TEACHING AIDS AND THE STUDENTS' ACADEMIC PERFORMANCE IN BIOLOGY AT ALLIANCE SECONDARY SCHOOL, IBANDA DISTRICT, UGANDA

BY

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DECLARATION

I Tumwesigye John Bosco do hereby declare that this report on *Teaching Aids and the Students' Academic Performance in Biology at Alliance Secondary School* is entirely my own original work, except where acknowledged, and that it has never been submitted before to any other University for any award.

Signed: ..... Date: 10.10.08

SUPERVISOR'S APPROVAL

This research report has been submitted for examination with my approval as the candidate's university supervisor.

Signed: .....

ARINAITWE ANTHONY HENRY

DEDICATION

This report is dedicated to my dear parents Mr. and Mrs. Kabafunzaki Victor of Kanoni Buremba, my brother Eddie Moses and to my future wife and children.

ACKNOWLEDGEMENTS

I have not toiled alone in the execution of this research report; various parties have assisted me in one or another. I especially than my dear parents for meeting the costs throughout this research report. I cannot forger my supervisor, Mr.Arinaitwe Anthony Henry for his guidance and courage accorded to me, and the teaching staff of Kampala international university for their guidance and support.

I am very grateful to the head teacher, staff and students of Alliance Secondary School for feeding me with the data that has enabled me to produce this report; not forgetting my colleagues in the struggle at KIU year 2008.

May the Lord reward their efforts in full measure!

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ABSTRACT

This research report established the influence the teaching aids on students' academic performance in Biology at Alliance Secondary School-Ibanda. It is composed of five chapters, the introduction, literature review, Methodology, Presentation of findings, analysis and interpretations and recommendations.

The introduction shows thee background, the statement of the problem, purpose, research questions, significance and others. The major objective of the study was to establish the influence of teach9ing aids on the students' academic performance. The literature review is a scrutiny of related literature to the study particularly on the basic employment of teaching aids during the teaching-learning process in biology lessons.

Chapter three; the methodology shows a cross-sectional design, open and closed questions as well as oral interviews instruments of date collection.

Relatively, chapter four illustrates the presentation, analysis and interpretation of the research findings. It is a description of the use of teaching aids at Alliance Secondary School.

Thee research findings indicate that teaching aids are not used in biology lessons which affects the performance of students negatively in Biology.

Recommendations such as intervention by the school management and the ministry of Education, monitoring of lessons by head teachers and others are suggested under this chapter.

CHAPTER 1:

INTRODUCTION

1.1 Overview

The research study was about the relationship between teaching aids and students' academic performance in Biology at Alliance Secondary School, Ibanda. Included in this chapter are; thee background to there study, statement of thee problem, research questions, significance, hypotheses, definition of terms, the scope, significance of the study, limitations and the review

1.2. Background to the Study

One of the challenges facing the present generation is to achieve academic excellence in terms of performance (results). This excellence in academic performance is always associated with the mental strength of a learner. However, there are other interrelated factors which affect the academic performance of learners but the use of teaching aids has been considered important by the researcher.

A teaching aid has been defined as something that assists a teacher to transmit to a learner facts, skills, attitudes, knowledge, understanding and appreciation. For effectively teaching, the teacher wants an effective communication with his/her students in a quite interesting and useful way (Kootchar, 1985).

1.3. Statement of the Problem

The correlation between teaching aids and students' academic performance has not been given appropriate consideration in Ibanda District in general and at Alliance Secondary School in particular. To make worse, no study has been carried out to examine the impact of teaching aids and students' academic performance in Secondary Schools in Ibanda. This prompted the researcher to find out if there is any relationship between teaching aids and students' academic performance at Alliance Secondary School.

1.4 Objectives of the Study

The study was guided by general and specific objectives.

1.4.1 General Objective

The general objective of the study was to determine the relation between teaching aids and students' academic performance in Biology at Alliance Secondary School.

1.4.2 Specific objective

1 To find out the age, sex and class of students of Biology

2 To find out the age, sex and level of experience pf teachres of Biology at Alliance Secondary School

3 To identify the teaching aids used in Biology lessons at Alliancee Secondary School

4 To find the scores of students in Biology examinations and exercises

5 To find out the number of teachers of Biology in thee school, number of Biology lessons in a week, and the number of teachers of Biology per class.

1.5 Research Questions

What methods of teaching Biology are used at Alliance Secondary School?

Do these methods fit the level of learners, age and sex?

What are teaching aids used in teaching Biology at Alliance Secondary School?

Do teaching aids affect the students' academic performance in Biology?

1.6 Scope of the Study

The study was carried out at Alliance Secondary school, Ibanda district, Uganda, Senior Three (S.3) and Senior Four (S.4) were used out of the six classes. The researcher mainly focused on thee students' academic performance in Biology between 2007 and 2008 end of term examinations.

1.7 Significance of the Study

Other than fulfilling the partial requirements for the award of the degree of bachelor of Education, this study will also be significant to;

- School administrators of Alliance Secondary School in making programs related to the teaching of science subjects, Biology in particular, and the teaching aids.

- Teachers of Biology at Alliance Secondary School on how best they can use the teaching aids in order to make the teaching-learning process successful.
- Students of Biology at Alliance Secondary School on how they can improve on their academic performance.
- District officials and the ministry of education in spearheading the teaching of sciences.
- Other scholars who will be carrying research in future.

CHAPTER 2:

REVIEW OF THE RELATED LITERATURE

2.1 Overview

This chapter reviews the related literature by various scholars, researchers and publishers on the teaching aids and academic performance

2.2 Definitional issues

Education:

According to Dewey (1982), education is the development of all those capacities in the individual which will enable him/her to control his environmemt and fullfil his responsibilities.

Education also refers to thee creation of a sound mind in a sound body(Aritotle)

Learning:

This is a process that involves changes occurring over a relatively shorter period of time which enable the learner to respond more edequately to te situation (Kochhar, 1985)

Mazir (1994) defines education as a relatively enduring change in observable behavior that occurs as a result of experience.

Rambhai (2001), defines learning as a more or less permanent change in behavior which occurs as a rexut of practiceOn the other hand, Egge (1997) defined learning as a change in a person's mental structures that provides the capacity to demonstrate changes in behavior.

Teaching:

This is an act of disseminating information to the learners in thee class room (Chaihan, 1979)

Teaching aid

This is any device that assists a teacher to transmit to a learner facts, skills, attitudes, knowledge, understanding and appreciation (Ki3chhar, 1985).

Academic performance

This is the output of a learner in terms of results

2.3 Methods of Teaching

According to Dr. Rambhai (2001), methods of teaching refer to planned and well-organized sequences of learning activities.

The following are some of the methods that are appropriate in teach3i3ng Biology;

a) Demonstration Method

In this method, the learner performs experiment before the class and is simultaneously explains what he/she is doing. He/she also asks relevant questions from the class and students are compelled to observe carefully because they have to describe each and every step of the experiment accurately and draw inferences. After thorough questioning and cross questioning, the inferences drawn by the students are discussed in class. In this way, the students remain active participants in the process of teaching.

b) Heuristic method

This is a pure discovery method of learning Biology independent of a teacher. In his words, Armstrong defines heuristic method as the method which involves our placing students as far as possible the attitude of the discoverer, as a method which involve their finding out instead of being merely told about things.

Heuristic derived from a Greek word meaning discover. The method requires the student to solve a number of problems experimentally.

c) Assignment method

In this method of teaching, the given syllabus is split into well planned assignments with a set of instructions about solving the assignments. It is also possible to plan assignments based on the individual needs of the students.

d) Project method

A project is a unit of a whole hearted purposeful activity carried on preferably in its natural setting (Kipatrick). It also be defined as a problematic act carried to its completion in its natural setting.

According to Ballard, a project is abit of real life that has been incorporated into the school.

The project method of teaching is based on the following principles

- Learning by doing

- Learning by living
- Children learn better through association, cooperation and activity.

e) Discussion method

In this method, the topics for discussion are announced to the students well in advance. The teacher gives a brief introduction about the contents of the topic and then suggests to his students various reference books, text books and other books. Students are then required to go through the relevant pages of these books and come prepared for a discussion of the topic on a specified day and time.

During actual discussion period, teacher throws light on a few problems and this provides the necessary motivation to the learners.

2.4 Teaching Aids

For effective teaching of Biology, the teacher wants/needs an effective communication with his/her students in a quite interesting and useful way. For such a communication, the teacher sometimes resorts to some aids which are referred to as teaching materials/aids.

Such aids are primarily used to supplement the process of teaching. Most of thee teaching materials are sensory and their function is to make teaching concrete, effective and interesting.

The most important teaching aids in biology are

- Biology laboratory apparatus

- Biology text books
- Aquarium
- Museum
- Nature study garden

2.4.1 Importance and Need of Teaching Aids

- they help the teacher in getting the attention of his/her students
- they help in creating interest of thee student in the topic and activate the mental process of the student
- the students gets an opportunity of getting first hand experience by visualizing some concrete things, living specimens and actual demonstrations
- they help a student to get clear conception of ideas information, facts and principles
- they provide an opportunity for a better support between the teacher and the student
- they a student to develop a scientific attitude
- they provide a training in scientific method of teaching
- they provide permanent and effective teaching
- they provide an opportunity for a change in the monotonous atmosphere that generally prevails in a classroom.

2.4.2 Types of teaching aids

The teaching aids may be grouped as; visual, audio, audio-visual aids, activity aids and memory aids.

Visual aids

These are aids which can be appreciated and understood by seeing them only. **Visual aids include:**

a) Display boards such as chalk boards, flannel boards, bulletin boards, magnetic boards e.t.c. though the material for display on such a board can be collected from any source, even from the text book, for being effective, and the material should be displayed in such a way that it is eye catching, colorful and purposeful.

b) Charts, pictures and models

These are also important in teaching aids. These include various systems of the human body, internal combustion engine e.t.c. however, when using charts, only essentials can be sown and unnecessary details may be avoided.

Audio aids

These include;

Broadcast talks: where radios feature some programs meant for school children. In such a program education talks or scientific matters are

broadcast. Such a talk is quite useful for students as well as teachers. The topic, date, and time of the such a talk are given in advance by the radio.

Gramophone Lectures and tape recordings: another teaching aid available to a teacher is records of short talks on interesting scientific topics by eminent scientists say Doctors.

Magnetic tapes of such recorded talks are now available and thee talk can be reproduced in the classroom and they can an inspiration to the student.

For instance, the voices of different birds and animal can be recorded and reproduced in the class while teaching about such birds or animals.

Audio-visual talks

In this category, the teaching aids used involve the use of two of our senses. i.e hearing and seeing.

- Audio-visual aids include projectors (film projector, micro projector and film-strip projector)
- Television which combines the advantages of a radio and of a film.

Science museum:

A museum ought to a valuable part of a science department in school.. the museum not only provides necessary help in teaching but also helps in creating the right type of scientific atmosphere in the school.

The museum should consist of:

- Dry exhibits such as leaves, roots, weeds, specimen of ores and minerals e.t.c
- Fish, snakes, frogs, water-weed e.t.c
- Models of various mechanical devices
- Specimens of some local industrial products, various stages in the manufacture of items such as a match box, pencil e.t.c
- Terrarium: this is a miniature replica of terrestrial habitant containing specimen plants and animas representing that habitant. It is useful because it helpd students in studying various kinds of plants and animals and in understanding the living and feeding habits of animals.

Aquarium: this contains aquatic plants and animals. It is very helpful in teaching concepts relating to ecology. Students can directly observe the locomotion of aquatic animals and it helps them to develop a love for animals.

Nature study garden:

This is a must for very school involved in nature study; which should have a pond as well. The teacher should encourage his/her students to

maintain the nature study garden of the school and to maintain as many varieties of plants and animals in this garden as possible. In such a garden, plants and animals can then be shown to students while actually discussing about them in class. Here, the school garden is essential for providing an opportunity to the student for studying living things in their natural setting.

Science fairs and exhibitions in a school

Functions such as prize distribution, parents' day, sports day, visiting day e.t.c form a regular feature of most school. Just like these functions, an effort should be made to hold an annual science fair or exhibition.

A science fair provides an excellently opportunity for displaying and dissemination of various activities that being carried over by the science fair can also serve the purpose of acquitting parents in particular and people of locality in general with the diverse nature of scientific that is under taken in the school.

CHAPTER 3:

METHODOLOGY

3.1 Overview

This chapter explains in specific terms how the research study was carried out. It analyses the research design, study area and the population of thee study. It also highlights on the methods of collecting, analyzing and the presentation of data to avail information

3.2 Research Design

the research was both quantitative and qualitative using the cross-sectional survey design. Quantitatively, the researcher established the number of students in S.3 and S.4 at Alliance Secondary School who passed Biology. Qualitatively the researcher established the scores in terms of grades.

3.3 The Sampling Procedure

The subjects were randomly drawn from S.3 and S.4 students of Alliance Secondary School, Ibanda.

3.4 Sample Selection and Size

At least 30 students from each class were selected randomly. Senior Three and Senior four students have studied in the school for at least two years, so were expected to have mastered some concepts in Biology and could explain their performance scores in the subject.

3.5 Instruments of Data Collection

Questionnaires both open and closed were given to two teachers of Biology, one questionnaire to the head teacher. Students were given their questionnaires. Oral interview schedules/guides from the respondents' emotions during interviews

3.6 Validity of Instrument

Research instruments were developed and given to experts in the KIU for reliability test. Content validity was done and based on their recommendation appropriate corrections were made.

3.7 Procedure of Data Analysis and Interpretation

The researcher collected all questionnaires and interviews from respondents. All jotting from the emotions of respondents were also given meaning tabulation and graphing for frequency mean and percentages were computed; proper conclusion on the effect of theory in relation to the research findings.

CHAPTER 4:

PRESENATION, ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Overview

This chapter deals with presentation, analysis and interpretation of findings. Research questions are answered under this chapter. Findings are presented, analyzed and interpreted.

4.1.1 Biology lessons and students' attendance to Biology Laboratory

Thirty students were interviewed about their interest for Biology lessons and their visits to Biology laboratory. Findings were tabulated and percentages computed as follows;

Table 1: S.3 students' responses about their interest for Biology lessons

Opinion	No. of Respondents	Percentage Response
Interesting	5	16.7%
Fairly interesting	10	33.3%
Not Interesting	15	50%
Total	30	100%

Source: Primary data, 2008.

Out of 30 students that were interviewed, five of them (16.7%) asserted that lessons are interesting; 10 students (33.3%) asserted that lessons are fairly interesting whereas 15 students (50%) asserted that Biology lessons are not interesting.

Table 2: S.4 students' responses about their interest for Biology lessons

Opinion	**No. of Respondents**	**Percentage Response**
Interesting	3	10%
Fairly interesting	10	33.3%
Not Interesting	17	56.7%
Total	30	100%

Source: Primary data, 2008.

Out of 30 students that were interviewed, three of them (10%) asserted that lessons are interesting; 10 students (33.3%) asserted that lessons are fairly interesting whereas 17 students (56.7%) find Biology lessons are not interesting at all.

Tables 1 and 2 interpreted

On average, S.3 and S.4 students of Alliance Secondary School find no interest in Biology subject.

Table 3: End of Term II Biology marks (%), 2008

32	65	33	56	58	20	65	41	49	31
49	31	48	35	25	51	13	37	26	34
56	30	56	38	35	19	61	79	46	41
43	69	49	32	51	26	42	39	22	15
14	63	22	36	50	40	51	35	31	34
41	15	34	65	13	61	42	51	20	51

Source: Head of Biology Department, Alliance S.S.S

The above marks were tabulated in table below and frequency, cumulative frequency, mean median, mode and mode frequency computed.

Table 4: A grouped frequency distribution table for end of term II Biology Marks

Class	Class mark	Class boundaries	Frequency (f)	C.f	f.x
10_19	14.5	9.5_19.5	6	6	87
20_29	24.4	19.5_29.5	7	13	171.5
30_39	34.5	29.5_39.5	17	30	586
40_49	44.5	39.5_49.5	12	42	534
50_59	54.5	49.5_59.5	10	52	540.5
60_69	64.5	59.5_69.5	7	59	451.5
70_79	74.5	69.5_79.5	1	60	74.5
			$\Sigma f = 60$		$\Sigma =$ 2445

Mean mark = $\Sigma fx / \Sigma f$

= **2245/60**

= 40.75

Mode = **34.55%**

Mode Frequency = 17

Median = 39.5%

From the above table and calculations, the mean mark in Biology in term II was 40.75, mode was 34.55, modal frequency was 17, and median was 39.5%. So, on average, each student scored 40.75%. The commonest mark was 34.5%.

Interpretation:

Students of Alliance Secondary School passed in Grade 7 (40.75%) on average. Since the mode is 34.5%, modal frequency is 17, it means that the failure rate was 17/60 x 100 = 28.33% (Grade 9). 71.67% passed in either Grade 7 or 8 that is, 43 students out of 60.

Thee above information depicts message from tables 1, 2 and 3-that students are not interested in Biology lessons and poor attendance to laboratory for practicals

4.2 Answers to Research Questions

4.2.1 Students profile

S.3 and S.4 students of Alliance Secondary School have an average age of 16 years old and 17 years old respectively. They are both males and females.

4.2.2 Challenges Faced in Studying Biology

The study found out that students of Alliance Secondary school face challenges such as inadequate Biology text books, scarcity of teachers of Biology for consultation especially after lessons.

4.2.3 Teachers' Profile

The study found out that there were three teachers of Biology in the School, two males and a female aged 22, 28 and 23 years old respectively. The study further found out that these two teachers are licensed teachers and that they are senior six vaccists.

Table 5: Methods of teaching Biology

Type of T/Method	Percentage
Chalk and talk	57
Lecture	33
Demonstration	2
Heuristic	1
Assignment	2
Project	3
Discussion	2

The study found out that the commonly used methods of teaching Biology at Alliance Secondary School are Talk and chalk method (57%) and the Lecture method (33%)

Table 6: Teaching Aids Used

Type of T/aid	Percentage
Chalk	40
Lab. equipment	0
Study garden	0
Text Books	60
Charts and pictures	0
Museum	0
Any other	0

The study found out that the chalkboard and text books are the only teaching aids used in teaching Biology at Alliance Secondary School.

4.2.5 Teachers of Biology opinion

The performance of students of alliance secondary school is negatively affected by inadequate teaching aids.

Chapter four Generalization

Teachers of Biology at Alliance Secondary school are young in age with no experience in teaching Biology except one teacher who is currently pursuing his

degree in Education. Teachers use traditional teaching methods and have limited knowledge on how to use the teaching aids and on how they can improvise. The methods of teaching used do not suit the learners. Teachers teach those topics for their interest. Teachers lack knowledge of assessment and recording; which affect negatively the performance of students.

CHAPTER 5:

CONCLUSION AND RECOMMENDATIONS

5.1 Overview

This chapter outlays conclusion and suggested recommendations by the researcher. It also suggests further areas for future research.

5.2 Conclusion

Students of Alliance Secondary School do not perform well in Biology subject because teachers do not use the teaching aids for the reasons mentioned in chapter four. Absence of teaching aids affect students' performance in thee subject negatively

5.3 Recommendations

The researcher base on thee study findings and recommends that:

Head teachers should recruit qualified teachers of Biology

The ministry of education and Sports should ensure that qualified teachers are deployed in secondary schools and that this ministry should revise the supervision of the activities private secondary schools.

Teachers should use appropriate teaching aids so as to motivate learners to learn practical subjects like Biology

Alliance Secondary school should have Nature study garden:

This is garden should have a pond as well. The teacher should encourage his/her students to maintain the nature study garden of the school and to maintain as many varieties of plants and animals in this garden as possible. In such a garden, plants and animals can then be shown to students while actually discussing about them in class. Here, the school garden will be essential for providing an opportunity to the student for studying living things in their natural setting.

The ministry of education should supply text books and laboratory equipments in schools and monitor quality purchase and store of these equipments in private schools.

5.4 Areas for Future Research

The study did not examine all the factors which affect the academic performance of students in secondary schools. Therefore further studies or future research can be made on the following areas;

- Impact of teachers' qualifications on academic performance.
- The impact of students' attitudes on academic performance.
- The impact of school policies on academic performance.

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Appendices

Questionnaire for S.3 &S.4 Studnts of Biology

Name:

Sex:

Age: 15-18 ☐ 19-21 ☐ 22-24 ☐ 24^{+} ☐

2. How do you find the study of Biology?

Opinion	**Tick the appropriate**
Interesting	3
Fairly interesting	10
Not Interesting	17
Total	30

3. Which topics do you like most in Biology

a) Transport in Plants and animals

b) Excretion

c) Respiration

d) Coordination

e) Nutrition

f) Locomotion

4. Why do you like to study the topics selected in 4 above?

_____

_____

_____

5. a) *which topics do you not like to study in Biology?*

g) Transport in Plants and animals

h) Excretion

a) Respiration

b) Coordination

c) Nutrition

d) Locomotion

Give a reason for your answer in 5 above

_____

_____

_____

6. What challenges do you face when studying Biology?

_____

_____

_____

7. In your view, what can be done to improve on the situation?

_____

_____

Thank you for your time

Questionnaire for Teachers of Biology

Name: _____

Sex: _____ Age: _____

Number of year spent on the job: _____

Number of years spent teaching Biology: _____

2. Which topics do you like to teach in Biology?

a) Transport in Plants and animals

b) Excretion

c) Respiration

d) Coordination

e) Nutrition

f) Locomotion

3. Why do you like to teach the topics selected in 2 above?

_____

_____

_____

4. a) *which topics do you not like to teach in Biology?*

a) Transport in Plants and animals

b) Excretion

c) Respiration

d) Coordination

e) Nutrition

f) Locomotion

Give a reason for your answer in 4 above

_____

_____

_____

5 Which teaching methods do you use in teaching Biology in this school?

Type of T/Method	**Tick the appropriate**
Chalk and talk	
Lecture	
Demonstration	
Heuristic	
Assignment	
Project	
Discussion	

Why do you like to use the methods selected in 5 above?

_____

_____

_____

What challenges do you face when using the above methods of teaching Biology?

_____

_____

_____

6. Which teaching aids do you use in teaching Biology in this school?

Type of T/aid	**Tick the appropriate**
Chalk	
Lab. equipment	
Study garden	
Text Books	
Charts and pictures	
Museum	
Any other	

Why do you like to use the methods selected in

What challenges do you face when using the above teaching aids?

What challenges do you face when teaching Biology?

_____

_____

_____

_____

7. In your view, what can be done to improve on the situation?

_____

_____

_____

8. Basing on the performance record of your students, is there there any relationship between the teaching aids and the academic performance of your students in Biology subject?

Yes ☐ No ☐

9 Other than the teaching aids, what factors affect the performance of your students in Biology Subject?

_____

_____

_____

_____

Thank you for your time