CHAPTER ONE

BACKGROUND TO THE STUDY

Through critical observation during science lessons, the researcher realized that pupils in Nuamakrom Junior High School especially J.H.S. 2 do not take active part in science lessons. This is due to the following reasons.

Firstly, the school has got very few teachers who find difficult to apportion the various subjects among themselves.

Secondly, insufficient teaching and learning materials also compounded the problem of the school and pupils interest in the subject. With much closer and critical analysis of the problem compelled the researcher to use two methods of teaching (activity and discussion) to improve pupils' participation the subject. The researcher decided to use these methods of teaching because the activity method would engage pupils in the teaching and learning process after which pupils with teacher discuss what they have learnt. Through this, pupils can improve upon their oral language and vocabularies in science. Even though the community is a farming area and most of the pupils don't attend school regularly because they have to accompany their parents to the farm, the researcher has tried hard to reduce the problem if not eradicated completely.

By so doing, pupils' enrolment has increased and the researcher has taken this as an opportunity to improve their participation in science and to be used at their respective forms.

Statement of the Problem

As part of the researcher's ambition to become a good science teacher, he took it upon himself to improve pupils' participation in science at his school. The researcher observed that pupils at Twifo Nuamakrom J.H.S. 2 do not take active part and had no interest in science. The researcher noticed this during science lessons.

Most of the pupils had left for the house with the reason that they have no science teacher. The rest of the pupils could not answer simple questions given to them by the researcher.

Inadequate teaching and learning materials compounded the problem because there were insufficient teaching and learning materials such as charts, pictures, realia and improvised ones to teach science.

Purpose of the Study

The researcher deems it difficult and pleasure to help solve some problems and possibly develop pupils' interest in science. The researcher is interested to know the ill-participation in science for that matter lack of interest in the subject and use the appropriate methods of teaching (activity and discussion) to help develop interest in the subject. Understanding the nature of the problem, the researcher used two methods of teaching to improve pupils' interest and facilitate quick understanding of the subject.

Since most of the work load is centered in form two (J.H.S. 2) as far as the J.H.S. programmes is concerned and is the class of interest to the researcher. The students in J.H.S. 2 are the sample in the study of which the researcher is going to use. The number on roll is thirty (30) of which thirteen (13)a are males and seventeen are females.

The study is going to be carried on in a less endowed Junior High School (J.H.S.) which is situated adjacent to the Presbyterian Church in the town.

Research Questions

In the course of the research, the researcher designed some questions to help him in his study. Among some of the questions are stated below:

1. What are some of the causes of low participation in science lessons?
2. How can activity and discussion methods of teaching pupils improve pupils' participation and interest in the science subject?
3. What are some of the problems encountered by both the teacher and pupils during science lessons?

Significance of the Study

The project will help pupils to develop interest in the subject to facilitate high participation of them. It will be meaningful to the learners and for that matter would like activity and discussion methods to teach science lessons.

It will also make policy makers, heads of institutions and Ghana Education Service to employ activity and discussion methods as appropriate methods of teaching science.

Lastly, it will equip teachers with effective methodology, appropriate teaching and learning materials to employ when teaching the subject.

Limitation to the Study

The researcher faced a lot of problems when collecting information which nearly hampered his interest in producing this piece. However, the researcher maneuvered to pass through.

One of such problems was financial constraints. The researcher did not have enough money. The researcher himself was facing monetary problem and even offering a token to the interviewees as an incentive to motivate them to give more information was a problem.

Furthermore, insufficient teaching and learning materials was no exceptional. There were no teaching aids for pupils to observe during teaching processes. Also the absence of the interviewees and the nature of their work also posed a lot of problems to the researcher. On most occasions, the researcher would be there and the interviewees might be absent.

Delimitations

This project is confined to a specific subject area and a participate class. The problem is also married to a particular class. Another delimitation of the study is that it does not involve the whole school but a particular class (J.H.S.2); this made the study easier to be carried out. This project involved only thirty (30) pupils, head teacher and the science teacher.

Organization of the Study

The research project is organized and presented into five (5) chapters. Chapter one which is the introductory aspect of the project consists of the background to the study, statement of the problem, purpose of the study, research questions, significance of the study, limitations and delimitations and the organization of the study.

The next chapter (chapter two) consists of the review of related literature. It comprises of the explanation of activity and discussion methods and how to undertake the methods in the teaching and learning process.

Chapter three is the methodology. It discusses the population and sample method sample collection or selection data collection, procedure and the mode of analyzing data.

Chapter four deals with the presentation and analysis of the data and discussion. The last chapter five also provides summary of the research findings, conclusion and

recommendation for teachers, parents, policymakers, guidance officers and for further research.

CHAPTER TWO

LITERATURE REVIEW

Hammond Barnhart dictionary of Science (1987) defined science as a systematic body of knowledge based on observation and experimentation. It continued that before science can be studied effectively, then the learner must be a critical observer.

Integrated Science GNAST (1990) also defined science as a process by which people accumulate knowledge and skills in which they can be placed high and often measurable degree of confidence. The same reference again defined science as a continuous process of investigation and experimentation in order to widen peoples' understanding of the natural world.

The Cambridge International Dictionary also defined science as a knowledge obtained from systematic study of the structure and behaviour of the physical world, involving experimentation and measurement and the development of theories to describe the result of the countries.

A Barnhart (1989) explained that Science is a developing technology to benefit the human society. Wynne Harlen also explained science as essentially about understanding things through interacting with them, finding out by enquiring of the things themselves. He further explained that better enquiries can be made in science using various activities and effective discussions. It is from Wynne Harlen reference that

the researcher decided to use the activity and discussion methods to reduce low participation in the subject.

S.N. Macharia and L.H. Wario (1989) explained activity method as the realization that children learn best by being actively involved in a lesson, that, they learn by doing. The activity method usually includes certain teacher-activities like explanation, dramatization, distribution of materials and the giving of instructions, but most of the lessons' time is taken by pupils' activity such as:

- answering questions orally or in writing
- drawing
- dramatization situations
- modeling
- experimentation

The same reference expressed activity-method as a measure between child-centered and teacher-centered approaches. This is because the teacher takes part in the lesson but the pupils use most of the time. The word activity is used a lot in modern approaches to teaching and learning in the classroom. Activity method is better during science lessons. It takers into consideration learners

- Natural tendency and experience
- Previous knowledge and experience
- Familiar environmental and play materials

❖ Individual difference and abilities

Miller et al (1989) claims lessons which are practical mu8st best use activity method to answer. Activity with real objects and materials do not only help learners to communicate information and idea but also provide opportunities for students to develop understanding of the scientific approach to enquiry.

Miller and Driver (1987) pointed out that the processes needed to be situated within the study of some phenomenon cannot be taught in isolation.

Activity method has the following merits of

- helping children learn through first hand experience
- not easily forgetting what they have learnt
- better introduced into the world or work

Despite all these advantages, it also has demerits. Among these are:

- Consuming instructional time
- It involves liberal use of materials and may therefore be costly.

Discussion is another method the researcher used to check low participation and interest of pupils. The discussion method is a goal geared towards consensus learning strategy (Meiziebi 1992) Awoyemi (2001) defined discussion method as a co-operative learning in which learner pull their knowledge and ideas together in an interdependent

and learning section, brainstorming on an issue or problem and consensually arriving at conclusions.

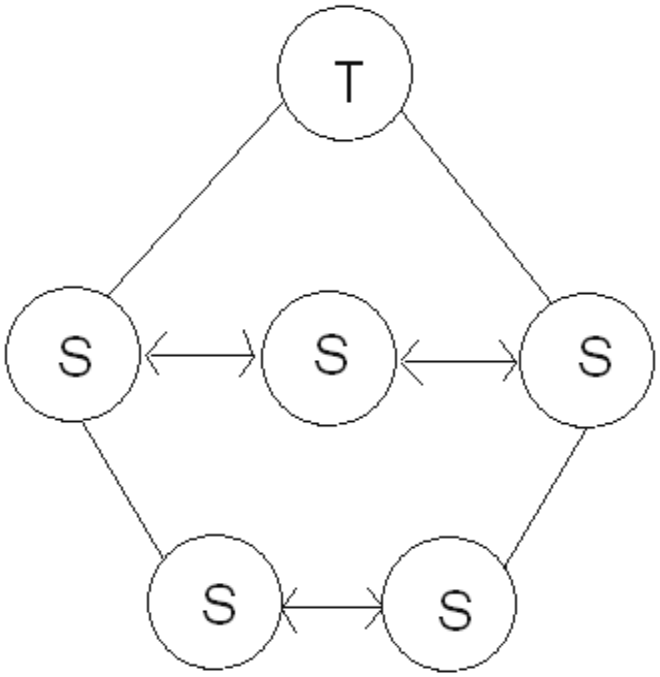
Higles (1990) explained discussion as a method of group studying and together or a group thinking out aloud or a group interacting within itself.

Drailing et al explained discussion simply as thinking together. This means that discussion involves the intelligent exchange of ideas. It does not proceed in a hit and miss fashion. Participants should present their views logically and support them well and the only way to ensure this is to give students adequate time to prepare themselves before hand.

Discussion is characterized by its purpose and manner in which the activity is carried out. In this way word describes not only group of human beings talking but a group seeking to put together their knowledge, ideas and opinions about one subject. In real discussion, people try to listen to each other to learn from each other and by working together to reach a little nearer to the truth or to the solution of the problem or to whatever other educational objective they have in mind.

Kinpolet et al (1984) perceive the different dimensions of discussion method which include whole class, small group, panel, debate discussion, panel presentation, round table discussion and debate. However, only two whole class and small group discussion is used by many teachers. In the whole class discussion all the pupils in the class share ideas with the teacher. With the small group, the teacher divides the class into

small discussion groups and appoints a leader and a recorder for each group. During the discussion session, the teacher goes from group to group to assess their progress. He or she may help direct the questions by asking leading questions. The small group is best used with matured students. The interaction that goes on in a discussion group is illustrated below:



The unbroken lines with arrow head indicate a more or less maximum active verbal interaction among members of the class or group.

Quartey (1984) stated that for discussion to be successful, the following must be observed:

- A well planned set of flexible questions
- Must be relevant to pupils lives

- Must be problem with clear cut answer
- The ability of the teacher to lead the class through the discussion.

Discussion is an effective means of developing the skills of utilizing any information. This help guard against knowledge becoming what A.N. Whitehead referred to as "inert ideas." That is ideas which cannot be used to improve oneself or the society in general. Discussion method has the following advantages:

- It provides an excellent opportunity for students to practice their oral communication
- It gives students practice in critical and evaluative thinking and listening
- Students seem to learn more readily from other people.
- It provides good practice for problem solving
- It gives students training in the democratic processes.

In spite of the above, the method has the following disadvantages

- It is very difficult to achieve maximum interaction with larger groups.
- It may give opportunity for bright students to show off.
- When the discussion leader is weak, it can result in unorganized and unproductive activity.
- It is not easy to be used in the entire subject or the topic and the choice of a suitable subject is a problem.

CHAPTER THREE

METHODOLOGY

This chapter is about research methodology which involves sampling and procedure, research design, data collection and research instrument. It focuses on how the study was conducted and the procedure followed in the investigation in order to support its main points.

Research Design

The research was action research. It seeks to address the problem of pupils within the classroom and also direct science teacher to know how to tackle science questions. The study was in phases; the first phase was an interview with the head teacher, science teacher and pupils in basic eight (8)

Again, the researcher intervened to the problems of the class based on the achievement test results. The researcher conducted post intervention activities.

Population

The population for the study is all the pupils at Twifo Nuamakrom J.H.S Pupils in basic seven (7) are forty-five, thirty in basic eight (8) and twenty-five in basic nine (9). This gives the total population of the school to be hundred of which sixty-five (65) are males and the thirty-five (35) are females.

Sample

The sampling of the population was taken from basic eight (8). The number on roll is thirty of which twenty are girls and the remaining ten are boys. The whole class was sampled because the study was to improve pupils' participation in science. The table below shows the number on roll in science in basic eight (8).

Sample Space	Sample Units
Boys	10
Girls	20
Total	30

Sampling Method

Sampling is a chosen section which adequately represents the whole. The researcher used random sampling in getting his information.

Instruments

The instruments for the study are interviews, observation and achievement test.

Observation

The researcher observed through lesson deliveries that Twifo Nuamakrom has low participation in science. They feel reluctant to call the science teacher and make

unnecessary noise during science lesson periods. The researcher therefore took it upon himself to investigate into their low participation. The researcher's first day of entering the class, he observed the following:

Firstly, the pupils were trooping in and out from class as if it was closing time. The researcher was confused and asked one of the pupils. The pupil said "we have no science teacher."

Secondly, the researcher realized that there are inadequate teaching aids for pupils and teacher.

Lastly, the pupils had a misconception in science and also thought they can proceed further without science. In order to obtain concrete evidence on the information gathered during the observation, a sustainable instrument such as interview was chosen to collect information from pupils, head teacher and the science teacher.

Interview

Interview is a face to face interaction with any group or individual to solicit information from them or him. Interview can also be defined as the meeting of person face to face to find out views, facts or to discuss important issues. The researcher interviewed the head teacher, the science teacher and the pupils in basic eight (8). The researcher asked the above group the problems he observed on his first day of entering the class.

On the part of the head teacher, he said he was aware of the pupils' trooping in and out from class during science period. He also said that the inadequate teaching aids were also a problem of the school.

The science teacher also said he stays at a nearby town so the cost of transportation prevents him from coming to school everyday. Also there were no teaching aids. The researcher also interviewed each pupil of the class and the response given was that the science teacher is not regular and when he teaches they do not understand.

Pre-Intervention

The researcher went to the class during a science period; he introduced himself as their new science teacher. He then decided and explained to them the importance of science in their lives.

The following were some of his points: Firstly, he said science is a core subject and unless you pass it you can never proceed further or do any better course at the second cycle institution.

Secondly, the researcher explained that the world is a changing world and for that matter all the new technology and intervention are as a result of science. He later explained that all electronic gadget and appliances are all from science. The researcher concluded by giving them a test. The researcher looked through the scheme of work and

gave them exercise on separation mixtures. The following are the questions the researcher gave to the pupils.

What method can be used to separate the following mixtures?

(a) Water and sand

(b) Iron filings and sand

(c) Muddy water

(d) Sand and gravels

(e) Palm oil and water

(f) Powder from iron filings

(g) Akpeteshie

(h) Iron filings and sawdust

(Refer to Appendix 1 for results)

Intervention

Based on the marks obtained by the researcher at the pre-intervention stage he decided to teach the topic again. A comprehensive lesson plan was prepared to re-teach the topic.

(See Appendix II for details)

Post-Intervention

To test the understanding of the pupils whether the pupils understood the lesson or not, the researcher gave them some few questions.

State the method of separation for the following mixtures.

- pebble and sand
- sand and stone
- iron filings and sawdust
- muddy water
- pebble and water
- dye
- green pigment in leaf
- sugar solution
- salt solution
- kerosene and water

(Refer to Appendix III for results)

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

The chapter presents the quantitative data collected during the pre-intervention, intervention and post-intervention stages of the project.

Frequency Distribution of scores and percentages at the pre-intervention stage

Class Boundaries	Frequency	Percentage
0- 9	14	46.67
10-19	6	20.00
20-29	2	6.67
30-39	4	13.33
40-49	3	10.00
50-59	1	3.33
60-69	0	0
70-79	0	0
80-89	0	0
90-99	0	0
TOTAL	30	100%

From the above table it could be seen that only one (1) pupil scored half mark that is ranging from 50-59. None of the pupils scored marks ranging from 60-69, 70-79,

80-89 and 90-99. Most of the pupils scored the lowest mark. Fourteen (14) pupils of a total percentage of 46.67% scored marks ranging from 0-9. Six (6) pupils also scored marks ranging from 10-19 at a percentage of 20%. Two (2) pupils representing a percentage of 6.67% scored marks ranging from 20-29. Four (4) pupils also scored marks ranging from 30-39 at a percentage of 13.33%. The last three pupils also at a percentage of 10% scored marks ranging from 40-49.

From the above analysis it can be said that almost all the pupils scored below the pass mark with the exception of only one (1) pupil who scored the pass mark.

Frequency distribution of scores and percentages at the post-intervention stage

Class Boundaries	Frequency	Percentage
0- 9	0	0
10-19	0	0
20-29	0	0
30-39	0	0
40-49	1	3.33
50-59	0	26.00
60-69	6	26.00
70-79	9	30.00
80-89	4	13.33
90-99	2	6.67
	30	100%

The above table can be explained that only one (1) pupil scored marks ranging from 40-49. That is below pass mark. Eight (8) pupils at a percentage of 26.67% scored pass mark that is ranging from 50-59. Two (2) pupils scored the highest marks ranging from 90-99 representing a total percentage of 6.67%.

Many pupils scored marks ranging from 70-79. Nine (9) pupils obtained this mark representing a total percentage of 30.33%. The third highest percentage that is 70% ranged from 60-69 with six (6) pupils. Four (4) pupils also scored marks ranging from 80-89 representing a total percentage of 13.33%.

From the above analysis it could be seen that almost all the pupils had pass mark or more with the exception of only one (1) pupil who had below pass mark.

CHAPTER FIVE

FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter is concerned with findings, conclusion and recommendations by the researcher.

Findings

It was found that pupils' performance increased after the intervention and gradually developed their participation and interest in the subject. This is because the pupils obtained very high marks at the post-intervention stage.

Conclusion

It can be concluded that pupils developed full participation and interest and understood the topic very well based on the marks obtained at the post intervention stage. It can therefore be said that the teaching methods employed by the researcher was fruitful.

Recommendations

The researcher recommends activity and discussion methods of teaching to science teachers to facilitate full participation and interest in science lessons.

Again the researcher suggests that science teachers should devote themselves and time during science lessons to enable them use the good and effective methods such as the activity and the discussion to improve pupils' interest in science.

Lastly, the researcher recommends teaching and learning materials to be supplied to school to enhance interest of pupils in science. He again urges science and other subject teachers to improvise their own teaching when the need arises. It is believed that using effective teaching and learning materials and pupils performing activities themselves promote and facilitate understanding and interest.

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A P P E N D I C E S

APPENDIX 1

Results from Pre-Intervention

Class Boundaries	Frequency	Percentage
0- 9	14	46.67
10-19	6	20.00
20-29	2	6.67
30-39	4	13.33
40-49	3	10.00
50-59	1	3.33
60-69	0	0
70.79	0	0
80.89	0	0
90.99	0	0
	TOTAL 30	100%

Calculation of the Percentage

$\frac{14}{30} \times 100\% = 46.67\%$

$\frac{6}{30} \times 100\% = 20\%$

$\frac{2}{30} \times 100\% = 6.67\%$

$\frac{0}{30} \times 100\% = 0\%$

$\frac{0}{30} \times 100\% = 0\%$

$\frac{4}{30} \times 100\% = 13.33\%$

$\frac{3}{30} \times 100\% = 10\ \%$

$\frac{1}{30} \times 100\% = 3.33\%$

$\frac{0}{30} \times 100\% = 0\%$

$\frac{0}{30} \times 100\% = 0\%$

Appendix II

Results from Post-Intervention

Class Boundaries	Frequency	Percentage
0- 9	0	0
10-19	0	0
20-29	0	0
30-39	0	0
40-49	1	3.33
50-59	0	26.00
60-69	6	20.00
70-79	9	30.00
80-89	4	13.33
90-99	2	6.67
	TOTAL 30	100%

Calculation of the percentage

$\frac{0}{30} \times 100\% = 0\ \%$

$\frac{0}{30} \times 100\% = 0\ \%$

$\frac{0}{30} \times 100\% = 0\ \%$

$\frac{0}{30} \times 100\% = 0\%$

$\frac{1}{30} \times 100\% = 3.33\%$

$\frac{0}{} \times 100\% = 0\%$

$\frac{6}{30} \times 100\% = 20\ \%$

$\frac{9}{30} \times 100\% = 30\ \%$

$\frac{4}{30} \times 100\% = 13.33\ \%$

$\frac{2}{30} \times 100\% = 6.67\ \%$