UNIVERSITY OF EDUCATION, WINNEBA

CAUSES OF PUPILS‟ POOR PERFORMANCE IN INTEGRATED SCIENCE IN SELECTED JUNIOR HIGH SCHOOLS.

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A DISSERTATION IN THE DEPARTMENT OF SCIENCE EDUCATION, FACULTY OF SCIENCE EDUCATION, SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, UNIVERSITY OF EDUCATION, WINNEBA IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF EDUCATION IN SCIENCE DEGREE

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DECLARATION

Student's Declaration

I, SAMUEL NKUM BAAH declare that this Dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for any other degree elsewhere.

Signature:…….....…….

Date:…….....…….…….

Supervisor's Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of Dissertation as laid down by the University of Education, Winneba.

Name of Supervisor: Dr. Ernest I. D. Ngman-Wara

Signature:…….....…….

Date:…….....….

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DEDICATION

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ABSTRACT

This is an investigative study into the causes of pupils‟ poor performance in Integrated Science in some selected Junior High Schools in the Anomabo Circuit of Mfantsiman Municipality of Ghana. The study took a look at the factors that might exist to hinder the performances of the pupils. The study adopted the descriptive method of qualitative research and data were collected with a set of questionnaire and an interview schedule and data from questionnaire were analysed using frequencies and percentages. The validity and reliability of these research instruments were realized after pilot testing. The trustworthiness of the interview guide was ascertained by using member check. Inter-rater was used for the observer reliability, and content and face, and Cronbach Alpha was used for the validity and reliability of the questionnaire respectively. Using the purposive and simple random sampling techniques, a sample of three schools with 69 respondents comprising 60 pupils and 9 teachers were selected for in-depth study.

The results indicated that the science teachers faced some challenges in dealing with the content of the Integrated Science syllabus. Lack of the availability of teaching resources, low teacher competency and low experienced teachers. It was, therefore, recommended that there is the need for regular organization of professional development activities such as induction and in-service training by the Ghana Education Service, adequate resources should be provided, experience and qualified teachers should be provided in order to address the problem in the Anomabo Circuit.

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter presents an introduction to the study. It comprises the following subtopics: background to the study, statement of the problem, objectives and research questions. It spells out the limitation, delimitation, definition of terms, importance of the study and the organization of the rest of the study.

1.1 Background of the Study

Education is the bedrock or engine to the successful political, economic, social and cultural development of every nation. Education in this regard cannot be left out in the development of nations due to its tremendous contribution. Generally speaking, the task of education is to change the behavior of learners in desirable ways. This usually implies adding to the stock of knowledge they possess, equipping them with the needed skills and developing in them a sense of positive values and attitudes. Education has now become the key to success and development the world over. A country‟s development does not necessarily depend on its natural resources but rather the level of education (literacy level) as could be witnessed in some developed nations like USA, Germany among others. This has led to the shift of attention by nations towards education in recent times.

Particular attention has also been paid to the abysmal performance of students or pupils in recent times and the causes of such abysmal performance.

Gbadamasi A. (2005, April 23). Poor standards in education. The Daily graphic, p.16 stated that teachers have always been blamed for the poor performance of pupils in

BECE especially in public schools. Although poor performance in Integrated Science runs through all basic schools in Ghana, the then minister of state in charge of tertiary education, observed that even with less investment, private schools are achieving better results because they place premium on supervision (Ohene, 2005). Kuwornu (2008) also confirmed the hypothesis that the poor performance of pupils in BECE may be attributed to the fact that most of the teachers are not patriotic to their work.

Anderman, Sinatra, and Gray (2012) pointed out that issues such as availability of appropriate science textbooks and classroom resources, preparation and training of pre-service and in-service science teachers, political and religious oppositions to the cutting-edge of science are some of the enormous issues confronting science education.

All the above mentioned researchers were able to detect that pupils do not perform better in BECE in some subjects for which Integrated Science forms part. However, the information given by these people could be more of conjecture, since they never stated the source of their claim. There are several pressing questions in education which educators cannot ignore.

Before, Ghana had its curriculum innovation, all schools used to teach General Science and Agric Science as separate subjects (Gbadamasi, 2005). Ghana, decided on the integrated approach for the teaching and learning of these subjects so that persons who do not wish to enter into the various fields of scientific study may be able to apply in life. For example, a house wife who had had some basic education would be able to prepare compost to manure the vegetables in her backyard garden.

For goals of science teaching and learning to be achieved, attention must be directed towards two aspects of science programme. These are: (a) the dimension of

knowledge acquired by the students and (b) the dimension of performance of students (the output of the students) when they are assessed. To be effective, each dimension must become the vehicle of development of the other.

Although Integrated Science plays very vital roles in providing pupils with countless opportunities and skills, it appears there are certain factors that militate against the performance of pupils in basic schools in Ghana.

The Chief Examiners‟ Reports for BECE (West African Examination Council [WAEC], April, 2014) in Integrated revealed that,

1. Pupils were unable to use scientific concept, principles, theories and facts to solve simple problems as expected by the marking scheme.
2. Some candidates were ignorant about some of the scientific terms.
3. Students were unable to apply scientific principles to explain situations and problems.
4. Students were unable to organize their works properly.

The above weaknesses indicated in the Chief Examiner‟s report in Integrated Science and the concerns raised by some concerned people have necessitated the study into the causes of pupils poor performance in Integrated Science in the Anomabo circuit of Mfantsiman Municipality in the Central Region of Ghana.

1.2 Statement of the Problem

Performance of pupils in Integrated Science in Anomabo Circuit cannot be alienated from effectiveness of teachers, teaching and learning resources. It is for this reason that a District Director of Education would blame the headteacher of a school in Anomabo Circuit for the massive failure of pupils at the Basic Education Certificate

Examination (BECE) and order his immediate demotion. This incident sounds very incredible since no investigations were conducted to find out the possible factors that might have contributed to that in order to address them. There is a high correlation between teacher output, availability of teaching and learning resources, and pupils‟ performance.

Many candidates are therefore unable to pursue further education after completion of the Basic school due to poor performance in the Integrated Science discipline and this adversely affects the image of the schools and could be a reason for low intake and retention of academically good pupils. It is also a source of anxiety to staff, school administration and both continuing and past students.

1.3 Purpose of the study

This study aimed at identifying the causes of pupils‟ poor performance in Integrated Science in Anomabo circuit of Mfantsiman Municipality.

1.4 Objectives of the study

The objectives of the study were to:

1. Identify the professional qualifications and competence of the Integrated Science teachers in the Anomabo Circuit.

2. To examine how science is done at the various schools in the Anomabo circuit.

3. To identify the requisite teaching and learning materials available in the Anomabo Circuit

4. To identify time available for the teaching of Integrated Science in the Anomabo Circuit

1.5 Research questions

The study was guided by the following research questions:

1. What are the professional qualifications and competence of the Integrated Science teachers in the Anomabo Circuit?
2. How do integrated science teachers in the Anomabo Circuit approach instruction and assessment of integrated science lesson?
3. What are the requisite teaching and learning materials available in the Anomabo Circuit?
4. What is the time available for the teaching of Integrated Science in the Anomabo Circuit?

1.6 Significance of the study

Parents want to see positive results of the heavy investment they make on their children at school, in the form of payment of feeding fees, buying of books and stationaries, and other materials.

The present study is hoped to be of help in the following was:

1. Creating awareness in both Integrated Science teachers and pupils of this circuit about some causes of pupils‟ abysmal performance and some remedies to correct them.
2. The positive image the schools would be improved.
3. Schools administration would be aided in taking decisions aimed at achieving higher standards in planning, and organizing teaching and learning activities so that it would be more beneficial to both teachers and students in the schools.

4. It would serve as a resource material for teachers" use at in-service training.

1.7 Delimitations of the study

The study considered only three selected Junior High Schools in the Anomabo circuit that perform poorly in Integrated Science in the BECE. The scope of this study was only limited to identifying factors that contribute the abysmal performance of pupils in Integrated Science.

1.8 Limitation of the study

One possible limitation of this study was the difficulty in getting respondents to be sincere about some of their responses to questions that seemed to elicit information about their professional competence. Respondents were assured of confidentiality. Another feature was that of suspicion of victimization on the part of respondents who were members of staff.

1.9 Abbreviations/Acronyms

BECE	Basic Education Certificate Examination
CRDD	Curriculum Research and Development Division
D	Difficult
EL	Every lesson
F	Frequency
GES	Ghana Education Service
JHS	Junior High School

Ms	Microsoft
ML	Most Lessons
NR	Never
SHS	Senior High School
SES	Socio-economic Status
SD	Somehow difficult
SL	Some Lessons
SPSS	Statistical Product and Service Solution
T	True
TLMs	Teaching and Learning Materials
UEW	University of Education, Winneba
VD	Very difficult

1.10 Organization of the rest of the chapters

Chapter Two entail the review of literature relevant to the topic. Chapter three focused on the procedure, instruments and techniques used in the study.

Chapter four is devoted to presentation of results. It also includes discussion of the findings.

Finally, chapter five covers the summary, conclusion and recommendations of the study

CHAPTER TWO

REVIEW OF LITERATURE

2.0 Overview

This chapter is concerned with the review of literature pertaining to the study on pupils‟ poor performance in Integrated Science in some selected JHS in the Anomabo circuit of Mfantsiman Municipality of Ghana. Various educators, academics and policy makers have argued about the causes of poor performance of students in Integrated Science over the years. Age of students, parents‟ education and class attendance after many studies have been pointed out to be major determinants of pupils‟ performance at the JHS school level.

This study will therefore review literature on the following sub headings:

1. Integrated Science Education in Ghana
2. Methods used in the teaching and learning of Integrated Science
3. Professionally qualified Integrated Science teachers
4. Time allocated for the teaching of Integrated Science
5. Effect of teaching and learning materials.

2.1 Integrated Science Education in Ghana

According to Showalter (2007) Integrated science is the process of teaching and learning of the various fields of science in a holistic manner such that none of the fields (chemistry, biology, physics and agriculture) stands on its own or those approaches in which concepts and principles of science are presented so as to express

the fundamental unity of scientific thoughts and to avoid premature or undue stress on the distinctions between the various scientific fields.

The definition stresses approach rather than content and this is perhaps the most significant distinguishing feature of Integrated Science teaching.

Modern life requires general scientific literacy for every Ghanaian citizen, a requirement that will result in the creation of a scientific culture in line with the country‟s strategic programme of achieving scientific and technological literacy in the shortest possible time. Scientific culture is therefore the common property of every citizen of this country because it is the antithesis to superstition and the catalyst that will help development.

The focus of the study of Integrated Science is to understand the natural world. There are generally two main goals of Science education. First, it inculcates scientific literacy and culture for all, so that people can make informed choices in their personal lives and approach challenges in the workplace in a systematic and logical order. Second, it aims to produce competent professionals in the various scientific disciplines who can carry out research and development at the highest level. For meaningful scientific education, it is important for pupils to be trained in the investigative process of seeking answers to problems. This requires pupils to physically explore and discover knowledge within their environment and in the laboratory to be able to contribute new scientific principles and ideas to the body of knowledge already existing in their culture (Settlage, 2000).

Teaching and learning Integrated Science is a conscious effort to raise the level of scientific literacy of all students and equip them with the relevant basic Integrated Scientific knowledge needed for their own survival and for the development of the

country. It is also expected that scientific experiences in Junior High School will cultivate in pupils an interest and love for science that will urge some of them to seek further studies in science as preparation for careers in science. The study of science will also provide excellent opportunities for the development of positive attitudes and values which include; Curiosity to explore their environment and question what they find, Keenness to identify and answer questions through investigations, Creativity in suggesting new and relevant ways to solve problems, Open-mindedness to accept all knowledge as tentative and to change their view if the evidence is convincing, Perseverance and patience in pursuing a problem until a satisfying solution is found, Concern for living things and awareness of the responsibility they have for the quality of the environment, Honesty, truthfulness and accuracy in recording and reporting scientific information and Love, respect and appreciation for nature and desire to conserve natural balance.

2.2 Methods used in the teaching and learning of Integrated Science

A teaching method comprises the principles and methods used for instruction. Common used teaching methods may include class participation, demonstration, recitation, memorization, or combination of these. The method to be used depends largely on the information or skill that is being taught, and it may also be influenced by the aptitude and enthusiasm of the students. Agbenatoe (2011) recommends that methods which tend to appeal to the affective domain of learning should be given priority by science teachers. These include field trips, project work, problem solving approach and enquiry approach among others. Agyemang (2013) also backed the idea that all teaching methods can be classified in terms of the type of interaction they involve , teaching by radio and television which is a one way interaction (teacher to

student), text books and program instruction involves two way back to the teacher. Committee works and unit procedures are three-way transactional (teachers-pupil-pupils) and team teaching in four-way interaction (teacher-teacher-pupils-pupils). There are methods which have been suggested by authorities for the teaching of integrated science. These include the discussion method, lecture method, role playing, case study method and project work among others.

Lockhart (2006) sees discussion method as a technique within a method. He further explained that discussion is characterized by increased involvement and active participation of members of the class. Unlike the lecture method were the teacher is the dominant person in class, in discussion method, the teacher stays in the background.

Another method employed by teachers is the lecture method. This method is basically teacher-centered. It is seen as a one way communication in which information is passed on from teacher to the students while the students become passive listeners. Teachers typically use lecture method as the major way of transmitting knowledge. Good (20012) outlined various forms of lecture method such as formal oral essay, provocative lecture, lecture demonstration, question, lecture recitation and lecture laboratory.

The case study method is also another method often used in the teaching of science. Case studies are investigation of an individual, group, institution or other social unit. The social unit may be a person, a family, social group or a solid institution of a community. In other words, case studies mostly involve the observation of individual unit, for example, a student, a family, group, a class, a school, a community or an event.

According to Asihene (2009), the researcher conducting case study attempts to analyze and understand the variables that are important to the history, development or the subject problems. Research on teaching methods that are employed in the in the course in abstract subject areas like mathematics, economics, and accounting shows that, traditional methods of instructing and evaluating student skill predominate to a large extent based on teaching and evaluation methods such as lecture methods, discussion methods, project methods, field study and multiple choice examination. However, there are also examples of instructors or institutions that have either revised individual courses or have redesigned their entire curriculum to modernize and improve educational process.

Callahan (2006) agreed that, all teaching methods can be classified in terms of the type of instruction they involve. Teaching by radio and television are examples of one way interaction (teacher to students). Textbooks and programme involves two-way back to the teacher. The researcher thinks that, any means through which teaching and learning effectively and efficiently take place could be described as a method of teaching.

It is believed that learning is knowledge or skill gained through study, teaching, instruction and experience. The methods adopted in teaching and instruction would promote in pupils a phenomenon that has come to be known as either "shallow" or "deep" learning. Shallow learning assumes students' ability to reproduce some learning material or Information studied without necessarily understanding its principles. These principles are acquired from a teacher or instructor, without initial commitment or deep consideration. These principles are often discarded, soon as the need for them has gone (Biggs, 2007). Thus is what is expressed in popular places as

"chew - pour - pass - and - forget". Deep learning on the other hand involves thinking about the meaning of what is being learnt. Inferring from the various views held by traditionalists and constructivists that all learning involves thinking and assessment models, and that curriculum should be designed such as would produce students who are able to learn in many domains (Tamakloe cited in Biggs, 2007). Thus, for students to perform well the kind of learning they undertake should produce competence or otherwise in the learning material they have learnt.

Another phenomenon that has emerged from the dependence on external tests to determine students' performance and attainment is teachers "teaching to the test". Emphasis here is on students' specialisation of content without necessarily understanding or being committed to the learnt material or information. This is especially true of "high states" tests. These are test whose results are perceived to be important in their use for decision-making, like certification at the end of a course of study. Biggs (2007) stated that students have been observed to have different abilities, based on a number of factors. Ideally, therefore, each student requires the teacher's attention and assistance to discover these abilities, with a view to making effective use of them in and outside the classroom

Haribson (2010) also proposes that "everyone learns from experience and knows that experience is a basis for new ideas and behaviour"(p.15).

Experiential learning assumes that one learns best where one is personally involved in the learning experience. This may, therefore, be applicable to the learning of Integrated Science by pupils. Other assumptions are that learning is more meaningful and learners get highly committed to it when the learners set their own learning goals and discover knowledge by themselves. Teachers' methods in the teaching and

learning process ought to motivate students to make self-discovery and be as self-reliant as possible.

2.3 Professionally qualified Integrated Science teachers

The teaching of Integrated Science calls for a teacher who is trained purposely to teach integrated science due to the uniqueness of the subject. According to Darling (2008), good teaching results in high achievement as the quality of the curriculum and teacher skills impact student outcomes more than other school correlates. Again the national policy on education stated "of all the factors which determine the quality of education and its contribution to national development, the teacher is the most important. It is his formal qualities and character, his educational qualification and professional competence that the success of all educational endeavors must ultimately depend". This implies that the knowledge of the subject matter by the teacher is as important as his knowledge of the students. The teacher must have mastery over the subject matter. The integrated science teacher must therefore undergo in-service training to improve upon his or her methods of teaching and also to keep up with the changing trend of integrated science. Aside the training, the teacher must also be enthusiastic about the teaching of the subject.

An effective teachers experience few problems with ending their lesson than less effective teachers by using methods like pacing and planning the lesson there by leaving sufficient time for the students to prepare for the next lesson to avoid time wastage (Muijs,2005). Sarantakos (2005) also stressed that a person with high sense of academic and professional efficiency displays greater persistence with effort and high intrinsic interest in improving academic learning and performance than one with just knowledge of facts. According to Rodriguez (2008), teacher‟s self-esteem also

influences students‟ performance in the learning process. He explained self-esteem as a personal judgment of worthiness expressed in the attitudes the individual holds towards themselves.

If science teachers are to assist students to understand this complex world in which we live, in order that they may better adapt themselves to it and prepare themselves an intelligent and constructive citizenship, we must provide well trained teachers for science at all stages of education (Eamon, 2005; Majoribanks, 1996; Jeynes 2002). According to Bush (2005), the personality of the teacher has three aspects: physical, passive and executive virtues. The physical aspect includes personal appearance including dress, social expression, mannerism, and personal cleanliness and etiquette which also includes good manners, observance of social forms, courtesy and refinement. The passive virtues include enthusiasm, fairness, friendliness, optimism, patience, self-control and understanding. The executive virtue, according to him includes adaptability, direct ability including initiative, organizing ability, resourcefulness, self-confidence and self-reliance. It therefore calls for integrated science teachers to have all these in order to impact positively in improving students‟ performance.

According to Kilgore (2011), teacher‟s integrity is mostly a powerful motivator than salary and his love for children encourages him to communicate purposefully with the students. Another good quality of an integrated science teacher according to Richmond (2004) is the teachers‟ knowledge of the subject matter. “The primary task of any teacher is a thorough knowledge of the subject matter which the teacher will get his or her students to learn” (Richmond 2004, p21). It is therefore very vital to bear in mind that lack of subject preparation before teaching stands near the top of

virtually every list of causes of teacher failure. Teachers must therefore be extensively knowledgeable in the field in which they teach.

According to Bonney (2009), it is desirable for teachers of Integrated Science to have a degree or at least a diploma in the subject. The teacher‟s mastery over the subject matter and ability to relate it positively to improve students‟ performance in the classroom goes beyond his academic competence of view of the researcher. To some scholars, the shortage of these teachers has been a problem in most secondary school, thus leading to poor performance of most students in their external examinations.

In the researcher‟s view, the teacher is part of the learning process and his ability to communicate effectively with students depends much on his professional skills. Biggs (2007) in a similar argument also observed that, people‟s ability to teach specific skills depends on their self-efficacy. He defined self-efficacy as how a person estimates his personal effectiveness, ability to organize and execute the causes of action required to produce a given attainment. To him, personal estimated competence is very vital in classroom situation if performance is been improved.

Eamon (2005) and his attribution theory explained that students success is based on the external and internal reinforcement available to them in their learning environment. To him, externally oriented student should be given open praises and gift to create the necessary environment for them and those on internal motives should be intrinsically motivated to do so. This stems from the fact that, motivational techniques in making the teaching and learning lovely is another critical feature of a good professional teacher.

Dass (2009) states that, when reinforcement is used judiciously and systematically, it can have a profound effect on behavior change. In the view of the researcher, the most

powerful reinforcement for students to improve performance are stimuli such as praises and gift and these help to improve teaching and learning in the classroom.

2.4 Time allocated for the teaching of Integrated Science

A well-known saying is "if you fail to plan, you plan to fail". Planning and time allocated for the teaching of integrated science is a key to success. Unfortunately, integrated science has for many years been given a limited time on the school time table. According to Fensham (2008), the major problem facing the teaching of integrated science is the limited time allocated to it. Teachers are therefore forced to rush through the syllabus because of the limited time allotted to the subject. This goes a long way to hinder the effectiveness of teaching and learning of integrated science in the junior high schools.

According to Bamford (2006), the most important resource a teacher controls is time, not only how much time spend on a particular subject but how to manage and influence the students to be effective users of time in order to impact the needed information to students" own benefits. Jeynes (2002) identified four categories of time in classroom interaction as:

1. Planned time: this is where teachers set aside a certain amount of time for different subjects and activities.
2. Allocated time: the amount of time the teacher actually spends on one particular subject or task.
3. Engages time: the amount of time students actually spend on an activity or task.
4. Academic time: the amount of time a student spends engaged in a task at which he or she is successful. (p. 136).

According to Hunt (2005), inadequate time allocated to integrated science prevents the students from having practical and going on field trips. This prevents the students from the acquisition of in-depth knowledge and understanding of the required material presented during the lesson. As a result of insufficient time, teachers are compelled to use such methods as the lecture method instead of the required methods like the discussion or role playing. This goes a long way to affect the performance of the students.

With Hipp (2005) "although it is obviously important to allocate adequate time to academic content, making time on the schedule is not enough. How this allocated time is used in the classroom is the real key to student achievement" (p.23) in addition, the researcher believed that such allocated time for teachers, participating in class discussion, solving problems with friends, among other academic activities. This is so because when student rather engage themselves in non-integrated science issues and interest, nothing would be achieved regardless of the time schedule available to them.

2.5 Effect of teaching and learning materials on Integrated Science

The designing of an instructional programme calls for the inclusion of many and varied materials. Teaching-learning materials are very important for effective instructional communication. No teacher, however, qualified and efficient, can effectively carry out successful teaching without the use of instructional aid. In the same vain, no matter how competently and carefully designed a resource material is it cannot supplant the teacher. It will, therefore, require a competent and efficient teacher to make use of a resource material to bring about effective teaching and learning. This brings into sharp focus the use of multimedia teaching and learning

resources. These include anything that can be an object of study or sources of stimulus to the pupil or an aid to the teacher. Morakinyo (2003) has categorized these materials into four, namely; reading materials, audio-visual materials, community resources, and teacher and pupils made material

The reading materials include textbooks, supplementary readers, reference books, newspapers and magazines. The audio-visuals are illustrations, pictures, photographs, billboards, chalkboards, radio, cassette players, television sets, objects and models. The use of community resources comes into play during field trips.

In the view of Haribson (2010), community resources include persons, places of civic, cultural, economic, geographical, historical, and scientific interests. Materials made by teachers and students include sketches, maps, graphs, models, charts and symbols. A fifth resource that is activity-based is worth mentioning here. This is made of simulation, role-play, and story-telling. In this area pupils' participation should eclipse completely that of the teacher, since it is what the pupil does that yields effective learning and not what the teacher does. With respect to the resources that should be readily available in the institutions two issues become prominent (Tamakloe, Amedahe, & Atta, 2005). These are:

1. It is essential that a well-organized centre for storing materials be established.

2. There should be an efficient system for the storage and retrieval of materials.

These issues have prerequisites and implications. The prerequisite is that there should be someone well versed in the process of storage and retrieval of information or materials. The implication is that pupils must also be well equipped with the rudiments of retrieving materials.

Students have interest or been motivated to learn integrated science only when they can have easy access to the required integrated science textbooks. The textbooks in the hand of knowledgeable practitioner become one of the many aids to assist the students in acquiring clear concept of the subject matter (Barry cited in Siaw, 2009). The textbook provides security for the unprepared teacher. That is if the teacher fails to prepare an effective unit plan, he can depend on the text book. According to Kochhar (2004), the ubiquitous text book for a teacher who teaches "by the book" functions as a day to day guide that is as a guide to both the ends and means of instruction. Without textbooks teaching would be difficult.

The use of textbooks in the teaching and learning of integrated science in this regard is very necessary. This is because it serves as a guide to both teachers and learners of the subject. Basil (2007) also defined textbook as a book designed for classroom use, carefully prepared by experts in the field and equipped with the usual teaching devices.

Books are highly portable form of information and can be accessed when, where and at whatever rate and level of detail the reader desires. Research indicates that, for many people, visual processing (example reading) is faster than auditory processing (example listening to lectures), thus making textbook a very effective resource (Amissah, Sam-Tagoe, Amoah & Mereku, 2002). Reading can be done slowly, accompanied by extensive note taking, or it can be done rapidly by skimming and skipping.

There are advantages to both styles and may find it useful to discuss their merits with your student. Although a well -written book can engage and hold student interest, books have several limitations. Books are not inherently interactive. However, if

students are encouraged to ask questions whiles they read, seek answers within the text, and identify other resources to explore ideas not contained in the textbooks.

To meet the needs of broad audience, text are often thick, which can overwhelm students seeking key information. Texts are often forced to rely on historical or dated examples, and rarely give a sense of the discovery aspects of research and disorganization of information facing modern researchers. Before selecting a text in integrated science, is important to know what books are currently on the market. Teachers who teach same or similar subjects are good sources for ideas and information. For example, they know whether a textbook contains errors.

There are a number of factors to consider when selecting a textbook. To be of greater value to students, the objective of a textbook must be consistent with the goals you set for the course. Authors often try to meet particular objectives in their books, and a given book may or may not meet your goals. In addition to the content, evaluate the text structure and layout. Studies indicate that the “principle-first” structure, in which a concept or principle stated explicitly and then supporting evidence is presented, is most effective for long-term retention and understanding by readers.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter discusses the method which is used in collecting the data for the study. It spells out the research design, target population, sample and sampling procedure, research instrument, validity or reliability, types of data, questionnaire administration, data collection procedures, ethical consideration and data analysis plan.

3.1 Research Design

The research design used for the study was the descriptive survey. The descriptive survey is directed towards determining the nature of a situation as it exists at the time of the study. This design describes and interprets events as they occur (Best & Kahn, 1993). It is versatile and practical in that it identifies present conditions and points to recent needs. It has the characteristics of analysing the relationships, differences and trends that contribute to the poor performance of pupils in the area of Integrated Science challenges in the Junior High Schools in the Anomabo Circuit. By this approach, the researcher could find clues to answer research questions which involved classroom related factors (Cohen, Manion & Morrison, 2000; Sarantakos, 2005). Survey is also considered as the best approach for the study because it is a relatively inexpensive way of getting information about people‟s attitudes, beliefs and behaviours, and things happening at a particular place. It assures manageability of the collected data. It also involves asking the same question or questions prepared in a written questionnaire to a large number of individuals (Mitchell & Jolley, 2004; Fraenkel & Wallen, 2000).

Fraenkel and Wallen (2000) identified three major difficulties associated with descriptive surveys. The first difficulty is ensuring that the questions to be answered are clear and not misleading. The second is getting respondents to answer questions thoroughly and honestly. The third has to do with the difficulty of getting sufficient number of questionnaire completed and returned for meaningful analysis to be made. The above problems were overcome through the use of simple words, appealing to respondents to be frank and truthful and also making effective follow-ups during questionnaire administration.

3.2 Population

According to McMillan and Schumacher (2011) population is defined as a group of elements or cases, whether individuals, objects or events that conform to specific criteria in research. In this study, the target population is made up of Integrated Science teachers and pupils in public Junior High Schools in Anomabo Circuit of Mfantsiman Municipality in the Central Region of Ghana.

Ideally the researcher should have used all the Integrated Science teachers and pupils in both the private and public schools in the circuit. However, only 60 pupils and nine teachers were used because some of the teachers and pupils were not willing to participate.

3.3 Sampling Techniques

In order to ensure a fair representation, the purposive and simple random sampling techniques were used to identify and select a number of schools, teachers and students for the study. Thus a stratified random sample of 60 pupils was selected. A quota of 20 was given to each of the three schools. It must be noted that form one and two

pupils are the only selected classes within the three schools. This was done in order to have a fair representation of attitude and other variables in in school. The form three pupils were exempted from this study because initially the design was to be a longitudinal survey since they were due to complete school in June 2015.

The average class population was about 30 but for the purposes or administering the questionnaires 10 students were randomly selected from each class. The girls were given a quota according to girls to boys‟ ratio in the various classes. Thus a total of 60 students constituted the invited sample for the administration of' the questionnaires.

Nine randomly selected teachers made up of six (6) males and three (3) females responded to the teachers' questionnaires.

3.4 Research Instruments

Questionnaire, observation and semi-structured interview guide were the main instruments for data collection in the study.

The questionnaire was used to gather information from the Integrated Science teachers and pupils in the selected Junior High Schools while the semi-structured interview guide and observation guide helped in gathering data from teachers only. The questionnaire and the interview guide were developed through the extensive use of literature and consultations with fellow research colleagues.

3.4.1 Questionnaire

The form pair of view of Leedy and Ormrod (2005), questionnaires offered participants the advantage of answering questions with the assurance of anonymity for their responses. Questionnaires are fast and convenient and given the level of education of both the teachers and pupils in the schools, it was not likely for them to

misinterpret the questions and give misleading answers. The use of questionnaires ensured that quantifiable responses were obtained for the purpose of establishing relationships between the identified variables and the responses.

Two kinds of questionnaires were designed. These were questionnaire for pupils and questionnaire for Integrated Science teachers. The questionnaire sought to answer questions on pupils and teachers‟ background data, teaching and learning methods, time allocated for the teaching and learning of Integrated Science, and professional competence and qualification of teachers.

For the pupils‟ questionnaire, there were twenty items in all. These items are made up of both open-ended items and close-ended items. There were only six open-ended items and the rest are closed-ended items. Section A dealt with the pupils‟ background data. Section B is about the teaching and learning method employed in the teaching and learning of Integrated Science. Section C consists of items which investigated into resources (teaching and learning materials) used in the teaching and learning of Integrated Science. That of section D consist of items which also talked about time allocated for the teaching and learning of Integrated Science.

In the teachers‟ questionnaire a total number of 38 eight items was used in collecting responses from Integrated Science teachers. Respondents were made to answer certain statements relating to teaching of Integrated Science in Junior High Schools.

There were four sections in all. Section A comprised teachers‟ data, section B Professional Competence and Qualification, while section C dealt with the teaching methods employed in the teaching and learning of Integrated Science and lastly section D investigating the effects of teaching and learning materials available to teachers in relation to the teaching and learning of Integrated Science.

3.4.2 Interviews

Frankel and Wallen (1996) explain that interviews are taken to find out from people things that we cannot directly observed or notice. They point to the fact that one cannot observe everything, for instance feelings, thoughts and intentions. One also cannot observe the behaviour that took place in the past. In light of this the researcher structured informal face - to - face interviews with the sampled students and teachers. The interviews were follow-ups to the questionnaire. The interview was conducted on the same day the questionnaire were given to be filled. The interviews were touched on issues such as the resources available for teaching and learning of Integrated Science.

3.4.3 Observation

According to the Sage Encyclopaedia of Qualitative Research Methods (2008), observation is the use of one"s senses to look and listen in a systematic and purposeful way to learn about a phenomenon of interest. Observation was used to gain insight into the various teaching techniques and methods used by the teachers in the Integrated Science class for the theory and practical lessons.

In this study, the researcher acted as a complete observer (non-participating) and sat in the classrooms during instructional hours to collect data from students and teachers in the three selected schools without participating in the activities they engaged in. The focus was on how lessons were organized (using of teaching and learning materials, performing practical, etc.) during instructional hours for better understanding by the pupils.

3.5 Validity and reliability research instruments

Validity refers to the degree to which an instrument measure what it is supposed to measure. For this study content validity was tested by discussing the instruments with the supervisor and research specialists. The experts analysed the instruments suitability in line with the research questions. The experts offered suggestions and criticisms which were used to improve the content validity of the instruments. The pilot test also helped to improve the questionnaire as well as the interview schedules. The validity of the interview guide was also ascertained by using member check.

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials. To test for the reliability, a pilot study was carried out. The researcher administered the instruments himself. The researcher also interviewed the head teacher, observed lesson session, evaluated level of availability of Integrated Science teaching and learning resources. Split half method and Cronch Alpha of assessing reliability was used to test for the reliability of the questionnaire. For that of the split half method, the questionnaires were numbered and their contents entered into a SPSS computer code sheet and reliability determined using split half for the even numbered and odd numbered questionnaire. A reliability coefficient of 0.654 was obtained and since 0.7 indicates an acceptable reliability coefficient (Jackson, 2003), the coefficient of all sections were found to be reliable hence the safe conclusion that the questionnaire used in this study as main data collection tools was reliable. Inter-rater was used for the observer reliability

3.6 Data Collection Procedures

The researcher obtained permissions from the selected schools to conduct the research. Upon obtaining consent, the study was undertaken in two phases:

Phase one involved the researcher visiting the participating schools in order to be introduced, familiarized and seeking respondents‟ permission to be involved in the study.

In phase two, the researcher administered the questionnaires to the pupils and Integrated Science teachers. The researcher assured the respondents of the confidentiality of the given information. The researcher equally interviewed the teachers, observed Integrated Science lesson in progress per school as well as teaching and learning resources and facilities in the participating schools using the observation guide [Appendix D].

3.7 Ethical Consideration

Ethical consideration for this study included communicating the aims of the investigation to the respondents, establishing rapport with the respondents and being honest at all times. The researcher took necessary precautions for the confidentiality of both the data and respondents.

The schools were assured a copy of the final report on the study to enable work on areas where they were deficient.

3.8 Data Analysis Plan

All the information gathered from the study using questionnaire was checked for accuracy, clarity expression and completeness. To answer the research questions, descriptive statistics were employed, where the researcher used frequencies and

percentages to make the interpretation of the results more meaningful. In doing this, Statistical Product and Service Solution (SPSS software) programme was used.

In using comparative analysis, field notes taken from the classroom observation of how teaching and learning were done were transcribed into reports and compared to details documented literature sourced. For that of the interview, the data were collected, organized, coded, categorized and interpreted. Details of these are presented in Chapter 4.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF MAIN FINDINGS

4.0 Overview

This chapter presents the results of the study. The chapter is divided into three sections. The first section covers the biographic data for both pupils and teachers, the second section covers the views of teachers on the poor academic performance of pupils in Integrated Science and the Last section covers the views of pupils on the poor academic performance of pupils in Integrated Science.

The data from questionnaire, observation and interview conducted were collated and Statistical Package for Social Sciences (SPSS) was used in the analysis.

4.1 Preliminary Data

The descriptive statistics of data collected on sex, age, status of respondents are presented in Tables 1 to 5.

Table 1: Sex of Pupils

Sex	Frequency	Percentage (%)
Male	24	40.0
Female	36	60.0
Total	60	100.0

The number of female respondents were 36 representing 60.0% whiles male respondents were 24, representing 40.0% of the respondents. The female pupils were more than their male counterparts.

Table 2 indicates the sex of respondents (teachers)

Table 2: Sex of Teachers

Sex	Frequency	Percentage (%)
Male	6	66.7
Female	3	33.3
Total	9	100.0

Three (33.3%) of the teachers were females whiles six (66.7%) were males. Therefore majority of Integrated Science teachers in the schools were males at the time of study

Table 3 shows the distribution of pupils between the forms (1 and 2)

Table 3: Distribution of Pupils

Form	Frequency	Percentage (%)
Form 2	34	56.7
Form 1	26	43.3
Total	60	100.0

Analysis shows that, the number of form 2 respondents were 34 corresponding 56.7% whiles the number of form1 pupils were 26, representing 43.3%. This indicates that the form 2 respondents were more than the form 1 pupils.

Table 4 shows the ages of teacher respondents

Table 4: Age of Teachers

Age	Frequency	Percentage (%)
Under 25 years	0	0.0
25-30 years	6	66.7
30-35 years	0	0.0
Above 35 years	3	0.0
Total	9	100.0

The analysis shows that three of the teachers were above 35 years and 6 (66.7%) were between the age of 25-30. Majority (66.7%) of the teachers were young.

The various teachers‟ academic qualifications are shown in Table 5

Table 5: Teachers academic qualification

Qualification	Frequency	Percentage (%)
Diploma	6	66.7
Bachelor‟s Degree	3	33.3
Master‟s Degree	0	0.0
Total	9	100.0

From Table 5, it can be seen that no respondents had neither Cert A nor master‟s degree qualification whiles six respondents corresponding to 66.7% had obtained diploma and three respondent corresponding to 33.3% has obtained bachelor‟s degree. It is therefore clear that the majority of the teachers have diploma certificates. This result indicates that the professional qualifications level of most of the teachers handling Integrated Science is low.

4.2 ANALYSES OF MAIN DATA

The analyses for the relationship that may exist between the dependent variable (pupils‟ performance) and its suggested independent variables (the level of teachers qualification, the method use in the teaching and learning of Integrated Science, availability of TLMs, and the time allocated for the teaching and learning of Integrated Science) in the research instruments are as follow:

1. **What are the professional qualifications and competence of the Integrated Science teachers?**

The professional qualification of teacher respondents are presented in Table 6 below

Table 6: Professional Qualifications of Teacher of Integrated Science

Qualification	Frequency	Percentage (%)
Cert A (science)	0	0.0
Diploma(science)	6	66.7
Bachelor‟s Degree (science)	3	33.3
Master‟s Degree(science)	0	0.0
Total	9	100.0

From Table 6, three (33.3%) of the respondents in the selected schools had a degree in science and six (66.7%) had diploma in science. None of the teachers had Cert A or master‟s degree in Science and this indicates that majority of the teachers in the selected circuit holds Diploma in Science. The Ghana Education Service (GES) considers a university degree or diploma in a teacher's subject of specialisation appropriate qualification for one to teach at the JHS. All nine teachers in the school are therefore suitably qualified to teach Integrated Science

Table 7 shows the number of years teachers have taught

Table 7: Years of Teaching

Years	Frequency	Percentage (%)
1-5 years	6	66.7
6-10 years	0	0.0
10 years and above	3	33.3
Total	9	100

Table 7 reveals that 6 (66.7%) had been in the teaching profession between 1-5 years, three (33.3%) had been in the teaching profession above 10 years and none had been in the teaching profession within the 6-10 years. The length of years the teachers had served in the classroom suggests the possibility of them acquiring much knowledge and expertise in sharing, coaching and mentoring of younger teachers, active involvement in decision making in the schools as well as using their rich teaching experience to help the less experienced teachers to raise academic achievement for their students (Siaw, 2009). Although some teachers had taught for more than 10 years, most of the teachers (66.7%) had taught less than 5 years and this depicts that must of them are inexperienced and therefore will affect their coaching and in decision making. In addition to this, item 8 of (Appendix B) requested to find out how long the teachers have been teaching Integrated Science.

The number of years which teachers had taught Integrated Science is shown in Table 8.

Table 8: Years of Teaching Integrated Science

Years	Frequency	Percentage (%)
1-5 years	9	100.0
6-10 years	0	0.0
10 years and above	0	0.0
Total	9	100

Analysis in Table 8 shows that all teachers had taught Integrated Science between 1-5 years. This therefore reveals almost all the teachers have little experience in the teaching of Integrated Science. This will therefore have negative impact on the academic performance of pupils in the subject.

Professional competence of a teacher is also a factor which can contribute to the success story of pupils in an exam and the professional competence of teacher respondents are shown in the Table

Table 9: Professional competence of Integrated Science Teachers

STATEMENTS	YES		NO	
	F	%	F	%
Attend of In-service training in Integrated Science	3	33.3	6	66.7
Problems encountered when teaching some topics in Integrated Science	9	100.0	0	00.0
Marking and discussing of Integrated Science exercises and assignments	9	100.0	0	0.0
Teaching of other subject(s) as well as Integrated Science	3	33.3	6	66.7
Other responsibilities as a teacher	3	33.3	6	66.7
If other responsibilities affect your responsibility	9	100.0	0	0.0
Completing of syllabus before final examinations (BECE)	3	33.3	6	66.7
motivated in the teaching of Integrated Science	3	33.3	6	66.7

The analysis showed that majority of the teachers (66.7%) had not had in-service training to refresh their minds. However, there was still room for improvement since 3 (33.3%) answered otherwise. This result indicated that majority of the teachers‟ needed in-service training to enhance the handling of the subject for positive result to be obtained.

In responds to the statement „Problems encountered when teaching some topics‟ all the respondents responded „Yes‟. This implies that majority of the teachers encounter problems in some topics. It is therefore likely for the teachers not to teach the topics they face difficulties and if the topics are taught, students are likely to be polluted or might not understood the concept and at the long run be detriment to pupils‟

performance. Respondents were further asked to state topics in Integrated Science syllabus they find difficult to teach and the results were shown in Table 10.

With the marking of exercises and assignments, and discussing them with pupils, all the respondents (100%) answered „Yes". This gives a fair idea that; all teachers understood the importance (improving pupils" performances) of holding discussions with pupils after marking assignments and class exercises. Hence this attitude of theirs is likely to have positive impact of the performance of the pupils.

Majority of the respondents (66.7%) agreed that the scope of the Integrated Science syllabus is too broad and for that matter they were unable to complete the syllabus before the writing of the BECE. The inability of the teachers to complete all topics in the syllabus is likely to have negative impact on the performance of pupils since most pupils find it very difficult to learn and grasp fresh topics on their own.

In reply to the statement „motivation in the teaching of Integrated Science", 3 respondents answered „Yes" whiles 6 answered „No". This indicates that greater numbers of teachers handling Integrated Science were not motivated in the teaching of the subject. Follow-up questions during the interview section revealed that most pupils see science like a package of knowledge existing somewhere to be discovered by some clever people and this alone demotivates them for handling such subject because pupils are not ready to take the advice that "science is a human construct".

Table 10 shows some topics in Integrated Science syllabus that teachers find it difficult to teach.

Table 10: Topics in Integrated Science syllabus that teachers find it difficult

Statements	VD		D		SD	
	F	%	F	%	F	%
Basic electronics	6	66.7	3	33.3	0	0.0
Chemical Compounds	9	100.0	0	0.0	0	0.0
Acids, bases and salts	0	0.0	6	33.3	3	33.3
Electrical energy	6	33.3	3	33.3	0	0.0

An inspection of the results presented in Table 10 shows that most of the respondents felt topics were not difficult with the exception of some few topics in the area of Physics and Chemistry. This is in line with the WAEC (April, 2008) report which indicated that emphasis should be laid on the teaching of items on Physics and Chemistry in the syllabus as pupils performed poorly in these areas. Although topics were not difficult to handle, the mere fact of the teachers identifying some topics in the area of physics and chemistry indicate that items on Physics and Chemistry are not likely to be taught well. It can be observed that 6 (66.7%) of the respondents saw the teaching of Basic Electronics as very difficult, and 3 (33.3%) claimed not to be very difficult but accepted the fact that it is difficult topic. Also, 9 (100.0%) of the respondents felt that the handling of Chemical Compounds was very difficult. The science teachers confirmed this during the interview session and explained there are some topics which are quite technical and most teachers found it a bit difficult to handle. The inabilities to handle all topics in science are likely to affect the performance of pupils negatively because WAEC do set questions these topics.

Conducting of class exercises and assignments are some of the ways for testing the level of understanding of pupils on topics taught. Table 11 shows how often class exercises and assignments were conducted.

Table 11: Giving of Class Exercises and Assignment

Response of teachers	Frequency	Percentage (%)
Not often	6	66.7
Very often	0	0
Often	3	33.3
Total	9	100.0

In response to the statement „giving of class exercises and assignment" 66.7% of the respondents responded to „Not often" and the remaining percentage responded to „Often". This indicates that majority of the teachers do not give class exercises and assignment often.

According to Hovver (1972), the main aim for assessing pupils after being taught is to find out how they are coping with lessons taught and based on teacher performances, a teacher would be able to make a decision for example the teacher devices new and better method to teach a particular subject when pupils performance is not encouraging. Majority of teachers choosing "Not Often" depicts negative impact on the performance of pupils.

The number of exercises conducted by teacher in a week is shown in table 12.

Table 12: Number of Exercises Given in a Week

Response of teachers	Frequency	Percentage (%)
One	0	0.0
Two	9	100.0
Three and above	0	0.0
Total	9	100.0

In response to the statement „the number of exercises given in a week, all the teachers responded to „Two". This indicates that majority of teachers give class exercises twice in a week which is in accordance with the Ghana Education Service target sets for Teachers of Science. Hence it is likely to have positive impact on the performance of the pupils.

Table 13 shows the class size of the schools which were considered for the study.

Table 13: Number of Pupils in Class

Response of teachers	Frequency	Percentage (%)
Below 20	0	0.0
20-40	6	66.7
40-60	3	33.3
60 and above	0	0.0
Total	9	100.0

In reply to the statement „number of pupils in class" 6 respondents corresponding to 66.7% responded to the range of 20-40 whiles 3 representing 33.3% responded 40-60. None of the respondents responded to either „Below 20" or „60 and above". This indicates that majority of schools have class size within the range of „20-40".

Crosnoe, Johnson, and Elder (2004) have suggested that class size is an important structural component of schools. Private schools tend to have smaller class size than Public schools. The smaller class sizes of privates‟ schools lead to better academic performance. Smaller class size creates more intimate setting and therefore can increase teacher-students bonding which have a positive effect on students‟ success. Class size in this survey is not likely to affect the performance of pupils since most of the schools had a class size within the stipulated range.

Activities which are normally used by teachers to improve performance of pupils in Integrated Science are shown in the Table 14

Table 14: Activities Used to Improve Pupils' Performance in Integrated Science

Response of teachers	Frequency	Percentage (%)
Debates	0	0.0
Quizzes	9	100.0
Essay competition	0	0.0
Others	0	0.0
Total	9	100.0

In reaction to the statement „learning activities used to improve pupils performance in Integrated Science‟ all the respondents corresponding to 100.0% used quizzes to improve the performance of the pupils in the area of Integrated Science. This indicates that majority of teachers use quizzes as their learning activity to improve pupils‟ performance in Integrated Science. This method adopted by all teachers might not be healthy or helpful for the progress of the academic performance

2. **How do Integrated Science teachers in the Anomabo Circuit approach instruction and assessment of integrated science lesson?**

Teaching methods and Assessment of Integrated Science lessons in the Circuit are tabulated in Table 15.

Table 15: Teaching Methods and Assessment of Integrated Science Lessons

Statements	EL		ML		SL		NR	
	F	%	F	%	F	%	F	%
I demonstrate experiments for my pupils to watch	0	0.0	0	0.0	9	100.0	0	0.0
I plan experiments alone	0	0.0	6	66.7	0	0.0	3	33.3
I conduct experiments with pupils	0	0.0	3	33.3	6	66.7	0	0.0
I make my pupils work in small groups	0	0.0	3	33.3	6	66.7	0	0.0
I give my pupils homework every week	0	0.0	6	100.0	0	0.0	0	0.0
I make my pupils write class tests	0	0.0	6	66.7	3	33.3	0	0.0

It can be noted from the results that the assessment process most frequently used by teachers was giving homework to pupils after science lessons. All the teachers indicated that they give homework to their pupils in most lessons and this is likely to yield a positive result. The results also indicates that only three (33.3%) teachers reported that they never planned experiments alone. The others, six (66.7%) teachers

said they did plan science experiment alone in most of the lessons. Abell, Bryan and Anderson (1998) found that lack of clarity of meaning of scientific concepts could act as obstacles as teachers develop their ideas about instruction. Thus, for more sophisticated ideas or practices with regard to instruction and assessment, Settlage (2000) supports that the teacher may need support to identify effective instructional representations or to develop their own. A critical look at the results presented in Table 14 show that most of the responses fell between "most lessons" and "some lessons". This gives the impression that the science teachers were trying their best in these areas of concern.

To investigate the method employed by teachers in the teaching of Integrated Science, the results obtained from the teachers have been analysed and presented in Table 16.

Table 16: Methods Employed by Teachers in the Teaching of Integrated Science

Method of teaching	Frequency	Percentage (%)
Discussion method	9	100.0
Question and answer method	0	00.0
Lecture method	0	0.0
Note dictation method	0	0.0
Case study method	0	0.0
No Idea	0	0.0
Total	9	100.0

Nine (100.0%) in the sampled schools preferred using class discussion to deliver the Integrated Science lessons. Observation during Integrated Science lessons in Schools indicated otherwise. The Lecture method was used in the Integrated Science lessons observed in the classrooms. This suggests that students who are not auditory learners may be put off by long lectures and may not benefit from the lessons. The planners of

the Integrated Science syllabus (CRDD, 2007) recommend that about 40% of Integrated Science instructional hours should be given to the teaching of practical skills. From the findings, it can be said that it is unhealthy for Integrated Science teachers to use the lecture method as the main strategy in teaching this subject. This lecture method of teaching does not fulfill the rationale for the programme which is to inculcate scientific literacy and culture for all, so that people can make informed choices in their personal lives and approach challenges in the workplace in a systematic and logical order and also to produce competent professionals in the various scientific disciplines who can carry out research and development at the highest level (CRDD 2007).

3. **What are the requisite teaching and learning materials available?**

Table 17 shows the number of times lesson notes are prepared by teachers

Table 17: Preparation of Lesson Note

Response of teachers	Frequency	Percentage (%)
Once	9	100.0
Twice	0	0.0
Other specify	0	0.0
Total	9	100.0

In answer to the statement „preparation of lesson notes" all respondents corresponding to 100.0% responded to „once". This indicates that all the teachers prepare lesson notes once in a week which meets GES requirement for the preparation of lesson note. Since teachers prepare lesson note, it can be used as a teaching and learning material during instructional hours.

The adequacy of TLMs for the teaching and learning of Integrated Science is shown in table 18.

Table 18: Adequacy of Teaching and Learning Materials

Response of teachers	Frequency	Percentage (%)
Not adequate	9	100.0
Very adequate	0	0.0
Adequate	0	0.0
Total	9	100.0

In answering to the statement „adequacy of teaching and learning materials", all the respondents corresponding to 100.0% responded „not adequate". This indicates that all the teachers do not have adequate teaching and learning materials and this can affect teaching and learning negatively.

Table 19 shows the availability of required TLMs and how they are used.

Table 19: Availability of Required Teaching and Learning Materials and Their Uses

STATEMENTS	YES		NO	
	F	%	F	%
Using of required TLMs in the teaching of Science	9	100.0	0	0.0
vetting and marking of lesson note by the head teacher	9	100.0	0	0.0
Availability of recommended Integrated Science textbooks	9	100.0	0	0.0
Sufficiency of recommended textbooks	0	0.0	9	100.0

From Table 19, it can be seen that all the respondents representing 100.0% answered „Yes" to the statement „using of required teaching and learning materials" in the teaching of Integrated Science. This indicated that all teachers did use the required teaching and learning materials in the teaching of Integrated Science.

In response to the statement „vetting and marking of lesson note by the head teacher", three respondents corresponding to 100.0% responded „Yes". This indicates that every teacher"s lesson notes are been vetted and marked by his/her head teacher. Vetted lesson not is the best required lesson not expected to be used by a teacher.

In reaction to the statement „availability of recommended Integrated Science textbooks", none of the respondents responded to „No". Nine respondents corresponding to 100.0% responded „Yes". This indicates that books which are to be used by teachers in the Integrated Science discipline are available and majority of teachers enjoy the availability of recommended Integrated Science textbooks.

In reply to the statement „Sufficiency of recommended textbooks", all the corresponding representing 100% responded „No". This implies that majority of the teachers do not have sufficient recommended Integrated Science textbooks.

Teaching Aids used by teachers are shown in Table 20

Table 20: Teaching Aids Used by Teachers

Response of teachers	Frequency	Percentage (%)
Chalkboard	9	100.0
Television	0	0.0
Projector	0	0.0
Cardboard	0	0.0
Radio or tape	0	0.0
Total	9	100.0

The analysis shows that three (100%) of the teachers use chalkboard. It also indicated that none of the respondents use television, projector, cardboard illustration, radio or tape in the teaching and learning of Integrated Science. This tells us that all teachers use chalkboard as a teaching and learning resource and this is not enough since not everything can be presented using chalkboard illustration. It therefore affects pupils understanding of various concepts and principles in Integrated Science and in the long run, their performance.

ANALYSIS AND DISCUSSION OF FINDINGS ON PUPILS

How do Integrated Science teachers in the Anomabo Circuit approach instruction and assessment of integrated science lesson?

Table 21 depicts some of the teaching and learning methods used by teachers.

Table 21: Teaching and learning methods

STATEMENTS	YES		NO	
	F	%	F	%
The method used by teacher helps pupils to understand concept better	28	46.7	32	53.3
Motivation from teachers in the learning of Integrated Science	39	65.0	21	35.0
Involving pupils when teaching Integrated Science	29	48.3	31	51.7

To establish whether the pupils understood the concept better, the analysis from Table 21 shows that out of the 60 respondents thirty two (53.3%) do not understand the method used by teachers for the pupils to understand concept better. It is only twenty eight (46.7%) who responded that method used by teachers helps pupils to understand concept better. This is a clear indication that methods used by most of the teachers do not help pupils to understand the Science concept better.

In reply to the statement „Motivation from teachers in the learning of Integrated Science" twenty one respondents corresponding to 35.0% responded „NO" whilst 39 respondent representing 65.0% responded „Yes". This indicates that majority of pupils in the selected schools get motivation from teachers in the learning of Integrated Science and if pupils are motivated in a subject area, it gingers them to improve upon their performances.

With respect to the statement „Involving pupils when teaching Integrated Science", analysis shows that 31 respondents corresponding to 51.7% responded „NO" whilst twenty nine respondent representing 48.3% responded „YES". This indicates that

majority of pupils in the selected schools remains passive in the teaching process of learning which is very bad practice and does not enhances good result.

What are the requisite teaching and learning materials available?

The resources available to be used by pupils are indicated in the Table 22

Table 22: Resources available and uses

STATEMENTS	YES		NO	
	F	%	F	%
Availability of personal JHS Integrated science textbook	38	63.3	22	36.7
Availability of school library	20	33.3	40	66.7
Usage of school library	6	30.0	14	70.0

From the Table, out of the total number of 60 pupils, 22 representing 36.7% do not have JHS Integrated Science textbooks of their own. The remaining 38 thus 63.3% which is the majority do have Integrated Science textbooks of their own. This indicates that although some pupils do not have Integrated Science Text books on their own, it is not going affect the performance of the pupils much since majority of them have the textbooks which can be shared with those not having the textbooks.

In reaction to the statement „availability of school library", 40 respondents corresponding to 66.7% responded „No" and 20 respondent representing 33.3% responded „Yes". This indicates that majority of the schools in the circuit do not have library. The absence of the school library in most of the schools can be detrimental to the performance of pupils in such schools since lessons taught since students can bot read wide.

In response to the statement „Usage of school library" 12 respondents corresponding to 60.0% responded „No" and 8 respondent representing 40.0% responded „Yes". This indicates that majority of the pupils in schools having library do not use the school library.

From the same table, out of the 20 pupils who indicated that they have school library, six (30.0%) answered „Yes" to the statement „Sufficiency of recommended textbooks" signifying that they have Integrated Science textbooks at the school libraries. However, majority of them 70.0% pointed out that they do not have sufficient or textbooks at their school libraries. This therefore goes a long way to militate against performance of pupils in these schools.

Table 23 presents how often the Library available in the various schools is used.

Table 23: How Often the Library is Used

Response of pupils	Frequency	Percentage (%)
Often	5	83.3
quite often	1	16.7
very	0	0.0
Total	60	100.0

In reply for the statement „frequent use of the library", none of the correspondents responded „very often". 16.7% responded „Quite often" and 83.3% answered „Often". This indicates that even majority of pupils having library in the school don"t make good use of the library to improve their academic performance.

Other materials used by pupils in the learning of Integrated Science are shown in Table 24

Table 24: Other Materials Used In the Learning of Integrated Science

Material	Frequency	Percentage (%)
Pamphlets	12	20.0
teacher‟s note	48	80.0
Total	60	100.0

It is seen from Table 24 that forty eight (80.0%) of the pupils rely on teacher‟s note in their private studies. The rest of the pupils representing 20.0% rely on pamphlets. None of the pupils (0.0%) indicated that they use other material apart from those stated in the table. This therefore shows that most of the pupils rely heavily on only the notes given to them in class by their teachers. Hence an error in the teacher‟s notes will therefore affect the student negatively and it would lead to a decline in their performance.

The resources often used by teachers are shown in the table 25.

Table 25: Resources Often Used By the Teacher

Resources	Frequency	Percentage (%)
Chalkboard illustration	48	80.0
Television	0	0.0
Projector	0	0.0
Cardboard illustration	12	20.0
Total	**60**	**100.0**

The analysis shows that twelve (20.0%) of the teachers use cardboard illustrations, forty eight (80.0%), which is the majority, use chalkboard illustration, 0 of the

teachers corresponding to 0.0% use neither television nor projector as a teaching and learning resources and this is not enough since everything cannot be presented using chalkboard illustration. It therefore affects pupils understanding of various concepts and principles in Integrated Science and in the long run, their performance.

What is the time available for the teaching of Integrated Science?

The number of periods allocated for the teaching of Integrated Science are shown in Table 26.

Table 26: Number of Integrated Science Period(s) Per Week

Number of period(s)	Frequency	Percentage (%)
1 period (35mins)	0	0.0
2 periods(70mins)	0	0.0
3 periods(105mins)	0	0.0
4 periods(140mins)	7	11.7
5 periods(175mins)	0	0.0
6 periods (210mins)	53	88.3
Total	**60**	**100.0**

From Table 26, seven (11.7%) of the respondents answered that four periods (140mins) are allocated to the teaching of Integrated Science whiles the remaining fifty three (88.3%) of the respondents answered that six periods (210mins) are allocated to the study of Integrated Science in their Schools. This indicates that majority of schools time table is in conformity with the GES JHS Integrated Science syllabus which suggests that a total of six periods a week (four theory periods and two

practical periods) should be allocated to the teaching of Integrated Science at the Junior High School level.

Table 27 is a comparison between the periods allocated to the teaching of Integrated Science and the other subjects.

Table 27: Integrated Science Period with Other Subjects

Response	Frequency	Percentage (%)
Yes	32	53.3
No	28	46.7
Total	**60**	**100.0**

The aim of this part of the study was to compare Integrated Science periods with that of other subjects (English Language, Mathematics, Social Studies, Religious and Moral Education, etc). The analysis pointed out that, out of the 60 respondents, twenty eight constituting 46.7% of the selected pupils indicated that the other subjects taught in the selected schools are allotted more time periods as compared with Integrated Science. Thus they answered „No" item 18 of Appendix A. However, thirty two respondents totaling 53.3% answered „Yes" to the same item. These responses revealed that other subjects do not have more periods than Integrated Science within the week.

The views of students on the Integrated Science periods within the week are indicated in table 28.

Table 28: Views about the Integrated Science Periods in the Week

Response	Frequency	Percentage (%)
Enough	43	71.7
Not enough	17	28.3
Total	**60**	**100**

From the table above, it can be confirmed that out of 60 pupils that were selected for the study 43 pupils agreed that the time taken for Integrated Science within a week is enough constituting 71.7% of the total valid responses. Also it could be read that seventeen pupils out of the 60 indicated that the time allocated for Integrated Science is not enough totaling 28.3% of the total valid responses. This tells us that most of the pupils (71.7%) are satisfied with the number of periods in Integrated Science in the selected schools and the time allocated is likely to affect students‟ performance positively.

4.3 Main Findings for interview and observation

In line with the objectives of investigating the causes of pupils‟ poor performance in Integrated Science in the Anomabo Circuit of Mfantsiman Municipality of Ghana, the following outcomes were achieved after the observation and interviews on how teaching and learning of Integrated Science take place in the selected schools;

4.3.1 Learning methods

It was observed that Integrated Science lessons usually began with the teacher‟s presentation where the teacher explains the concept to be taught to the pupils and then writes examples from the textbook on the chalkboard. Lessons normally took 70 minutes. To establish whether the pupils understood the concept, questions were

asked by teacher. When questions asked, only between three and five pupils are able to answer them. This suggested that more than halve of the pupils do not understand what is taught. It was again observed that when pupils found it difficult to grasp a concept, the teacher explained it to them again using only textbook examples. This is in line with Mereku,,s (2003) finding that the majority of teachers make pupils to use only the standard textbook methods irrespective of their abilities. However, the syllabus gives teachers the freedom to use other relevant examples outside what is found in the textbooks. This is to enhance the understanding of pupils.

4.3.2 Frequency of Practical Activities

On the frequency of practical activities done during lessons, it was found that none of the teachers used any practical activities to explain the outlined concepts to their pupils as the syllabus requires them to do. The reasons given for non-introduction of practical activities in teaching Integrated Science in the selected schools were that, lack of laboratory and teachers are required to conduct a specified number of exercises during the term, failure of which results in serious sanctions from education officials. Therefore to meet the requirements and work within time, the teachers forgo practical activities and focus on the recommended class exercises. This observation is consistent with Mereku"s (2003) finding that teachers frequently do not employ practical activities in their teaching.

4.3.3 The degree of participation of pupils in lessons

The observation revealed virtually no participation of pupils in the lessons taught by the teachers. The pupils remained passive because it was realized that they hardly understood the Science concepts that were taught by their teachers. The lessons were theoretical with no practical activities that could get them involved to make them

understand the lessons. This supports the submission made by Mereku, (2003) that infrequent use of teaching/learning materials and practical activities do not enhance the participation abilities of pupils in lessons.

4.3.4 The consideration of multiple intelligence when teaching

It was also evident from the observation that the teachers did not factor in the fact that the pupils in their classrooms had different levels of learning abilities and learning styles as the theory of Multiple Intelligences suggests. Knowing that Ghanaian classrooms consist of pupils with mixed ability (Opoku-Asare, 2000; CRDD, 2007) makes it necessary for the teachers to adapt their teaching methods so that they can reach all their pupils in all their lessons.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Overview

This chapter considers the summary of the research, conclusions and recommendations. It also provides a synopsis of the study and makes suggestions based on the findings of the research.

5.1 Summary

This study was conducted in Anomabo Circuit of Mfantsiman Municipality to investigate causes of pupils' poor performance in Integrated Science and to give recommendations to improve their performance.

A sample of 60 pupils were selected in three schools in the circuit and they were named school A, B and C. Form one and form two were the classes that pupils where picked from for the investigation. Variable studied included teacher"s personal data comprising academic and professional qualification, length of teaching and of teaching Integrated Science at the JHS, methods of teaching and assessment, teaching and learning materials available for the teaching and learning of the subject, and the time allocated for the teaching of the subject. Nine science teachers three from each school participated in the study.

Two sets of questionnaires were prepared for data collection; one for teachers and the other for the pupils. A hundred percentage return rate was achieved. Interview guide and observation guide were the other instruments used for the study.

5.2 Summary of Key findings

From the data analysis in chapter four, the study isolated some factors which were found to be contributing to the persistent poor performance of pupils in Anomabo Circuit of Mfantseman Municipality. The key findings of the analysis can be summarized as follows:

a. Professional qualifications and competence of the Integrated Science teachers

Poor performance were not resulting from professional qualification of teachers since the least among had a diploma certificate which meets the ideal standard set for modern education in Ghana, thus the Ghana Education Service (GES) considers a university degree or diploma in a teacher's subject of specialisation appropriate qualification for one to teach at the JHS. The score for teaching experience in Integrated Science was not encouraging since all the teachers had little experience in the teaching of Integrated Science.

b. How Integrated science teachers approach instruction and assessment of Integrated Science lesson

Though the teachers reported using discussion method technique to deliver Integrated Science Lessons, it was found to be otherwise during the observation time. The lecture method was rather used by teachers which were found to impact negatively on pupils‟ performance in Integrated Science. It was found that none of the teachers used any practical activities to explain the outlined concepts to their pupils as the syllabus requires them to do.

The assessment method most frequently used by all teachers was giving home work to pupils after Integrated Science lessons.

c. Requisite teaching and learning materials available and use

The result for the availability of requisite teaching and learning materials for the teacher of Integrated Science was not adequate with regard to audio visual instructional materials and this might have negative impact on the performance of pupils.

d. Time available for the teaching of Integrated Science

The time available for the teaching of Integrated Science was found to be satisfactory.

e. Result of observation carried

In the course of observation, it was observed that class sizes were all normal. There was however inadequate teaching and learning materials. It was also observed that, most of the teachers did not factor in the fact that the pupils in their classrooms had different level of learning abilities and learning style.

f. Result from interviews

There was one interview carried out-Integrated Science teachers interview. From the interview, the teachers reported and provided proof of poor performance in Integrated Science in their schools. The teachers also reported being demoralized due to several challenges they listed as facing in teaching Integrated Science in their respective schools. Among this were lack of motivation and in-service training.

5.3 Conclusion

Pupils‟ poor performance in the selected schools was neither due to the qualification of teachers, lesson note preparation, availability of books to be used by teachers, giving of homework to pupils after lesson, motivation of pupils by teachers, lack of textbooks, time allocated for the teaching of Integrated Science in the various schools, marking of exercises nor class size because the results obtained for these factors were

all satisfactory. Poor performance of pupils may result from the following factors: lack of in-service training for teachers, lack of Teaching and Learning Materials, lack of motivation on the parts of teachers in the teaching of the subject since the data analysed shows 66.7% of teachers handling the subject were not motivated in the teaching of the subject, teachers not involving pupils always when planning experiment, lack of school library, bad teaching method for teaching and assessment of Integrated Science Lessons, inability to complete the syllabus before writing the BECE, lack of science laboratories for practical work, using of chalkboard as the only teaching aid used by teachers, and teachers not considering multiple intelligence when teaching.

5.4 Recommendations

In the light of the research findings and conclusion, the following recommendations are made:

1. The Ghana Education Service (GES) need to place more emphasis on the regular organisation of science-specific induction and in-service training programmes for both beginning and experienced teachers especially before a new school term begins. Alternatively, the heads of schools could be well resourced to enable them play this vital role.
2. Science lessons should be more practical oriented to motivate students.
3. The Science teachers need to be supported regularly by the GES to enable them identify effective instructional and assessment approaches.
4. There is the need to look at the teaching methods adopted to teach Integrated Science. Teachers of Integrated Science should use different kinds of methods like debate, field trip, role play, team teaching, etc. when teaching. These

methods should involve the students in doing many activities in the teaching and learning of about a given topic rather than one way lecture method. While doing this, teaching and learning become pupil-centered.

5. More requisite Integrated Science text books should be provided since they are very useful tool needed by both teachers and pupils. This will aid pupils and teachers by giving them better understanding of what they learn and serving as source of reference materials for teaching respectively.
6. Supervision should be strengthened and circuit supervisor should be more regular in the schools to check on the work done by teachers or to keep the teachers on their toes.
7. Teachers should consider multiple intelligence when teaching in class.

Suggestion of areas for further research

The researcher was unable to cover some areas that would equally affect the performance of Integrated Science pupils in the Junior High Schools. It is therefore recommended that further research should be carried out in areas such as:

1. The issue of the perception of pupils toward the study of Integrated Science.
2. The performance of pupils in Integrated Science; the parent factor.
3. Students" attitude towards learning science
4. Nature of WAEC test items for BECE candidates

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APPENDIX A

QUESTIONNAIRE FOR PUPILS

University of Education, Winneba

Faculty of Science Education

My Dear Pupil,

For a long time now all of us have been concerned about the level of performance in Integrated Science both in school examinations and in the BECE. The question now is how should all of us put our hands and heads together to optimize achievement in Integrated Science?

The attached questionnaire has been designed to enable you suggest the ways by which our grades especially at the BECE could be improved. If you need any clarification, do not hesitate to ask me.

Please submit the completed questionnaire to me as soon as possible.

SECTION A

Please tick appropriately or where applicable

1. Sex : Male [ ] Female [ ]

2. Form: ……..……

SECTION B

Teaching and learning methods

3. Does the kind of method used by your teacher help you to understand Integrated Science concept better?

   Yes [ ] No [ ]

4. Do teachers involve pupils when teaching Integrated Science?

   Yes [ ] No [ ]

5. Are you motivated by your teachers in the learning of Integrated Science?

   Yes [ ] No [ ]

6. If „Yes", how are you motivated by your teachers?

……

SECTION C

Resources (Teaching and learning materials)

7. Do you have Junior High School Integrated science textbook of your own?

Yes [ ] No [ ]

8. Do you have school library?

Yes [ ] No [ ]

9. Do you use the library?

Yes [ ] No [ ]

10. If your answer to question 9 is „yes", how often do you use the library?

i. Often [ ] ii quiet often [ ] iii. very often [ ]

11. Do you find enough copies of the Integrated Science textbooks at the school library? Yes [ ] No [ ]

12. Apart from the Integrated Science textbooks what other materials do you use in the learning of Integrated Science?

Pamphlets [ ] teacher"s note [ ]

13. If other(s), specify and indicate the title of the books.

……

14. Which of the following resources does your teacher often use?

i. Chalkboard [ ] ii. television [ ]

iii. Projector [ ] iv. Cardboard [ ]

15.If others,

specify…….

SECTION D.

Time allocated on the time table for the study of Integrated Science in your school

16. How many Integrated Science period(s) do you have in a week?

i. 1 period (35mins) [ ] ii. 2 periods (70mins) [ ] iii 3 periods (105mins) [ ]

iv. 4 periods (140mins) [ ] v. 5 periods(175mins) [ ] vi. 6 periods (210mins) [ ]

17. If more specify……..

18. Do you have the same Integrated Science period as other subjects within the week?

Yes [ ] No [ ]

19. What is your view about the Integrated Science periods in the week?

i. Enough [ ] ii. Not enough [ ]

20. Give reasons for your answer abov……

……

APPENDIX B

QUESTIONNAIRE FOR TEACHERS OF INTEGRATED SCIENCE

University of Education, Winneba

Faculty of Science Education

School of Graduate Studies

Please this questionnaire seeks to find out some of the factors that have led to the poor performance of students in Integrated Science over the years in our circuit. The research is purely for academic purpose and you will be contributing immensely to this research if you respond to the following items as precise as possible. The information you provide will be treated strictly confidential. Please frankly tick the appropriate boxes and provide the appropriate responses where applicable and fill the blank spaces. Thanks for your kind gesture

SECTION A

Teacher's biographic data

1. Sex Male [ ] Female [ ]

2. Age Under 25 years [ ] 25-30 years [ ]

30-35 years [ ] above 35 years [ ]

SECTION B

Professional Competence and Qualification

3. What is your academic qualification?

i. Master‟s degree [ ] ii. Bachelor‟s Degree [ ]

iii. Diploma [ ] iv Cert A [ ]

4. If others specify

……

5. What is your professional qualification?

Master‟s degree (Science option) [ ]

Bachelor of education (science option) [ ]

Diploma (science option) [ ]

Cert A (science option) [ ]

6. If others, specify

……...

7. How long have you been in the teaching profession?

i. 1-5 years [ ] ii. 6-10 years iii. 10 years and above [ ]

8. How long have you been teaching Integrated Science?

i. 1-5 years [ ] ii. 6-10 years [ ] iii.10years and above [ ]

9. Have you had any In-service training in Integrated Science?

Yes [ ] No [ ]

10. If yes how many times? ……

11. Do you encounter problems when teaching some topics?

Yes [ ] No [ ]

12. If yes, indicate the topics ……

13. Are pupils given class exercises and assignment?

i. Not often [ ] ii. Very often [ ] iii. Often [ ]

14. Are the exercises and assignments marked and discussed in class?

Yes [ ] No [ ]

15. How many exercises do you give to pupils in a week?

i. One [ ] ii. Two [ ] iii. three and above [ ]

16. Do you teach other subject(s) aside Integrated Science?

Yes [ ] No [ ]

17. If yes, specify

……..

18. Do you have other responsibilities as a teacher?

Yes [ ] No [ ]

19. If yes, specify

……..

20. If your answer to question 18 is „yes" does it affect your responsibility?

Yes [ ] No [ ]

21. How many pupils are in a class?

i. Below 20 [ ] ii. 20-40 [ ]

iii. 40-60 [ ] iii. 60 and above [ ]

22. Do you normally complete the Integrated Science syllabus before final examinations (BECE)?

Yes [ ] No [ ]

23. If no, give reason(s) for your answer

……

…

24. Are you motivated in the teaching of Integrated Science?

Yes [ ] No [ ]

25. If yes, how are you motivated?

……

……

26. Which learning activities do you use to help pupils improve their performance in Integrated Science?

i. Debates [ ] ii. Quizzes [ ] iii. Essay competition [ ]

27. If others, specify ……..

SECTION C

Teaching Methods and assessment of Integrated Science Lessons

28. Which of the following methods do you often employ in Integrated Science?

i. Discussion method [ ] ii. Question and answer method [ ]

iii. Lecture method [ ] iv. Note dictation method [ ]

v. Case study method [ ] vi. Role play method [ ]

vii. No idea [ ]

29. Do you demonstrate experiment for pupils?

i. Every lesson [ ] ii. Most lessons [ ]

iii. Some lessons [ ] iv. Never [ ]

30. Do you plan experiment alone without involving pupils?

i. Every lesson [ ] ii. Most lessons [ ]

iii. Some lessons [ ] iv. Never [ ]

31. Do you conduct experiment with pupils?

i. Every lesson [ ] ii. Most lessons [ ]

iii. Some lessons [ ] iv. Never [ ]

32. Do you make your pupils work in small groups?

i. Every lesson [ ] ii. Most lessons [ ]

iii. Some lessons [ ] iv. Never [ ]

33. Do you give your pupils homework every week?

i. Every lesson [ ] ii. Most lessons [ ]

iii. Some lessons [ ] iv. Never [ ]

34. To you make your pupils write class test?

i. Every lesson [ ] ii. Most lessons [ ]

iii. Some lessons [ ] iv. Never [ ]

SECTION D

Teaching and Learning Materials

35. How many times in a week do you prepare lesson note?

i. Once in a week [ ] ii. Twice in a week [ ]

36. If other specify,…….

37. Is the note vetted and marked by the head teacher?

Yes [ ] No [ ]

38. Do you use required teaching and learning materials in the teaching of Integrated Science?

Yes [ ] No [ ]

39. If others, specify ……..

40. If your answer to question 38 is yes how would you describe the adequacy of the teaching learning materials?

Not adequate [ ] ii. Adequate [ ] iii. Very adequate [ ]

41. Which of these teaching aids do you use in teaching?

i. Chalkboard illustration [ ] ii. Television [ ]

iii. Projector [ ] iv. Cardboard illustration [ ]

iv. Radio or tape [ ]

42. If others, specify

……..……

43. Do you have recommended Integrated Science textbooks in your school?

Yes [ ] No [ ]

44. If your answer to question 43 is yes, are the textbooks sufficient for the teaching and learning of Integrated Science?

Yes [ ] No [ ]

45. What do you think should be done to improve teaching of Integrated Science at the basic level?

……

THANK YOU.

Appendix C

Interview Guide.

INTEGRATED SCIENCE TEACHERS

• Are Integrated Science textbooks available for pupils to learn?

• Are you teaching in your area of specialization?

• Do teachers involve students in the teaching and learning process?

• What problem do you face as an Integrated Science Teacher?

APENDIX D

OBSERVATION GUIDE

ANGLE OF OBSERVATION **Teaching and learning**	RATING SCALE				
	5	**4**	**3**	**2**	**1**
2. In-depth of knowledge of subject					
4. Kind of examples given					
8. Evaluation of lesson delivered					
How Lessons are Organised					
1. Lesson aid and material					
2. Available apparatus and equipment					
3. The use of text books					

Rating scale

Excellent 5

Very Good 4

Good 3

Fair 2

Poor 1