is a limit to the information one can obtain about a school.

## **1.9. DELIMITATIONS**

- (i) The research will only target one school in Thika District.
- (ii) Only form 4 students will be involved in the research.

#### 4. THEORETICAL AND CONCEPTUAL FRAMEWORK

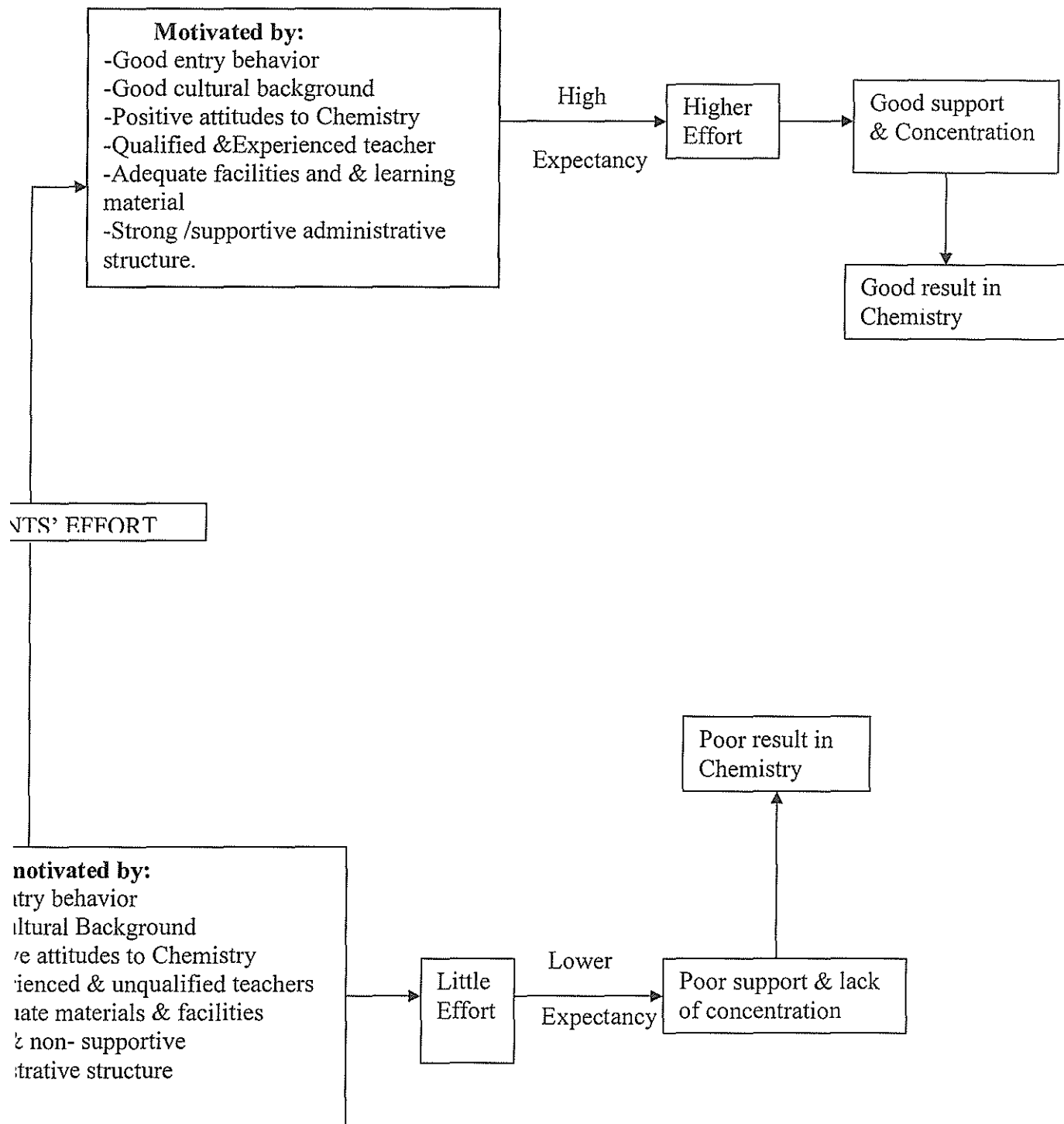
The researcher will be interested in testing expectancy theory which posit that – motivation is a force or drive within a person and that this force varies according to three factors:

- (i) Valence ( degree of perceived attractiveness or repulsiveness of and object)
- (ii) Expectancy ( momentary belief concerning the probability that a particular outcome or sets of outcome will follow a particular action that ranges from the strength of certainty that action will result in the outcome, to action which will not result in the outcome)
- (iii) Instrumentality (expected utility or usefulness of a direct outcome of the attained or avoided relation between direct and indirect outcomes.

To illustrate the application of the theory in conceptual framework the stating conceptualization is that all human behavior can be regarded as a result of a state of aroused or internal tension that serves as a springboard for action motivation is the force to perform. It has a degree of intensity and direction. The theory proposes that the force to perform an action; (effort expectancy and whether the outcome will lead to another outcome (performance expectancy) holding a higher value.

From the conceptual framework the student's efforts motivated by the stated factors will choose path 1 Thus, based on the motivated factors, he creates a higher effort in learning and this enhances good performance in English. On the contrary de-motivated by the stated factors leads to the less efforts by the students follows path 2 and leads to poor performance.

## CONCEPTUAL FRAMEWORK ON FACTORS INFLUENCING STUDENTS' POOR PERFORMANCE IN CHEMISTRY



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1. INTRODUCTION**

The issue of poor performance in Chemistry, by students, in most schools has raised a lot of concern to many researchers. This has stimulated researchers to investigate the causes. Their studies were directed towards formulating strategies, methods and ways in which poor performance can be rectified. The studies discussed below were found useful informing a background to the study. The factors have been broadly categorized into human and physical factors.

#### **2.3. HUMAN FACTORS**

##### **2.3.1 TEACHERS CHARACTERISTICS:**

Jenknins and Warbuston (1981) revealed that lack of confidence of teachers as a major problem. The teachers form a central role in the effectiveness of teaching any particular subject.

Maritime (1983;23) says that the improvement of teacher self awareness of their behaviour in a learning situation is a vital factor.

Cohen (1994) , urges that poor teaching including most instances of grossly inappropriate behaviour that might seem to stem from malice or callousness or not done deliberately or even consciously by the teacher. He adds that some may result from lack of adequate mechanism of providing feedback to the teacher.

Daily Nation dated 24/6/2002, states that lack of regular in-service programmes to a teacher reduces their efficiency in the delivery of concept.

Rosenthal and Jacobson (1969) in their research found out that teacher pupil interaction is important in the understanding of children's self and different achievement. They attributed the intellectual gain and the reading performance of the student to the teacher's classroom behaviour.

Kanyagia J.K. (1989) in his study found out that lack of teachers limited teaching experience with poor administration and learning environment as some of the factors that account for poor performance.

### **2.3.2. STUDENT CHARACTERISTICS**

Gignot (1972; 223) in this book, *Teacher and child* noted that "a child becomes what he experiences" But the student's will to achieve and his/her ability to achieve matters a lot. The intrinsic and factors influences on the student performance in examinations, comes in here. Adenson (1937) comments that learners acquire attitudes towards the subject matter through interaction with the learning process as well as the curriculum. This means that attitude is not something innate but it is developed. The intrinsic factors that influence student performance in examinations include self-perception and self-past experiences.

The extrinsic factors are cultural background pupil'/student's status in his/her social grouping, social economic base and peer group interactions.

Oliver(1964) defined attitudes as ".....How we feel and think about anyone of the thousand of elements in our environment"

### **2.4 PHYSICAL FACTORS**

Editorial Columns of the Ministry of education newsletter (Jan and Feb 1991) noted that: "Effective implementation of curriculum calls for adequate and relevant supply of text books and related school equipments."

An article in the Daily Nation dated 30<sup>th</sup> July 1993 indicated that lack of laboratory equipment and failure to expose students to practical work contributes to poor performance in sciences.

It is also worth pointing out that studies of pupils performance by Colin Wood (1977) on theory and practical exams showed correlations that were so low to suggest that they were not measuring to the same range of facilities.

This implies that teachers tend to dwell more on theory than on practicals, hence performance is poor. This could be due to lack of facilities in the school, ignorance of the teacher on the importance of practical Chemistry or negligence by teachers.

Eshiwani ( 1982) noted that lack of adequate facilities contributes to low performance in exams in Secondary schools.

## CHAPTER THREE

### RESEARCH METHODOLOGY:

#### 3.1 INTRODUCTION

This chapter gives the method and rationale for the sample population selection and the description of the research instruments used in data collection and information from the school's Chemistry students and teachers. The research was to investigate the causes of poor performance in Chemistry in K.C.S.E. at Kihumbu-ini Secondary school, of Thika District.

#### 3.2. RESEARCH DESIGN

The study adopted a case study design and focused on Kihumbu-ini Secondary school.

#### 3.3 POPULATION AND SAMPLING

The target population was the Chemistry students and teachers in Kihumbu-ini secondary school- for the student sample, out of the total 200 Chemistry students, only 40 students selected, through simple random sampling method, balloting was engaged. The teacher's sample comprised all the three Chemistry teachers see (table 3.1.)

TABLE 3.1. SHOWING AND SAMPLING

SCHOOL	CHEMISTRY TEACHERS		CHEMISTRY STUDENTS	
	POPULATION	SAMPLE	POPULATION	SAMPLE
KIHUMBU-INI SEC. SCHOOL	3	3	200	40



### **3.4. INSTRUMENTATION**

The researcher used questionnaires.

Questionnaires were used because they cover a large population within a short time, and are easily administered and less expensive.

The two different types of questionnaires used were:-

- (i) Questionnaire for Chemistry teachers (Appendix 1). This has well researched questions that specifically explored the objectives of the study.
- (ii) Questionnaires for the student (Appendix 11)

### **3.5. PILOTING**

The questionnaires were piloted by administering them to four Chemistry students randomly selected and one of the Chemistry teachers.

The purpose for piloting was to assess the clarity and suitability of the language used in the questionnaire.

### **3.6. DATA COLLECTION TECHNIQUES**

A letter of introduction was handed over to the principal of the school, from the course coordinator. The researcher used simple random sampling technique to identify the representative sample of the Chemistry student population. All the 3 Chemistry teachers in the school were given teacher questionnaires to fill. The respondents were given one day to fill.

### **3.7. DATA ANALYSIS**

Once the completed questionnaires are received, the data will be coded according to different respondents. It will then be tabulated and edited for analysis. The editing will focus on the objectives which will be frequently addressed by the majority of respondents. Those areas which are of more prominence and of more significance to the research will be tabulated from the tabulated data. Descriptive statistics using percentages and frequencies of the causative factors to the research question will be used to support or reject the hypothesis

## CHAPTER FOUR

### INTRODUCTION

#### FINDINGS OF THE STUDY AND DATA ANALYSIS

The aim of this study is to establish the factors that cause poor performance in Chemistry at the Kenya Certificate of Secondary Education (KCSE). For this reason a number of possible variables were floated for verification in the field.

The following were considered as the most probable factors that cause poor performance in Chemistry:

- Students' the attitudes towards the subject
- The availability of activities relevant to the teaching of Chemistry,
- The teachers experience and training
- The role played by the school management in facilitating the learning of Chemistry.

The responses obtained through the questionnaires pertaining to the variables under investigation have been tabulated and analysed together as shown in the following pages:

#### Students' attitude towards the subject

**Variable 1.** On attitude I intended to establish which three subjects are liked by students.

Table 4.2.1 Three Most Liked Subjects

SUBJECTS	NO. OF STUDENTS	%
English	40	38
Mathematics	39	38
Chemistry	42	40
Biology	46	44
Physics	17	16
Agriculture	23	22
Geography	25	24
History	08	08
Kiswahili	23	22

It should be noted that each subject had a chance of being chosen by all the students and this makes the total percentages more than one hundred percent.

The table reveals that less than fifty percent of the sampled students like Chemistry which has a score of forty percent.

#### 4.3.2 Why the mentioned subjects are liked

This was tested with variables 2 which indicated that most of the students liked the subjects because they wanted to pass in them.

Table 4.2.2 reasons for liking the subjects

Reason	No. of students	%
Because I like the subject teacher.	02	02
Because the subject is interesting.	35	34
Because I perform well in them.	23	22
Because my friends like them.	00	00
Because I want to pass in them.	44	42
<b>Total</b>	<b>104</b>	<b>100</b>

The table above shows that students have varied reasons for liking the subjects. Teachers need to identify these individual differences in order to help the students pass in the subjects.

#### 4.3.3 Subjects in which teachers' guidance is sought.

Variable3 was to find out in which subjects students sought teacher's teachers' guidance.

Table 4.2.3 table indicating the subjects in which teachers' guidance is sought

Subjects	No. of students	%
English	04	04
Mathematics	87	84
Chemistry	85	82
Biology	29	28
Physics	69	66
Agriculture	02	02
Commerce/BED	12	12
Geography	04	04
History	04	04
IRE	00	00
CRE	00	00
Kiswahili	00	00

From the table it can be seen that more than eighty percent of the sampled students need teacher's guidance in order to perform well in Chemistry. This implies that well trained teachers with enough experience are required in a school to improve the performance in Chemistry.

#### 4.2.4 Subjects with the highest number of assignments.

Further efforts establish the student's attitudes towards Chemistry were made on variable 4, which was to establish in which subject the students had the highest number of assignments. The figures in the table below illustrate the findings.

Table 4.2.4 subject with the highest number of assignments.

Subjects	No. of students	Percentage
English	35	34
Mathematics	85	82
Chemistry	29	28
Biology	17	16
Physics	29	28
Agriculture	21	20

The table shows that only twenty-nine students stated that they had the highest number of assignments in Chemistry. Whereas Chemistry had a high percentage as a subject that requires teacher's guidance, students are not given enough consistent and continuous practice. The teachers should realize that these two variables are quite related and should therefore increase number of tests and assignments to enhance good performance in the subject.

#### 4.2.5 Duration of study

Variable 5 on attitude was to establish how often students studied Chemistry during their preps or private study time. The table below illustrates the findings.

**Table 4.2.5 time allocated for Chemistry per week**

No. of days	No. of students	Percentage
Everyday	6	6
1-2 times	54	52
3-4 times	35	34
5-6 times	2	2
Not at all	4	4

It was noted that the majority of the students studied Chemistry 1-2 times a week. This time period is not enough since Chemistry requires constant revision.

#### 4.2.6 Whether Chemistry requires constant revision

Variable 6 was aimed at finding out whether Chemistry requires constant revision. The table below shows the findings.

Response	No. of students	Percentage
Yes	92	88
No	12	12
<b>Total</b>	104	100

From the findings on the table above, more than eighty percent of the students believe that Chemistry requires constant revision. However most students do not revise the subject

frequently. This is therefore one of the reasons for poor performance in the subject at KCSE level. Teachers therefore have a duty of advising the students of the importance of constant revision.

### **Response to the teaching of Chemistry**

This variable attempts to establish whether the students find the teaching of Chemistry interesting or boring. The table below presents the findings.

Response	No. of students	Percentage
Very interesting	29	28
Interesting	60	58
Boring	10	10
Very boring	5	4
<b>Total</b>	104	100

Looking at the percentages in the table above, majority of the students felt that the teaching of Chemistry is interesting; however the ten percent who said that it is boring and the four percent who said that it is very boring should not be overlooked. It is therefore a big challenge on the part of the teachers and administration to ensure that the teaching of the subject is made as interesting as possible.

### **4.2.8 Whether Chemistry will be pursued beyond form four**

This variable aimed at finding out whether Chemistry will be pursued by the students beyond form four. The table shows the findings.

Response	No. of students	Percentage
Yes	81	78
No	23	22
<b>Total</b>	104	100

The table shows that the majority of the students want to pursue Chemistry beyond form four.

#### 4.2.9 Suggestions on how to improve the teaching of Chemistry

Variable 9 was aimed at soliciting students' views on how they felt the teaching of Chemistry can be improved. The findings are as shown in the table below.

Response	No. of students	Percentage
More practical	40	38
More time for revision	29	28
Purchase more text books	30	19
More exercises and tests	36	35
<b>Total</b>	<b>135</b>	<b>120</b>

The table shows that the majority of the students have the opinion that more practical should be conducted to enhance the learning of the subject. Lack of enough tests and exercises have also been cited to retard the learning of Chemistry.

#### 4.3 facilities relevant to the teaching of Chemistry

The availability of the relevant facilities for the teaching of Chemistry is a very important determinant in the student's performance. The facilities are varied ranging from text books, school library, laboratory and radio among others. Variables 10-18 in the code sheet were aimed at finding out whether these facilities are available in the sampled schools.

##### 4.3.1 The main text book used in Chemistry

The study revealed that different teachers were using different books as their main texts. However the books that were commonly used were Kenya institute of education (KIE) pupil's book and Chemistry pupils' book by Patel.

##### 4.3.2 Whether there are enough copies for students

Another relevant worth mentioning is that there are not enough textbooks to be shared among the students as shown in the table below:

Table 4.3.2 Whether There Are Enough Copies for Students

Response	No. of students	Percentage
Yes	0	0
No	9	100
<b>Total</b>	<b>9</b>	<b>100</b>

#### 4.3.3 Number of students sharing a copy of textbook

This is major factor as it determines how frequent student is able to revise questions in the subject. The table below shows the findings.

Response	No. of Books	Percentage
One student	0	0
Two students	2	22
Three-four students	1	11
Five- Ten students	1	11
More than Ten	4	45
No copy for ten students	1	11

The table shows that in most classes, one copy of a textbook is shared among more than one student. This means that if it is not properly coordinated, some students may end up not using the book at all. It should be noted that some students have no access to textbooks and rely on the teachers notes in the subject. This fact may lower the learner's performance.

#### 4.3.4 Mode of testing the students

This variable addresses the methods teachers use in giving assignments and continuous assessment tests to the students. This is important because the afore-mentioned determine the number of questions and type of questions to be attempted. The table below sows the finding.

Response	No. of Teachers	Percentage
I write on the board.	8	89
Students have enough reference books.	1	11
Questions are all answered orally.	0	0
<b>Total</b>	<b>9</b>	<b>100</b>

#### 4.3.5 Availability of school radio

The study also revealed that in all the sampled schools \, none of them had a radio. This means that the students have no access to radio programmes as a teaching aid. This



extrapolates into Chemistry being learnt in an abstract manner which hampers the learning of the subject.

#### 4.4 Teachers experience and training

Teachers experience and training can be important factor determining student's performance in Chemistry. This is because the handling of subject content to large extent depends on the level of training one had undergone. Variables 19-21 were set to asses whether the teachers' experience and training do contribute to better performance.

##### 4.4.1 TEACHING EXPERIENCE

Experience	No. of Teachers	percentages
One year	0	0
Two years	5	56
Between three-four years	2	22
Between five-ten years	2	22
Over ten years	0	0
<b>Total</b>	9	100

This is a very important factor as it determines the confidence with which the teacher will approach the topics, how he/she will handle the students during lessons. The table below shows the findings.

The table above shows that five of the teachers have experience of two years; two had experience of between three and four years, and another two with experience of between five and ten years.

#### **4.4.2 LEVEL OF TRAINING**

Although all teachers in the sampled schools are degree holders, they are not teachers by profession. When teachers not trained in teaching of the subject are deployed, they not only lack the confidence but also mislead the students.

#### **4.5 Role Played By The School Administration In Facilitating The Learning of Chemistry**

As indicated in the previous sections, teachers' training is very crucial as indicated in the findings of the interview, most of them confessed that they did not like teaching but have resorted to it a result of lack of employment in the areas in which they were trained. This has resulted into high teacher turnover in the school. This study revealed that teachers come in and go anytime they get an alternative employment. This has occasioned the school to drag behind in the completion of the syllabus as a lot of prime time is wasted in advertisement for a new teacher to join the school.

Another set back in the teaching of Chemistry in the school is the low pay. The teachers who sought anonymity complained of the low pay which demoralizes them. Majority of them have a gross package of between seven thousand shillings which actually is less than half what their counterparts in the government institutions are getting. The absence of allowances like medical allowances, house allowances have further aggravated the problem. Other benefits that would motivate the teachers are equally lacking

Despite all these horrible conditions of work the teachers are overburdened. The study also revealed that a teacher is expected to teach even the subjects he/she left at secondary level.

Obviously under such circumstances the teachers cannot perform optimally.

## CHAPTER FIVE

### DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

#### INTRODUCTION

This chapter offers a brief discussion, conclusion and recommendations of this research. The discussion highlight the core areas covered in the study. Conclusions are drawn from the findings of the study whereas recommendations are based on the outcome of the findings.

#### DISCUSSION

##### **Attitudes**

This is a very important factor that determines student's academic performance, not only in Chemistry but also in other subjects. It can only be developed with time and must first and foremost be the teacher's initiative. Developing a positive attitude towards a subject must be gradual just like a child learning how to talk and walk. It should be noted that a student with the positive attitude towards a subject will be self propelled and does not need to be pushed around to perform well. However, to develop the right attitude requires a deep collaboration between all the stakeholders, in this case students, teachers, administration, parents and the immediate community.

It should also be borne in mind that the presence of other factors does not automatically lead to good performance if apposite attitude towards the subject is lacking. Teachers therefore have an uphill task in nurturing this vital aspect on the students to enable them perform well in the subject. The teachers need to correctly identify the causes of negative attitude of the students towards Chemistry and work towards reversing the trend. Some indicators of negative attitudes include poor performance in tests, failure to attempt assignments and low level of students' participation during the lesson.

##### **Facilities**

This is a major factor that can singly have a bearing on student's performance in the subject. It is worth mentioning that it also determines the learner's attitude towards a subject and the school. It goes without saying that the presence of the right type and number of teaching aids

will enhance the learning of a subject, more so, those that require practical like Chemistry. It is true to say that providing experimental equipment to learners during examination and none during teaching sessions is like giving medicine to a person breathing his last breath. This is also important to bear in mind that the students can only use effectively the tools and equipment that they are conversant with.

### **Teaching experience and training**

The ability of the teacher to deliver and adequately prepare the learners for an examination is a function of his or her teaching experience. Teachers with little teaching experience are not in apposition to identify which areas of the syllabus should be stressed to enable the students develop the right skills and attitudes in the subject.

In fact allowing inexperienced teachers to prepare an examination class can be equated to taking a driver who has just completed a driving to a very busy road where he is likely to cause a serious accident. Such teachers are yet to develop confidence in themselves leave alone students having confidence in them.

Training of teachers contributes positively on the performance of students especially in mathematics and sciences. The 1998 Kenya Certificate of Secondary Education (KCSE) examination analyses showed that only 16 percent of the students from national school scored D and E in sciences. This can be attributed to the presence of trained teachers in the schools. It can be argued out that the presence of facilities without the right training is of no or little consequence to the learning process. In fact allowing someone who trained in a different profession to teach is like giving a bus driver an opportunity to fly an airplane full of passengers. In this case, the untrained teacher is not well equipped with the techniques of planning and dissemination of the subject content. Such teachers harbor either negative or neutral attitudes towards teaching. In most cases they use practical lessons for teacher demonstration which leave the students without hands- on practical skills. Such attitude by the teachers undermines students' performance especially in sciences.

## **Role of administration**

The school administration has a multiplier effect on the other factors and hence plays a significant role in determining the overall performance of the students.

It is the school administration to provide a conducive environment for cultivation of the right attitudes towards learning.

In private schools, it is the duties of the administration not only hire the right personnel but also to motivate them in order to achieve the desired goals and objectives of the school. It is therefore wrong to believe that teachers will always be effective unless their needs are met to some level.

Moreover, the administration is expected to ensure that facilities are purchased and used effectively by the teachers. In other words the control of facilities and careful supervision of the teachers is vital for proper management of the schools.

## **CONCLUSIONS**

Following the findings of the study, the following conclusions can be made:

### **Attitude:**

This is a very important factor that determines students performance in Chemistry. Generally the students from the sampled school have a negative attitude towards Chemistry. From this, it can be correctly argued that this attitude contributes significantly to the poor performance of students. Attitude can only be developed with time and must first and foremost be the teacher's initiative. This attitude can be reversed in different ways some of which include, teachers, administration and parents developing a conducive atmosphere for learning.

Teachers should impress upon students that Chemistry needs constant revision both in school and at home. They should also increase the number of assignments.

Most students tend to like the subject because they want to pass in it. This should not be confused with the attitude since after passing one may abandon it. For the objective of industrial development to be realized, the real attitude must be developed to enable the

learners participate in industrial development actively. In this regard, an awareness that Chemistry is important both in and out of school should be emphasized to the students.

### **Relevant Facilities for Teaching of Chemistry**

It is evident that lack of facilities in the school has led to poor performance especially in sciences, Chemistry included. For the development of the right skills in the students, the following aspects should be addressed adequately.

- a) Enough copies of relevant texts should be provided in the library to enhance proper revision.
- b) A well equipped laboratory for Chemistry is a basic requirement. Teachers should also ensure that practical are performed by the students themselves to minimize rote learning. This enables the learners to relate what is learnt in class and what happens in their immediate environment.
- c) Other facilities like the radio, recorded materials should be used occasionally to substitute the boring lecture method that has taken the centre stage in our learning institutions.

### **5.3.3 Teacher Experience and Training**

Most low cost schools hire the services of the less experienced and untrained teacher. This has contributed negatively in the development of reliable and competent personnel who can help the country to achieve its objective of industrial development by the year 2020. Training in the teaching subject is necessary for it helps the teacher to be confident. Experience helps a teacher to understand which areas of the subject or a topic needs emphasis.

### **5.3.4 School Administration as a Facilitator to the Learning of Chemistry**

The school administration is a 'master' factor which controls other factors which can help to improve the performance of the students in examination. From the study carried out,

it can be concluded that the school administration has contributed to the poor student's performance in the following ways:

- a) By employing less experienced and untrained teachers.
- b) By failing to motivate the teachers in order to boost their morale in teaching.
- c) By failing to provide enough text books and equipping the laboratory to enable the teachers to carry out practical as required.

## **RECOMMENDATIONS**

On the basis of the research findings of the study, a number of recommendations can be made with a view to improving the teaching of Chemistry and the students' performance in the examination.

### **5.4.1 Developing A Positive Attitude Towards Chemistry**

Attitude is a crucial factor that determines students' performance in the subject. Teachers of Chemistry should note that a positive attitude can be developed with time and cannot be forced.

This can be done through the following ways:

- a) There should be concerted effort from the teachers, parents, the society and the government in creating awareness on the importance of Chemistry in and out of school. This can be enhanced by inviting resource people from a related discipline like a doctor. This will help them to develop a positive attitude because the students will relate the subjects with success in life.
- b) Teachers should consistently give students constructively give students constructive assignment which are varied in nature. Not all those assignments need to be marked by the teachers. The students should be encouraged to read widely to supplement the information provided by the teachers.
- c) Teachers should encourage students to seek guidance in Chemistry. Through regular practice and asking questions on difficult areas, the student's performance can greatly improve. Teachers should make subjects interesting

by varying the teaching techniques. Other than this, the teachers should cultivate a friendly relationship with the students as this helps them to identify individual problems of the students.

#### **5.4.2 Facilities Related To the Teaching of Chemistry**

With the introduction of cost sharing in schools, parents have been given the full responsibility of equipping the schools or rather buying text books to their children. As much as it being a function of economic trend in the developing countries, this has led to regional disparities. 1998 Kenya Certificate of Secondary Education analysis showed that schools that are well equipped perform very well. For example the results showed that failure rate in National schools is very low.

A baseline survey by the ministry of Education officials and the Japanese Development Agency (JICA) of 1998 says that the main reason behind the poor results in Science is lack of facilities. This problem could be averted through the following ways.

- a) Educating the parents on the need of purchasing the necessary equipment for their children. This could be done by the parents teachers Association (PTA) organizing harambees to raise money for such a project.
- b) The ministry should not abdicate the sole responsibility to the parents, but should come in to help especially in selected areas where the level of income of most parents is very low.
- c) Registration of schools as operating entities should only be done after thorough inspection to ensure that the schools have the basic requirements like a well equipped laboratory.
- d) The ministry should ensure also ensure the suitability of teachers employed in private schools that students are not taught by mediocre teachers. This can be achieved through thorough inspection of school records and a resolve by school inspectors to resist bribery.



## **Teachers experience and training**

Training and experience of Chemistry teachers is a prerequisite for good performance in exams. Currently there are professional teachers who are not involve in active teaching whereas the so called low cost private schools have hired the services of educational quarks the government should therefore change this trend by insisting on schools o have trained teachers.

In addition, in-service courses should be introduced to enable the untrained teachers already in the field to acquire the necessary skills in teaching. Seminars and workshops should be frequent to allow old teachers to focus on the desired goals.

## **Role of school administration**

As indicated earlier, not only is teachers' experience and training level important but also their level of motivation. Whereas you can force a cow to go to the river but you cannot force the cow to take water. For this reason, the government should set the lowest salary that teachers in all schools ought to earn to boost their morale other than leaving them to be exploited. Some level of protection should be given to the teachers in these schools to minimize unreasonable dismissal.

## **Suggestions for further research**

1. The impact of the rate of teachers' turnover on the performance of students.
2. The effects of teachers load (number of lessons per week) on the students' performance.

**APPENDIX 1**  
**QUESTIONNAIRE ON STUDENTS ATTITUDE TOWARDS CHEMISTRY**

**A. PERSONAL DATA ON RESPONDENT**

Name of respondent \_\_\_\_\_

Age

Class

School

Sex

Adm.No

Division

B. Below are simple questions. Answer them accurately and sincerely.

1. Which three subjects do you like most? List them down in order of preference.

A. English

B. Mathematics

C. Chemistry

D. Biology

E. Physics

F. Agriculture

G. Commerce/BED

H. Geography

I. History

J. IRE

K. CRE

L. Kiswahili

2. Why do you like these subjects?

A. Because I like the subject teacher.

B. Because the subject is interesting.

C. Because I perform well in them.

D. Because my friends like them.

E. Because I want to pass in them.

3. In which three of the subjects below would you seek teachers guidance so that you may understand them better?

- A. English
- B. Mathematics
- C. Chemistry
- D. Biology
- E. Physics
- F. Agriculture
- G. Commerce/BED
- H. Geography
- I. History
- J. IRE
- K. CRE
- L. Kiswahili

4. In which two of the subjects below do you have the highest number of assignments?

- A. English
- B. Mathematics
- C. Chemistry
- D. Biology
- E. Physics
- F. Agriculture

5. How many days per week do you study Chemistry during preps or private studies time?

- A. Everyday
- B. 1\_2 times
- C. 3\_4 times
- D. 5\_6 times
- E. Not at all

6. In your opinion, does Chemistry require constant revision as in mathematics?

- A. Yes
- B. No

7. Do you find the learning or the way Chemistry is taught interesting or boring?

- A. Very interesting
- B. Interesting
- C. Boring
- D. Very boring

8. Do you want to study Chemistry beyond form four?

Yes

No

9. Give two suggestions which can be used to improve the teaching of Chemistry, in your class.

More practical

More time for revision

Purchase more text books

More exercises

**APPENDIX 2**

**QUESTIONNAIRE FOR THE TEACHERS OF CHEMISTRY**

**A. PERSONAL DATA ON RESPONDENT**

Name of respondent

Sex

School

Division

District

B. Below are simple questions. Answer them sincerely and accurately.

**1. FACILITIES RELEVANT TO THE TEACHING OF CHEMISTRY**

1.State one main text book you use for the teaching of Chemistry in your school.

.....

2. Are there enough copies for all the students in the classes you teach?

Yes

No

3. How many students share each copy of the main text?

One copy for every student

One copy for every two students

One copy for three-four students

One copy for more than five students

One copy for ten students

One copy for the teacher only

4. Do you write the questions on the blackboard or the students have enough reference books to read and answer the questions?

I write on the board

Students have enough reference books

Questions are all answered orally

5. Which other text books do you use as reference materials for the teaching of Chemistry?

1).....

2).....

3).....

4).....

6. Do you have a school library?

Yes

No

7. If yes, how do ensure that students borrow and read them.

Students have access to the library

By allowing particular students to borrow on

Particular dates

Not applicable

8. Do you have a school radio in working condition?

Yes

No

9. If yes, do you listen to radio programmes in Chemistry?

Yes

No

10. Do you borrow or have access to recorded cassettes on various topics in Chemistry to be listened to by the students?

Yes

No

11. State any other facilities relevant to the teaching of Chemistry available in your school.

- 1).....
- 2).....
- 3).....
- 4).....

## APPENDIX 3

### TEACHERS EXPERIENCE AND TRAINING

1. For how long have you taught Chemistry?

- A) One year
- B) Two years
- C) Between three-four years
- D) Between five-ten years
- E) Over ten years

2. Have you had any training in the teaching of Chemistry?

Yes

No

3. If yes, state at what level

- A) Diploma
- B) University
- C) Other (specify)



## APPENDIX 4

### TEACHER QUESTIONNAIRE

#### Instruction:

You are kindly requested to fill in the questionnaire by writing the correct answer. The information gathered is solely for research purpose only. You do not have to write your name. Tick (✓) or fill in the correct blank space. Use the key provided, where applicable.

SD - Strongly Disagree

D - Disagree

UD - Undecided

A - Agree

SA - Strongly Agree

	STATEMENT	SD	D	UD	A	SA	TOTAL
a.	There are enough Chemistry text books for teachers and students						
b.	There are adequate teaching resources such as charts and models for Chemistry.						
c.	There are adequate chemicals/reagents and apparatus for teaching Chemistry						
d.	There are adequate laboratories for Chemistry						
e.	Chemistry, apparatus and reagents are adequately used in teaching Chemistry						

Q2. Do you enjoy teaching Chemistry? Yes  No

Q3. Do you encounter any challenges in teaching Chemistry?

Q4. If yes, where do they come from?

Students

Facilities

Administration

All the above

Q5. For how long have you taught Chemistry?

Less than 1 year

Four years

More than 4 years

More than 1 Year

Q6. What percentage of your Chemistry students can be said to be below average?

10% and less

20% and less

30% and less

40% and less

More than 50%

Q7. Where did you go for your training as a Chemistry teacher?

University

Diploma College

Other

Q8. What do you think leads to poor performance in Chemistry , Give three reasons.

(i)

(ii)

(iii)

Q9. What do you think can be done to improve performance in Chemistry? Give 2 reasons.

(i)

(ii)

## APPENDIX 5

### STUDENTS QUESTIONNAIRE

#### INSTRUCTION:

- Do not write your name in this paper.
- Try to be brief & honest in your answers.
- This is NOT an exam.

1. Do you like the Chemistry subject: Tick one

Yes

No

2. If you like Chemistry, how do you like it?

Very much

Not very much

A little

3. If you do not like Chemistry why? Tick only one.

It is hard to speak

It is hard in exams

It is poorly taught

I failed in STD 8

4. Do you like Chemistry teacher? Tick one

Yes

No

5. How does your Chemistry teacher teach Chemistry? Tick one.

Very well

Average

Poorly

6. Do you think it is important to learn Chemistry in school?

Yes

No

7. What was your Science grade in STD 8? Tick one

A  B  C  D  E

8. Do you share Chemistry text books in school? If you do share what is the ratio? Tick one.

1 book: 2 students

1 book more than 2 students

1 book: 1 student

9. What do you think can be done to improve performance in Chemistry? Give 3 points

(i)

(ii)

(iii)

## **DEFINITION OF CENTRAL TERMS**

**K.C.S.E.** – An abbreviation for Kenya Certificate of Secondary Education.

**K.C.P.E.** - An abbreviation for Kenya Certificate of Primary Education.

**Performance** – Change of the intended behaviour after learning.

**Education** – Process of acquiring and developing desired knowledge, skills and attitudes.

**Curriculum** – All that is planned to enable students acquire and develop desired knowledge, skills and attitudes.

**Syllabus** - An arrangement of subjects to be studied over a period of time.

**Attitude**- Acquired disposition to respond to something in a certain way depending on how one views and feels about that thing.

**Behavior** – Mode of acting and functioning towards something in a given situation.

**Teaching Aids**- Items such as radio cassettes, video-machines & diskettes, which can be used to make teaching more effective.

**Qualification**-acquired competence through training measure through degrees, diplomas or lowest, certificate.

**Experience-** accumulated knowledge or skills on a given area the technical 'know how' of doing something- teaching.

**Effort-** (i) Energetic attempt or struggle to do something.  
(ii) Result of the attempt.

**Characteristics-** Distinguishing features such as attitude, behaviour experience, qualification, manner or doing something.

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