THE EFFECTS OF TEACHING RESOURCES ON STUDENTS PERFORMANCE IN CHEMISTRY SUBJECT IN SECONDARY SCHOOLS IN KIRUMBA SUB COUNTY RAKAI DISTRICT

BY

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DECLARATION

I Golooba Paddy declare that this research report is my original work and has not been presented for an award of a degree or it's equivalent in any other university or institution of high learning

Sign:.....

Golooba Paddy

Date: 29th/April/2010

APPROVAL

This research report has been submitted for examination with my approval as a university supervisor

Sign:.....

Mr. Samanya Bulhan

Date:.....22nd/July/10

DEDICATION

I dedicate this work to my dad and mum plus my brother Emmanuel and all the people who supported me towards my education carrier and with their moral encouragement and material support.

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To begin with, I wish to express my sincere gratitude and thanks to Mr. Samanya Bulhan, my supervisor in Kampala International University, who has guided me through out the time of writing this report by correcting me where need arose.

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ABSTRACT

The purpose of this study was to examine the effects of students' performance in chemistry subjects in secondary schools in Kirumba sub country-Rakai district, Uganda.
Specifically the study determined the attitude of students towards science subject, learning environment, culture, home background, gender, behavior and role models.

Three questionnaires were used, one for principles, another for chemistry teachers and the other for students. There was one interview guide for the zonal inspector of schools.

The study found out that experience of chemistry teachers and behaviors of subjects had no major influence on the student's performance in chemistry. Students attitudes towards chemistry subjects, culture, learning environment, lack of equipments, home background, gender and lack of role models greatly affects the student's performance in chemistry subject

The study concluded that more principles, inspectors and experienced chemistry teachers are needed so as to raise students' performance in chemistry, learning environment, culture and students' attitude towards chemistry need to be changed positively.

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter gives an overview of the study specifically the chapter presents the background of the study the research, objectives and research questions, scope and the significance of the study.

1.1 Background of the study

The research set out to examine the effects of teaching resources on student's performance in chemistry subject in secondary schools in Rakai taking Kirumba sub county as a case study.

Following the research observation of Uganda examination results, analysis year 2007 (Rakai District secondary schools). Students' performance in chemistry led to low numbers. Joining tertiary institution for example students who wished to join tertiary institution for a course like bachelor of science in analytical chemistry and had scored a grade of "O" in chemistry was not considered even though he or she had passed well in other subjects for her to qualify, she or he must do abridging course of chemistry to up grade his chemistry low grade (o)

This bridging course in chemistry was not only very expensive but also time consuming in most cases most parents were not able to pay for it and so many students end up being shut out for various careers. Opportunities like nursing courses, diploma courses in education and many other courses.

Statistics also showed that the number of students taken for the course were on the decline as a result of getting low grade in chemistry.

1.2 Statement of the problem

The students have performed poorly in chemistry examination in secondary schools in Kirumba Sub County from 2002 and 2008, according to the school performance records for candidate classes every end of the academic year in all the three schools chosen indicate 2001 to 2008. For example in 2008 Monica's secondary school produced only six students with D and above while most candidates got C and below. Poor performance was also seen in other schools in the sub county and its against this back ground that the researcher thought of this study which explored the effects behind this poor performance for the students in Kirumba sub county.

1.3 Objectives of the study

To examine the relationship between students and chemistry teacher.

To investigate students' attitudes towards chemistry

To asses the gender and attitudes of students

1.4 Research question

1. Do the students have study relationship with their teachers?
2. What are the students' attitudes towards chemistry?
3. Does the gender and attitude affect students' performance?

1.5 Significance of the study

The finding of the study will be important in the following ways;

The ministry of education will be able to organize the secondary school curriculum in such a way that it will cater for gender equality for example use of language that is not gender baised.

The findings of the study will provide information to the ministry of education that will enable it to advice the government to lower the costs

of learning materials and textbooks make education affordable and more practical.

The ministry of education will organize projects that cater for improvement performance for example in service courses for chemistry teachers.

The district supervisors will be able to through the quality assurance standard officers hold seminars regularly where they will educate students on importance of chemistry either at zonal level or school levels.

The teachers will be able to handle individual difference of the students in class after the seminar and also prepare themselves adequately as they will be aware that they will be inspected.

The parents having attended the annual general meeting will be able to provide necessary materials for learning chemistry in school, they will also be encouraged to pay fees promptly to avoid students wastages of time which can result in poor performance in chemistry.

1.6 Limitation of the study

- Most students did not give out the exact data due to fear of the head teacher.
- Most teachers failed to give data as far as their weakness in teaching (low data)
- The head teacher also did not explain clearly about the performance at UNEB (S.4 and S.6)
- Some students who had good data were absent for example those who work hard at home and fail to get time for studies.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter gives a review of related literature. The literature is organized according to the objectives of the study.

2.1 Relationship between heads

The government, non governmental organizations (NGOs), parent's teachers association (PTA) and other stake holders are getting concerned over the issue. In Rakai, the population of the students is high but when it comes to performance especially of chemistry subject they get low grades. When it comes to joining the tertiary institution for example universities and teacher training colleges, students like girls are admitted with low cut off points in chemistry than boys and they are few.

The government in collaboration with the ministry of education has tried to establish different projects whose aim was to strengthen teaching of chemistry in secondary education.
They came up with factor mainly affecting students' performance in chemistry. They are:-

Teaching resources, gender, environment, home back ground failure among others are the major contribution on students' poor performance in chemistry because non of the above is being fulfilled in all the schools in the area of the study.

In this chapter a lot of emphasis if put in the discussion of first three aspects.

2.2 Attitude towards chemistry

The term attitude can be defined a way of thinking, acting. It can also be defined as behavior of a person towards a situation. Attitude and interests are closely related; interests are attitudes, which causes a person to seek more activities in a given area.

They are positive attitudes about selected aspects of the environment. Attitudes are directed by emotions and feelings.

Many students have formed a negative attitude towards chemistry. The subject has been performed poorly by students compared to other subjects like language and Arts. This is evident from pas performance records in national examination analysis. The negative attitude towards chemistry can be learnt from school, off at home of teachers and parents talking negatively about the subject for example they argue that chemistry is difficult which is not easy to afford by many students.

The inadequate teaching resources also contribute to the negative attitude towards chemistry. Some students from negative attitudes in chemistry, long before they enroll in secondary school. At times negative attitudes towards chemistry are acquired due to the methods used in teaching. Students will express the negative attitude formed in ways such as:-

a. Poor attendance of lessons
b. Low participation in class
c. Low performance in the evaluation tests.

Chemistry teachers have also performed negative attitudes towards chemistry which they have transformed to students, due to the various factors like

(i) Deficiencies of teachers in their schools
(ii) Frustrations in their schools

(iii) Nature of students (performance low)

(iv) School administration

2.3 Gender and attitudes

The society we are living in has different expectations for students both boys and girls as they grow. Difficult tasks are associated with men and ones with women.

This has been extended to education such that chemistry, which is believed to be difficult, is associated with boys.

Some parents even discourage their daughters from taking chemistry seriously. Some ladies even after passing well in senior four are discouraged from taking courses like nursing and architecture on their basis that they are masculine.

The teacher too, have a role to play in instilling the negative attitude to the students. They expect all students to perform in the same range in class. This is evident in the comments. They make to students for example don't let your neighbor defeat you and more comments. Research has shown that many teachers account for poor performance for students in terms of intellectual inadequacies.

Some students like girls, are seen as innately incapable and unlikely to improve. These issues are important because girls learn about themselves while interacting with others. Teachers are therefore a powerful source of information about the self or personal identity for girls, since they act on role models. Girls actions are thus directed by their sense of self identity as which in turn may be determined by what the students feel is allowed to do.

There has been a continuous increase in the number of candidates entered secondary level in the five years. It is notable that the percentage

increase for girls has been higher than that of boys in the last five years. Girls perform better than boys in languages while boys perform better in sciences. University and higher education has expanded. However, girls continue to enroll in traditional female courses due to poor performance in chemistry, mathematics, cultural and technical subjects.

Gender refers to social, cultural and psychological features that identify some ones a man or woman, gender is culturally defined, socially formed and psychologically installed. Gender is constructed through the social institutions. They include name, school, church, work language and leisure. This is done by the socializing agents that include parents, relatives, teachers and other members of society.

The following gender issues affects girl's performance in chemistry-parent's economic hardship. Girl's roles in homes pull girls out of school to do name choirs –especially when their mothers are sick (truancy). Adolescence when girls reach the adolescence age they feel that they become parents (women and start preparing to become woman). This makes here decline in performing most community's feel that they are of age and start courting her for marriage.

Sexual relationship-sexual relationship in and out of school affects girls. They are often forced to drop out the main stream formal education system.

2.4 Study environment and performance

Environment refers to situation, surroundings or area where learning activities like place. These include aspects like school organization, classroom methodology, curriculum and others.

2.4.1 Effects of school organization on students' performance in chemistry

Few teachers are able to organize their classes exactly as they wish. They are bound by constraints of the overall time table, staffing and school policy. Difficulties will arise because teachers will not be able to employ setting to classes that are not differentiated by ability as most schools stream by general ability and hence difficulties too organize mixed ability sets in chemistry will usually arise in mixed schools where some times girls are separated fro boys be classes which result into some times poor performance for both boys and girls.

2.4.2 Classroom methodology

Classroom methodology is linked to school organization for example teacher-pupil ratio of 50:1 does not allow much personal attention to slow learners. However, teaching effectiveness increase with decreased pupil teacher ratio.

The difficulties that arise from one methodology include

(i) Teacher inadequate presentation may be due to:-

a) Over lacking gaps in students knowledge
b) Lack of clarity and structure in the approach
c) It may be based on unwanted assumptions concerning pupils progress and ability
d) Insufficient emphasis given to key ideas appropriate activities such as practical work, drawing measuring investigation or problem solving may not have been provided
e) Few straight forwards worked example to consolidate explanations.
f) Lack of ongoing critical supervision and appropriate assessment adds to the difficulties.

(ii) Pace of work

The speed at which the teacher develops topic may be too rapid for some students even if the approach is satisfactory. A speedy pace will cause stress and failure of students who are not quick in learning.

(iii) Unsuitability of learning resources

There are no perfect text books or work cards. However some produces are better than others. Visual presentation is important for all age levels of difficulty.

(iv) Topic sequencing

Difficulties can be caused for certain students because a necessary pre-requisite skill for a new topic has not been encountered for sometime. The benefits of a spiral curriculum may be greatly enough and there is not sufficiently frequent return to certain key topics.

(v) Language levels

The language level employed by the teacher is not carefully adopted to the abilities and comprehensive of his pupil. Chemistry is taught in a second language English which may make it difficult for example words like products has other meaning like in geography, and another meaning in sciences, case of technical language must be clearly spelt out.

2.4.3 Chemistry curriculum

There are basically three ways in which teaching difficulties have their sources in the curriculum.

(i) Lack of mistery of earlier content. An obvious example of this aspect is a student who can not manipulate integers is going to find difficulties in solving equations. In this cases lack of ability with integer's manipulation is fairly obvious. But some times the links are not clear. A student

factoring expressions is handicapped if she or he has poor knowledge of basic chemistry facts, a handicap that can be overlooked because the teacher is concentrating on other concepts involved which are demand in themselves.

(ii) Level of abstraction

The students will be ready for the degree of abstraction expected for example, geometry in our schools is often presented in the abstract with very little practical work. Students are expected to grasp the properties of a parallelogram by looking at a drawing on the blackboard, such drawing will make the symmetry properties hard for students to appreciate where a cutting folding and rotating shapes greatly reduces the difficulties of perception involved.

(iii) Innate ability

The third resource of a curriculum based learning difficulty concerns intelligence level. The view of this aspect remains person because some people think that chemistry's ability is not for every one. They will take that, while some boys may benefit from remedial tuition, some girls are late developers, some girls who may be prevented by low general; ability firm going beyond a certain point in a particular topic it is also assumed that every girl can achieve some measure of success in every chemistry lesson depending on the teachers attitudes and methodology.

Learning difficulties inherent in the subject.

Students' poor performance in chemistry in secondary schools result from the:

Abstract nature of the concepts involved for example, introduction of formulas and symbols in relation to their measurement and calculations there is no mention of periodicity or functional nature completing of the concept.

Chemistry is complex underestimation of this complexity by the teacher creates learning difficulties to students. A teacher needs to analyze features of an idea (or concept or techniques) which a student must understand before he can be fully conversant with it.

The hierarchical nature of chemistry

Chemistry is probably the most hierarchical subject in nature. If this hierarchy of content is allowed to dominate the teaching sequences substantial learning difficulties, boredom and apathy will arise.

The logical nature of chemistry

The logical nature of chemistry inability to carry through logical argument is the cause of considerable learning difficulties in chemistry, the playing down of this skills in favour of instrumental application of relies even with students of limited chemistry ability is always bad practice.

Chemistry notations

Chemistry notation, which is concerned to development of the subject cause considerable confusion in the minds of many students this is partly due to the fact that various misconceptions arise from separation of this visible appearance form the underlying meaning. Moe precisely, students tend to attempt to attach meaning to notations solely on the basis of its visible appearance.

Chemistry across the curriculum

For many students, it is only in application that chemistry acquire any real value. There are three main reasons. For the difficulties pupils find in applying chemistry in other areas of the curriculum.

(i) Mismatch of the syllabus

A chemistry topic may be met in another area of the curriculum, before it has been developed in the chemistry class or in a form different that in which it is learned in chemistry or with out recent revision. For example, the chemical weathering in geography make chemical symbols and approach may have many accounts for the difficulties students encounter this in this topic.

(ii) Attitudes of teachers of others subjects to chemistry. Teachers of other subjects may give impression to pupils that, they themselves regard chemistry as necessary aid but not subject, which one needed between too much to understand.

(iii) Attitudes of teacher of chemistry to other subjects. Teachers of chemistry ay show no great interest in the way their subject is used in other areas of the curriculum, consequently, they teach chemistry related activities.

2.5 Home background and social effects

The home background where the students come from also affect the students performances in that, chemistry for some students who come from poor families, they find themselves overloaded with home chores immediately they arrive home form school. They spend a lot of time in cooking, fetching firewood, water e.t.c and by the time they finish to go and study or do assignments they are already tired and so retire to bed.

At other times, the students like girl child is to be absent from school to do the roles the mother play especially when the mother fall sick at other times, the girl child is to labor in order to get daily bread for the family. At some points the girl child will not get enough facilities required to pursue her studies like enough paraffin to put in his lamp, learning

materials. All these affect the performance of chemistry by girls "truancy is very strong factors."

The culture has in it that, girls are the ones who contribute in the house chores and boys are let to be in school.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter on methodology covers the research design, area and population of study, sample selection and size, the instruments, quality control of instruments and procedure for data collection.

3.1 Research design

Across section was employed to collect views about the attitudes and opinions of the respondent's concerning the effects of teaching resources on students performance in chemistry in secondary school, Kirumba sub county- Rakai. This particular research design is chosen because it is the most appropriate way to collect data from across section of people through questionnaire.

3.2 Area and population of study

The study targeted both male and female students and in secondary schools in Kirumba sub county Rakai district (Uganda) and chemistry teachers and principals of these schools.

3.3 Sample size and selection

There are nine secondary schools in Kirumba sub county three schools were selected for the study.

(i) One day and mixed school were randomly selected from three such schools

(ii) One full boarding was randomly selected from four such schools in the area

(iii) One private school was selected because there is only one private secondary school in the area.

These schools turned out to be

St. John's Secondary School

Kabuwoko C/U Secondary School

St. Monica's Secondary School

3.3.1 Selection of the subject

The population that was investigated includes students and academic staff selected from three schools. The students from each school were randomly selected. The chemistry teacher was also randomly selected from the selected education institution. The principals from the selected institutions were taken finally the zonal inspector of that education zone.

The total respondents were;

Thirty four students from the three schools

Six chemistry teachers from the three schools

Three principals of the same schools

One zonal inspector of schools from that zone.

The students, chemistry teachers and principals were investigated and responded through one questionnaire each. The zonal inspector responded through an interview guide.

3.4 Research instrument

The researcher used questionnaires for the key informants that are student, the chemistry teachers and principals to collect data. An interview guide was used to collect data from the zonal inspector of schools.

3.5 Data analysis

Data was analyzed using descriptive methods where by table and accompanying frequencies were presented which was followed by the discussion of findings.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter focuses on the presentation and analysis of background information of the participants, the findings from the questionnaires and interview observation. The chapter also shows the number of candidates who joined Uganda universities from Kirumba Sub County year 2007 and 2008.

4.1 Background information of the participants

During one administration of the questionnaires, the respondents were required to first give general information about their demographic and socio-economic back ground. This information was on gender, education levels, academic and professional qualifications and work experience.

The principals, teachers and students were selected as they had to provide some of the key factors affecting the students' performance. But the information was confidential.

The teachers were selected because they are the ones who teach the subject and therefore could have more answers to the problem and the students were selected because they are the ones who know why they don't perform well in chemistry.

Table 1: **Number of students who joined Ugandan universities from Kirumba sub country in Rakai district**

Year	**Boys**	**Girls**	**Total**
2003	8	6	14
2004	6	5	11
2005	7	5	12
2006	4	3	7
2007	3	2	5

Table 2: Chemistry performance by three schools in Kirumba sub county year 2007 and 2008

	St. John's S.S		Kabwoko C/U S.S		St. Monica's S.S	
Gender	2007	2008	2007	2008	2007	2008
A	-	1	-	-	-	-
B	2	-	1	-	-	1
C	16	6	2	7	3	2
D	-	3	15	5	12	3
E	10	4	6	11	3	9
O	-	3	2	1	5	-
F	-	-	-	5	4	3
Total	**28**	**17**	**26**	**29**	**27**	**18**

4.2 Findings from the questionnaires

4.2.1 Gender of the respondents

When the respondents were asked to give their gender, that is whether male or female, this is what they responded.

Table 3: Gender of respondents

	male	%	**female**	%	**total**	%
Principals	2	66.7	1	33.3	3	100
teachers	4	66.7	2	33.3	6	100

Out of the three principals 2 (66.7%) were male while 1 (33.3%) was a female

Out of the 6 chemistry teachers, 66.7% were male and the rest 33.3% were female. This implies that the principal sample was dominated by male respondents. When the respondents were asked where they preferred male teachers or female in teaching chemistry, this is how they responded.

Table 4: Respondents preference

Female teachers		**Male teachers**		**Total**	
Frequency	%	Frequency	%	Frequency	%
8	33.3	18	66.7	26	100

Out of the 18 students 66.7% preferred male chemistry teachers to female teachers while 33.3 preferred female chemistry teachers. This implies that most of students prefer male chemistry teachers than females.

4.2.2 Academic/ professional qualification.

The respondents were asked to indicate their level of professional qualification. This is how they responded.

Table 5: Academic/ professional qualifications

Professional qualification	Principal		Teachers		Zonal inspector	
	Frequency	%	Frequency	%	Frequency	%
Diploma/ S1	0	0	1	12.5	-	-
ATS	1	25	2	25	-	-
Graduate (Degree)	2	75	3	62.5	1	100
					1	
Total	**3**	**100**	**6**	**100**	**1**	**100**

Out of the respondents, the following results were obtained out of the three principals 75% were graduates (degree holders) and 25% were ATS scale.

Out of 6 chemistry teachers 62.5% were degree holders, 25% were ATS scale and 12.5% we Diploma/ S1 scale teachers.

4.2.3 Teaching/ working experience

Table 6: Teaching/ working experience

Experience	Teachers		Principals		Education officers	
0-3 years	1	125	0	0	-	-
4-7 years	0	0	0	0	-	-
8-10 years	2	25	1	25	1	100
11 and above	3	62.5	2	75	-	-
Total	**6**	**100**	**3**	**100**	**1**	**100**

Out of the six 96 chemistry teachers over 87.5% has a teaching experience of over 7 years and 100% of the principals have over 7 years

teaching experience. This implies that most of the education officials had enough experience in teaching

Table 7: Teaching materials

	More than enough		**Enough**		**Very few**		**Negligible**		**Total**	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
rincipals	0	0	0	0	3	100	0	0	33	100
eachers	0	0	0	0	4	66.6	2	38.4	6	100
tudents	0	0	0	0	12	625	6	37.5	18	100

All the principals (100%) that took part in the study indicate that there are very few teaching materials for chemistry out of 6 chemistry teachers 66.6 said that there were very few teaching materials for chemistry and 33.4% said that the chemistry teaching materials were negligible.
Out of the 18 students 62.5% answered that the teaching materials were rely few and 37.5% said that there were negligible teaching materials. This implies that lack of materials is one of the reasons behind poor performance in chemistry in the sub county.

4.2.4 Students performance as they moved up from senior one to senior four.

When the respondents were asked about chemistry performance as they moved up from senior one to senior four, they responded in this manner.

Table 8: Students performance

Respondents					
Yes		No		Total	
Frequency	%	Frequency	%	Frequency	%
30	83.6	6	16.67	36	100

Out of the 36 respondents 83.3% said that students' performance poorer in chemistry as they climbed up the ladder from senior one to senior four and 16.67% answered that they do not perform poorer as they climb the ladder. Thus as they get upper classes the students become more serious and this brings about a slight improvement in performance.

4.2.5 Gender responsive language

Do chemistry teachers say that the chemistry is difficult in class?
This is how they responded

Table 9: Gender responsive language

Respondents					
Yes		No		Total	
Frequency	%	Frequency	%	Frequency	%
12	62.5	6	37.5	18	100

Majority of the students' respondents of almost 62.5% showed that chemistry teachers say that the subject is hard 37.5% did not use such language. Such statement demotivates the students and this in turn affects their performance level especially in UCE exams.

4.2.6 Students percentage market score in chemistry

When the respondents were asked whether 50% of the students in class score below 25% marks in chemistry this is how they responded.

Table 10: Students' score is less than 25% in chemistry

Respondents					
Yes		No		Total	
Frequency	%	Frequency	%	Frequency	%
12	62.5	6	37.5	18	100

Out of the 18 students, 62.5% indicate that 50% of the students in class score less than 25% marks in chemistry and 25% responded that 50% of the students in class score more than 25% in class.

4.2.7 General comments why students perform poorly in chemistry by 32 students

When asked they responded

Table 11: Why students perform poorly in chemistry

	No. of respondents	Percentage
Chemistry is difficulty	17	53.125
They hate chemistry	15	46.875
Total	32	100

Table 11 indicate that 17 (53.125%) of the respondents referred to chemistry being difficult subject as the cause of poor performance and 15 (46.875%) considered hate for chemistry to be the cause.

4.3 Interview observation

The zonal inspector of schools in Kirumba Sub County was interviewed by the researcher. This was his observation

i) There are more male chemistry teachers than female teachers in Kirumba Sub County

ii) Students preferred male chemistry teachers than female teachers

iii) In this zone, he said that he had enough qualified teachers to teach chemistry who had good (enough teaching experience)

iv) He gave his observation that there were not enough teaching materials in most of the schools in his zone.

v) The students attitude towards chemistry was negative

vi) The teachers were demotivated to work due to high pupil teacher ratio and the low salary levels especially when compared to the private sector salaries.

vii) Parents played a big role in discouraging students from liking chemistry because of the language they sued at home. Brothers and sisters, some teachers especially from primary school planted the negativity of chemistry (sciences) to the students in class.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.0 Introduction

The study set out to examine the effects of teaching resources on students' performance in chemistry in secondary schools with an aim of exploring practical solutions. The preceding chapter has presented and discussed-the results of the study as obtained in the field. This chapter highlights the summary, conclusion and makes the relevant recommendations.

5.1 Summary

The objectives of the study was to find whether attitudes towards chemistry, gender, study environment and performance, teaching resources, home background affect the student's performance in chemistry and search for possible recommendations and solutions to those problems.

Literature related to the study was reviewed that, the attitude of the students towards chemistry, the gender, the study environment, resources and home background affected the students' performance in chemistry.

He study adopted descriptive analysis techniques. The data was tabulated using frequency distribution tables. An interview schedule was used. Three sets of questionnaires were prepared one set for principals another set for the teachers, and one set for students.

An interview schedule was prepared for the zonal inspector and questionnaires were developed and pre-tested to determine their validity

and reliability. The survey sample constituted of total respondents, 28 which included 18 students, 6 chemistry teachers, 3 principals and 1zonal inspector of schools.

Data was collected and analyzed using descriptive statistics. Tables with frequencies and percentages were used to illustrate the findings. Observation were also recorded.

5.2 Conclusion

Out of the 28 respondents, it was clearly found out that the effects of students performance in university was as follows.

Gender

It was found out that males dominate in the teaching profession and in the principals and in the principals of the schools. Most of the principals and chemistry teachers are male 75% of the principals and 62.55 of the chemistry teachers are male. This means that the girl students did not have enough role models and therefore become discouraged in learning chemistry.

The study included that there are few female teachers in the area. This means that the students preferred male chemistry teachers to female teachers. The zonal inspector of schools confirmed that A the area, there were more male chemistry teachers than female chemistry teachers.

The teacher did not use the gender responsive language. Instead kept saying that chemistry was hard subject for students especially girls. The majority of the teachers were well qualified which suggested that they are well trained and able to teach chemistry effectively. The teaching/ working experience was also high standards and hence could not affect the students' performance in chemistry.

Learning environment

From the findings, it was clear that learning environment affected the students' performance in chemistry.

100% of the principals said that there are very few learning materials in schools. Most of the respondents said that there few learning/ teaching materials and this contributed to the chemistry being an abstract subject, hence making it difficulty without the teaching aids, some topics could not be comprehended by the learners as they required visual presentation.

In the interview schedule, it was concluded that the teachers were demotivated to teach by the high teacher-student ratio of 1:50, which reduced the effectiveness of learning especially to the slow learners. The increased poor performance in chemistry by students as they rose up from senior one to senior four is an indication that chemistry becomes harder as the syllabus builds up. This is because of the learning/ teaching materials, which means that a concept which was never understood in senior one could not be understood in senior two if it formed the basis of the back borne of the next topic.

Students' attitudes towards chemistry

The 32 students said that they performed poorly in chemistry because it was difficult (53.125%) and the rest (46.875%) said that they performed poorly in chemistry because they did not like the subject. From the interview schedule, it was observed that the negative attitude planted in the students early from their homes by their parents, elder brothers and sisters and early from the primary schools by the primary school teachers. This was done by the used of discouraging language like chemistry (science) and by not buying the relevant teaching/ learning materials for the students required for learning.

5.3 Recommendations

After identifying the effects of teaching resources on students' performance in chemistry, the following are the suggestions which can offer practical solutions to the problems.

The ministry of education in conjunction with government should try every hard to bring in the factor of the gender parity in this field. More female chemistry teachers should be employed in that they call men's jobs like engineering, pilot and many more. The society needs to be sensitized that there are no tasks for men and others for women especially at home. Those tasks considered as difficult should be assigned to the girls equally as the boys. Parents should encourage their children to take courses like engineering, architecture and others which are considered masculine. The teacher too should be encouraged to stop the use of language like "how can you be defeated by a girl?" girls can not make is in chemistry" e.t.c

5.3.1 Study environment and performance

The respondents clearly pointed out that lack of adequate learning resources contributed to the poor performance in chemistry by students. The following recommendation should be taken upon this aspect.

Much attention should be given to the slow learners by lowering the teacher: pupil ration to about 1:30 to increase the effectiveness in learning. The teachers should prepare for the lessons adequately so as to give emphasis to the key ideas of the topic.

The ministry of education which is responsible for preparing the syllabus to give the proper sequencing of the topic to allow the good flow of materials in the syllabus (spiral curriculum).

The teachers should pace their work to suit the slow learners that is the speed of developing a topic should be adopted to cater for the slow learners. The teacher should use the correct (appropriate) learning/ teaching materials in class, teaching aids should be used where applicable.

The teacher should try to reduce the use of technical language in chemistry and where used to be clearly defined to avoid ambiguity.

Teachers should give precise meaning to chemistry notations and symbols. For example;

$4feo + O_2 \longrightarrow 2fe + O_2$ students should be made aware of the problems caused by visual appearances of such notations above. The teachers should give purpose to the development of notations and computations. The teacher should emphasize in class the relationship between spatial concepts and geometric thinking. It should be emphasized that a square is a rectangle and a chord is close to diameter but not a diameter should be stressed as a chord and attain meaning to such words like "Bi" means two and "Ti" means three in geometry.

Teachers should try to much as possible to relate chemistry to the other subjects.

5.3.2 Attitudes towards chemistry

Teachers, parents and the society at large should be encouraged to help students develop a positive attitude towards chemistry by using gender, responsive language in class, in the field and at home.

Teachers should educate the students on the importance of chemistry in life and especially in careers like architecture so as to be role models of the other students in school.

Teachers are supposed to improve on the methodology of teaching in class to reduce the abstract nature of chemistry. Use of "ethino" chemistry should be highly encouraged.

The ministry of education should work hard to come up with well sequenced topic. The number of female chemistry teachers should be increased to increase the role models towards girls. The teacher: student ratio should be reduced to a reasonable level of say 1:30 to improve on the efficiency.

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APPENDENCES

APPENDIX I

Questionnaire for principal

This is part of an education study that is being carried out to investigate on the effects of teaching resources on students' performance in chemistry in secondary schools in Rakai. Your school has been selected to complete the questionnaire as accurately as possible. The information obtained will be treated as confidential and will be based for the study intended and nothing else.

Your cooperation and assistance will be highly appreciated.

Instructions

Respond to each item by putting a tick (✓) in the boxes provided and briefly write in the space provided.

1. What is your gender?

   Male ☐ Female ☐

2. What is your marital status?

   Married ☐

   Divorced ☐

   Single ☐

   Separated ☐

3. What is your age bracket?

   22-35 ☐

   36-45 ☐

   46-55 ☐

4. What is your level of education?

   S1 ☐

   Degree ☐

   Diploma ☐

   Masters ☐

   Other specify.....

5. (i) How long have you been a principal?

6. How many chemistry teachers do you have in your school

   ..... Are they enough?.....

7. Are there untrained chemistry teachers in your schools?

   Yes ☐ No ☐

8. Are there enough teaching materials for chemistry subject from both teacher and students?

   Yes ☐ No ☐

   If no, how do you solve the problem?

   .....

   .....

9. What do you think is the reason (s) for students' performance policy in chemistry?

   .....

   .....

10. DO students perform poorly in chemistry as they move up from senior one to senior four?

Yes ☐ No ☐

If yes, what do you think are the reasons?

.....

.....

Appendix II

Students questionnaire

You are kindly requested to fill this questionnaire of the study about the effects of teaching resources on students' performance in chemistry in secondary schools, Kirumba Sub Country, Rakai District. The information you will give will be used for purely academic purposes and shall be held confidential. You should therefore give the right information that applies to you in your own opinion.

Instructions

Please tick in the boxes and fill in the blank spaces provided for each question

Section I

1. (i) What is the name of your school?.....

   (ii) Are you a border or a day scholar?

   Boarder ☐ Day scholar ☐

2. What is your gender?

   Male ☐ Female ☐

3. What is your class?

   S.1 ☐ S.2 ☐ S.3 ☐ S.4 ☐ S.5 ☐

4. What is your age in years?.....

Section II

5. A (i) Is your school mixed or girls/ boys only

Mixed ☐ single girls/ boys ☐

(ii) If mixed schools, who score the highest market in chemistry

A boy ☐ B girl ☐

B. How many boys are in your class?

5-10 ☐

11-16 ☐

Above 17 ☐

C. How many girls are in your class?

10-18 ☐

19-25 ☐

Above 26 ☐

6. Who teaches chemistry in your class?

Male teacher ☐ Female teacher ☐

7. How many male chemistry teachers are in your schools?

1-2 ☐

3-5 ☐

Above 5 ☐

8. How many female chemistry teachers are in your schools?

1-2 ☐

3-5 ☐

Above 5 ☐

9. Do students in your class like female chemistry teachers more than male chemistry teachers?

   Yes ☐ No ☐

Section III

10. More than quarter of students in your class score 50% and above in chemistry exams

    Yes ☐ No ☐

11. 10% of the students get 70% and above in chemistry in your class

    Yes ☐ No ☐

12. 50% of the students in your class score less then 25% of the marks in chemistry in your class

    Yes ☐ No ☐

13. Do chemistry teachers say that chemistry is difficult it subject in your class?

    Yes ☐ No ☐

14. Do students perform poorer in chemistry move from senior one to senior four?

    Yes ☐ No ☐

15. In your own opinion, comment briefly why students perform poor in chemistry

    .....

    .....

16. Do you think that the learning materials (text books, geometrical sets, graph books, apparatus e.t.c) are enough for the students?

More than enough

Enough ☐

Very few ☐

Not available at all ☐

Appendix III

Teacher's questionnaire

Dear Teacher,

You are kindly requested to fill this questionnaire of the study about the effects of teaching resources on students performance in chemistry in secondary schools, Kirumba education zone Sub Country, Rakai District.

The information you will give will be used for purely academic purposes and shall be held confidential. You should therefore give the right information that applies to you in your own opinion.

Instructions

Please tick in the boxes and fill in the blank spaces provided for each question

Section I

1. What is the name of your school?.....

2. What is your gender?

   Male ☐ Female ☐

3. What is your age?

   20-25 ☐

   26-30 ☐

   31-45 ☐

   45 and 55 years ☐

4. What is your highest academic qualification?

   S.1 ☐

   Degree ☐

   Diploma ☐

   Masters degree ☐

   Others specify ☐

5. How many years of teaching experience do you have

   1-3 ☐

   4-6 ☐

   7-9 ☐

   Over 9 years ☐

6. How many times have you attended the in-service courses related to your teaching subject?

   Not attended any ☐

   Between 1 and 2 times ☐

   Over 2 times ☐

7. Comment on the students performance in chemistry

   Good extremely ☐

   Good ☐

   Fair ☐

   Extremely bad ☐

8. In your own account state the reasons for that performance

   .....

   .....

   .....

   .....

Appendix IV

Interview schedule

To be answered by key informants (General inspector of schools)

Dear Sir/ Madam,

You are requested to respond to questions of this interview guide for the study about the effects of teaching resources on students performance in chemistry in secondary schools, Kirumba Sub Country, Rakai District Uganda. The information will be used exclusively for academic purposes. You should therefore give information that applies to such institutions in your area of operations. You are assured of total confidential.