

KAMPALA INTERNATIONAL UNIVERSITY

FACULTY OF EDUCATION

DEPARTMENT OF BIOLOGY

**TITLE: THE EFFECT OF TEACHING METHODS ON STUDNETS ATTITUDES
TOWARDS BIOLOGY ON SECONDARY SCHOOLS. ILALA – DISTRICT
TANZANIA.**

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DECLARATION

I declare that the material in this book has been done entirely by my effort and has not been presented elsewhere for any academic qualification.

SIGN:


DATE:

APPROVAL

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

SIGN: 

MR. SSEKANDI ERIAS

DATE: 

DEDICATION

This work is affectionately dedicated to my beloved parents for their support patience and understanding during this period of study not forgetting all those who constantly wish me success.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the problem

An attitude may be defined as a predisposition to respond in a favorable or unfavorable manner with respect to a given attitude object (Oskamp, 2005). The focus of the study is on school student's attitudes towards chemistry subjects taught in the secondary classrooms. The term subject refers to both theory and laboratory classes in secondary schools.

Understanding of students' attitudes is important in supporting their achievement and interest toward a particular discipline. Student's attitudes toward science have been extensively studied, but research was initially focused greatly on science in general and less attention was addressed to particular disciplines like biology, chemistry or physics. This can partly camouflage student's attitudes because science is not viewed as homogeneous subject.

The study of attitude is important a social learning in that it helps the observer changes the behavior of style of learning hence increases their performance. The other importance of altitudes is the acquisition of knowledge by a student as a result of instruction, but achievement is the paramount objective of most instructional activities. However, it may also be important to recognize the need for planning activities designed to facilitate effective outcomes in learner's consequences of an instructional situation (Simson , 1985)

Also, students are more likely to remember information, seek new ideas and continue studying when they react favorably to an instructional situation or like a certain content area. Students, who like biology will tend to stay after class to work on experiments, read about biology outside the class and be more likely to **elect** to take biology course than will those who not like biology (Spall, 2005). Students tend to do what they like, not what they do not like. They gravitate toward their interests (Gray 1999). Many factors could contribute to student's attitudes toward studying biology. Several studies (including

Halladyna and Shanghnessy, 1982) reported that a number of factors have been identified as related to student's attitude to science and biology, such factor includes; influence of parents, teacher attitude, gender, career interests, social view of science and Scientifics, age, cognitive style of students/pupils , teaching methods, social implicating of biology and achievement.

Much research has shown clearly that a negative attitude towards biology is the dominant factor affecting student's willingness to study further biology (Cheung, 2009). Unfortunately, research has revealed that much of what have been examined by other researcher has not kept much emphasis on the effective teaching method like the participatory method that brought much attention in teaching and learning especially for the science subjects (Stark, 1999)

The studies reviewed suggests that there is a relationship between attitude and methods of instruction and that it is possible to predict achievement from attitude scores (Spall, 2003)) what is needed to complement the result of such studies, however is the nature of relationship between students attitude and factors related to teaching and learning of biology.

Student's attitude toward biology has been examined by looking different factors like gender, difficulty of the subject and teacher attitudes but less attention on, teaching method, laboratory practical practices and future career. Therefore, all those factors that has not yet examined can be taken as a hint for further research. The effect of curricular difference should be included as a parameter to be considered for the studies related to student attitude. Thus, the result of this type of study is likely to broaden our knowledge as how we can influence student's attitude from negative attitude to positive attitude toward biology as a subject.

1.2 Statement of the problem

Despite the Tanzania Government encouraging students studying science and biology subject by motivating them by giving books and textbooks and giving them priorities in selection to high school and tertiary education, students show negative attitude toward studying the biology (Jegade, 2003). The reasons for student's negative attitude towards biology are not yet established. This study tries to find out the factors that lead to negative attitude of students toward biology.

1.3 Purpose of the study

The main purpose of this study is to investigate the factors for the effect of teaching methods on students towards biology subject in some toward biology subject in some selected secondary school in Ilala municipal.

1.4 Research objectives

1. To examine the extent to which teaching methods affects students attitude toward biology
2. This amount to methods: whether a teacher can relate biology content with real life, what approach a teacher uses to increase this.

1.5 Research questions

- i. What teaching methods are used in classroom teaching?
- ii. What teaching and learning materials are available?
- iii. How does a teacher handle student's problem in biology?

1.6 Significance of the study

The results of the study will be beneficial to the students, teachers, administrators and curriculum workers, as it will present facts about effect of teaching methods on attitude of the students toward biology subject.

To students, findings of this study may help the students to develop their favorable attitude toward biology that could eventually improve their achievement in biology

To teachers, knowing the better methods of teaching will influence the students to improve their attitude toward biology; they can utilize these to enhance their teaching in congruence to the needs of their students. They can enhance their teaching by using new strategies in teaching, utilizing different teaching tools and attending seminars to update to the latest trends in teaching tactics and timely approaches.

To curriculum workers, the findings of this study may help them create innovative strategies to motivate students in biology. They can also recommend and advocate through and candid assistance to the teachers as they employ strategies to heighten student's attitudes toward biology.

1.7 Delimitation of the study

The study will be limited to three secondary schools in Ilala municipal only. Based on the time frame and financial constraints in covering all the secondary schools in this municipal, the study will be limited to the students of ordinary level (O-level) in both public and private schools.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

The purpose of this chapter is to examine the numerous literatures written by many eminent schools researchers, scientists and educationists on biology education. It is therefore imperative to renew the works of these elites with a view of making them a strong background for the problem under study especially attitudes of students to biology learning in Secondary Schools.

2.2 Students Attitudes and Science Achievement

Review of relevant literature depicts varying opinions and findings on the students' attitudes towards science and their performances. According to Yara, (2009), attitude of students can be influenced by the attitude of the teacher and his methods of teaching. He further showed in his work that teachers' method of Biology teaching and his personality greatly accounted for the students' positive attitude towards the subject and that without interest and personal effort in learning by the students, they can hardly perform well in the subject.

According to Barnes et al (2005), attitudes towards science, biology inclusive are, in general, highly favored, indicating strong support for science and the learning of science. There is also consistency across countries and age levels within a country in the average level of attitude towards biology and general science. However, in countries where a high level of technological and industrial development had been achieved, the findings showed that attitude towards science were more neutral.

Kempa (1974) reported that pupils' interest in science is associated with their achievement in science. Collaborating these reports, Olatoye(2001) found that students attitude towards biology have significant direct effect on student achievement in the subject. Adesokan (2000) asserted that in spite of the recognition given to biology among

the science subjects, it is evident that student still show negative attitudes towards the subject thereby teaching to prior performance and low enrolment.

Our nation needs to attract all the academically gifted students into the pursuit of biology. There is also the need to maximize the scientific literacy of all students, and to achieve equity in participation in biology. Bennett et al.,... (2001) argued that students normally start fearing biology and other science subject once physical science and biology become optional at the secondary school level; there is a downward spiral of performance in biology accompanied by decrease in achievement and interest. This implies that there are underlying factors affecting the attitudes of students towards biology that needs to be addressed at the secondary school level (Santonimo, 2005).

To locate relevant previous student studies, computer (internet) searches of three databases were conducted and several reports (Barnes et al, 2005 Shannon et al., 1982) were conducted and their scope of study was limited to biology as experienced by students in Secondary School rather than out-of-School experiences obtained from external sources such as the media, museum, field trips, and friends. A number of curriculum evaluation projects included student attitude to biology as one of the dependent variables (Adesoji, 2000), but they are not renewed in this project because they focused on the effectiveness of a curricular or instructional innovation rather than the attitudes of students toward biology lessons at different levels of schooling.

2.3 Student's attitudes and the teaching materials in relation to teaching methods

According to Cheung (2009), he argues that the presence of enough materials for teaching and learning like laboratories, teaching aids, laboratory apparatus, facilitate the students to raise their attitudes and increase in their performance in science subjects since they are exposed to real situation. Also according to Cheung most developed countries like Japan, China and Malaysia have a great advance to encourage students in taking biology hence and much influence in their attitude due to enough teaching and learning materials which related to the methods.

Also Gray (1999) conducted a study on the importance of teaching method and learning materials for improving performance and their liking of science subjects. Gray suggested that student must be directed to gather information or facts from textbooks, dictionaries, newspaper and encyclopedia. By doing this will help students to be encouraging in taking biology simply they will get more understanding apart from the knowledge they get from their teachers in the classroom and this will determine their liking or disliking in taking biology subject.

2.4 Student's attitudes and proper teaching methods

In (1999) Stark emphasized that, being poor in pedagogical skills leads to failure in science subjects, the use of obsolete methods of teaching like lecture method does not capture the students interest simply students acts as a listener and undermine creativity of the students. According to Stark science teachers should mostly use pedagogical skills in teaching and learning process like the use of participatory technique between teachers and students will create creativity to students and helps teacher to recognize area of weakness, therefore the use of pedagogical skills lead to understand the abstract concept in science (biology)

Shannon et al (1982) insists that teachers have to be care in selecting the appropriate teaching technique in science subject since failure in using the appropriate teaching and technique may lead to failure in making the clear concept.

In (1961) Jean Piaget emphasizes the use of proper teaching and learning technique in teaching science subjects. According to Piaget the children have different mental capacity at different level of development. The appropriate teaching technique must be carefully employed in order to make the children successfully in science subjects

2.5 Summary and synthesis of literature review

Different authors have written a lot on the effect of teaching methods on students attitudes toward biology and argued that students attitudes and teaching methods has a much contribution on lowering the students attitude toward biology

The following are some factors mentioned by some authors as the core factors for students attitudes toward biology as; influence of parents, teachers attitudes, gender, career interests, social view of science and Scientifics, age, cognitive style of students, teaching methods, social implicating of biology and achievement

This study differs from the other research in secondary schools in Ilala in that, it aims to investigate the effect of teaching methods toward biology rather than other studies that studies student's attitude toward science in general. Moreover, the studies promises to fill one of the gaps in the area related to comparing students attitude with respect to curricular differences

One of the findings of the study is that students attitudes and effect of teaching methods has strongly affected students attitude toward biology, this can be taken as a hint for future research or further studies.

3.5 The study sample

The study sample consists of students in secondary school in an ordinary level (o-level) in ilala municipal. A total of fifty (50) students classified in gender i.e.' male and female was systematic selected from the three secondary schools' These schools are; Kisutu secondary school, Abdu Jumaa secondary school and Tiravira secondary school' The selected students in each school was form one and form two students The aim of selecting this sample and school as concerns was based on time frame and financial constraints. Moreover, these schools experience the same problem under this study'

3.6 Sampling Procedures

The lists of the schools that was under the study are as follows; Kisumu secondary school, Abdu Jumaa secondary school and Tiravira secondary school. The sample from each school selected was drawn in systematic random for this research purpose. The sample size was fifty (50) students.

3.7 Methods and instruments for data collection

The study employed questionnaire type of instrument for collection of necessary data for the study, but sometimes more than one instrument can be used since no single instrument is completely adequate in itself. The questionnaire is of closed type that allows for either strong agree (SA), agree (A), strong disagree (SD), undecided (u) or disagree (D) responses from respondents. Schibeci (1984) suggests that high school students' general attitudes to science can be measured with the semantic differential technique, but if more specific attitudes are to be measured with the semantic differential technique, but if more specific attitudes are to be measured, Likert scale are more appropriate. Barnes et al. (1982) found that Likert type items had produced the highest reliability when several formats were tested. The instrument was divided into four sections, based on the likeness for the subject, teachers' attitudes, teaching methods and students' attitudes, teaching methods and students' expectation or future career.

The aim of using closed ended questionnaire is that, it involves little writing and allows greater uniformity in the manner in which the questions are provided and therefore ensure greater comparability in answers (Aclesokan, 1980). In closed ended questions the task of the respondents is greatly simplified, also statistical manipulation of data are possible and greatly facilitate analysis of data.

3.8 Validation of instrument

Validity implies the ability of the data collection instruments to measure what it was intended to measure. It is something to do with accuracy of the scientific findings. Hallayna and Shanghnessy (1982) described validity in terms of instrument predictive power of sufficient generality to address a range of related situations. The questionnaires

Were pre-tested in order to know whether the sample of the subjects had sufficient understanding of the questionnaire items (Gall' i999)

3.9 Data processing and data analysis

Descriptive statistics will, be used to analyze data so as to find for sample means for studies variables. The response from the students' attitudes toward biology was collected and analyzed in a simple percentage (%).

3.10 Ethical considerations

The study observed ethics. Before collecting data from the students, permission will be sought from the head of school. Using gender sensitive questions will be avoided during the pilot study. Permission was sought from parents to allow their children to participate in the exercise.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This chapter consists of the research approach and design, area of the study, target population, sample for the study, sampling procedures, method and tools for data collection, validation of tools for data collection, data processing and analysis as well as research ethical considerations.

3.2 Research approach and design

The study adopted a qualitative approach. This was due to the nature of the study that it investigates the human beings. By qualitative it means the data collected are based more on student's perception of reality. Most of the data depended on student's interpretation, feelings and options.

3.3 Area of study

The study was conducted in Ilala municipal –Tanzania. Ilala municipal is located in the Eastern zone ($6^{\circ} 49'S$ and $37^{\circ} 40'E$) in Dar es Salaam Tanzania. The municipality is about 190kilometres from West Morogoro and it is about 264 kilometers from the central zone-Dodoma. The municipal has got a total of sixty five (65) secondary schools.

The aim of selecting this area was based on the reason that, geographically most of the area for data collection is accessible, cost minimization and the time management in collecting of data.

3.4 Target population

The study was targeted to ordinary students' in both public and private school in Ilala municipal, form one and form two classes, that age's between 14-18 years old who are taking biology subject under the selected secondary schools.

3.5 The study sample

The study sample consists of students in secondary school in an ordinary level (O-level) in Ilala municipal. A total of fifty (50) students classified in gender i.e. male and female was systematic selected from the three secondary schools. These schools are; Kisutu secondary school, Abdu Jumaa secondary school and Tiravira secondary school. The selected students in each school was form one and form two students. The aim of selecting this sample and school as concerns was based on time frame and financial constraints. Moreover, these schools experience the same problem under this study.

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CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF THE FINDINGS

4.1 Overview

In this part, the data collected through questionnaire as a data collection tool are presented. The data collected via the questionnaire are processed, summarized and presented in tables followed by brief description of the data. Generally, for the sake of convenience, related items have been treated together. Thus, this findings and discussion are with respect to the question.

4.2 Teaching method used in the classroom

The data below represent the response of students on the teaching methods used by their teacher and the students were answered depends on their perception by responding to the agreement response or disagreement response in which simple percentage were calculated by considering the total number of population which were fifty (50).

Table 4.2: response of student's questionnaire on teaching method used in the classroom

Items of questionnaire	Frequencies		Percentages	
	Agreed	Disagreed	Agreed %	Disagreed %
1. Does your teacher use participatory method in teaching?	20	30	40	60
2. Does your teacher prefer lecture method of teaching rather than other method?	35	15	70	30
3. Is your biology teacher involves you in discussion during teaching?	21	29	42	58
4. Does your teacher involve you in an interactive demonstration during practical session?	19	31	38	62
5. Is your biology teacher approachable?	34	16	68	32

Source; field data September, 2011

Table1 reveals, about 60% respondents disagreed that their teacher does not use participatory method during teaching in the classroom. Only 70% of student's response gave true response in that their teacher do prefer lecture method of teaching rather than other method of teaching, 58% disagreed on the involvement of their biology teacher in classroom discussion especially for problem solving. 62% were highly disagreed on the lack of interactive demonstration when students are in the laboratory practice and about 68% of student's response agreed that their biology teacher are approachable. From the results obtained, it indicates that teaching method of their teacher used mostly shows a negative influence to students attitude toward biology subject, this is due to the fact that teachers do not involves students in an interactive methods of teaching that could rise students attitude toward biology like the use of participatory and discussion methods.

4.3 Teaching and learning materials available in schools

The data below represent the response of students on the teaching and learning materials used by their teacher and the students were answered depends on their perception by responding to the agreement response or disagreement response in which simple percentage were calculated by considering the total number of population which were fifty (50).

Table 4.3. Response of student's questionnaire on teaching and learning materials available in schools

Items of questionnaire	Frequencies		Percentages	
	Agreed	Disagreed	Agreed%	Disagreed%
6. Is your school having enough textbooks of biology?	12	38	26	76
7. Does your teacher provide your lecture notes for further studies?	28	22	56	44
8. Do you find your biology textbook too easy for private studies when leading at home?	11	39	22	78
9. Is your teacher uses instructional materials to arouse your interest while teaching some concepts in biology?	25	25	50	50
10. Do your biology teacher uses modern media like overhead projector in teaching?	08	42	16	84

Source; field data September, 2011

The results showed that 76% disagreed on the presence of enough textbooks of biology in their schools, 56% did bother about the lecture in sense that their teacher normally provides the notes for their home repetition, 78% disagreed that they do not find it easy or understand few textbooks when doing their private study, 50% each agreed or disagreed on the use of instructional materials to arouse students interests while teaching and 84% disagreed on the use of modern media like overhead projectors (OHP) and Liquid crystal display (LCD) in teaching. From the results obtained it showed that unavailability of enough teaching and learning materials to schools contribute to the drop of student's attitude toward biology subject.

4.4 Teachers handling student's problems in biology

The data below represent the response of students on the teachers ability in handling student's problems in biology where answered depends on their perception by responding to the agreement response or disagreement response in which simple percentage were calculated by considering the total number of population which were fifty (50).

Table 4.4 Responses of student's on teachers handling problem in biology.

Items of questionnaire	Frequencies		Percentages	
	Agreed	Disagreed	Agreed%	Disagreed%
11. Is your biology teacher assists you in problem solving in biology once you encounter a problem?	24	26	48	52
12. Is effective problem solving in biology too boring hence taking much of your time?	30	20	60	40
13. Do you enjoy doing private practices missing problem in biology?	14	36	28	72
14. Is your biology teacher looking your notes for the purpose of making necessary collection?	24	26	48	52
15. Do you often create time for problem solving in biology at your own volition?	20	30	40	60

Source; field data September 2011

From the analysis (table3) 52% of respondents disagreed on the assistance provided by their teacher in problem solving in biology subject, 60% agreed that effective solving problem solving in biology is too boring and take much of their time, 72% did not enjoy better when doing their private practices missing problem in biology, 52% disagreed on their teacher looking for their notes for the purpose of making necessary correction and 60% they did not have chance to create time for the problem solving in biology due to difficult of the subject. It could be deduced that students negative attitude toward biology may be resulted due to their teachers not to handle students problem in biology.

4.5 Student's perception regarding benefits of biology in future life

The data below represent the response of students perception regarding benefits of biology in future life where answered depends on their perception by responding to the agreement response or disagreement response in which simple percentage were calculated by considering the total number of population which were fifty (50).

Table4.5. Responses of student's perception regarding benefits of biology in future life.

Items of questionnaire	Frequencies		Percentages	
	Agreed	Disagreed	Agreed%	Disagreed%
16. Is your future career independent from biology knowledge?	15	35	30	70
17. Would you like to be biology in future life?	18	32	36	64
18. You biology teacher is your personal model; would you like to work like him or her?	17	33	34	66
19. Is biology knowledge necessary for your future life?	09	41	18	82
20. Is biology needed at all in your work or course of study?	27	23	54	46

Source; field data September 2011

The results showed that 70% and 64% depicted that most students disagreed that their future career does not depend from biology knowledge and they do not like to be biologists in their future life respectively. About 66% disagreed to work like their biology teacher who looks as a personal as the subject involves a lot of calculation. The 82% and 54% disagreed on biology knowledge be necessary for their future life and biology is not needed at all in their course of study or work. From the foregoing, it could be deduced that attitude of students regarding benefits of biology in future life contribute to the negative attitudes of students to the subject.

4.6. Discussion

The findings of this study revealed that the negative attitude of the students are the function of the lack of interest erroneous, believed that biology is volatile and poor teaching methods by the teachers. This is in support of the report of Cheung (2006) and Oskamp (2005), suggested that students should be taught with relevant teaching method that could put student in their best way to study of the subject.

The study also showed that negative attitude toward the subject is influenced by some factors, that are lack of teaching and learning materials that are normally discourage the students to take biology subject, also the perception of the students toward the subject in future life is among of the factor that made student to quit from taking biology as they believe biology is difficult and the knowledge of biology is not necessary to their future life.

Lastly, the study showed that teachers did not use adequate instructional materials for practical and students complain about textbooks not explicit enough for their private study. This attitude of biology teachers were not in agreement with ideas of Yara (2009) and Barnes et al (2005) they believe that they should use recent or modern and adequate instructional materials for practiced to teach their students, by this student's interest would be aroused.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.0 SUMMARY

From the results of the study it was revealed that the negative attitudes of students is contributed due to factor like, poor method of teaching in biology both theory and practical. It seems we need to concentrate all efforts and energy on improving factors that tend to lower the attitudes of student's toward the subject of biology. It was found that teaching method of their teacher used mostly shows a negative influence to students attitude toward biology subject, this is due to the fact that teachers do not involves students in an interactive methods of teaching that could rise students attitude toward biology like the use of participatory and discussion methods, also unavailability of enough teaching and learning materials to schools contribute to the drop of student's attitude toward Biology subject. Necessary, modern textbooks should be provided to learners and teachers. Teachers should employ modern methods of teaching that will facilitate individualized instruction. They should provide instructional materials for practical to schools and should please find adequate schools to keep them going respectively. It could be deduced that students negative attitude toward biology may be resulted due to their teachers not to handle students problem in biology. Therefore, teachers are supposed to be patient in handling student's problem in biology hence lead to the rise of student's attitude. From the foregoing, the attitude of students regarding benefits of biology in future life contribute to the negative attitudes of students to the subject because of their difficulties encountered by the students in biology like lack of enough textbooks in biology .

5.1 Recommendation

The results of the study showed that the students who found the subject of the study were glaringly opposing biology as a subject. It is believed that their feeling is a reflection of their apathy and frustration created in part by the prevailing conditions surrounding to effect any meaningful change in the present situation biology teaching and learning facilitates must be provided into all schools.

The following suggestions if well executed would assist students to pass with flying colors.

- i. Teaching methods; teachers should realize that no single method is perfect for instruction
- ii. Selection of suitable books; modern and relevant textbooks should be recommended and should be used in schools
- iii. Provision of enough exercise; teachers should endeavor to give substantial work to students to aid mastery of concepts. These must be cross checked, marked and give correction wherever the need arises.
- iv. Practical work; emphases should be laid on the practical aspects of the subject. This is just to arouse student's interest and understanding in the subject.

To the general populace, there is no assistance that is too small or big to help our educational standard especially in the area of biology, since for any meaningful advancement in technology and industrial revolution, biology is part of the needed disciplines. If all the recommendation and appeals are followed we should expect positive attitudes and better performance of the students in science education.

5.2 Area for further study

I suggest that more studies should be carried out to identify in detail a single factor how does it affect and what are the permanent measures should be taken to make students negative attitude toward biology is omitted and influenced to take biology.

Besides, certain measures must be taken to improve the quality of biology teachers, this include better recruitment, better substantive education of biology teachers in training institutions, retraining programme for young teachers with shallow experience, in services and long vocation courses improvement in teacher's salaries with special allowances for biology teachers and upgrading of the teaching profession.

This could be ways by which biology teaching can be made more interesting to the teachers.

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APPENDICES

ADMINISTERED QUESTIONNAIRE TO THE STUDENTS

Kindly read through each statement, tick (fill appropriately) in the space provided

(i) Name of the school

(ii) Form/class.....

(iii) Sex Male () Female ()

Items of questionnaire	Response frequencies			
	SA	A	SD	D
Does your teacher use participatory method of teaching?				
Does your teacher prefer lecture method of teaching rather than other method?				
Is your biology teacher involves you're in discussion during teaching?				
Does your teacher involve you in interactive demonstration during practical session?				
Is your biology teacher approachable?				
Is your school having enough textbooks of biology?				
Does your teacher provide you notes for further studies?				
Do you find your biology textbooks too easy for private studies when reading at home?				
Is your teacher uses instructional materials to arouse your interest while teaching some concepts in biology?				
Do you biology teacher uses modern media like overhead projector in teaching?				
Is your biology teacher assists you in problem solving in biology once you encounter a problem?				
Is effective problem solving in biology too boring hence taking much of your time?				
Do you enjoy doing private practices missing problem in biology?				
Is your biology teacher looking your notes for purpose of making necessary correction?				
Do you create time for problem solving in biology at your own volition?				
Is your future career independent from biology knowledge?				
Would you like to be biology in future life?				
Your biology teacher is your personal model; would you like to work like him/her?				
Is biology knowledge necessary for your future life?				
Is biology needed at all in your work or course of study?				

APPENDIX II

Results of analysis of student's questionnaire

n	Items of questionnaire	Response frequencies				percentages	
		SA	A	SD	D	A%	D%
	Does your teacher use participatory method of teaching?	11	09	23	07	40	60
	Does your teacher prefer lecture method of teaching rather than other method?	09	06	19	16	30	70
	Is your biology teacher involves you're in discussion during teaching?	16	05	23	06	42	58
	Does your teacher involve you in interactive demonstration during practical session?	01	18	07	24	38	62
	Is your biology teacher approachable?	34	00	07	09	68	32
	Is your school having enough textbooks of biology?	02	11	03	35	26	76
	Does your teacher provide you notes for further studies?	16	12	13	09	56	44
	Do you find your biology textbooks too easy for private studies when reading at home?	00	11	15	24	22	78
	Is your teacher uses instructional materials to arouse your interest while teaching some concepts in biology?	16	09	02	23	50	50
0	Do you biology teacher uses modern media like overhead projector in teaching?	00	08	30	12	16	84
1	Is your biology teacher assists you in problem solving in biology once you encounter a problem?	08	16	03	23	48	52
2	Is effective problem solving in biology too boring hence taking much of your time?	25	05	14	06	60	40
3	Do you enjoy doing private practices missing problem in biology?	04	10	22	14	28	72
4	Is your biology teacher looking your notes for purpose of making necessary correction?	15	09	10	16	48	52
5	Do you create time for problem solving in biology at your own volition?	07	13	03	27	40	60
6	Is your future career independent from biology knowledge?	06	09	19	16	30	70
7	Would you like to be biologists in future life?	10	08	24	08	36	64
8	Your biology teacher is your personal model; would you like to work like him/her?	00	17	08	25	34	66
9	Is biology knowledge necessary for your future life?	09	00	38	03	18	82
0	Is biology needed at all in your work or course of study?	14	13	07	16	46	54