

LEARNING RESOURCES AND ACADEMIC PERFORMANCE
IN CHEMISTRY BIASHARA WARD,
NAKURU DISTRICT,
KENYA

By

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APPROVAL

This research report is submitted for examination with my approval as a University supervisor.

Signed



.....

Mr. Fred Ssemugenyi

18/08/22

DEDICATION

This book is dedicated to my mother Ruth

ACKNOWLEDGEMENT

First I thank my supervisor; Mr. Fred for guidance and continued support. Second, to my family for their inspiration as I carried out this research.

To the respondents who returned the questionnaires, thanks very much for your cooperation.

DEFINITION OF TERMS

1. **Teaching resources;** materials intended for use by teachers
2. **Learning resources;** those used by the learners to enhance the learning process.
3. **Audio visual resources;** learning materials involving motion pictures and sound.
4. **Print Resources;** printed materials for study like books and crafts.
5. **Realia;** real objects or artifacts in models, specimens e.t.c
6. **Non reading materials;** extra audio visual materials for learning through observation like films, VCD,DVD.

ABSTRACT

The purpose of this study was to explore the relationship between learning resources and academic performance in chemistry in Biashara Ward, Nakuru district, Kenya.

The specific objectives of the study were to determine the levels of performance in relation to availability of text books, curriculum implementation, facilitation, better classrooms, laboratories and practical materials.

Quantitative data was categorized according to the research variables and data generated from questionnaires was computed into frequency counts and percentage.

The methods used for data collection were questionnaires to students and interviews with the head teachers of schools.

The findings indicate that there were effects of learning resources on academic performance in chemistry.

The study recommended government buying learning resources in schools so that they are adequate and available for use of science students to help them perform better in academics.

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CHAPTER ONE

THE PROBLEM AND ITS SCOPE

INTRODUCTION

1.1 Rationale Of The Study

Education plays a key role in human development. It equips a person with relevant skills, knowledge and values to enable one to serve and actively participate in nation building. This has made education to be declared human right which should be given to every person in Kenya.

According to Combs(1985) "No other subject in the curriculum has drawn greater world wide attention over the past 20years than science". Education has come not from only teachers, scientists and mathematicians but also from political and business leaders and not atleast education systems themselves. The aim is not only solely to produce scientists and technologists. It is also to produce a new generation of citizens who are scientifically and better prepared.

According to national development plan (2000 -2008) the analyst of education particularly science in the country has declined while its relevance has not been systematically adapted to meet needs.

According to Norak Kloppter Hazel (1990) there are four easy solutions to the improvement of science instructions. It is face with two significant realities.

The amount of Knowledge to be learned is overwhelming for students and teacher. New Knowledge is being constructed at a rate that is equally overwhelming. Science education faces myriad of problems not only in Kenya but also in the whole world.

Poor performance by students in sciences and in particular chemistry has been of great concern to educators, the government, parents and other concerned parties. Education views it as failure to achieve the present instructional objective. This leads to frustration on the education and perhaps the biggest victim of the failure of the structures in sciences is the student themselves, the art and society at large.

According to Coombs (1985) the most serious problem in almost all countries is finding and retaining science and mathematics teachers who are competent and inspiring.

Government relies on education for the provision of the much needed manpower. This is clearly reflected on the budgetary allocation to the ministry of education science and technology as represented on budget day June 2003.

In dispute, Maranga (1993) points out that the general performance is still wanting. Determinants of school achievement in the united world countries include; student traits, teachers' characteristics, resources available and management.

Poor performance reduces their job placement opportunities. This curtails the active participation in national development. This has therefore made education to be highly result can be judged by grades on the certificates.

1.2 Theory

This study is based on the THEORY OF PERFORMANCE (Tuckman, 1975), which states that "the point of academic performance or excellence, is positioned towards the label of

observable manifestation of knowledge, skills, concepts and understanding idea.” Hence, basics of the study determine a lot in the student’s performance in the subject. If performance is the accomplishment of set tasks in a course objective in order to meet the requirement of examination syllabus, what explains the difference between the high performance in ‘O’ level and ‘A’ level. Thereby, performance is the application of the learning product that at the end of the process provides mastery.

The acquisition of particular grades on examination indicate candidates ability, mastery of content, skills in applying learned knowledge to particular situations. A student’s success is generally judged on examination performance. Success in examinations is a crucial indicator that a student has benefited from a course of study (Wiseman, 1961). Why? Fishman (1962) states that, “all British studies have relied on examination performance.” This reality provides the basis on which performance is measured by western civilization.

However, Harrison (1974), a Jamaican, pointed that although an examination is not a perfect measure of educational success for pupils, it is an important indicator in this country’s educational system and such cannot be ignored. It should be noted that the British established the educational system in Jamaica and so one should understand why this position is widely accepted.

The researcher believes that authentic academic performance should involve an examination of total person. Meaning the examination should cover individual’s academic ability, and skills in applying practical abilities.

Joan Freeman (1993) states that, “good intellectual skills have to be learnt, although basic sensory awareness naturally is common

condition.” Meaning one’s intellectual ability to cope with incoming information, store it in flexible category in the memory, retrieve it for application to different situations, adopt a new information, all have to be refined to reach levels of competence. This process needs directive teaching, such as learning to distinguish between shapes, recognizing forms and estimating distances to mention but a few.

It is through skills such reading, and listening that an individual acquires information (Lindgren, 1976). The deed for information about the world is a challenge that we can only meet by acquiring and using appropriate skills, and it is impossible to learn skills without using information. Wright (1987) agreed with Lindgren when he appointed that it is important for learners to account being accurate about facts and information concerning their school tasks.

Meaning in being accurate about facts and information, reading skills is being utilized. Hence students are faced with the challenge of sub-standard reading materials. This issue may be an undiscovered reality that could explain the performance of candidates who write the examination.

Accuracy is necessary for a student to stay successful. It therefore means that students should learn to utilize as much academic resources as possible in chemistry performance. Meaning that ultimately to this end are students being prepared. By reading and listening, then the skill of comprehension will be improved. It can be noted that at the point where the students understand what is expected when they will be able to perform the tasks more competently. The ability to listen to instructions is an important

factor to be considered. This will enable the students to produce accurate and efficient work.

Better performance requires constant revision to aid the gathering of information. It is therefore important for students to be able to use the skill of computation efficiently. As such it is evident that students need to have the ability to do arithmetic. This is the key as students must be able to do basic chemistry to produce accurate information. The Kenya secondary school syllabus is designed to offer a variety of experience that may lead to all rounds mental social and moral development of a learner which should enable a learner to make a positive contribution to society. The experiences also assure that there is appropriate balance in development of cognitive psychomotor and effective skills.

The theory is related to the study in that it emphasizes the major factor of availability of learning resources as central and effective for teaching and academic performance. The acquisition of material either through purchase or improvisation is therefore imperative to the learning process.

1.3 Statement of the hypothesis

Availability of learning resources and students performance in chemistry in Biashara ward Nakuru district Kenya.

CHAPTER TWO

2.1 Introduction

This chapter gives reference to what other scholars have written about chemistry as a subject and performance of chemistry and availability of resources. Literature review helped the researcher with data compilation, statistics analysis as well as in understanding the problem. Materials used in the review included magazines and journals on their performance, newspaper articles and education related websites over the internet.

2.2 Review of Related Literature

According to Kamn and Taylor (1996), the view that textbook are an important resources has been expressed for long and most important tool of the teacher even in the audio-visual age has been maintained as a leading role in the teaching process. All other reading materials therefore act as supplementary since the text books have greater percentage.

Effective implementation of any curriculum depends on the kind of teaching materials that are available. The chemistry subject program for African schools (S.E.P.A) which was established to produce curriculum materials and introduce them to schools have been helpful to teachers and students they teach.

According to Nathenson and Handerson (1980) "the need for learning materials offers the teacher another new role. He can be a developer of materials when as an individual preparing them solely for his own students use or as part of a team preparing them for a wider audience. Teachers can be hard pressed to obtain suitable materials for instructions when there are no suitable materials

available for instructions when there are no suitable materials available for part of planned objectives.

Kathuri (1984) agreed that better facilitation and provision of resources in a school lead to better performance in examination. The presidential working party on education and manpower training for the next decade and beyond (Republic of Kenya 1998) report stated that, the resources should be planned properly and utilized in an effective manner to bring about efficient provision of quality and relevant education. Eshiwani (1983) quoting Postec Wailer (1980) pointed out that the schools that had the best facilities performed poorly in KCSE in Western province Kenya. Hence the difference in school facilitation would seem to account for the difference in achievement. His conclusion was that the presence or absence of schools that do well and those that do poorly.

The technical working group by ministry of education science and technology (2003) recognized the fact that the availability of educational materials has a major role to play on education outcomes. The group found that there was a critical shortage of laboratory facilities which is major contributor to the performance in national evaluation. (Bet 1986) revealed that poor support from local community in the development of learning materials and facilities was prevalent in most schools.

2.3 The SMASSE project

SMASSE project started in 1998 and is jointly sponsored by the government of Japan and Kenya. The area targeted was the teaching methods, equipment and allocation of teaching methods, equipment and allocation of financial resources to the areas of

mathematics and sciences. Several factors have been discovered which seem to affect teaching and learning of chemistry. It has been claimed that there is no improvement of performance with improved availability of teaching aid (SMASSE 2001).

As stated earlier education is the process in which relevant knowledge, appropriate skills and proper attitudes are impart to learners. These mainly fall in these domains of learning. All those activities in classroom and laboratory are guided by these objectives. For the objectives to be achieved, the activities in the classroom must be geared towards achievements of these objectives.

According to Wellington(2002), the work of a teacher is a tough one because they not only have to teach scientific knowledge, develop skills and foster scientific attitudes. The curriculum is therefore inclusive of laboratory experiments and projects, which provides learners with opportunity to undertake investigations to find solutions to a problem and help in the transfer and application of the required scientific knowledge to solving day to day problems.

Chemistry is an experimental science in which laboratory work is essential in maximizing learning. Many scientists and teachers agree that students learn better and more from practical and observation than from mere lectures; Musoko (1983)

According to Gardener and Gould in Hazel (1990) " laboratory work, its supporters claim, not only provides a science to students with experiences which foster cognitive development and psychomotor skills it provides opportunities for enhancing their scientific attitudes and their enjoyment of science as well. Klopfer Hazel (1990) objectives of laboratory work includes the final range of science processes such as observing and measuring, seeing and

seeking solutions to problems, interpreting data, generalizing and building, testing and revising theoretical models. It is most obvious that most adequately equipped laboratories, students can manipulate skills and acquire expertise in the use of instruments and apparatus.

The methods of teaching chemistry like lectures, discussions, demonstrations, class experiments and projects work are more vital to performance. Wellington (2000) identifies some possibilities for organizing and carrying out practical work in average school situation with constraints.

According to Woolnough(1991) “ practical science involves the doing of experiments or practical exercises with scientific apparatus usually in science laboratory. Gott Welford and Fouls (1998) identified the fine types of practical work in science; illustrative experimenting, enquiry based experimenting, investigating, using basin skills and observing. Jacobson Eggen and Kauchak (1998) in guided discovery stated that students are provided with information through teachers’ guidance where inquiry teaching is largely investigative and involve providing students with content related problems which serve as a focus for the subject research activity.

Newton (1998) suggests that other methods like integration of chemistry teaching approach make it more interesting. Biographies of scientists humanize the teaching of sciences and change view of a scientist as normal as any other and make it appealing to learn science.

Although methods of teaching include stimulation experiences, hypothetical case studies, integrating topical issues and events

which are of current significance, there are several factors which affect general student performance in schools. According to Opondo (1998) categorizes them into problems related to school management, staff and inadequate physical facilities at school, equipment, orientation, climate and discipline and school community.

Hazel (1990) comments on professional scientist work in laboratory. Laylonton in Hazel(1990) comments on professional scientist work in laboratory at some or all stages in their careers, where the student scientist must also work in laboratory. Laylonton in Hazel(1990) adds science education without laboratory experience is unthinkable. Waweru (1978) asserted that “ Harambee schools are always lacking laboratories”, and Musoko (1983) stated that “ in many Kenyan schools one serves as a science room for physics and chemistry and the other for biology.

In the study of Musoko (1983) a significant 50% of the schools buy laboratory equipment near examination time and these are same times schools prepare candidates for practical examination in form four. She goes ahead and comments that: it is obvious that “it is obvious that materials bought near examination time are basically for examination purposes only. This means that in real sense few or no equipment is bough for actual teaching during the year. Hazel comments that certainly the laboratory is not only unique in kind but uniquely expensive in terms of resources”.

Another important aspect of a poorly equipped laboratory worth mentioning is the absence of laboratory assistant/technician.

According to Newton (1995) a laboratory assistant helps the science teacher to accomplish their laboratory lessons by assembling the necessary specimens or materials/apparatus ready

for laboratory classes. A laboratory assistant is in this light important in that he relieves the science teacher work thus enabling the teachers to attend other duties.

God (1989) notes that teacher's lack both the basic conditions for teaching especially lack of learning resources. Digolo (1997) asserted that inadequacy of resources is one of the causes of performance.

Kathiri (1984) observed that better facilities in a school lead to better performance in examination.

The technical working party group by M.O.E.S.T (2003) recognized the fact that the availability of educational resources has a major bearing on educational outcomes.

2.4 Significance of the study

This study will benefit the following disciplines.

The ministry of education will be able to establish some of the general problems which are encountered by teachers in the acquisition and utility of the much needed learning resources.

The teachers will be able to plan, monitor and evaluate learning resources better. It may help them recognize their implementation of the chemistry syllabus which will result in higher quality learning of the chemistry to the learner.

The future researchers will be able to access data on the state of learning resources in secondary schools for the teaching of chemistry. This will be of value to the teacher trainer and trainees in Kenya public universities and colleges in planning of the use and improvisation of resources in teaching chemistry.

The curriculum will design relevant syllabus for secondary schools.

2.5 Objectives

General: This study determines the effects of learning resources on academic performance in chemistry.

Specific: This study seeks to;

1. Determine the levels of resources available interns of;
 - 1.1 Social demographic data
 - 1.2 Age
 - 1.3 Gender
 - 1.4 Academic level
2. Determine the levels of resources available in terms of;
 - 2.1 Availability of text books
 - 2.2 Curriculum implementation
 - 2.3 Facilitation
 - 2.4 Education materials
 - 2.5 Classrooms
 - 2.6 Laboratories
 - 2.7 Practical materials
3. To determine the usage of resource an academic performance.

2.6 Research questions

1. How does lack of teaching resources affect chemistry performance?
2. Which are the teaching resources needed for chemistry learning?
3. What is the difference between learning resources available in Biashara ward and those recommended by KIE for chemistry teaching?
4. What IS the relationship between students' performance in chemistry at KCSE examination and learning resources available in schools?

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This section entailed the methods assessed to collect the data necessary to answer the research. It is divided into:

Statistical treatment of data

3.1 Design

This study will employ a descriptive survey method involving qualitative analysis to determine the level at which level learning resources affects chemistry performance.

3.2 Environment

The study will be conducted in an environment defined as a complete set of individuals' cases or objects with some common observable characteristic Mugenda (1999) the target population will consist of all science teachers specifically for chemistry selected from Biashara ward secondary schools.

3.3 Respondents

The study will involve a total of six schools out of ten in Biashara ward selected through stratified sampling to participate in the study. A total of 50 respondents will be used involving 18 chemistry teacher, 30 students and two officials.

3.4 Instruments

This study will utilize a researcher devised instruments which are questionnaires and interviews.

3.5 Questionnaires

The questionnaires will be addressed to three chemistry teachers and five chemistry students from each school.

3.6 Interviews

In addition two officials from the ministry will be interviewed to supplement on the situation.

3.7 Data Collection procedures

The researchers will obtain an introductory letter from the institute of distance learning. This will enable the researcher to go to the field to carry out the study. The researcher will personally distribute questionnaires to teachers, students and interview the officials.

3.8 Scope

The study was to increase knowledge on the factors affecting the performance in chemistry in Biashara ward. Nakuru district, Kenya and come up with proper measures to control the poor performance. The result of the study were useful in saving and answering questions concerning the performance in chemistry and provide ground for further research in the specified area.

Statistical treatment of data

Quantitative analysis

Data will be categorized according to the research variables. Data will then be coded in sheets from which it will be keyed into the computer. Quantitative data generated from questionnaires will be computed into frequency counts and percentages using the formula below;

$$\text{Percentage (\%)} = \frac{F}{\text{Total no.}} \times 100$$

Where F =no. of respondents observed

Quantitative analysis

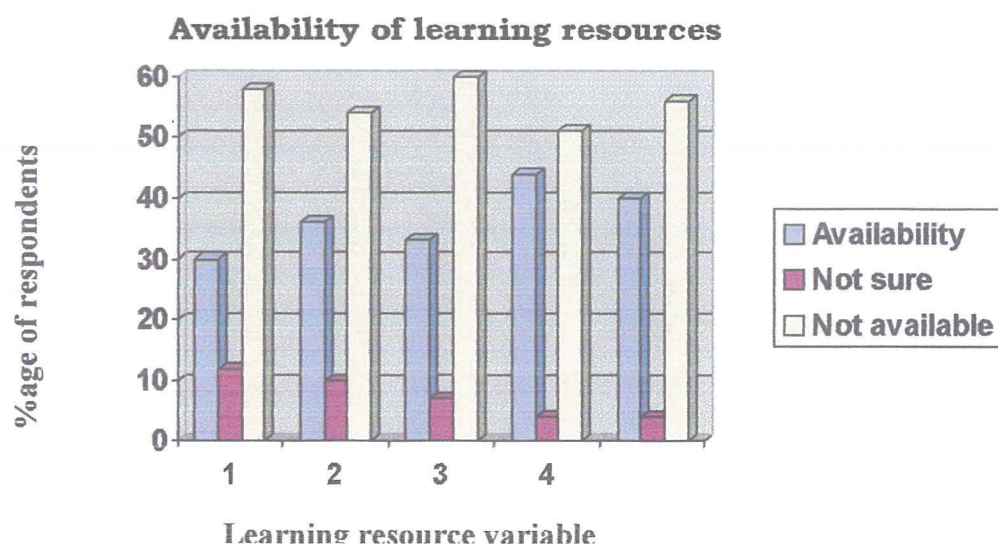
Data from questionnaires and interviews will be standardized and categorized. Such data will be presented in a descriptive form and will be used to discuss the results of quantitative data.

Table 2**Determining the level of resource availability**

The research finding on the availability of the level of learning resources is presented in the table below.

Availability of learning resources

	Item	Availability	Not sure	Not available
1.	Enough text books	30%	12%	58%
2.	Enough classrooms	36%	10%	54%
3.	Practical materials	33%	7%	60%
4.	Building facilities	44%	4%	51%
5.	Laboratories	40%	4%	56%

Bar Chart 1

Results form table 1 and chart 1 above show that 60% of the respondents say practical materials are not available, 58% said there no enough textbooks. Also, 56% said the necessary tools are not available

while 54% were of the view that there no enough classrooms fro study. This all naturally affects the academic performance of students.

To determine the usage of learning resources in relation to academic performance.

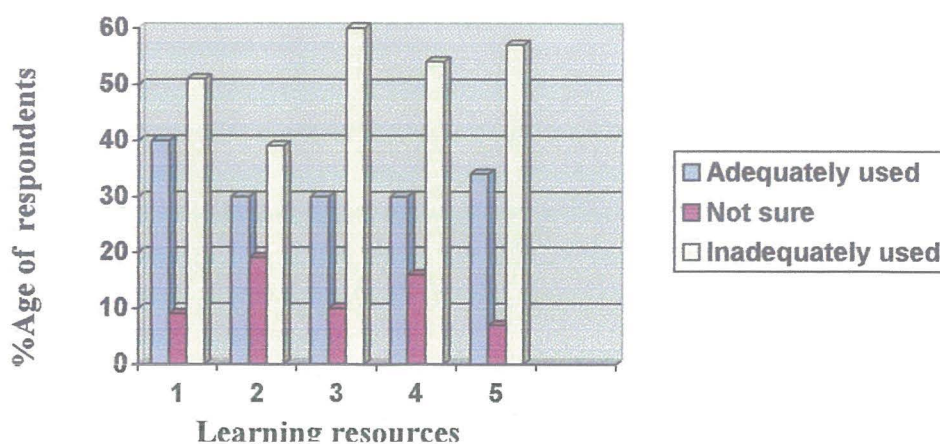
The findings of the study are presented in table II and chart II below

Table 3

	Item	Adequately used	Not sure	Inadequately
1.	text books	40%	9%	51%
2.	Science reader	30%	19%	39%
3.	charts	30%	10%	60%
4.	Television	30%	16%	54%
5.	Models	34%	7%	57%

Chart II

Usage of learning resources



Results from table II and chart II above indicate that 60% of the respondents said charts are not adequately used; another 59% said science readers were not adequately used whereas 57% were of the view that specimens were not adequately used. This generally affects their academic performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study looked at the relationship between learning resources and academic performance of chemistry students in Biashara Ward, Nakuru district. In an attempt to achieve the above two objectives were developed. This chapter presents the summary, conclusion and recommendations.

5.2 Summary of Major Findings

The level of resource availability

The first objective sought to identify the relationship between level of resource availability and academic performance. The study focused on availability of text books, classrooms, practical materials and laboratories in relation to academic performance.

The findings revealed that 60% of respondents said practical materials were not available, 58% said the text books were unavailable while 56% said there were no laboratories.

5.3 Usage of learning resources

The second objective focused on the usage of learning resources. The study focused on the usage of test books, charts, television and models.

The study findings revealed that 60% of respondents said charts were adequately used, 59% said science readers were inadequately used, 57% said models were inadequately used. Also 57% televisions were inadequately used while 51% said text books were inadequately used. All these affect their academic performance.

5.4 Conclusion

The level of resource availability

The first objective sought to identify the relationship between level of resource availability and academic performance.

The findings revealed that textbooks, classrooms, practical materials, building facilities and laboratories were not available.

Usage of learning resources in relation to academic performance

The objective was to find out the usage of learning resources in relation to academic performance.

The findings revealed that textbooks, science readers, charts, television and specimen among others were inadequately used.

RECOMMENDATIONS

The following recommendations are based on the findings and conclusions.

1. The government should buy learning resources in schools so that they are adequate and available for use to science students to help them perform better in academics.
2. The school authorities should make available learning resources and ensure they are adequately utilized to improve the academic performance of chemistry students.

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QUESTIONNAIRE FOR THE STUDENTS

The purpose of this study is to determine learning resources of schools in relation to academic performance of science students.

You are requested to fill in this set of questions and tick where appropriate with much sincerity.

1. Profile of the students

Age

13 – 18

☐

19 – 24

☐

25 and above

☐

2. Determining the level of resource availability

Enough text books

Strongly agree

☐

Agree

☐

Disagree

☐

Strongly Disagree

☐

Enough Classrooms

Strongly Agree

☐

Agree

☐

Disagree

☐

Strongly disagree

☐

Charts are used as learning resources

Strongly Agree ☐

Agree ☐

Disagree ☐

Strongly disagree ☐

Television is used as learning resource

Strongly Agree ☐

Agree ☐

Disagree ☐

Strongly disagree ☐

Models are used as learning resources

Strongly Agree ☐

Agree ☐

Disagree ☐

Strongly disagree ☐