UNIVERSITY OF EDUCATION, WINNEBA

DEPARTMENT OF SCIENCE EDUCATION

DIFFERENTIAL VIEWS OF SHS TEACHER FACTORS THAT AFFECT STUDENTS' PERFORMANCE IN BIOLOGY

ISSAH IBRAHIM

(8140130004)

A THESIS IN THE DEPARTMENT OF SCIENCE EDUCATION OF THE FACULTY OF SCIENCE, SUBMITTED TO THE SCHOOL OF RESEARCH AND GRADUATE STUDIES OF THE UNIVERSITY OF EDUCATION, WINNEBA, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PHILOSOPHY IN SCIENCE EDUCATION OF THE UNIVERSITY OF EDUCATION, WINNEBA

JUNE, 2016

DECLARATION

STUDENT'S DECLARATION

I, **ISSAH IBRAHIM**, declare that this thesis, with the exception of quotations and references contained in published works which have been identified and acknowledged, is entirely my own original work, and that it has not been submitted, either in part or whole, for another degree elsewhere.

Name of student: Issah Ibrahim

Signature……..…… Date ……

SUPERVISOR'S DECLARATION

I, hereby certify that the preparation and presentation of the thesis were supervised in accordance with guidelines and supervision of thesis laid down by the University of Education, Winneba.

Signature:……..…… Date ……

Principal Supervisor: Professor John K. Eminah

Signature:…… Date……

Co-Supervisor: Dr. Victor Antwi

ACKNOWLEDGEMENTS

It would not have been possible to write this thesis without the help and support of the kind people around. This thesis grew out of a series of dialogues with my supervisor, Professor John K. Eminah. I would like to thank him for his patience and support, not to mention his advice and knowledge in Science Education. Professor John K. Eminah has been invaluable at both academic and personal levels, for which I am extremely grateful. Also, my special thanks go to Dr. Victor Antwi, who has been a great source of encouragement to me, and constantly reading through my work and making constructive criticisms and corrections. I am indebted to my wife, Nimatu Kasssim for her patience, endless contributions, support and encouragement. I appreciate your continual support of my academic and life pursuits. I would also like to thank my family for providing me with a solid foundation upon which to build and grow. My parents, especially my father, whispered I could do this from the start. Their support has made it possible for me to reach every goal I have achieved. Without them I would not be here today. I appreciate your continual support and thanks for being there during every setback and every bleak moment I experienced.

DEDICATION

I dedicate this thesis to my beloved wife. Also, to my entire family for their endless love and support through it all.

TABLE OF CONTENT

Contents Page

LIST OF TABLES

ABBREVIATIONS

NBC	-	National Board Certification
WAEC	-	West African Examination Council
WASSCE	-	West African Secondary School Certificate Examination
SHS	-	Senior High School
HOD	-	Head Of Department
CK	-	Content Knowledge
PCK	-	Pedagogical Content Knowledge
GES	-	Ghana Education Service
CAL	-	Computer Assisted Learning
NEST	-	New And Emerging Science And Technologies

ABSTRACT

This study investigated the differential views of SHS teacher factors that affect students‟ performance in biology in two districts of Eastern Region, Ghana. The research was guided by five research objectives. The study sought to establish the effect of certain factors such as teachers‟ motivation, qualifications, instructional approaches, professional experience and job satisfaction on students‟ performance in biology in two selected Districts of Eastern Region. The study used descriptive survey design. The techniques used to select the respondents were purposive and simple random sampling. The sample consisted of 124 respondents; made up of 4 school heads, 80 biology teachers and 40 educationists. The main instrument was a questionnaire and the data was analysed by the help of Statistical Package for Social Sciences (SPSS). This was supplemented with interviews and document analysis. The analysed data indicated that many (52.5 %) of the biology teachers were of the view that motivation of teachers made them do a lot of research to teach effectively. It was also found that all the biology teachers indicated that qualified teachers adopt good teaching methods which improved students‟ performance. Many (60.7%) of the respondents strongly agreed that teachers with high professional qualifications teach students better. Many (61.2%) of the respondents indicated that experienced teachers

use learner centered approach in lessons delivery and they build upon students existing knowledge and experience. Majority of the respondents strongly agreed that, experienced teachers are more understanding in dealing with student related matters. This study was expected to significantly contribute to knowledge in other to improve learning and performance of students in biology.

CHAPTER ONE

INTRODUCTION

Overview

This chapter contains information on the background to the study, statement of the problem, the purpose of the study, educational significance of the study, and the research questions addressed by the study. Also presented are the limitations and delimitation of the study. The chapter ends with the presentation of the operational definitions used in the study as well as a description of the organization of the research report.

Background to the study

In the history of education, science has held its leading position among all school subjects because it is considered as an indispensable tool in the development of the educated person. Educators give special recognition to biology among the sciences because of its educational values, its close relation to man as a living organism, its peculiar field of experimentation and interrelationships with the other sciences. As important as knowledge of biology is to human beings, it appears students‟ achievement in this subject at the secondary school level is becoming worse than in the other science subjects. Ibe and Maduabum (2001) argued that candidates performance at the senior school certificate examinations (SSCE) conducted by West African Examination Council have consistently remain poor, with biology having the highest enrolments and the poorest results over the years. Looking at the importance of biology to the national development and considering the state of poor academic achievement in this very subject at the secondary school level which incidentally serves as the foundation for advance learning and professional courses

in fields such as medicine, pharmacy, nursing and other allied courses, the poor academic achievement observable in the biology results of the students should be a thing of serious concern to any citizen of Ghana. The teachers: motivation, instructional approaches, qualifications, job satisfaction and the professional experience possessed by teachers in teaching biology as a subject to the students may be key factors for the downward trend in achievement observed in the results of the students in the subject. Hence, the need to investigate teacher related factors influencing students" performance.

There are empirical evidences that instructional methods used by teachers affect learners" achievement. Whereas appropriate instructional methods facilitate grasping of new ideas or concepts, inappropriate methods constrain knowledge retention and application (Chang, 2010). Accordingly, teachers should align instructional methods to the needs and preferences of students to ensure effective learning and achievement. Students whose learning preferences are mismatched with instructional methods are less likely to develop interest in the subject matter, prompting some to drop out altogether (Odundo, 2003; Zeeb, 2004). In another study, Chang (2010) investigated the effectiveness of teacher-centered and learner-centered pedagogical methods on the performance of students. The study found that learner-centered methods were more effective in influencing the perception of students towards science subjects. Some teachers adopt learner-centered approaches, in which their role is restricted to facilitation of the teaching process (Ahmad & Aziz, 2009). Learner-centered methods are associated with imaginative, critical and creative skills; active participation of students in the learning process through discussions and intellectual engagement; as well as higher learning achievement and effectiveness in addressing problems of humanity (Ministry of Education, 2001; Eken, 2000; Curtin,

2005; Froyd, 2007; Ahmad & Aziz, 2009). Although teachers have the discretion to choose methods for delivering lessons to their students, Chika (2012) observes that learner-centered pedagogy is a powerful strategy for improving learning achievement in examinations and application of knowledge and skills acquired.

Students placed more value on active participation in-group discussions than attendance of lectures. In Kenya Kang"ahi, Indoshi, Okwach and Osodo (2012), investigated the influence of teaching styles on learners" achievement in Kiswahili language in secondary schools. The study found a positive relationship between teaching styles and learners" academic achievement. Besides, learning achievement was seen to increase with more learner-centered teaching styles. Also, Muraya and Kimano (2011) found that cooperative learning (learner-centered) approach resulted in significantly higher mean achievement scores compared to regular teaching (teacher-centered) method.

Teacher-centered methods are however, associated with a number of shortcomings. For instance, Adeyemi (2008) noted that lecture, which is the most common method, does not stimulate students" innovation, inquiry and scientific thinking but rather encourages routes learning which are easily forgotten. McDowell (2001) noted that instructional methods that encourage memorization and reproduction are short of knowledge that can be used to solve problems in new situations. Tella, Indoshi and Othuon (2010) noted that teacher-centered methods often result to students not enjoying lessons and missing the benefits of intellectual discovery.

Furthermore, learner-centered methods actively engage students in the learning process for effective mastery of the subject matter and promotion of a positive attitude towards the subject. As noted by the Ministry of Education in its National Report on the

Development of Kenya Education, presented at the International Conference on Education in September 2001, teaching approaches adopted should make learning more learner-centered in order to promote imaginative, critical and creative skills in students (Ministry of Education, 2001). In a learner-centered class, students take a participative role by leading discussions and teachers become facilitators In this regard, teachers facilitate student‟s discussion and interject only when necessary, allowing students to put the language to use and explore aesthetics of learning materials (Eken, 2000; Ahmad & Aziz, 2009). According to Froyd (2007), the standard features of a learner-centered pedagogy include collaborative learning, connecting new information to previous knowledge and critical thinking.

It is noted that learner-centered pedagogy is an interactive learning process within a classrooms that involves facilitating, presentation of questions and small groups activities. Interactive pedagogy may also include the use of media and involvement of students in fieldwork activities. Furthermore, interactive teachers allow for diverse learning styles among their students and encourage active involvement of all students, while helping them to improve in individual weaknesses (Curtin, 2005). Students are also encouraged to ask questions, define problems and lead conversations (Chika, 2012). Besides, such methods connect students‟ world with learning pursuits in the classroom (Bush, 2006; Kumar, 2006). However, it is not sufficient to have an experience, if such is not discussed and shared, they may be forgotten rapidly. Sharing of experiences through group discussions improves the application of acquired knowledge and skills (Kumar, 2006). Learner-centered methods are advantageous in a number of ways, for instance, they promote democratic participation in the learning process, encourages critical

thinking, meets student‟s communication needs and improves performance (Cummins, 2007). The positive impact of such methods have also been documented by Chika (2012), who indicate that interactive methods are more powerful improving learning achievement than teacher-centered pedagogy. Kumar (2006) also indicates that interactive methods have higher impact in overall learning achievement than didactic classrooms.

In addition, the teacher has been identified by psychologists as a principal character that can make successful learning within the formal system of education. According to Buddin and Zamarro (2009), teacher quality is a key element of student academic success. Obasi (2010) also asserted that the professional and academic training and qualification of the teacher can raise the prospects of a student‟s academic performance and attainments. This validated the truism that the quality of our schools cannot be better that the quality of the teachers we have.

However, researchers have raised several questions about the relationship between teacher qualification and the academic success of students. The calibre of students admitted into the Colleges of Education has influence on their grades. This implies that unprofessional teacher trainees can affect the teaching and learning process since education depends on the intellectual strength of the people who are recruited to teach (Fullan & Stiegelbauer, 2000).

Koedel and Betts (2007) used a value-added gains model to look at student achievement. They attest that specific teacher qualification (experience, quality of undergraduate college, education level, and college major) had little effect on student achievement. In support of Koedel and Betts‟ findings, Buddin and Zamarro (2009) also found that teacher experience was weakly related to student achievement, and the level of education

attained by teachers has no effect on student achievement in their learning endeavours. Buddin and Zamarro (2009), further argue that experienced or better educated or more skilled teachers (as measured by licensure exams) may inherently be better able to teach, but they may not consistently deliver their best performance in the classroom.

Khurshid (2008) conducted a study to determine the relationship between the professional qualifications of teachers and the academic performance of their students at secondary school level in Multan, Pakistan. It was found that the performance of the students taught by the untrained teachers with B.A. / B.Sc qualifications was better than the students taught by trained teachers with professional qualifications like B.Ed and M.Ed.

However, Zuzovsky (2009) conducted a study in Israel to re-examine the extent to which higher degrees, years of teaching experience, and intensive participation in professional development activities. It was found that these components of teacher qualification were indeed positively associated with student achievement in mathematics and science. Several studies have found a significant relationship between teachers‟ qualification and specialized knowledge in mathematics and students‟ achievement in mathematics (Martin, Mullis, Gregory, Hoyle & Shen, 2000; Hill, Rowan & Ball, 2005; Mogari, Kriek, Stols & Iheanachor, 2009).

Job satisfaction has been defined as a pleasurable emotional state resulting from the appraisal of one‟s job; anaffective reaction to one‟s job; and an attitude towards one‟s job (Ubom, 2001). It has also been shown that when job satisfaction in the teaching profession increases, turnover decreases (Robert, Jones, & Lynn 2004).Though teachers are a crucial element of educational opportunity structures, the recent opening-up of

labour markets in general and within the school system has raised concerns about retaining qualified teachers especially in schools serving poor communities. While several factors have been identified as accounting for the above phenomena, recent studies conducted in some developing countries underscore the fact that more than onequarter of the teachers who left teaching did so because of job dissatisfaction (Henke, Choy, Chen, Geis & Broughman 1997). Job satisfaction of teachers has been the focus of considerable research in recent decades (De Nobile, 2003). Given the links that have been established between job satisfaction and employee commitment, turnover, absenteeism, productivity and occupational stress (De Nobile & McCormick, 2005; Luthans, 2002; Spector, 2000), such interest is, perhaps, not surprising. More recently, Zembylas and Papanastasiou (2006) have defined teacher job satisfaction as the teachers affective relation to his or her teaching role and is a function of the perceived relationship between what one wants from teaching and what one perceives its offers a teacher. Based on these definitions, we simply define teacher job satisfaction as a teacher‟s feelings and perceptions of happiness and contentment with teaching.

Motivation is one of the factors that has been reported in primary, secondary and colleges of education to influence academic performance through study effort as a mediator, (Vansteenkiste, 2005). Fenech (2006) reported poor work conditions, low salaries, heavy workloads, unrealistic expectations from managers, low professional status, and reduced autonomy as important factors that contribute to teacher dissatisfaction.

Motivation of teachers in education and the influence on academic performance are considered significant in promoting effective learning. In addition, (Sandra, 2002; Skaalvik & Skaalvik, 2006), revealed that there was a significant relationship between

academic performance and motivation. Teacher incentives, may improve student performance if they thrive in aligning the social goals with the goals of the teacher. In this case, a combination of incentive and composition effects will increase student performance (Lazear, 2003).

Studies have shown that inexperienced teachers were typically less effective than more experienced teachers. If the teacher is ineffective, students under the teacher‟s tutelage will achieve inadequate progress academically. This is regardless of how similar or different the students are in terms of individual potential in academic achievement. According to Rivkin, Hanusheck and Kain (2005), there has never been consensus on the specific teacher factors that influence students‟ academic achievement. Akiri and Ugborugbo (2008) established that there was a significant relationship between teachers‟ gender and students‟ academic achievement. Yala and Wanjohi (2011) and Adeyemi (2010) found that teachers‟ experience, and educational qualifications were the prime predictors of students‟ academic achievement. It is for this reasons that this research is to investigate the influence of teacher related factors such as teacher motivation, teachers job satisfaction, teachers instructional approaches, teacher qualifications and teachers experience on students‟ performance in biology in the two districts of the Eastern Region.

Statement of the problem

The performance of students in biology in the West Africa Secondary School Certificate Examination (WASSCE) has been unsatisfactory over the years in many senior high schools in the country. Senior high schools in the two districts of the Eastern Region is no exception. The performance of students in biology in the two districts of the Eastern Region for years now has been unsatisfactory. It appears that whatever is reported at the

national level is also reflected on the research area. The Chief Examiners‟ Reports from WAEC have consistently indicated the poor performance of SHS students in biology (WAEC, 1996; 2002; 2003; 2004; 2005). According to the Chief Examiners‟ Reports more students failed in biology because they did not perform creditably in paper 2, which is a practical paper.

Many factors contribute to the students‟ poor performance in biology at the West African Secondary School Certificate Examination (WASSCE). These factors include: students‟ attitude towards the subject, inappropriate teaching approaches that are teacher-centered rather than student- centered, teacher related factors, inadequate mastery of the subject content by some teachers, inadequate teaching and learning resources and heavy teaching loads of the teachers. Studies have been done by Odhiambo (2010), Yala, and Wanjohi (2011) to address factors influencing students‟ performance. These studies did not address the problem of poor performance in relation to teacher factors .This apart; no such study had been conducted in the research area. With these in mind, exploration of differential views on Senior High School teacher factors that affect students‟ performance in biology in the research area is of great interest and is also worthwhile.

Purpose of the study

The purpose of this research is to specifically explore the differential views on Senior High School teacher factors that affect students‟ performance in biology. The teacher factors are; instructional approaches, job satisfaction, motivation, qualifications and professional experience do influence students‟ academic performance in biology.

Objectives of the study

This study was designed to determine the influence of teacher;

i. motivation on students‟ performance in biology.
ii. qualifications on students‟ performance in biology.
iii. instructional approaches on students‟ performance in biology.
iv. professional experience on students‟ performance biology.
v. job satisfaction on students‟ performance in biology.

Research questions

The study was guided by the following research questions;

1. In what ways does teacher motivation influence classroom instructional activities?
2. To what extent do teacher qualifications influence students‟ performance in biology?
3. What is the effect of teacher instructional approaches on students‟ performance in biology?
4. To what extent does teacher professional experience influence students‟ performance in biology?
5. What is the effect of teachers‟ job satisfaction on the students‟ performance in biology?

Significance of the study

The findings of this study will have both theoretical and practical benefits to the future of science education and development in Ghana. The study is expected to contribute to the improvement of knowledge and skills needed for effective biology education. The study may lead to improved strategies in teaching and conducting practical biology lessons not

only in Ghana but also in other parts of the world. The research seeks to bring to the doorsteps of policy makers and implementing bodies and other stakeholders the actual situation on the ground so that they can have a fair assessment and judgment of the impact of the conduct of effective biology lessons. The study may also be of immediate benefit to the Ministry of Education (MOE) and other educational stake holders in the formulation of future science education policies aimed at enhancing students‟ achievement in science subjects related to biology. This would help authorities come out with pragmatic measures to address this shortcoming.

This study would guide teachers in helping students to develop positive attitudes towards the learning of biology. It will also assist parents to understand their role in helping their children towards the learning of biology.

Delimitations

The study only focused on teacher related factors influencing the academic performance of students in the secondary schools. The factors included teacher job satisfaction, teacher motivation, teacher qualifications, teacher instructional approaches and professional experience of the teachers. The study involved the school heads, biology teachers and the educationists in the senior high schools in the two districts of the Eastern Region.

Limitations

The researcher encountered some problems in conducting this investigation or research. Some of the problems include financial constraints, time available to complete the project and some school heads were not willing to release their students‟ performance readily. Therefore the researcher assured them of anonymity and confidentially, some teachers were not ready to disclose the academic qualification. The researcher assured them of

coding the information. Again, the attitude of some of the respondent undermined the credibility of the data that is their unwillingness to answer certain questions in the questionnaire. To overcome this, the researcher collected data from a cross –section of all teachers disregarding age and experience.

Definition of terms

Teacher: Refers to a person who provides education for pupils (children) learners and students (adults).

Students: Refers to a learner, or someone who attends an educational institution to acquire knowledge, skills and petition.

Educationist: Is someone who works within an educational system in various roles such as (HODs, Assistant Headmaster Academics, Laboratory Technicians etc)

Qualification: Refers to both academic qualification and professional qualification.

Teaching experience: This is the length of time one has put into teaching after graduation.

Academic performance: students‟ achievement/results in West African Senior School Certificate Examination after the end of an academic programme in school.

Motivation: The process whereby goal-directed activity is instigated and sustained.

Management: Refers to school administrative personnel who direct, plan, organise, coordinate and control all school resources to achieve predetermined goals.

Learning: The process of acquiring and retaining knowledge or skills to do something.

School Head: the administrative leader and principal coordinator of Senior High School affairs.

Organisation of Report

This research report is presented in five chapters. The chapter one deals with the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, educational significance of the study, delimitation of the study, limitation of the study, and organisation of the study.

The review of the relevant literature on the study forms the chapter two with the chapter three dealing with the methodology. This comprises of the design of the study, population, sampling and sampling techniques used, instrument and data collection procedure as well as the procedure for analyzing the data.

Again, the fourth chapter deals with the presentation of results and the discussion of the findings. Lastly, the chapter five includes the summary, the main findings, conclusions and recommendations as well as suggestions for further studies.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Overview

This chapter presents the views of various authorities on the subject matter under study. It provides a broad view of various empirical and theoretical ideas and perspectives on the study to assist the researcher to conduct the study. The literature is reviewed on the theoretical framework and conceptual framework, empirical studies on how biology should be taught at the Senior High School level. Some global and regional perspective of teacher factors (qualifications, knowledge, experience and competencies), instructional approaches, job satisfaction and teacher motivation effects on students‟ performance are also reviewed.

Theoretical Framework

This study was guided by Affective Events Theory developed by organizational psychologists Weiss and Cropanzano (1996). The theory explains how emotions and moods influence job performance and job satisfaction in workers. The model explains the linkages between employees' internal influences (example, emotions, mental states) and their reactions to incidents that occur in their work environment that affect their performance, and job satisfaction. The theory proposes that affective work behaviors are explained by employee mood and emotions, while cognitive-based behaviors are the best predictors of job satisfaction. The theory proposes that positive-inducing e.g., uplifts as well as negative-inducing e.g., hassles emotional incidents at work are distinguishable and have a significant psychological impact upon workers' job satisfaction. This results in

lasting internal e.g., emotions, mental states and external affective reactions exhibited through job performance, job satisfaction, and organizational commitment.

Also, when workers experience uplifts e.g., completing a goal, receiving an award or hassles for example, dealing with a difficult client, reacting to an updated deadline, their intention to continue or quit depends upon the emotions, moods, and thoughts associated with the satisfaction they derive from their jobs. Research has demonstrated that the relationship between job satisfaction and turnover is fully mediated by intention to quit; workers who report low job satisfaction are likely to engage in planned quitting.

However, the weakness of this theory is that it does not account for employees who report high job satisfaction but quit unexpectedly. It does not also consider extrinsic rewards, such as better job offers outside their current organization that may influence their decisions, employees personality factors may also impact their decisions to exit early from otherwise ideal jobs under ideal working conditions while the theory emphasize on emotions/moods. This are subject variables which cannot be measured objectively because teachers are times influenced by emotions/moods which they carry alone to the school. This emotions/moods may interfere with the performance of teaching duties and therefore, this theory is relevant to the study in that the teacher factors such as motivation, job satisfaction, academic qualification, professional qualification, professional experience, and instructional approaches, which have affected the productivity of the teachers also affects the outcome of the students in WASSCE performance in senior high schools in the two districts of the Eastern Region. However, the theory was found to be suitable for this study

Conceptual Framework

Simkins (2013, as citing Adeyemi, 2008) argued that the education system is a productive system that has outputs. According to Worthington, (2001), the outputs are generally defined in terms of students‟ test scores which denote academic performance. Simkins further expressed that the components of an education system could be represented in an input – process – output model. According to Wobmann (2004), student achievement is produced by several inputs in the educational process. Such inputs include but are not limited to student‟s family background characteristics, class size, availability of teaching and learning materials, and teacher characteristics. The teacher as an input is the principal factor in education provision and thus affects the quality of education in a significant way. According to Ankomah, Koomson, Bosu and Oduro (2005), teacher factors that have an influence on students‟ achievement include motivation, job satisfaction/dissatisfaction, instructional approaches, teachers‟ qualification and teachers‟ professional experience as independent variable. The intervening variables include; type of school, government policy and students cognitive ability, while the dependent variable is the academic performance of the students. This indicated the teacher factors once exposed to the teaching and learning process influences students‟ performance in WASSCE.

A teacher brings these factors to class to facilitate the learning process. The extent to which other inputs can improve the quality of education is directly related to the extent to which teachers effectively use the inputs to improve the teaching and learning process. This study therefore sought to explore the differential views on Senior High School

teacher factors that affect students‟ performance in biology in the two districts of the Eastern Region.

Table 2.1: Conceptual framework for the study

Input	Process	Output
Teacher‟s job satisfaction Teachers motivation Instructional approaches Teachers qualifications Professional experience	Teaching and Learning Process	Improved Performance

Empirical Studies

A substantial amount of research has been conducted on the relationship between teachers and student achievement.

“How and Why Do Teacher Credentials Matter for Student Achievement” by Clotfelter, Ladd, and Vigor (2007) collected administrative data from North Carolina over a ten year period to explore questions involving the relationship between teacher characteristics and student achievement.

“Teacher Credentials and Student Achievement in High School: A Cross-subject Analysis with Student Fixed Effects” by Clotfelter, Ladd, and Vigor (2007) uses data again from North Carolina but specifically looks at the effect of teacher credentials on individual student achievement of high school students.

“The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data” by Rockoff (2004) used panel data to estimate the effects of teachers while controlling

students and classroom variables. One of Rockoff‟s findings was that teacher incentives have effects on student test scores. Rockoff suggests raising teacher quality and incentives linked to student achievement would be beneficial to increasing student achievement.

Goldhaber‟s article “The Mystery of Good Teaching” (2002) examines teacher quality. He too finds, based on other scholarly articles that teacher incentives and pay structure need to be reevaluated so that there is more room for performance-based incentives.

“Teacher Training, Teacher Quality and Student Achievement” by Harris and Sass (2007) conducted a pre-test and post-test analysis of the effects of teacher training on the effects of student achievement based on standardized tests. They found no evidence that scholastic or undergraduate aptitude affects a teacher‟s ability to increase student achievement. Teacher experience on the other hand had some effect on student achievement.

The research by Rivkin, Hanushek, & Kain (2005), (using data from Texas), and by Rockoff (2004), using data from New Jersey have found large gaps between the best and worst teachers, and shown that this variation has significant consequences for student achievement.

Goldhaber and Brewer (2000) observed that students do better in math if taught by a teacher with a bachelor‟s or master‟s degree in mathematics**.** They also establish that, although advanced degrees in general were not associated with higher student achievement, an advanced degree that was specific to the subject area that a teacher taught was associated with higher achievement. In contrast, other studies did not indicate that teachers with graduate-level training in a content area performed better than did

teachers having an undergraduate degree in their content area (Rivkin, Hanushek, & Kain, 2005).

Fuller and Alexander‟s (2004) analysis identified similar students who were taught by Texas math teachers who were also similar except that some were certified and others were not. The study found that the students taught by certified teachers scored better on the state math achievement test. Similarly, Laczko-Kerr & Berliner (2002) examined the math achievement of elementary students and reported that students taught by new, uncertified teachers did significantly worse on achievement tests than did those taught by new, certified teachers. These studies did not, however, examine the exploration of differential views on Senior High School teacher factors that affect students‟ performance in biology.

How biology should be taught at the Senior High School

According to biology syllabus the teaching of biology should be student-centered and activity oriented. The teacher acts as a facilitator. For effective teaching and learning in this course, it is recommended that the school should establish a small botanical garden, animals in a cage, fishpond and insects in a cage. Plan must be made for visiting well-established experimental and commercial farms, agricultural research institutes and other institutions. Visits must also be planned to scientific and manufacturing organisations, forest and game reserves, man-made lakes, the seashore, hospitals, where students will observe scientific work and the application of science in manufacturing, different types of habitats and interactions in nature. Video clips could also be shown where these are available. The provision of well-equipped laboratories will enhance teaching and learning biology. It is also suggested that well trained laboratory technicians be made available to

play complementary role to the teacher. The syllabus is presented in a teaching sequence. However, the teacher may change the teaching order in a particular year provided the linkage between the sections and the respective units is maintained and the syllabus for the year completed by the end of each year. It is important that classroom teaching be supplemented with field trips wherever appropriate. Even though biological drawings, interpretation of biological data, writing of scientific reports are done as integral part of teaching of the biology syllabus, it is given as a unit on its own in the syllabus to emphasize its important and also make students appreciate it better. Besides the above advice, the teacher‟s attention is drawn to some new concepts that have been introduced in the new set of syllabuses to help improve instructional delivery and learning

How the Syllabus is Structured/Sections and Units

The syllabus has been planned on the basis of sections and units. Each year‟s work is divided into sections. A section consists of a fairly homogeneous body of knowledge within the subject. Within each section are units. A unit consist of a more related and homogenous body of knowledge and skills. The syllabus is structured in five columns: Units, Specific Objectives, Content, Teaching and Learning Activities and Evaluation. A description of the contents of each column is as follows: Column 1 – Units: The units in Column 1 are divisions of the major topics of the section. You are expected to follow the unit topics according to the linear order in which they have been presented. However, if you find at some point that teaching and learning in your class will be more effective if you branched to another unit before coming back to the unit in the sequence, you are encouraged to do so. This research will find out whether teachers prepare students in line with the biology curriculum.

Global and regional perspective of teacher factors on students' performance

According to data obtained from students in North Carolina by Jackson (2010) teacher effectiveness is higher after a transfer to a different school and teacher-school matching can explain a non- negligible part of teacher quality. Teachers whose students demonstrate higher achievement growth are less likely to transfer to another school. These results suggest that one reason teachers may desire to move is that they are a poor fit for their present schools. Thus a better school job matching may potentially increase productivity and student achievement in their former and new school. According to Fenech (2006), satisfaction at work may influence various aspects of work such as efficiency, productivity, absenteeism, turnovers rates, and intention to quit. Satisfied teachers are expected to hold their jobs longer, to be able to engage in more responsive, positive and consistent interaction with students, and to positively influence students‟ performance. The extrinsic factors evolve from the working environment while the actual satisfiers are intrinsic and encourage a greater effectiveness by designing and developing teachers higher level needs. The issues of motivation of teachers in education and the impact on academic performance are considered as an important aspect of effective learning. However, a learner‟s reaction to education determines the extent to which he or she will go in education.

A study of teacher absenteeism carried out in 2004 in Uganda found an average rate of teacher absenteeism of 27 percent considerably high than most countries.

According to a report based on three countries, Zambia, Papua and New Guinea on valuing of teachers there is a potential crisis in the teaching profession that threatens the ability of national government to reach internationally agreed targets to expand and

improve education. In many developing countries the teaching force is demoralized and fractured. The report focuses on factors in four areas conditions of the level of teachers, the situation as educators, the relationship with their local community and their voice in educational policy. This report concludes that teachers‟ poor payment adversely affects their status in the society hence poor performance. Etsy (2005) study in Ghana found that the teacher factors which significantly contributed to low academic achievement were incidences of lateness to school, absenteeism and in ability to complete the syllabus thus affecting students‟ performance in national examinations.

Teachers Factors Influencing Students' Performance

Antwi (1992), in Ghana, noted, that the teaching profession is still in the process of building up systematic education based on intellectual training. Consequently, some people with various levels of education, including those with no professional qualification have been employed as teachers. Probably some of the biology teachers currently on the field are not professionally qualified. Among all academic-based professions, it is only in teaching that non-professionals or those without the requisite professional qualification and training are allowed to teach subjects which are not of their special area (Antwi, 1992, p.132, 133). The study focused on exploration of differential views on Senior High School teacher factors that affect students‟ performance in biology.

Influence of Instructional Approaches on Students‟ Performance

Instructional Approach is a process by which an instruction module, instruction phase, or an entire course is delivered, and it takes the form of conference, demonstration, discussion, lecture, etc. One important aspect in the study of the sciences and biology is the method used during impartation of knowledge to the students. Although a great deal

of effort had been made in the Eastern Region to promote the teaching and learning of biology in the past. WAEC results in recent years do not paint the picture as such.

Damtse (2000) conducted a similar study and found out that most of the biology teachers did not make use of new method of teaching biology such as Inquiry, Discovery, and Group work.

Instructional methods can be teacher-centered, learner-centered or mixed approach. Quite often, teachers prefer methods that make their work easier based on their beliefs, personal preferences and norms of their disciplines (Watson, 2003). In this regard, some teachers believe that lessons should be teacher-centered, where the teacher is the expert and the authority in presenting information (Ahmad & Aziz, 2009). Nevertheless, teacher-centered methods are associated with inadequate stimulation of students‟ innovative capacities, intellectual thinking, memorization, cramming of facts, poor knowledge retention and high dependency among graduates (Adeyemi, 2008; McDowell, 2001; Tanner, 2009; Tella, et al.,(2010).

On the other hand, some teachers adopt learner-centered approaches, in which their role is restricted to facilitation of the teaching process (Ahmad & Aziz, 2009). Learner-centered methods are associated with imaginative, critical and creative skills; active participation of students in the learning process through discussions and intellectual engagement; as well as higher learning achievement and effectiveness in addressing problems of humanity (Ministry of Education, 2001;Eken, 2000; Curtin, 2005; Froyd, 2007; Ahmad & Aziz, 2009). Although teachers have the discretion to choose methods for delivering lessons to their students, Chika (2012) observes that learner-centered

pedagogy is a powerful strategy for improving learning achievement in examinations and application of knowledge and skills acquired.

Lawson (2007) conducted a similar study in Akuapem North District and found out that only a few of the teachers used materials that they could gather from the environment for science teaching. She also found out that there were no hands-on activities during science lessons to allow students to interact with the materials at their disposal.

Lucas (2001) on his part conducted a similar research in Apam District and found out that when teachers used group work in teaching biology and made it more practical-oriented the students were able to learn better and were able to discover things on their own.

Teaching biology through investigation, research activities and problem solving and by linking these with a focus on local environment achieves better understanding of biology as opposed to rote learning of scientific facts and theories for examinations after which learning ends. Also, in practical examinations, students show that they cannot use even rulers accurately for measurements. Hence, the claim that teaching of science in Ghana has become more theoretical than practical.

Activity -based methods of teaching, in the form of group work during practical, enable students to be actively involved in seeking information that can be applied to solve real life problems. By this method students are placed at the centre rather than the teacher and it‟s not text book centered. The activity method is used to teach science in which the child is placed at the center of the learning process and made to interact with materials and experience things for themselves.

These are the activity – based method and lecture (transfer) methods of teaching.

1). Activity - Based Method

The activity -based method of teaching consider students as very important in the instructional process, where teachers build on the students‟ experiences. Activity-based method actively engage students in the learning process for effective mastery of the subject matter and promotion of a positive attitude towards the subject. As noted by the Ministry of Education it its National Report on the Development of Education in Kenya, presented at the International Conference on Education in September 2001, teaching approaches adopted should make learning more learner-centered in order to promote imaginative, critical and creative skills in students resulting in better achievement of instructional objectives (Ministry of Education, 2001). In a learner-centered class, students take a participative role by leading discussions and teachers become facilitators. In this regard, teachers facilitate student‟s discussion and interject only when necessary,allowing students to put the language to use and explore aesthetics of learning materials (Eken, 2000; Ahmad & Aziz, 2009).

According to Froyd (2007), the standard features of a learner-centered pedagogy include collaborative learning, connecting new information to previous knowledge and critical thinking. Some scholars refer to learner-centered pedagogy as interactive learning. Interactive pedagogy may also include the use of media and involvement of students in fieldwork activities. Furthermore, interactive teachers allow for diverse learning styles among their students and encourage active involvement of all students, while helping them to improve in individual weaknesses (Curtin, 2005). Students are also encouraged to

ask questions, define problems and lead conversations (Chika, 2012). Besides, such methods connect students‟ world with learning pursuits in the classroom (Bush, 2006; Kumar, 2006). However, it is not sufficient to have an experience, if such is not discussed and shared, they may be forgotten rapidly. Sharing of experiences through group discussions improves the application of acquired knowledge and skills (Kumar, 2006). Learner-centered methods are advantageous in a number of ways, for instance, they promote democratic participation in the learning process, encourages critical thinking, meets student‟s communication needs and improves performance (Cummins, 2007). The positive impact of such methods have also been documented by Chika (2012), who indicate that interactive methods are more powerful in enhancing learning achievement than teacher-centered pedagogy. Kumar (2006) also indicates that interactive methods have higher impact in overall learning achievement than didactic classrooms. As noted by Arends (1997), learner-centered methods can be used to teach complex academic materials and can help teachers accomplish important social learning and human relations goals.

Advantages of the Activity – Based Method

The activity–based methods of teachings have the following advantages: Students are trained to easily identify problems with local interest and impact. Students are also encouraged to use local resources in locating information that can be used in problem resolution. It also extends the learning situation beyond the classroom. Teaching and learning become more realistic and meaningful to students who explore and share ideas together. High order thinking skills in the context of the problem, rather than seeing

problems as separated entities in the school programme is enhanced. Creativity, freedom of expression, initiative and leadership qualities are inculcated into students.

Disadvantages of the Activity-Based Method

Though this method is perceived to be one which helps students to explore, there are some disadvantages. They include the following: Lesson may take a very long time for students to go through the activity successfully. Students normally become frustrated especially, when they fail to discover or find the solution to a problem. Organizing, managing and controlling of students towards effective achievements of results can be difficult.

It can be an expensive method of teaching considering resources, materials and funds to be provided for the learning process. In spite of the disadvantages of the activity-based method of teaching it enable students have more hands on than minds-on experiences in the teaching and learning of science.

2. Lecture Method of Teaching

This is a one way process where the teacher transfers a body of knowledge to students according to a pre-planned scheme. The lesson is teacher- centered and the students are regarded as recipients of instruction. The teacher therefore ignores students in terms of what they might bring to the classroom. Teacher-centered methods are also known as traditional instructional methods, where teachers are at the center of classroom activities, including explanations and discussions (Ahmad & Aziz, 2009).Teacher centred method is behaviourist in nature. Teacher-directed learning that follow the instructivist approach which involves careful and meticulous planning of the curriculum and purposeful

instructional procedure employed by the teacher. Under such circumstances, students have a definite and fixed perception of their roles as listeners, while teachers are expected to be the talkers and „custodians of knowledge". This implies that students" active participation is minimal, until the teacher authorizes them. Tanner (2009) found that teachers dominated classroom talk and students talked only when called upon to answer questions. Teacher-centered methods are however, associated with a number of shortcomings. For instance, Adeyemi (2008) notes that lecture, which is the most common method, does not stimulate students" innovation, inquiry and scientific thinking but rather encourages students to cram facts, which are easily forgotten. According to McDowell (2001), instructional methods that encourage memorization and reproduction are short of knowledge that can be used to solve problems in new situations. Tella, Indoshi and Othuon (2010) noted that teacher-centered methods often result to students not enjoying lessons and missing the benefits of intellectual discovery.

Advantages of the Lecture Method

(i) More topics are covered in a relatively short period of time.

(ii) Students are given good training and insight into the techniques of analyzing issues.

(iii) The method is very suitable for teaching very large classes.

It is very easy in using to deliver knowledge. With the advantages stated above this method has numerous disadvantages which makes it unsuitable to use in practical lessons.

Disadvantages of the lecture method

Lessons, which are not interesting and also very long, may bring about boredom in the teaching process. Class involvement, class participation and process skill development are not encouraged. The method cannot be effective, in teaching some specific concepts and subjects at the senior high school level. Students understanding are rarely-assessed during lectures, because students are not encouraged to participate fully in the lesson.

It leads more to rote learning and does not give actual understanding of science concepts.

The missing link between learning biology to pass an examination and learning biology to select a career can be attributed to the need for innovativeness, improvisation and foresight by teachers to consciously expose the students to biology in action through the use of modern teaching aids, application of videos, education tours etc. There is the need by the biology teacher to demystify the teaching and learning of biology and science as a whole and to make the process more interesting and to promote the inquisitiveness of the students. Three areas to be addressed to demystify the teaching and learning of biology and all the sciences and also make the process more interesting are (i) introducing new ideas, knowledge and educational technologies (including audio-visuals aids) and (ii) improving the teaching and learning environment (iii) embarking on outreach programmes.

Influence of Teacher Job Satisfaction on Students' Performance

Dissatisfied teachers who want to be transfer to another school may be poor performers both because of general motivational factors (Rockoff 2004; Hanushek, Kain & Rivkin 2005), and also because they are simply waiting to move on to a different location, putting low effort into their current work duties and disregarding any longer term plans

for their students. Teachers‟ motivation is likely to be a relevant factor affecting students‟ learning.

Motivated teachers are typically those who have chosen to be in a given school, while teachers just waiting to move to another school may be rather unmotivated. Using data of students in North Carolina, Jackson (2010) shows that teacher effectiveness is higher after a transfer to a different school and teacher-school matching can explain a non-negligible part of teacher quality. Teachers whose students demonstrate higher achievement growth are less likely to transfer to another school. These results suggest that one reason teachers may desire to move is that they are a poor fit for their present schools and thus a better school job matching job may potentially increase the teacher productivity and greatly influence students‟ performance. Satisfaction at work may influence various aspects of work such as efficiency, productivity, absenteeism, turnovers rates, and intention to quit, and finally employees‟ well-being. This premise holds for a variety of employees, including qualified educational staff. Indeed, educators‟ well-being has serious implications for the quality of the education they provide (Fenech, 2006). Given the importance of job satisfaction, special attention should be dedicated to determine why some teachers express dissatisfaction in their jobs. Fenech (2006) reported poor work conditions, low salaries, heavy workloads, unrealistic expectations from managers, low professional status, organizational conflict, and reduced autonomy as important factors that contribute to teacher dissatisfaction. For teachers, satisfaction with their career may have strong implications on student learning. The hypothesized outcomes of job satisfaction include the use of new techniques in class for better performance which, in turn, may be conducive to students' better achievement.

While the study of job satisfaction is immense among organizational behavior researchers, it is interesting to note that factors influencing job satisfaction similarly influence job performance, which in turn creates the context for the job. As such, the behaviors exhibited by employees that contribute to organizational effectiveness are said to be variables that have effects on „the psychological, social, and organizational context" of an employee"s work (Reio & Kidd, 2007). This kind of contextual performance includes employee"s doing such things as volunteering for additional assignments, persisting in completing difficult tasks, assisting colleagues in the completion of their tasks, and supporting organizational policies and goals despite disagreement with them (Reio & Kidd, 2007).

Influence of Teachers Knowledge about Knowledge on Students" Performance

For many years, educational scholars and policy makers have been concerned with the factors that influence teaching and learning. The qualifications of teachers have been assumed to be one of the critical factors. However, studies that examined the influences of teachers" subject matter knowledge on student achievement have produced mixed findings. Several reviews of empirical studies on the relationship between teachers" subject matter knowledge and the quality of teaching have found that the studies fail to yield consistent findings (Darling-Hammond, 2000; Wilson, Floden, & Ferrini-Mundy, 2001). Some studies have shown positive correlation between teachers" subject matter knowledge and student achievement (e.g., Chiang, & Miller, 1997; Darling-Hammond, 2000; Rowan).

This paper examines the reasons for these disparities. That is, the focus of this paper is not on the question of whether teachers‟ subject matter knowledge influences student learning. Such an influence is assumed. It is a question of why research has drawn different relationships between teachers‟ subject matter knowledge and student learning. That is, the main focus of our study is to find different kinds of variables that might contribute to variations in the strength and direction of the relationship by examining quantitative studies that relate mathematic teachers‟ subject matter knowledge to student achievement in mathematics.

Influence of Teachers Knowledge about Learners on Students‟ Performance

Recent research studies into effective teaching tend to indicate that teaching is not any longer considered as a linear process of transmitting knowledge from the teacher to students, or from educational materials to students. In turn, the demands on teachers mean that not only they need to be able to keep order and provide useful information to students, but also to be increasingly effective in enabling a diverse group of students to learn ever more complex material and develop a wider range of skills (Arends, 2004; Rivkin *et al*., 2000). Clearly, in today‟s schools, teachers must be prepared to teach a diverse population of students. That is, an understanding of how particular teaching, subjects, topics, problems, or issues are organized, presented, and adapted to the diverse interests and abilities of learners, and presented for instruction. This can be seen that teachers have always needed to address the diverse learning needs of their students; current and projected demographic trends prompt many educators to believe that awareness of and sensitivity to diverse learners have become even more pressing needs (Gay, 2003).

Knowledge of learners (KLS) consists of different elements namely the empirical and cognitive knowledge of learners. Empirical or social knowledge is a knowledge of what children of a particular age range are like, their social nature, how they behave in classrooms and schools, their interests and preoccupations, how contextual factors such as non-routine events or adverse weather can have an effect on their works and behaviours, and the nature of the child-teacher relationship.

Besides that, cognitive knowledge of learners consists of two elements. First, there is the knowledge of theories of child development, which informs practice. The second element is context-bound to a particular group of learners: the kind of knowledge that grows from regular contact with these learners, of what they know, of what they can do, and of what they are likely to be able to understand. From this kind of knowledge come the skills and processes of adaptation activities and representations to the needs of particular learners; in other words of differentiation for differing abilities. Effective teachers recognize differences among their learners and have the capacity and willingness to understand the impact of dissimilar backgrounds and abilities on learning. Understanding and appreciating diversity, successful teachers will be able to make effective decisions that allow them to respond to their students in appropriate ways

Influence of Teachers Content Knowledge (CK) on Students' Performance

Content knowledge (CK) is knowledge about the actual subject matter that is to be learned or taught. The content to be covered in high school biology is very different from the content to be covered in a graduate course on computer science or art history. Clearly, teachers must know and understand the subjects that they teach, including knowledge of central facts, concepts, theories, and procedures within a given field; knowledge of

explanatory frameworks that organize and connect ideas; and knowledge of the rules of evidence and proof (Shulman, 1986). Teachers must also understand the nature of knowledge and inquiry in different fields. For example, how is a proof in mathematics different from a historical explanation or a literary interpretation? Teachers who do not have these understandings can misrepresent those subjects to their students (Ball & McDiarmid, 1990).

Influence of Teachers' Pedagogical Content Knowledge (PCK) on Students' Performance

One of the characteristics of good teachers is that they possess a substantial amount of specialised knowledge which is referred to as pedagogical content knowledge (PCK). Pedagogical content knowledge (PCK) is the knowledge of how to transform formal subject matter knowledge into meaningful learning outcomes for students and it also involves an understanding of a particular topic and how teachers explain the topic or concepts to make sense to the students in the classroom. That is teachers are always expected to exhibit a basic set of pedagogical knowledge and skills in the classroom, which involves a good knowledge of their teaching subjects, teaching methods, skills and knowledge of child development. This is emphasized by (Hill, Ball & Schilling, 2004) that "In performing the process of teaching and learning, teachers bring alone with them the knowledge components, contents knowledge, good knowledge about the students and the various ways of using content knowledge in a classroom"s teaching and learning process indeed play a role" and the integration of all these knowledge is recognized as pedagogical content knowledge (PCK). Teachers" knowledge of subject matter continues to draw an increasing attention from policy makers in recent years all over the world,

since more emphasis is given to highly qualified teachers (Crespo & Nicol, 2006; Hill, Rowan, & Ball, 2005). The National Council of Teachers of Mathematics (2000) reported that teachers who have strong subject matter knowledge give details in their lesson, link the topic to other topics, ask students many questions, and stray from the textbook. Subject matter knowledge of teachers has been an interest for educators, but more recently there has been a shift to pedagogical content knowledge (Johnston & Ahtee, 2006). PCK concerns how teachers relate their subject matter knowledge to their pedagogical knowledge and how subject matter knowledge is related to the process of pedagogical reasoning. In the teaching and learning of biology in secondary schools for proper understanding, in-depth pedagogical content knowledge of the biology teachers should include, knowing what topics are typically difficult for students and why, knowing different representations that are useful for teaching a specific idea, and knowing ways to develop students‟ understanding of biology. According to Ball (2003), a teacher with good biology pedagogical content knowledge can break down biology knowledge into less polished and abstract forms, thus making it accessible to students who are at different cognitive levels. A teacher with good pedagogical content knowledge can unpack the biology into its discrete elements and can explain a concept or procedure at a level that includes the steps necessary for the students to make sense of the reasoning. He further indicated that teachers with good pedagogical content knowledge understand where students may have trouble learning the subject and should be able to represent biology concepts in a way that their students can comprehend its structure and avoid these difficulties. In order to prepare effective biology teachers, a teacher training program

must focus on all three types of knowledge: content knowledge, pedagogical skills, and pedagogical content knowledge.

Influence of Teacher Motivation on Students' Performance

Word motivation refers to the psychological processes that influence individual behavior with respect to the attainment of workplace goals and tasks. Motivation within an educational context, has been defined (Palmer, 2009) as any means that commences and sustains learning behaviour, a pre-requisite and co-requisite for meaningful learning to occur. Therefore, motivation has the potential to be influential to the teachers teaching process in biology. Within the definition, two distinct areas have been highlighted within motivation (Lin 2007), these are extrinsic motivation, which focuses on the achievements from doing the activity and intrinsic motivation which focuses on the innate satisfaction derived from doing the activity. Extrinsic motivation occurs when there is an external factor or reward, influencing the act unlike intrinsic motivation where the action is completed without any obvious external factors and/or rewards. Yet, Hidi & Harackiewicz (2000) have discussed how it is important to deal with all aspects of an individual‟s motivation especially for those who are un-motivated within academia because this has the potential to optimise academic work. It is important to note that motivation is *not* a stable concept within any individual. Indeed, the level of motivation depends on the environment along with other extrinsic and intrinsic factors (Barkoukis, Tsorbatzoudis, Grouios & Sideridis., 2008) and it is domain-specific (Linnenbrink & Pintrich, 2002).Therefore, this means that a student‟s motivation can fluctuate, in turn this can make it difficult to measure either by observation or direct questioning; this presents limitations to the researcher and the research obtained (Hardré, Davis &

Sullivan, 2008). Measuring the determinants and consequences of work motivation is complex because these psychological processes are not directly observable and there are numerous organizational and environmental obstacles that can affect goal attainment.

External regulation‟ is the most representative form of extrinsic motivation and involves the person undergoing an activity to gain a reward or avoid punishment (Barkoukis *et al*., 2008). „Introjection‟ involves an individual self-involved with the activity where the individual is beginning to understand the reason to their actions (Barkoukis *et al*., 2008; Deci & Ryan, 2000).Finally, identification‟, this is the completed form of internalised extrinsic motivation because the individual values their behaviour and so, engagement is taken as being decided upon by the individual (Barkoukis *et al*., 2008; Deci & Ryan, 2000). Intrinsic motivation includes: "the intrinsic motivation to know, to accomplish and to experience stimulation"(Barkoukis *et al*., 2008, p.40,). „Intrinsic motivation to know‟ refers to the engagement in an activity to improve cognition and is representative of intrinsic motivation in education because it links to conventional educational settings (Barkoukis *et al*., 2008).„Intrinsic motivation to accomplish‟ refers to engagement in an activity for the satisfaction when trying to achieve (Barkoukis *et al*., 2008). Researchers (Barkoukis *et al*., 2008; Deci & Ryan, 2000) also discuss „a motivation‟ as third aspect of motivation as defined in the self-determination theory. This third component to motivation (originally taken from Deci & Ryan, 2000) refers to the absence of how to behave. Amotivation is when the individual does not observe the effects between their actions and the outcomes (Barkoukis *et al*., 2008; Deci & Ryan, 2000). This type of motivation has strong links to "learned helplessness, where individual withdraw effort because of perceptions of incompetence and loss of control" (Barkoukis *et al*., 2008,

p.40). The three concepts of motivation (intrinsic, extrinsic and amotivation) are placed on a „self-determination continuum" running from a motivation, where there are low levels of self-determination, to extrinsic motivation with medium levels of self-determination, through to intrinsic motivation where the individual"s behaviour relates to high level of self-determination (Barkoukis *et al*., 2008 and Deci & Ryan, 2000).

Effect of Teacher's Qualifications on Students' Academic Performance

Education is the compilation and product of many and varied resources. Among these resources, teachers stand out as key to realizing the high standards that are increasingly emphasised in schools and school systems across countries (Rice, 2003). In a meta-analysis that focused on empirical studies of teacher quality and qualifications, Rice found five broad categories of teacher attributes that appeared to contribute to teacher quality: "(i) experience, (2) preparation programmes and degrees, (3) type of certification, (4) coursework taken in preparation for the profession, and (5) teachers" own test scores"(p12). Rice posited further that, despite the general agreement about the importance of high-quality teachers, researchers, practitioners, policy makers and the public have been unable to reach a consensus about what specific qualities and variables make a good teacher. According to Cavalluzzo (2005), findings related to teachers" academic degrees (Bachelor, Master"s and Doctorate) were inconclusive. Jones (2007) asserted that teachers played the main role in promoting academic achievement in students. This appeared to support earlier studies by (Rice 2003; Zuzovsky & Libman, 2003). These findings showed positive effects of teachers' degrees on students' performance. Vanderoort, Amrein-Beardsley and Berliner (2004) found that students in classes taught by National Board Certified Teachers outperformed their counterparts

taught by non-National Board Certified Teachers in Arizona. Koedel and Betts (2007) found in a related study that teacher quality was an important predictor of a student's achievement.

Although there appears to be no firm studies on the cause of fluctuating performance from students in Senior High School Biology, teacher qualifications according to the Ghana Education Service (GES) easily appear to be the immediate cause (GES, 2007). Viadero (2007) equally noted that the idea of keeping highly qualified teachers for all schools was a good one. In Ghana, various governments have initiated different efforts targeted at keeping academically and professionally qualified teachers in schools.

Teachers are individuals with different backgrounds and ambitions who worked in varied school. As a result, students' performance is affected by factors other than the instruction they receive (including their socio-economic status (SES), race, and class size) teacher effectiveness according to them was also affected by individual and school factors that influenced how they provided instruction. While there is enough evidence that teacher quality is a key determinant of students‟ learning, little is known about which specific observable variable of teachers could account for this impact (Rivkin, Hanushek & Kain, 2005; Aaronson, Barrow & Sander, 2007; and Metzler & Woessmann, 2010). However, according to Mezieobi (2008) no matter how well designed the biology curriculum is, no matter how well intentioned the objectives of biology curriculum, no matter the wealth of available biology curriculum for effective instructional delivery, the core of the subject of the biology curriculum rests in the professionally trained and qualified biology teacher who must translate the programme into action.

According to research findings by Hanushek and Rivkin (2006) and Metzler and Woessmann (2010), virtually, the only attribute that has shown to be more frequently significantly correlated with students' achievement is teachers‟ academic skills measured by scores of students on achievement tests. This again supports the reason why the current study tried to use teacher designed SPTISS to find out how the selected teacher variables could predict students‟ achievement. Metzler and Woessmann (2010) and Rothstein (2010) also found that teacher subject knowledge exerted a statistically and quantitatively significant impact on students' achievement.

Many teacher variables have influence on students' achievement in schools. However, the interests to policymakers according to Clotfelter, Ladd and Vigdor (2007) are knowledge about which specific variables or credentials of teachers are most predictive of students' achievement. Such information, they contended, could enable policymakers concerned about either the overall level or the distribution of students' achievement to design better licensure, salary and other teacher policies. Clotfelter et al., (2007) in the same study also found that on the average, elementary teachers who had completed master‟s degree were no more or less effective than others with lower academic qualifications at raising students' achievement.

According to Goe and Stickler (2008), the first strand of the framework for defining teacher quality focused on teacher qualifications which were also referred to as teacher inputs. In their opinion therefore, teachers‟ qualifications were among the important resources teachers brought to the classroom. The reliance on paper qualification as determinants for teacher quality seemed to hold sway in modern educational systems (Goe & Stickler, 2008). As a result, when students‟ do well or do not do well in

examination, the qualification of teachers is invariably interrogated. The qualifications teachers can hold that may enable them to teach at the SHS level in Ghana range from Diploma, Bachelors, and Masters level education. However, there appear to be no studies carried out on the impact of teachers‟ highest/lowest qualifications on students‟ performance/ achievement in SHS in Ghana. Teachers therefore enter the teaching profession with different academic qualifications. This may explain the fluctuating performance of students in SHS biology.

The majority of earlier researchers have found that teachers‟ certification levels had a positive impact on students‟ achievement especially in mathematics and science (Goldhaber & Brewer, 2002; Wayne & Youngs, 2003). In addition to these findings, Rice (2003) found that the correlations among teacher qualifications and students‟ achievement varied substantially across grades and across subjects. However, other findings have suggested that students taught by fully licensed and partially licensed practitioner teachers performed better on State–Mandated achievement tests than students of Non-Certified teachers (Boyd, Lankford, Loeb, & Wyckoff, 2008a).

A study by Harris and Sass (2007) on the effects of teacher education and training on students‟ performance, using student, school, and teacher fixed effects in the United States of America, found that advanced degrees did not contribute to teachers' effectiveness and were even associated with reduced effectiveness in high school mathematics and middle school reading. Contrary to the perception that teacher certification status was linked to the level of students‟ achievement in schools. In other studies carried out in the USA by Kaplan and Owings (2002), Cochran-Smith (2005), Lasley, Siedentorp and Yinger (2006) and William (2007) on teacher quality, it was

found that having highly qualified teachers within a classroom was essential to students‟ achievement in school. These earlier findings recognised the fact that teachers were most directly positioned to influence students' achievement with the requisite academic and professional qualifications. Different people rate the influence of teacher qualifications on students' achievement in school differently. This study is yet another attempt to find out how teacher qualifications can predict the outcome of students‟ performance in SHS in the Eastern Region of Ghana

According to Lewis (2005), if some students were asked who a highly qualified teacher was, they may say the teacher who spent time with them and made the class content clear and attainable to them. Yet others may say that unqualified teachers were the ones who were boring and did not connect with them. In his view, therefore students‟ appear not to care about teachers‟ educational certificates and years of teaching experience but were concerned more about the way(s) teachers facilitated their learning regardless of paper qualifications. As a corollary, Anobi (2006) recognised that as true educators, teachers were always learning and there was the need to continue to define the meaning of a highly qualified teacher as there is more to teaching than content knowledge and best practices. In support of earlier findings by Greenberg, Rhodes, Ye and Stancavage (2004), Anobi (2006) agreed with their respective studies that postgraduate qualifications at masters or higher level were not significantly related to students' school achievement.

In a study, Darling-Hammond (2000), using the National Assessment of Educational Progress (NAEP) in reading and mathematics scores in her analysis of teacher qualifications and students' achievement in the USA, examined the correlation between the percentage of well-qualified teachers in the state and students‟ NAEP scores. The

results showed that, teacher qualifications were significantly and positively correlated with students‟ achievement. In another development, Darling-Hammond, Holtzman, Gatlin, and Heillig (2005) examined teacher and student data to determine whether teacher certification made a difference in a student's academic outcome. In the study, they compared certified teachers with uncertified ones. They found that uncertified teachers and those with non-standard certifications had negative effects on students‟ achievement gains. This may therefore call for further study into the relationship, if any, between teachers‟ qualifications in terms of type of certification and students‟ achievement. This is imperative in view of the fact that, there appears to be very divergent views on the influence of teacher academic and professional attainment as predictors of students' achievement in SHS biology in Ghana.

Sanders, Ashton, and Wright (2005) carried out a study on the relationship between teacher qualifications and students' achievement in two North Carolina School Districts in the United States of America. Specifically, they compared teachers with National Board Certification (NBC) to other teachers without the NBC. They found that those teachers with the NBC were not more effective compared to the Non-National Board Certificate holders. They also found that the variation among teachers with the same certification status was sufficiently large.

From the foregoing, it appears that teachers' academic and professional qualifications are factors that could be used as bases to predict the achievement level of students‟ in schools.

Education is the compilation and product of many and varied resources. Among these resources, teachers stand out as key to realizing the high standards that are increasingly

emphasised in schools and school systems across countries (Rice, 2003). In a meta-analysis that focused on empirical studies of teacher quality and qualifications, Rice found five broad categories of teacher attributes that appeared to contribute to teacher quality: "(i) experience, (2) preparation programmes and degrees, (3) type of certification, (4) coursework taken in preparation for the profession, and (5) teachers" own test scores"(p12). Rice posited further that, despite the general agreement about the importance of high-quality teachers, researchers, practitioners, policy makers and the public have been unable to reach a consensus about what specific qualities and variables make a good teacher. According to Cavalluzzo (2005), findings related to teachers" academic degrees (Bachelor, Master"s and Doctorate) were inconclusive. Jones (2007) asserted that teachers played the main role in promoting academic achievement in students. This appeared to support earlier studies by (Rice 2003; Zuzovsky & Libman, 2003). These findings showed positive effects of teachers' degrees on students' performance. Vanderoort, Amrein-Beardsley and Berliner (2004) found that students in classes taught by National Board Certified Teachers outperformed their counterparts taught by non-National Board Certified Teachers in Arizona. Koedel and Betts (2007) found in a related study that teacher quality was an important predictor of a student's achievement.

Although there appears to be no firm studies on the cause of fluctuating performance from students in Senior High School Biology, teacher qualifications according to the Ghana Education Service (GES) easily appear to be the immediate cause (GES, 2007). Viadero (2007) equally noted that the idea of keeping highly qualified teachers for all schools was a good one. Teachers are individuals with different backgrounds and

ambitions who worked in varied school. Therefore students' performance is affected by factors other than the instruction they receive (including their socio-economic status (SES), race, and class size) teacher effectiveness according to them was also affected by individual and school factors that influenced how they provided instruction. While there is enough evidence that teacher quality is a key determinant of students‟ learning, little is known about which specific observable variable of teachers could account for this impact (Rivkin, Hanushek & Kain, 2005; Aaronson, Barrow & Sander 2007; and Metzler & Woessmann, 2010). However, according to Mezieobi (2008) no matter how well designed the biology curriculum is, no matter how well intentioned the objectives of biology curriculum, no matter the wealth of available biology curriculum for effective instructional delivery, the core of the subject of the biology curriculum rests in the professionally trained and qualified biology teacher who must translate the programme into action.

According to research findings by Hanushek and Rivkin (2006) and Metzler and Woessmann (2010), virtually, the only attribute that has shown to be more frequently significantly correlated with students' achievement is teachers‟ academic skills measured by scores of students on achievement tests. This again supports the reason why the current study tried to use teacher designed SPTISS to find out how the selected teacher variables could predict students‟ achievement. Metzler and Woessmann (2010) and Rothstein (2010) also found that teacher subject knowledge exerted a statistically and quantitatively significant impact on students' achievement.

Many teacher variables have influence on students' achievement in schools. However, the interests to policymakers according to Clotfelter, Ladd and Vigdor (2007) are knowledge

about which specific variables or credentials of teachers are most predictive of students' achievement. Such information, they contended, could enable policymakers concerned about either the overall level or the distribution of students' achievement to design better licensure, salary and other teacher policies. Clotfelter et al., (2007) in the same study also found that on the average, elementary teachers who had completed master‟s degree were no more or less effective than others with lower academic qualifications at raising students' achievement.

According to Goe and Stickler (2008), the first strand of the framework for defining teacher quality focused on teacher qualifications which were also referred to as teacher inputs. In their opinion therefore, teachers‟ qualifications were among the important resources teachers brought to the classroom. The reliance on paper qualification as determinants for teacher quality seemed to hold sway in modern educational systems (Goe& Stickler, 2008). As a result, when students‟ do well or do not do well in examination, the qualification of teachers is invariably interrogated. The qualifications teachers can hold that may enable them to teach at the SHS level in Ghana range from Diploma, Bachelors, and Masters level education. However, there appear to be no studies carried out on the impact of teachers‟ highest/lowest qualifications on students‟ performance/ achievement in SHS in Ghana. Teachers therefore enter the teaching profession with different academic qualifications. This may explain the fluctuating performance of students in SHS biology.

The majority of earlier researchers have found that teachers‟ certification levels had a positive impact on students‟ achievement especially in mathematics and science (Goldhaber & Brewer, 2002; Wayne & Youngs, 2003). In addition to these findings, Rice

(2003) found that the correlations among teacher qualifications and students‟ achievement varied substantially across grades and across subjects. However, other findings have suggested that students taught by fully licensed and partially licensed practitioner teachers performed better on State–Mandated achievement tests than students of Non-Certified teachers (Boyd, Lankford, Loeb, & Wyckoff, 2008a).

A study by Harris and Sass (2007) on the effects of teacher education and training on students‟ performance, using student, school, and teacher fixed effects in the United States of America, found that advanced degrees did not contribute to teachers' effectiveness and were even associated with reduced effectiveness in high school mathematics and middle school reading. Contrary to the perception that teacher certification status was linked to the level of students‟ achievement in schools. In other studies carried out in the USA by Kaplan and Owings (2002), Cochran-Smith (2005), Lasley, Siedentorp and Yinger (2006) and William (2007) on teacher quality, it was found that having highly qualified teachers within a classroom was essential to students‟ achievement in school. These earlier findings recognised the fact that teachers were most directly positioned to influence students' achievement with the requisite academic and professional qualifications. Different people rate the influence of teacher qualifications on students' achievement in school differently. This study is yet another attempt to find out how teacher qualifications can predict the outcome of students‟ performance in SHS in the Eastern Region of Ghana

According to Lewis (2005), if some students were asked who a highly qualified teacher was, they may say the teacher who spent time with them and made the class content clear and attainable to them. Yet others may say that unqualified teachers were the ones who

were boring and did not connect with them. In his view, therefore students‟ appear not to care about teachers‟ educational certificates and years of teaching experience but were concerned more about the way(s) teachers facilitated their learning regardless of paper qualifications. As a corollary, Anobi (2006) recognised that as true educators, teachers were always learning and there was the need to continue to define the meaning of a highly qualified teacher as there is more to teaching than content knowledge and best practices. In support of earlier findings by Greenberg, Rhodes, Ye and Stancavage (2004), Anobi (2006) agreed with their respective studies that postgraduate qualifications at masters or higher level were not significantly related to students' school achievement.

In a study, Darling-Hammond (2000), using the National Assessment of Educational Progress (NAEP) in reading and mathematics scores in her analysis of teacher qualifications and students' achievement in the USA, examined the correlation between the percentage of well-qualified teachers in the state and students‟ NAEP scores. The results showed that, teacher qualifications were significantly and positively correlated with students‟ achievement. In another development, Darling-Hammond, Holtzman, Gatlin, and Heillig (2005) examined teacher and student data to determine whether teacher certification made a difference in a student's academic outcome. In the study, they compared certified teachers with uncertified ones. They found that uncertified teachers and those with non-standard certifications had negative effects on students‟ achievement gains. This may therefore call for further study into the relationship, if any, between teachers‟ qualifications in terms of type of certification and students‟ achievement. This is imperative in view of the fact that, there appears to be very divergent views on the

influence of teacher academic and professional attainment as predictors of students' achievement in SHS biology in Ghana.

Sanders, Ashton, and Wright (2005) carried out a study on the relationship between teacher qualifications and students' achievement in two North Carolina School Districts in the United States of America. Specifically, they compared teachers with National Board Certification (NBC) to other teachers without the NBC. They found that those teachers with the NBC were not more effective compared to the Non-National Board Certificate holders. They also found that the variation among teachers with the same certification status was sufficiently large. A study by Adeogun (2001) in Nigeria found that the quality of any education system depends on the quality of teachers. Review of related literature indicates that the most important school-based determining factor of students achievement is the teacher quality (Rockoff, 2004; Rivkin *et al*., 2005; Aaronson *et al*., 2007).Therefore, there is need to assess the characteristics of the secondary school teachers in terms of qualification, experience and teaching methodology in order to ensure quality of education given to the youths. The teachers of SMT should be in-serviced where gaps are identified to enable them to cope with the requirements of the dynamic school curriculum (Murunga,Kilaha & Wanyonyi, 2013).

The educators, government, parents and society in general have constantly been interested in the academic achievement of students (Lydiah & Nasongo, 2009). According to Adeyemi (2010), teachers play an important role in determining the students‟ academic achievement. Researchers have never reached a consensus on the specific teacher factors that influence students‟ academic achievement (Rivkin et al., 2005). Some studies found that teachers‟ experience and educational qualifications

significantly influenced students‟ academic achievement (Ankomah, Koomson,Bosu & Oduro 2005; Asikhia, 2010; Njeru and Orodho, 2003; Olaleye, 2011; Yala and Wanjohi, 2011). When conducting research on factors contributing to under achievement of Zambian female students in OLevel Physics examinations, Maguswi (2011) found that lack of qualified teachers of Physics had a significant contribution. Moreover, a study done by Adaramola and Obomanu (2011) in Nigeria found that lack of qualified teachers led to consistent poor performance of students in SMT subjects.

From the foregoing, it appears that teachers' academic and professional qualifications are factors that could be used as bases to predict the achievement level of students‟ in schools. It is in the light of this observation that the current study tried to find out if teacher related factors could serve as predictors of students‟ performance in SHS biology.

Teaching Experience and Students‟ Academic Performance

This section intends to briefly discuss the relationship (if any) between teachers‟ professional experience and possible academic performance of the students the teacher teaches. This implies that an attempt to establish a common notion that the more experienced a teacher is, the more productive he will be in his teaching and the more likely his students will perform more brilliantly academically in their internal and external school examinations than those students taught by an inexperienced teacher.

The point being emphasized is that experience and productivity are interrelated. Experience has been defined in the Longman Dictionary (2005) as knowledge or skill gained from doing a job or activity for a long time. In the same vein, attempts have been made by several writers and researchers to correlate experience and productivity in any human organization, including educational institutions. Gross and Harrist (1995)discard

the notion that more experienced principals and teachers demonstrate greater executive and professional responsibility than less experienced ones or that the length of teaching experience positively correlated with productivity or age of the teacher is a determinant of efficiency and effectiveness.

The researcher however concluded that it is preferable to embark on advanced training and retraining programmes for teachers since experience alone does not necessarily make one a more effective teacher. Anderson (1991), in his own study titled "Production of Academic Achievement as a Function of Teachers Experience and Salaries", came up with the findings that teacher‟s experience is an important factor in students‟ academic performance. However, most of these researchers do not use or test other teacher variables to convince us that there is absolute unrelatedness between teaching experience and effectiveness in the classroom. One may meet principals or teachers who might have spent comparatively less number of years in training or in classroom exhibiting and employing exceedingly more brilliant administrative techniques and teaching strategies than some of their counterparts who nearly spent most part of their teaching career periods either in administrative capacity or practicing classroom teachers. From all the aforementioned discussions we can (confidently and unambiguously) state that it is possible for one to have taught for five or more years and have just one year‟s experience. This refers to some teachers who, despite the long years they have put in to teaching, continue using and repeating the same notes for students year in and year out, and who have refused to develop themselves academically and professionally but continue to quote out-dated principles of teaching and using archaic or obsolete methodologies. On the other hand, there is that teacher who has spent just five years or

less in teaching but who is very innovative, dynamic, pragmatic and democratic, and who is applying and using different methods in teaching, matching methods with the current situation and circumstances, thinking ahead, projecting and forecasting for improved effective teaching and learning. This teacher can be described as an „experienced" teacher as a result of his progressive mind.

From the ongoing discussion on the relationship between teaching experience and effectiveness with particular reference to classroom teaching and the output, students" academic achievement seems to be controversial. So far, there is no dichotomized line being drawn between the two variables.

Previous works conclude that experience cannot totally be devoid of effectiveness in classroom depending on the individual"s intelligence, acquired skills, supporting instructional materials, the environment itself and the students themselves.

Teaching and Learning Environment

The classroom, laboratory and the school environment can be made conducive to the teaching and learning of biology if the following issues are considered; the capability of the teachers to improvise by preparing simple models where teaching models are not available, using demonstration and activity kits, introducing new ideas and technologies (computers and internet) where available in teaching

Over viewing misconceptions and inhibitions on the part of students (mindset) that certain subjects or areas are too difficult or irrelevant, while some topics are considered not relevant to the topics to be studied. Adequate knowledge of the syllabus by reducing the conflicting demands and contradictions of the West African Examinations Council (WAEC) and Ghana Education Service (GES) syllabus which calls for comprehensive

lesson plans across board, whereby fundamental principles are taught first; Provision of logistics and other resources to support teaching, such as computers, projectors etc; Arrangement for distinguished scientists to talk to the students on debatable issues on science and society or science in action;

Experimentation with demonstration must be taken more seriously and handled with vigour and not as mere activities or games as pertains in GAST textbooks. Adepoju (1991) described the approach used by many teachers of science as one which does not give room for students to develop their intuition, imagination and creative abilities. The minds of the students must be disabused from looking for quick fix approaches to pass their examinations instead of going through the practical approach.

Computer Assisted Learning (CAL) can also be used to make lessons interesting. CAL is a system of educational software of pre-programmed tests for self- assessment on a computer where at each stage a correct answer is required before proceeding to the next item. CAL, unlike the textbook approach is interactive. Research in other countries such as South Africa (Naidoo, 1999), Malaysia (Gharzali & Ismail, 1997) and Greece (Olive, 1997) has shown that using computers when teaching stimulates learning and is good for concept development, concept formation and concept reinforcement. It is also thought provoking, encourages group work and also allows students to manipulate and discover things on their own. Experiments can be conducted on computers without any resource to physical apparatus. Common dry laboratory simulations can be used. Simulations act as further aid to understanding the scientific concepts. Graphs and statistical charts can be drawn using MS-Excel to demonstrate correct techniques of graphing without recourse to graph paper or ruled boards.

Teaching and learning of biology can also be made interesting by relating the topics to science and society and using illustrative examples from new and emerging science and technologies (NEST) to challenge students on new ideas and investigate them through critical observation, recording and analysis of the results. Such projects will demonstrate how things work in practice compared to ideal situations and will serve to remind the students of the limitations of humanity.

According to Young (1990), science is a doing subject. He also stated that science is the system of knowing about the universe through data collection by observation and controlled experiment. Students must observe and experience biology in action in the schools which will set the stage for career selection. Therefore, educational visits to some industries such as Uniliver, VALCO and other industries to observe and study processes and products and the development of the technologies utilized in industry.

Identification of the Research Gap

The above reviewed literature presents studies carried out in different parts of the globe, on matters pertaining to the teacher factors affecting the performance of learners. These studies have been carried out in other countries, but only a few studies have been carried out in Ghana which are addressing factors affecting students‟ performance such as school environment, instructional materials, efficiency in utilization of the specified teaching period but none has addressed the teacher related factors in the two districts of the Eastern region . This study aimed to fill the missing knowledge gap on the teacher factors affecting students‟ performance in biology, with the information and data obtained from senior high schools in the two districts of the Eastern region.

CHAPTER THREE

RESEARCH METHODOLOGY

Overview

The chapter describes the research design used for the study. It also describes the population, the sampling procedure and the instrumentation. The chapter gives the description of the validity and reliability of the instrument. This is followed by the description of data collection procedure and the method of data analysis.

Research Design

The design for this study was the descriptive survey. This design seeks to find answers to the questions generated from the statement of the problem. With this type of design the researcher attempted to find answers to questions by analyzing the variables that relate to the teacher factors affecting the academic performance of students in biology in the two districts of the Eastern Region.

Profile of the Study Area

The study was conducted among the Senior High Schools in two districts of the Eastern region. The two districts are New Juaben municipality and Birim Central Municipality. The New-Juaben Municipal District is one of the 216 districts of the Eastern Region. Its capital is Koforidua. The New Juaben Municipality shares boundaries with East Akim Municipality to the northeast, Akwapim North District to the east and south and suhum Kraboa-Coaltar District to the west.

The New Juaben Municipality falls within Eastern Region of Ghana. The New Juaben Municipality covers an estimated area of 110 square kilometers constituting 0.57% of the total land area of Eastern Region.

A predominant natural feature in Koforidua is the 'Obuo Tabri' Mountain, which is considered sacred. Nearby is Akosombo Dam which holds Lake Volta, the world's largest man-made lake. Waterfalls in the area such as Akan Falls and Boti Falls and the Umbrella Rock attract tourists to New Juaben Municipal and Eastern Region.

The Birim Central Municipal District Assembly is one of the 216 districts of the Eastern Region created in 2008. Its capital is Akim Oda which is a business center. The district is located in the south western corner of the Eastern region. To the north is the Birim North and Kwaebibirem districts and to the west, the Adansi South district in the Ashanti region and the Assin North district. Birim Central municipal district‟s southern neighbours are Asikuma-OdobenBrakwa and Agona West Municipal districts in the Central. West Akim Municipal district lies to the east of the Birim Central Municipal assembly.

The Big tree is one of the major attractions in the Birim Central Municipality. It is believed to be the biggest in West Africa as it measures 12 meters in circumference and 66.5 meters in height. The tree is in the „EsenEpan Forest Reserve‟.

Agriculture, wood processing, commerce, especially trading, lumbering and small-scale mining are major economic activities in the Municipality. It provides employment for about 60% of the active working population. However, a baseline survey conducted by Kesse-Tagoe and Associate in 1998 revealed that the majority of the labour force being 40% of the total population of 60,604 according to the 2013 census is engaged in

commerce. The public service employs 35% whiles Agriculture takes 10% with 5% involved in industry. This gives a reflection of the urban characteristics of Akim Oda, being the Municipal capital as well as the commercial and administrative center. Small scale mining also known as Galamsey is a renounced activity that also employs some of the people.

Population and Sampling Procedure

The target population consisted of all the science teachers, educationists and school heads in the Eastern Region of Ghana. The accessible population comprised all SHS school heads, biology teachers and educationists in the two districts of the Eastern Region.Mugenda and Mugenda (2003) recommend a representative sample of 10-30% for descriptive survey research .From the sampled schools, the school heads were purposively sampled while the educationists and teachers were randomly selected to participate in the study. The accessible population was made up of eighty (80) biology teachers, (4) school heads and twenty (40) educationists. The method of selecting the educationists was such that cards were distributed to educationists without looking at what is written on it and those who had theirs with inscription "chosen" were selected. The teachers were also selected using the same procedure

Instrumentation

Two main instruments were used in the study namely; questionnaires for school heads, Biology teachers and educationists, and document analysis.

The Questionnaires: Three types of questionnaires were designed for the study. One for the school heads, one for the biology teachers and one for the educationists. The

questionnaires were designed in such a way as to contain open-ended and close-ended items. In the close- ended questionnaire school heads, biology teachers and educationists were required to select from list of options while in the open-ended questions, respondents were required to write their views on the questions.

Document Analysis: This involved the thorough examination of various documents related to the study. The documents analysed included biology curriculum, materials (e.g text book, syllabuses, etc.).Other documents used were WAEC Chief Examiners‟ Reports.

Validity of the Main Instrument

In order to enhance the content validity of the instruments, my supervisors examined them. After the examination of the instruments vis-à-vis the research questions, these lecturers gave their comments and suggested changes, which were effected. The instruments also underwent face-valid analysis.

Reliability of the Main Instrument

A pilot test of the instrument was carried out with thirty (30) respondents (school heads, biology teachers and educationists) in Swedru Senior High School and S.D.A Senior High School of the Central Region in Ghana. These respondents used for the pilot test did not form part of the sample for the study. A reliability test was conducted by determining the Cronbach‟s alpha. Cronbach‟s alpha was used to calculate the coefficient of reliability, which was found to be 0.982. Cronbach‟s alpha reliability coefficient normally ranges between 0 and 1.The closer Cronbach‟s alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. George and Mallery (2003) provide the

following rules of thumb: "α > 0.9 – Excellent, α > 0.8 – Good, α > 0.7 – Acceptable, α > 0.6 – Questionable, α > 0.5 – Poor, and α < 0.5 – Unacceptable" (p. 231). While increasing the value of alpha is partially dependent upon the number of items in the scale, it should be noted that this has diminishing returns. It should also be noted that an alpha of .8 is probably a reasonable goal. It should also be noted that while a high value for Cronbach"s alpha indicates good internal consistency of the items in the scale, it does not mean that the scale is unidimensional. Thus, the internal consistency (reliability) of the instrument was calculated. The questionnaire was pre-tested in a pilot study carried out at Swedru Senior High School and SDA Senior High School in the Central Region of Ghana. The schools were selected because it shares similar characteristics with Senior High Schools selected in the two regions of the Eastern Region. The pilot study enabled the researcher to restructure the questionnaire to help elicit the right responses.

Data Collection

The researcher got an introduction letter from the University of Education, Winneba .The researcher visited all the schools to administer the questionnaires. The respondents were given one week to respond to all items adequately. Raw data was collected using questionnaires distributed to respondents.

The data to be use in the study is made up of both the primary and secondary data. Secondary data employed in the study consisted of a literature review of existing reports, and works, that is, previous studies relating to the subject matter as well as from journals, magazines, newspapers, textbooks and relevant websites on the subject matter

The primary data will be obtained from the field through questionnaires which will be administered to the respondents and through observation by the researcher. The primary

source will be considered because such source material is always in its original form and relatively free from editing, alteration or modification. As such it tends to be free from external influence, judgement and bias of others, which might lead to unsound interpretation by the researcher.

Data Analysis

Quantitative methods were used in the analysis of data. The data collected were edited, encoded and analysed through the help of Statistical Package for Social Sciences (SPSS) version 20.0.

CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

This chapter presents the data analysis and interpretation of the findings. The chapter presents the demographic data and the analysis according to the research questions.

The data collected were presented based on the research questions formulated for the study.

Demographic characteristics of the respondents

The demographic information of school heads, teachers and educationists was based on sex, age, highest educational level and their working experiences. Data is presented in the following section:

The researcher made a conscious effort to achieve an equal gender representation as shown in Table 1.

Table 4.1: Sex of the Respondents

Sex	Frequency	Percent	Valid Percent
MALE	85	68.5	68.5
FEMALE	39	31.5	31.5
Total	124	100.0	100.0

Source: Field work 2016

According to Table 1, 68.5 %(85) of the respondents were male and 31.5 %(39) of them were female. Traditional beliefs and prejudices held by people regarding the roles, occupations and participation of women in the society have made gender issues an important aspect for consideration in the education of men and women (UNESCO, 2006).

This could confirm the common perception that certain school subjects are often viewed as gender bias and that many science subjects for example are often viewed as „males" subjects (FAWE, 2004). Against this background, this study was interested in the distribution of the respondents sample in relation to gender.

The respondents were asked to indicate their age group as shown in Table 2.

Table 2: Age of the Respondents

Age Range	Frequency	Percent
23-30years	20	16.1
31-40years	60	48.4
41-50years	30	24.2
above 50years	14	11.3
Total	**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 16.1% (20) of the respondents were between 23-30yrs, 48.4% (60) of them were between 31-40yrs, 24.2% (30) of the remaining were between 41-50yrs and 11.3%(14) of the rest were above 50yrs. This indicates that the age distribution particularly in the schools studied indicates that a substantial proportion of the teachers were young (31-40) years and that could lead to efficient output. This lead to the assumption that shortage of the respondents, especially biology teachers are not likely to occur in terms of the retirement of teachers in the two Municipalities. Also, the respondents between the ages of (41 years to above 50 years) were more experienced to understand teacher related factors influencing students" performance.

Respondents were asked to state their marital status. This is illustrated in table 3.

Table 3: Marital Status of the Respondents

Marital Status	Frequency	Percent
Married	92	74.2
Single	26	21.0
Widowed	6	4.8
Total	**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 74.2% (92) of the respondents were married, 21% (26) of them were single and 4.8% (6) of the remaining were widowed. This implies that single individuals, especially those who were not in a romantic relationship, were perceived as less responsible, less mature, and less well-adjusted than married people. Based on the above, single individuals might be expected to be seen as less committed to their jobs and less likely to succeed as employees compared to married people, and might thus be discriminated against in employment decisions.

The respondents were given the opportunity to indicate their levels of education. This is illustrated in Table 4.

Table 4: Educational Levels of the Respondents

Qualifications	Frequency	Percent
Diploma	18	14.5
Bachelor‟s degree	94	75.8
Master‟s degree	12	9.7
Total	**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 14.5% (18) of the respondents had Diploma, 75.8% (94) of them had Bachelor‟s Degree, and the remaining 9.7% (12) had Master‟s Degree. All the respondents had attained some form of formal higher education. As a result of the respondents‟ qualifications, they were able to understand and respond to the questionnaire effectively. According to Tremblay, Ross and Berthelot (2001), pupils

perform better at school when taught by teachers who have more than 10 years‟ experience in the Senior High Schools. From the results in Table 5, the number of years of teaching experience ranged from 1 to above 15 years. The respondents were given the opportunity by the researcher to indicate their working experience as shown in Table 5.

Table 5: Working Experience of the Respondents

Years of experience	Frequency	Percent
1-5years	14	11.3
6-10years	23	18.5
11-15years	59	47.6
above 15years	28	22.6
Total	**124**	**100.0**

Source: Field work, 2016

In Table 5, 11.3 %(14) of the respondents, have taught from a period of one year to five years, 18.5 %(23) of them indicated a period of six to ten years, 47.6 %(59) of the respondents also indicated a period of eleven to fifteen years, and 22.6 %(28) of the rest indicated experience of above 15 years. It can be assumed that most of the respondents have adequate work experience and knowledge about their schools, and thus are able to provide reliable information about the schools. Bandura (1997) concluded that teachers with a longer experience display a high sense of confidence and self-efficacy in dealing with the learning problems of the learners. Since majority of the respondents have working experience of eleven to fifteen years, they are in better position to share their observations and experience with regards to the teacher related factors with the researcher.

The respondents were allowed to give factors that affect students‟ performance in biology as displayed in table 6.

Table 6: Factors that affect Students' Performance in Biology

General Factors	Frequency	Percent
Teacher related factors	52	41.9
Inadequate teaching and learning materials	41	33.1
Inadequate infrastructure	12	9.7
Poor supervision	10	8.1
Others specify	9	7.3
Total	**124**	**100.0**

Source: Field work, 2016

Out of 124 respondents, 41.9%(52) indicated that teacher related factors influence students‟ performance,33.1%(41) indicated inadequate teaching and learning materials,9.7%(12) indicated inadequate infrastructure,8.1%(10) indicated poor supervision, and finally, 7.3%(9) indicated other factors that influence the performance of the students that were given by the respondents are family problems, fear, gender and extracurricular activities. This means that there are several factors that influence students‟ performance. These can be put into two main factors that affect students‟ achievement. The two factors that affect the students‟ academic performance are internal and external classroom factors and these factors strongly affect the students‟ performance. Internal classroom factors indicated by the respondents includes teacher related factors, inadequate teaching and learning materials, inadequate infrastructure, poor supervisor, fear and gender of students and teachers. External classroom factors were family problems and extracurricular activities as indicated by the respondents.

Many studies conducted in the area of student achievement suggested that a number of factors (previous schooling, parents‟ educational background, family income, students‟ self-motivation, students‟ age, learning preferences, and entry qualification of students)

affect student performance at school, college, and even university level. (Ali, Haider, Munir, Khan, & Ahmed, 2013)

The respondents were given the opportunity to give reasons for their view on factors that influence the performance of students as seen in Table 7.

Table 7: How your choice influence Students' Performance in Biology

Teachers' Reasons	Frequency	Percent
Poor teacher output	52	41.9
Difficulty in Understanding lesson thought	41	33.1
Distraction of students attention in class	12	9.7
Leads to teacher absenteeism	10	8.1
Poor students output	3	2.4
Socio-economic status of parents	6	4.8
Total	**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 41.9%(52) of them indicated that, teacher related factors would lead to poor teacher output, 33.1%(41) of the respondents also indicated that without teaching and learning materials there would be difficulty in understanding concepts thought in science, 9.7%(12) are of the view that poor infrastructure would lead to distraction of students attention in class, 8.1%(10) indicated that poor supervision leads to teacher absenteeism and lateness, 2.4%(3) were of the view that school factors such as inadequate textbooks and other learning materials lead to poor student performance, and 4.8%(6) of the respondents indicated that family problems lead to socio-economic hardship of parents which also affect their wards and their performance in school.

The respondents were asked to indicate the type of teacher related factors that influence students" performance as shown in Table 8.

Table 8: Teacher Related Factors on the Performance of Students in Biology

Teacher Factors	Frequency	Percent
Motivation	19	15.3
Job Satisfaction	13	10.5
Teacher Qualifications	56	45.2
Professional Experience	36	29.0
Total	**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 15.3 %(19) indicated motivation, 10.5 %(13) also indicated job satisfaction, 45.2 %(56) of them indicated teacher qualifications, and the remaining 29 %(36) indicated professional experience. Although, there are several teacher related factors, but the major factor according to the respondents is the teacher qualification.

The respondents were given the opportunity to give reasons, why they made those choices in the above as can be seen in Table 9.

Table 9: How your choice influence Students' Performance in Biology

Reasons given by teachers	Frequency	Percent
Leads to teacher commitment	19	15.3
Leads to poor teacher output	13	10.5
Leads to poor teaching methods and strategies	56	45.2
Leads to teacher effectiveness	36	29.0
Total	**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 15.3%(19) of them indicated that, motivation leads to teacher commitment, 10.5%(13) also indicated that job satisfaction leads to good teacher output, which influence students "performance in biology, 45.2%(56) are of the view that teacher qualifications leads to good teaching methods and strategies, and the remaining 29%(36)

indicated that professional experience leads to teacher effectiveness, which affect students‟ performance in biology. Adeyemi (2010) and Yala and Wanjohi (2011) found that teachers‟ experience and educational qualifications were the prime predictors of students‟ academic achievement. Etsy (2005) study in Ghana found that the teacher factors that significantly contributed to low academic achievement were incidences of lateness to school, incidences of absenteeism, and inability to complete the syllabi. Oredein and Oloyede (2007) concluded that teacher management of homework and assignments given to students have an impact on student achievement especially when it is well explained, motivational, corrected and reviewed during class time and used as an occasion for feedback to students.

In the view of school heads, biology teachers and educationists as respondents were allowed to give causes of teacher related factors that influence students „performance in biology as shown in Table 10.

Table 10: Causes of Teacher Related Factors on Students' Performance in Biology

Causes of teacher Related factors	Frequency	Percent
Poor supervision	34	27.4
Lack of motivation	23	18.5
Poor conditions of service	15	12.1
Teacher qualifications	52	41.9
Total	**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 27.4%(34) indicated poor supervision influence students‟ performance,18.5%(23) indicated lack of motivation,12.1%(15) indicated poor conditions of service, 41.9%(52) indicated teacher qualifications.

The respondents were given the opportunity to give reasons why, teacher factors contributed to students‟ non –performance as seen in table 11.

Table 11: How teacher factors contributed to student's nonperformance?

Reasons given by teachers	Frequency	Percent
Leads to absenteeism and lateness that affect instructional time	34	27.4
Lack of commitment to duty	23	18.5
Leads to poor teacher output	15	12.1
Leads to poor teaching methods and strategies	52	41.9
Total	**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 27.4%(34) of them indicated that poor supervision leads to teacher absenteeism and lateness also that affect instructional time, 18.5%(23) also indicated that lack of motivation leads to lack of commitment to duty, 12.1%(15) of the respondents are of the view that poor conditions of service leads to poor teacher output, and the remaining 41.9%(52) indicated that those without teacher qualifications leads to poor teaching methods and strategies.

Data Presentation by Research Questions

Research Question 1:

In what ways does teacher motivation influence classroom instructional activities?

Research Question 1 was answered by the school heads and the biology teachers involved in the study. The respondents were asked to express their views on the extent to which teacher qualifications influence students‟ performance. The responses of the respondents are shown in Table 12.

Table12: Extent to which Teachers are Motivated

Statement		SA	AA	UC	DA	SD
i.	Teachers are motivated very often in my school.	7	44		33	0
ii.	Meals are provided for teachers.	18	60		6	0
iii.	The school has accommodation facilities for teachers.	2	8		60	14
iv.	The school head is concern about teachers‟ welfare.	1	33		47	3
v.	Motivational trips and retreats are organized at least once annually.	0	0		73	11

Source: Field work, 2016; SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Teachers are motivation

In the views of the school heads and the biology teachers to show the extent to which teachers are motivated. Out of the 84 respondents, 8.33 %(7) strongly agree, 52.38 %, (44) agree whiles 39.29 %(33) disagree that teachers are motivated very often in their school. Out of the 84 respondents, 21.43 %(18) strongly agrees, 71.43 %(60) agree and 7.14 %(6) disagree that meals are provided for teachers. Out of the 84 respondents, 2.38%(2) strongly agree, 9.52%(8) agree, 71.43%(60) disagree whiles 16.67%(14) strongly disagree that the school has accommodation facilities for teachers 1.19%(1) strongly agrees, 39.29%(33) agree, 55.95%(47) whiles 3.57%(3) strongly disagree that, the school heads are concerned about their teachers welfare, 86.90%(73) disagree and 13.10%(11)strongly disagree that motivational trips and retreats are organized at least once annually.

The Biology teachers were given the opportunity to express their views on how motivation influences students‟ performance in biology as shown in Table 13.

Table 13: Influence of Teacher Motivation on Students' Performance in Biology

Reasons given by teachers	Frequency	Percent
Teachers give out their best	38	47.5
Teachers make research to teach effectively	42	52.5
Total	**80**	**100.0**

Source: Field work, 2016

Out of the 80 respondents, 47.5 % (38) of them indicated that motivation of teachers makes them give out their best. Again, 52.5 % (42) of the respondents indicated that motivation of teachers makes them do a lot of research to teach effectively. Teachers are expected to earn both intrinsic and extrinsic reward from their work. Teachers will put in more effort at work if salaries, working conditions and fringe benefits given to them.

The success or failure of any educational system depends much more on the teachers. This is where effective motivation of teachers" comes to play. It is a well-known fact that a well-motivated teacher, who is provided with working incentives, good working conditions and adequate remuneration is bound to be dedicated to his/ her teaching, so as to bring about the needed learning on the part of students.

It is therefore the duty of a teacher to get the students to do what they are expected to do in order to help the educational system achieve its goal. This will be accomplished by providing motivation, paying the necessary attention and priority teachers deserve while they are working towards achieving the purpose of learning. One of the cardinal reasons for working in life is to satisfy the basic human needs. This shows that teacher motivation is central to any systematic attempt to improve learning outcomes. So when workers complain of lack of fringe benefits like transport, housing, and medical allowances; lack of payment of leave allowances for many years; lack of recognition, merits awards, bonus

and in-service training its leads to non-performance. It is believed that if teachers‟ pay, working conditions and fringe benefits given to the teachers are judged to be good by the teachers, they will put more at work. In other words, they will prepare adequately for their lessons, go to school regularly and punctually, attending classes as scheduled, teach the students well, give and mark assignments, test and examination.

Research Question 2:

To what extent do teacher qualifications influence students' performance in biology?

Research Question 2 was answered by the school heads and the biology teacher involved in the study. The respondents were asked to express their views on the extent to which teacher qualifications influence students‟ performance. The responses of the respondents are shown in Table 14.

Table 14: Extent to which Teachers' Qualifications influence Students' Performance

Statement		SA	AA	UC	DA	SD
i.	Opportunities for teachers to advance in knowledge and developed professionally.	0	8	0	30	46
ii.	Teachers with first degree and above demonstrate good mastery of the subject matter.	34	50	0	0	0
iii.	My school head provides funds to attend subject workshops, training and seminars.	2	48	0	25	9
iv.	Teachers‟ professional qualifications affect student achievement.	46	38	0	0	0
v.	Teachers with teaching qualification teach the students better.	51	33	0	0	0

Source: Field work, 2016; SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Opinion of school heads and biology teachers of teacher qualifications on students' performance

The school heads and the biology teachers were asked to express their views on the extent to which teacher qualifications influence students‟ performance. Out of the 84 respondents, 9.52 %(8) agree, 35.71%, (30) disagree whiles 54.76% (46) strongly disagree that opportunities for teachers to advance in knowledge and developed professionally would enhance the performance of students, 40.48 %(34) strongly agrees and 59.52 %(50) agree that teachers with first degree and above demonstrate good mastery of the subject matter at the S.H.S level, 2.5%(2) strongly agree, 57.14% (48) agree, 29.76% (25) disagree whiles 10.71%(9) strongly disagree with the view that my school head provides funds to attend subject workshops, training and seminars, 54.76%(46) strongly agree and 45.24%(38) agree that teachers‟ professional qualifications affect student achievement, 60.71%(51) strongly agree whiles 39.29%(33) agree to the fact that teachers with teaching qualification teach the students better. The knowledge, the intelligence and academic excellence the teachers possess have a direct bearing on the quality of education provided by schools in any country (UNESCO, 1991). The professional skills of a biology teacher contribute positively or negatively towards the levels of science anxiety of the learners (Nyongesa, 2010). According to Buddin and Zamarro (2009), teacher quality is a key element of student academic success. Ruthland and Bremer (2002) refer to teacher qualification in two ways - traditional and alternative qualification routes. Traditional certification is when an individual completes an undergraduate degree or post graduate program in education. Alternative routes of certification are based on coursework in pedagogy and subject area without a degree in

education. Hardy and Smith (2006) cite short term activities such as mentoring, peer evaluations and workshops as ways other than formal qualifications for improving teaching. More often graduates teachers with first degree content go into teaching if they cannot find another job right away. Although they often get somewhat lower salary than a fully qualified teacher; they choose not to enroll in the one year post- graduate professional training, and therefore lack a basic foundation for teaching. Richardson (2008) reveals that students in urban areas performed better than those in rural areas. The researcher suggests that the availability of enough qualified teachers must have been a determinant for students‟ performance. However, in Kenya, some schools in the rural areas have performed better than their urban counterparts (Owoeye & Yara, 2011). Obasi (2010) also asserts that the professional and academic training and qualification of the teacher can raise the prospects of a student‟s academic performance and attainments. This implies that a professional teacher must have the adequate content knowledge of the subject far ahead of the learners, because it takes expert knowledge to handle the attitude and science anxiety of the learners in biology.

The Biology teachers were given the opportunity to give out their view on whether teacher qualifications influence students‟ performance as shown in Table 15.

Table15: Influence of Teacher Qualifications on Students' Performance in Biology

Reasons given by teachers	Frequency	Percent
Qualified teachers adopt good teaching methods	80	100.0

Source: Field work, 2016

One hundred percent (80) indicated that qualified teachers adopt good teaching methods, which improves students‟ performance. Ruthland and Bremer (2002) refer to teacher qualification in two ways - traditional and alternative qualification routes. Traditional

certification is when an individual completes an undergraduate degree or post graduate program in education. Alternative routes of certification are based on coursework in pedagogy and subject area without a degree in education. Hardy and Smith (2006) cite short term activities such as mentoring, peer evaluations and workshops as ways other than formal qualifications for improving teaching. According to Goe and Stickler (2008), the first strand of the framework for defining teacher quality focused on teacher qualifications which were also referred to as teacher inputs. In their opinion therefore, teachers‟ qualifications were among the important resources teachers brought to the classroom. The reliance on paper qualification as determinants for teacher quality seemed to hold sway in modern educational systems (Goe & Stickler, 2008). As a result, when students‟ do well or do not do well in examination, the qualification of teachers is invariably interrogated. The qualifications teachers require teaching at the SHS level in Ghana range from Diploma, Bachelors, and Masters level education. However, there appear to be no studies carried out on the impact of teachers‟ highest/lowest qualifications on students‟ performance/ achievement in SHS in Ghana. Teachers therefore enter the teaching profession with different academic qualifications. This may explain the fluctuating performance of students in SHS social studies.

The majority of earlier researchers have found that teachers‟ certification levels had a positive impact on students‟ achievement especially in mathematics and science (Goldhaber & Brewer, 2002; Wayne & Youngs, 2003). In addition to these findings, Rice (2003) found that the correlations among teacher qualifications and students‟ achievement varied substantially across grades and across subjects.

Research Question 3:

What is the effect of teacher instructional approaches on students' performance in biology?

Research Question 3 was answered by the school heads and biology teachers involved in the study. The respondents were asked to express their views on the effect of teacher instructional approaches on students‟ performance in biology. The responses of the respondents are shown in Table 16.

Table 16: Influence Teachers' Instructional Approaches on Students' Performance

Statement		SA	AA	UC	DA	SD
i.	The school has biology laboratory for practical lessons.	15	49	0	20	0
ii.	Given students lessons that will enable them engage in inquiring activities.	18	45	0	21	0
iii.	Given students the opportunities to utilize their process skills.	25	48	0	11	0
iv.	Providing opportunities for students to learn collaboratively or cooperatively.	31	53	0	0	0
v.	Building upon my students‟ existing knowledge and experiences.	38	46	0	0	0
vi.	1	23	61	0	0	0

Source: Field work, 2016 SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

The views of the school head and Biology teachers on the extent to which teachers‟ instructional approaches influence students‟ performance in biology was investigated. Out of the 84 respondents, 17.86 % (15) of the respondents strongly agree, 58.33 %, (49) of them agree whiles 23.81 % (20) of the remaining disagree that the school has biology

laboratory for practical lessons. Again, 21.43 % (18) of the respondents strongly agree, 53.57 %(45) of them agree whiles 25 %(21) disagree on the issue that students lessons will engage them in inquiring activities, 29.76% (25) of the respondents strongly agree, 57.14%(48) of them agree whiles 13.10%(11) of the remaining disagree on the idea that by giving the students the opportunities to utilize their process skills would improve their performance. 36.90%(31) strongly agrees, whiles 63.10%(53) agree providing opportunities for students to learn collaboratively or cooperatively.45.24%(38) strongly agree and 54.76%(46) agree building upon my students‟ existing knowledge and experiences.27.38%(23) strongly agree and 72.62%(61) agree creating active learning situations in the classroom. From the above, there is a growing evidence on the effectiveness of student-centered learning approaches, Handelsman *et al* (2004), that there is mounting evidence that supplementing or replacing lectures with active learning strategies engaging students in discovery, scientific process improves learning and knowledge retention. Student-centered instruction [SCI] is an instructional approach in which students influence the content, activities, materials, and pace of learning. This learning model places the student (learner) in the center of the learning process. The instructor provides students with opportunities to learn independently and from one another, and coaches them in the skills they need to do so effectively. The SCI approach includes such techniques as substituting active learning experiences for lectures, assigning open-ended problems, and problems requiring critical or creative thinking that cannot be solved by following text examples, involving students in simulations and role plays, and using self-paced and/or cooperative (team-based) learning. Properly implemented SCI can lead to increased motivation to learn, greater retention of

knowledge, deeper understanding, and more positive attitudes towards the subject being taught (Collins & O'Brien, 2003).

Finally, it should be acknowledged that the greatest motivation for learning is learning itself. If a student can make the transition from extrinsic rewards (recognition, grades, etc.) to intrinsic rewards, then the basis for lifelong learning would have been established. The school heads and the biology teachers were given the opportunity to give reasons why, teachers‟ instructional approaches influence students‟ performance in biology as seen in Table 17.

Table17: Influence of Teacher Instructional Approaches on Students' Performance in Biology

Reasons given by teachers	Frequency	Percent
i. It enhances students understanding	31	38.8
ii. Teachers use good instructional approach	49	61.2
Total	**80**	**100.0**

Source: Field work 2016

Out of the 80 respondents, 38.8 %(31) of the respondents indicated that instructional approaches enhances students understanding of science concepts whiles 61.2 %(49) of them indicated that teachers use good instructional approaches in lessons delivery. One important aspect in the study of the sciences and biology is the method used during impartation of knowledge to the students. There is therefore the need to search for more effective strategies that are likely to improve achievement in Senior High School biology. Such strategies perhaps, include co-operative based learning instructional strategies (activity-based) or Learner-centered methods which actively engage students in the learning process for effective mastery of the subject matter and promotion of a positive attitude towards the subject. As noted by the Ministry of Education in its National Report

on the Development of Education in Kenya, presented at the International Conference on Education in September 2001, teaching approaches adopted should make learning more learner-centered in order to promote imaginative, critical and creative skills in students resulting in better achievement of instructional objectives (Ministry of Education, 2001). In a learner-centered class, students take a participative role by leading discussions, and teachers become facilitators In this regard, teachers facilitate student‟s discussion and interject only when necessary, allowing students to put the language to use and explore aesthetics of learning materials (Ahmad & Aziz, 2009; Eken, 2000). According to Froyd (2007), the standard features of a learner-centered pedagogy include collaborative learning, connecting new information to previous knowledge and critical thinking. Some scholars refer to learner-centered pedagogy as interactive learning. Interactive pedagogy may also include the use of media and involvement of students in fieldwork activities. Furthermore, interactive teachers allow for diverse learning styles among their students and encourage active involvement of all students, while helping them to improve in individual weaknesses (Curtin, 2005). Students are also encouraged to ask questions, define problems and lead conversations (Chika, 2012). Besides, such methods connect students‟ world with learning pursuits in the classroom (Bush, 2006; Kumar, 2006).

Research Question 4:

To what extent does teacher professional experience influence students' performance in biology?

Research Question 4 was answered by school heads and biology teachers involved in the study. The respondents were asked to express their views on the extent to which teacher

professional experience influence students‟ performance in biology. Responses of the respondents are presented in Table 18.

Table18: Extent to which Professional Experience of Teachers' influence Students' Performance

Statement	SA	AA	UC	DA	SD
i. Students with experience teachers perform well in WASSCE.	29	55	0	0	0
ii. Experience teachers are effective	26	53	0	5	0
iii. Experience teachers evaluate the students properly	27	57	0	0	0
iv. Experience teachers are more understanding in dealing with student related matters.	41	43	0	0	0
v. Experience teachers teach better	32	52	0	0	0

Source: Field work, 2016

Out of the 84 respondents, 34.52 % (29) strongly agree and 65.48%, (55) agree that students with experience teachers perform well in WASSCE, 30.95% (26) of the respondents strongly agrees, 63.10 %(53) of them agree whiles 5.95 %(5) of the remaining respondents disagree with the view that experience teachers are effective, 32.14%(27) of the respondents strongly agree, whiles 67.86%(57) agree with the fact that experience teachers evaluate the students properly,48.81%(41) strongly agree and 51.19%(43) agree that experience teachers are more understanding in dealing with student related matters, finally, 38.10 %(32) strongly agree whiles 61.90 %(52) agree to the fact that experience teachers teach better. This is shown in Table 19.This proves that experienced teachers are able to handle challenging situations at and devote much of their time to teaching their students for improved performance. Teacher quality results from the experience of the teacher that develops from longer years of teaching practice. Hence, an experienced teacher is found to be more effective than a novice teacher in improving

students‟ performance. This is supported by many empirical studies which have indeed shown a significant and positive relationship between number of years and students‟ achievement (Rice, 2003).

The respondents (the school heads and the biology teachers) were given the opportunity to express their views on how professional experience of teachers influences students‟ performance in biology as seen in Table 19.

Table 19: Influence of Professional Experience of Teachers on Students' Performance in Biology

Teachers' Views	Frequency	Percent
i. Experience teachers teach better	44	55.0
ii. Experience teachers assess students better	36	45.0
Total	**80**	**100.0**

Source: Field work, 2016

Out of the 80 respondents 55 %(44) respondents indicated that, experience teachers teach better hence influence students‟ performance, 45% (36) respondents indicated that experience teachers assess students better.

The above implies that an attempt to establish a common notion that the more experienced a teacher is, the more productive he will be in his teaching and the more likely his students will perform more brilliantly academically in their internal and external school examinations than those students taught by an inexperienced teacher.

Research Question 5:

What is the effect of teacher's job satisfaction on the students' performance in biology?

The above was answered by the biology teachers involved in the study. The respondents were asked to express their views on the effect of teacher‟s job satisfaction on students‟ performance in biology. Their responses are shown in Table 20.

Table 20: Influence of Teachers' Job Satisfaction on Students' Performance in Biology

Teachers Views	Frequency	Percent
i. Good performance of students in exams	10	12.5
ii. Salary does not come regularly	18	22.5
iii. Inadequate motivation	20	25.0
iv. The salary is inadequate	32	40.0
Total	**80**	**100.0**

Source: Field work, 2016

Biology teachers were allowed to give their reasons why teachers‟ job satisfaction influence students‟ performance, 12.5%(10) of the respondents indicated that job satisfaction leads to good performance of students in exams, 22.5 %(18) of them indicated the salary does not come regularly and 25 %(20) of the respondents indicated inadequate motivation whiles 32 %(40) of the remaining respondents indicated that the salary is inadequate. We simply define teacher job satisfaction as a teacher‟s feelings and perceptions of happiness and contentment with teaching. It has also been shown that when job satisfaction in the teaching profession increases, turnover decreases (Robert et al, 2004). While several factors have been identified as accounting for the above phenomena, recent studies conducted in some developing countries underscore the fact that more than one quarter of the teachers who left teaching did so because of job

dissatisfaction (Henke et al, 1997). Job satisfaction of teachers has been the focus of considerable research in recent decades (De Nobile, 2003). Given the links that have been established between job satisfaction and employee commitment, turnover, absenteeism, productivity and occupational stress (De Nobile & McCormick, 2005; Luthans, 2002; Spector, 2000), such interest is, perhaps, not surprising. Dissatisfied teachers who want to be transfer to another school may be poor performers both because of general motivational factors (Hanushek, Kain &Rivkin 2005; Rockoff 2004) and also because they are simply waiting to move on to a different location, putting low effort into their current work duties and disregarding any longer term plans for their students. Fenech (2006) reported poor work conditions, low salaries, heavy workloads, unrealistic expectations from managers, low professional status, organizational conflict, and reduced autonomy as important factors that contribute to teacher dissatisfaction

The school heads, educationists and the biology teachers were given the opportunity to express their views on what should be done to sustain and improve teacher job satisfaction as shown in Table 21.

Table 21: Conditions Necessary to Sustain and Improve Teacher Job Satisfaction

Reasons given by respondents		Frequency	Percent
i.	Motivation of teachers.	21	16.9
ii.	Improved working conditions of teachers.	50	40.3
iii.	Provision of school infrastructure.	11	8.9
iv.	Teachers must be given the opportunity for further studies with study leave.	30	24.2
v.	Teaching and learning materials must be provided to teachers and students.	12	9.7
Total		**124**	**100.0**

Source: Field work, 2016

Out of the 124 respondents, 16.9%(21) indicated motivation of teachers, 40.3%(50) indicated improved working conditions of teachers, 8.9%(11) of the respondents indicated provision of school infrastructure, 24.2%(30) of the respondents indicated teachers must be given the opportunity for further studies with study leave whiles 9.7%(12) of the remaining teachers are of the view that teaching and learning materials must be provided to teachers and students.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

Overview

The chapter presents the summary of the study, the conclusions which is based on the findings, recommendations, and finally presents suggestions for further studies thus creating the awareness that much needs to be done about the influence of teacher-related factors on student‟s performance in the teaching and learning of biology.

Summary of the Study Findings

The purpose of the study was to investigate the influence of teacher-related factors on students‟ performance in Senior High Schools in two districts of the Eastern Region. The objectives of the study were the influence of teacher; motivation, qualifications, instructional approaches, professional experience and job satisfaction on students‟ performance in biology in the two districts of the Eastern Region of Ghana.

The sample consisted of 124 respondents; made up of 4 school heads, 80 biology teachers and 40 educationists. The school heads, biology teachers and educationists were allowed to give factors that influence teacher output that in turn affect students „performance in biology. The study revealed that 41.9 %(52) indicated that teacher-related factors influence students‟ performance in biology, 33.1%(41) indicated that without teaching and learning materials there would be difficulty in understanding concepts thought in science. The study established that motivation, job satisfaction, teacher qualifications and professional experience were the teacher-related factors that influence students‟ performance. The study established that many (52.5%) of the biology teachers were of

the view that motivations of teachers help them do a lot of research to teach effectively. Again, all biology teachers indicated that qualified teachers adopt good teaching methods, which improved the students‟ performance. Many (61.2%) of the respondents indicated that many experienced teachers use learner centered approach in lesson delivery and they build upon students existing knowledge and experience. Many (60.7%) of the respondents strongly agreed that teachers with high professional qualifications teach students better and majority of the respondents strongly agreed that experienced teachers are more understanding in dealing with student related matters.

The school heads, educationists and the biology teachers‟ were given the opportunity to express their views on what should be done to sustain and improve teacher job satisfaction. Out of the 124 respondents, 40.3% (50) indicated improved working conditions of teachers. This was further supported by 24.2% (30) of the respondents, who indicated that teachers must be given the opportunity to further their studies with study leave.

Conclusions

Emerging trends according to the findings of this study indicated that, teacher-related factors have much influence on the performance of students. However, there are other factors like inadequate teaching and learning materials, inadequate infrastructure, poor supervision, and others such as fear and gender in this age of science education that directly or indirectly influenced performance of senior high school students in biology. Teacher-related factors such as motivation, teacher qualifications, teacher instructional approaches professional experience, and job dissatisfaction or satisfaction were the key teacher-related factors that influenced students‟ performance in biology.

Based on the findings of the study, it can be concluded that motivation of teachers, teachers‟ qualifications and teachers‟ instructional approaches influence students‟ performance.

Again, professional experience and job satisfaction influences academic performance of students.

Recommendations of the study

Based on the findings, the study recommends that;-

1. The study recommended that senior high schools managements and Ghana Education Service are to motivate with classroom and material resources and incentives/salary to put up their best in biology teaching.
2. Biology teachers with both professional and good content knowledge qualifications are to be recruited to teach at SHS.
3. Senior High Schools managements are to provide TLMs to encourage Activity-based methods of teaching and learning in biology lessons.
4. Senior High School heads are to provide on the job training for biology teachers to improve on their pedagogical and content knowledge efficiencies and students‟ performance.

Suggestions for Further Research

The researcher suggests the following areas for further studies:

1. Since the study focused on teacher factors only in the two political districts of the Eastern Region, another study could be carried out on a wider area for comparison purposes.

2. The researcher also suggests that studies could be carried out focusing on other factors influencing students‟ performance in WASSCE.
3. The study suggests for further studies to be conducted into differential perception of male and female SHS biology teachers on their working conditions and its effects on their classroom output.

REFERENCES

Aaronson, D., Lisa B. & William S. (2007). Teachers and student achievement in the Chicago public high schools. *Journal of Labor Economics 25* (1), pp. 95–135.

Adaramola, M .O. & Obomanu B. J. (2011). Factors related to under achievement in science, technology and mathematics education (STME) in secondary schools in rivers State, Nigeria. *World Journal of Education 1*(1)102-109.

Adeogun, A. A. (2001). The principal and the financial management of public secondary schools in Osun State. *Journal of Educational System of Development. 5(*1):1 - 10.

Adepoju, J. A. (1991). *Factors and problems in the teaching and learning of mathematics in Nigeria schools,* National school curriculum review conference proceedings. Lagos; Federal Ministry of Education.

Adeyemi, B. (2010). Teacher related factors as correlates of pupils" achievement in social studies in South West Nigeria. *Electronic Journal of Research in Educational Psychology, 8*(1): 313-332.

Adeyemi, B. A. (2008*).* "Effects of cooperative learning and problem solving strategies on junior secondary school students" achievement in social studies". *Journal of Research in Education Psychology*, *Vol. 16,* No. 3, pp. 691-708.

Adeyemi, T. O. (2008*).* The influence of class-size on the quality of output in secondary schools in Ekiti State, Nigeria. *American-Eurasian Journal of Scientific Research 3* (1): 7-14.

Ahmad, F. & Aziz, J. (2009*).* Students‟ perceptions of the teachers‟ teaching of literature communicating and understanding through the eyes of the audience. *European Journal of Social Sciences, Vol. 7,* No. 3. Pp. 17-39.

Akiri, A. A. & Ugborugbo, N. M.(2008). An Examination of genders influence on teachers‟ productivity in secondary schools. *Journal of Social Sciences, 17*(3): 185-191.

Ali, S., Haider, Z., Munir, F., Khan, H., & Ahmed, A. (2013). Factors contributing to the students academic performance: A case study of Islamia University Sub-campus. *American Journal of Educational Research, 1*(8), 283-289.

Anderson, B. & Dorsett, R. (1991). *Production of academic achievement as a function of teachers' training experience and salaries*. Eric Documentary, An: ED207240, CHN: EA014048.

Ankomah, Y., Koomson, J., Bosu, R., & Oduro, G. K. (2005). *Implementing quality education in low income countries.*Institute for Educational Planning & Administration (IEPA) University of Cape Coast Ghana.

Anobi, F. A. (2006). Beyond The all: Preserving reflection in the preparation of "highly qualified teachers". *Teacher Education Quarterly, 33*(2), 23-35.

Antwi, M. K. (1992). *Education, society and development in Ghana.* Accra: Unimax.

Arends, R. I. (2004). Learning to teach(6th Ed.). New York: McGraw-Hill. *Research in Science Teaching, 19* (8), 627-638.

Arends, R. I. (1997). *Classroom instruction and management*. Boston: McGraw Hill.

Asikhia O.A. (2010). Students and teachers‟ perception of the causes of poor academic performance in Ogun State Secondary Schools*: European Journal Social Sciences, 13*(2): 229-242.

Asuku, I. B. (1999). *Relationship of teachers' personal variables with their job performance and students' academic achievement in Kogi State secondary schools*. Unpublished Ph.D. Thesis, University of Ibadan.

Ball, D. L., & McDiarmid, G. W. (1990*).* The subject matter preparation of teachers. In W.R. Houston (Ed.), *Handbook of research on teacher education* (pp. 437–449). New York: Macmillan.

Ball, D. L. (2003). Mathematical proficiency for all students. *Toward a strategic research and development program in mathematics education*. RAND Mathematics Study Panel. Santa Monica, CA: RAND

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Teachers College Press

Barkoukis, V., Tsorbatzoudis, H., Grouios, G., & Sideridis, G. (2008).The assessment of intrinsic and extrinsic motivation and amotivation:Validity and reliability of the Greek version of the academic motivation scale. *Assessment in Education: Principles, Policy and Practice, 15* (1), 39-55.

Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2008a). *The Narrowing gap in New York City teacher qualifications and its implication for student achievement in high-poverty schools.* NBER Working Paper 14021 April 22-24,

2008. Retrieved from http;//www.ed.gov/about/reports/annual/teachprep/2008title-iii-report.pdf

Buddi, R. & Zamarro, G. (2009). *Teacher qualifications and student achievement in urban elementary schools*. Retrieved September 4, 2011 from www.rand.org

Bush, G. (2006). "Learning about learning: From theories to trends". *Teacher Librarian, Vol. 34*, No. 2, pp. 14-19.

Cavalluzzo, L. (2005). *Is National Board certification an effective signal of teacher quality?* Paper Presented at the Annual American Finance Association Conference, March 17-19. Louisville, Kentucky. Retrieved from http;//www.cna.org/documents/cavaluzzostudy.pdf.

Chang, Y. (2010). *Students' perceptions of teaching styles and use of learning strategies*. Retrieved from http://trace.tennessee.edu/utk_gradthes/782

Chika, P. O. (2012). "The extent of students" responses in the classroom. *International Journal of Academic Research in Business and Social Sciences, Vol. 2*, No. 1, pp. 22-37.

Clotfelter, C., Ladd, H. F., & Vigdor, J, (2007). *How and why do teachers credentials matter for student achievement?* Working Paper 2. Washington DC: Urban Institute, National Centre for Analysis of Longitudinal Data in Education Research. Retrieved: http://www.Caldercenter.org/PDF/1001058/teacher_Credentials.pdf.

Cochran-Smith, M. (2005). Teacher educators as researchers: Multiple perspectives. *Journal of Teaching and Teacher Education, 21*(2), 219-225.

Collins, J. W., & O'Brien, N. P. (Eds.). (2003). *Greenwood dictionary of education*. Westport, CT: Greenwood.

Crespo, S. & Nicol, C. (2006). Challenging preservice teachers‟ mathematical understanding: The case of division by zero. *School Science and Mathematics, 106*(2), 84-97.

Cummins, J. (2007). Pedagogies for the poor? Realigning reading instruction for low-income students with scientifically based reading research. *Educational Researcher, Vol. 36,* No. 9, pp.564-573.

Curtin, E. (2005*).* Instructional styles used by regular classroom teachers while teaching recently mainstreamed ESL students*:* Six urban middle school teachers in Texas share their experiences and perceptions". *Multicultural Education, Vol. 12,* No. 4, pp. 36-42.

Damtse, E. F. (2000). *Adapting innovative approaches to science teaching in the primary school*. An unpublished project presented to University of Education, Winneba.

Darling-Hammond, L. (2000). Teacher quality and student achievement: *A* review of state policy evidence. *Education Policy Analysis Archives, 8*(1), 1-44.

Darling-Hammond, L., Holtzman, D., Gatlin, S. J., & Vasquez Heilig, J. (2005). Does teacher preparation matter? Evidence about teacher certification, teach for America, and teacher effectiveness. *Education Policy Analysis Archives, 13*, 231-267.

De Nobile, J. (2003). *Organisational communication, job satisfaction and occupational stress in catholic primary schools.* Unpublished doctoral thesis, University of New South Wales, Sydney

De Nobile, J. J., &. McCormick, J. (2005), *Job satisfaction and occupational stress in catholic primary schools.* Paper presented at the Annual Conference of the Australian Association for Research in Education, Sydney, Australia.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11 (*4*),* 227-268.

Eken, D. K. (2000). "Through the eyes of the learner: Learner observations of teaching and learning*". ELT Journal, Vol. 53*, No. 4, pp. 66-80. Educational Publishers.

Etaugh, C., & Birdoes, L. N. (1991). Effects of age, sex, and marital status on person perception. *Perceptual and Motor Skills, 72*, 491–497.

Etsy, K. (2005). *Causes of low academic performance of primary school pupils in the Shama Sub-Metro of Shama Ahanta East Metropolitan Assembly of Ghana.* Regional Conference of Education in West Africa, Dakar Senegal, 1st-2nd November 2005.

FAWE, (2004). Students‟ attitudes to the teaching of SMT subjects by girls in primary schools. The experience of the pilot phase. *FEMSA. No. 11,* pp.12.

Fenech, M. (2006).The impact of regulatory environments on early childhood professional practice and job satisfaction: A review of conflicting discourses. *Australian Journal Early Childhood, 31*(2*)*, 49-57.

Froyd, J. E. (2007). *Evidence for the efficacy of student-active learning pedagogies*. Retrieved from http://cte.tamu.edu/programs/flc.php on 22/9/2012.

Fuller, E. J., & Alexander, C. (2004,). *Does teacher certification matter? Teacher certification and middle school mathematics achievement in Texas.* Paper presented at the national meeting of the American Education Research

Association, April, San Diego.

Gay, G. (2003). The importance of multicultural education. *Educational Leadership, Dec. 2003,* 30-35.

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Boston: Allyn & Bacon.

Ghana Education Service (2007). *Education Strategic Plan*. Accra: Government Publication.

Gharzali, M. & Ismail, Z. H. (1997). *Technology in the teaching of mathematics in Malaysian schools*. *The role of technology in the mathematics classroom.* Proceedings of working Group 16 at the 8th International Congress on Mathematics Education., Seville, Spain: UNESP.

Goe. L., & Stickler, L. M. (2008). *Teacher quality and student achievement: Making the most out of research.* Washington. D.C: The National Comprehensive Centre for Teacher Quality.

Goldhaber, D. D., & Brewer, D. J. (2000). Does teacher certification matter? High school teacher certification status and student achievement. *Educational Evaluation and Policy Analysis, 22* (2), 129–145.

Goldhaber, D. D., & Brewer. D. J. (2002). Does teacher certification matter? High school teacher certification status and student achievement. *Educational Evaluation and Policy Analysis, 22*, 349-407.

Greenberg, E., Rhodes, D., Ye, X., & Stancavage, F. (2004). *Prepared to teach: Teacher preparation and student achievement in eigth-grade mathematics*. American Educational Research Association, 2004 Annual Meeting. San Diego, California.

Gross R.E. & Harrist N.D.C. (1995*)*. Teleconferencing and distance learning. *British Journal of Educational Technology 2*(14), 103-108.

Handelsman, J., Ebert-May, D., Beichner, R., Bruns, P., Chang, A. & DeHaan, R., (2004). Scientific teaching. *Science 304*(567), 521–522.

Hanushek, E. A., J. F. Kain S. &. Rivkin G., (2005), Teachers, schools, and academic achievement. *Econometrica,l 73*(2), 417–458.

Hanushek, E. A., Steven G. & Rivkin, G., (2006). Teacher quality. In E. A. Hanushek, F. Welch (eds.), *Handbook of the Economics of Education*, *Volume 2,* pp. 1051–1078. Amsterdam: North-Holland.

Hardré, P. L., Davis, K. A., & Sullivan, D. W. (2008). Measuring teacher perceptions of the "how" and "why" of student motivation. *Educational Research and Evaluation, 14*(2), 155-179.

Hardy, I. & Smith, E. (2006). 'Contesting tertiary teaching qualification. *Australian Perspective' Teaching in Higher Education, Vol 11*(2):337-350.

Harris, D. N & Sass, T. R. (2007). *Teacher training, teacher quality and student achievement.* CALDER Working Paper 3. Washington, D.C.: The Urban Institute.

Henke, R. R., Choy, S. P., Chen, X., Geis, S., Alt, M. N., & Broughman, S. P. (1997), *America's teachers: Profile of a profession,* 1993-94 (NCES 97-460). Washington, DC: National Center for Educational Statistics.

Henson, K. T. (2004). *Constructivist methods for teaching in diverse middle-level classrooms*. Boston, MA: Allyn & Bacon.

Hidi, S., & Harackiewicz, J. M. (2000). Motivating the academically unmotivated: A critical issue for the 21st century. *Review of Educational Research, 70* (2), 151-179.

Hill, H. C., Rowan, B., & Ball, D. L. (2005). Effects of teachers‟ mathematical knowledge for teaching on student achievement. *American Educational Research Journal, 42*(2), 371-406.

Hill, H. C., Ball, D. L. & Schilling, S. G. (2004). Developing measures of teachers‟ mathematics knowledge for teaching. *Elementary School Journal*, *105*,11 – 30.

Ibe, B. O., & Maduabum, M. A. (2001). Teachers‟ qualification and experience as correlates of secondary school students‟ achievement in biology. *Journal of Education Thought*, *1*(2), 176-183.

Jackson, C. K. (2010*).* Match quality, worker productivity, and worker mobility: *Direct evidence from teachers*, NBER Working Paper 15990, National Bureau of Economic Research.

Johnston, J., & Ahtee, M. (2006). Comparing primary student teachers‟ attitudes, subject knowledge and pedagogical content knowledge needs in a physics activity. *Teaching and Teacher Education*, *22*, 503-512.

Jones, S. J. (2007). Culturally responsive instruction. *Leadership*, *37* (2), 14-17.

Kang‟ahi, M., Indoshi, F. C., Okwach, T. O. & Osodo, J. (2012). Teaching styles and learners‟ achievement in Kiswahili language in secondary schools. *International*

Journal of Academic Research in Progressive Education and Development, Vol. 1, No. 3, pp. 62-82.

Kaplan, L. S., & Owings, W. A. (2002). The politics of teacher quality: Implications for principals. *National Association for Secondary Schools Principals Bulletin 86*, 22-41.

Khurshid, K. (2008). A study of the relationship between the professional qualifications of the teachers and academic performance of their students at secondary school level. Pakistan. *World Academy of Science, Engineering and Technology, 38*, 1-7

Koedel, C., & Betts, J., (2007). *Re-examining the role of teacher quality in the educational production function*. Working paper, University of California, San Diego.

Kumar, M. (2006). Constructivists epistemology in action. *Journal of Educational Thought, Vol.40,* No. 3, pp. 246-262.

Laczko-Kerr, I., & Berliner, D. C. (2002,). The effectiveness of "Teach for America" and other under-certified teachers on student academic achievement: A case of harmful public policy. *Education Policy Analysis Archives*, *10*(37), 423-424.

Lasley, T. J., Siedentop, D., & Yinger, R. (2006). A systemic approach to enhancing teacher quality: The Ohio model. *Journal of Teacher Education, 57,* 112-136.

Lawson, E. A. (2007). *A survey of science teaching and learning approaches in primary schools*. An unpublished research presented to University of Education, Winneba.

Lazear, E. P. (2003). `Teacher incentives', *Swedish Economic Policy Review, 10*(2), 179-214.

Lewis, A. C. (2005). Highly qualified teachers: We know them when we see them. *Phi Delta Kappan, 88* (8), 563-564.

Lin, H. F. (2007*).* Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science, 33 (2),* 135-149.

Linnenbrink, E. A., & Pintrich, P. R. (2002). Motivation as an enabler for academic success. *School Psychology Review, 31* (3), 313-327.

Longman, P. (2005). *Longman dictionary of contemporary English.* London: Pearson Education Ltd.

Lucas, J. K. (2001). *Investigating the effectiveness of group work in the teaching and learning of science at the junior secondary school level*. An unpublished Project presented to University of Education, Winneba.

Luthans, F. (2002). *Organizational behavior* (9th ed.). New York: McGraw-Hill

Lydiah, L. M & Nasongo, J. W. (2009). Role of the headteacher in academic achievement in secondary schools in Vihiga District, Kenya. Current Res. *Journal of Social Sciences 1*(3):84-92.

Maguswi, B. V (2011). *Factors contributing to under achievement of Zambian female students in O-level physics examinations*. A case of selected high schools in Central Province. A Master Thesis, University of Zambia.

Martin, M. O., Mullis, I. V. S., Gregory, K. D., Hoyle, C., & Shen, C. (2000). *Effective schools in science and mathematics*. Chestnut Hill, MA: International Study Centre, Boston College.

McDowell, G. R. (2001). A student-centered learning approach to teaching soil mechanics.

International Journal of Engineering Education, *Vol. 17,* No. 3, pp. 255-260.

Metzler, J., & Woessmann, L. (2010). *The impact of teacher subject knowledge on student academic achievement: Evidence from within-teacher within-student variation.* IZA Discussion Paper No 4999. University of Munich: Institute for Economic Research.

Mezieobi, K. A., Fubana, V, R., & Mezieobi, S. A. (2008). *Social studies in Nigerian teaching methods, instructional materials and resources*. Owerri: Acadepea.

Ministry of Education (2001). *National report on the development of education in Kenya.* Presented at the International Conference on Education 46th session, Geneva, 5-7th September.

Mogari, D., Kriek, J., Gerrit, S. & Ugorji, O. I. (2009). Lesotho‟s students‟ achievement in mathematics and their teachers‟ background and professional development. *Pythagoras, 70,* 3-15S.

Mugenda, A. G. (2003). *Research method in quantitative and qualitative approaches*. Nairobi: Acts Press.

Muraya, D. N. & Kimamo, G. (2011). Effects of cooperative learning approach on biology mean achievement scores of secondary school students‟ in Machakos District, Kenya*”. Educational Research and Reviews, Vol. 6*, No. 12, pp. 726-745.

Murunga, F., Kilaha, K., & Wanyonyi, D. (2013). Emerging issues in secondary school education in Kenya. *International Journal of Educational Research 1*(3):231-240.

Naidoo, R. (1999). *Programming in numerical mathematics*: Proceedings of the 7th Annual SAARMSE Conference, Harare, Zimbabwe.

National Council of Teachers of Mathematics [NCTM]. (2000). *Principles and standards for school mathematics.* Reston, VA: Author.

Njeru, E. H. N., & Orodho, J. A. (2003). *Access and participation in Kenya*. Nairobi: Institute of Policy Analysis and Research.

Nyongesa, K. W. (2010). *Influence of gender, attitude and science anxiety on performance of secondary school students in biology in Bungoma District, Kenya.* Unpublished M.Ed Degree Thesis, Egerton University

Obasi, M. N. (2010). Urban-rural differential in teaching and learning of geography in Ahiazu Mbaise and Owerri Municipal Council in Imo State. *Report and Opinion*, *2*(9).41-50.

Odhiambo, G. (2010). *Appraising teacher performance. Themes and issues* Germany; Lambert Academic Publishing.

Odundo, P. A. (2003). *Impact of instructional methods on learners' achievement in business studies in Kenya's secondary schools*. Unpublished PhD Thesis submitted to the University of Nairobi, November 2003. *Education, 70*, 256-284.

Olaleye FO (2011). Teacher characteristics as predictor of academic performance of students in secondary schools in Osun State –Nigeria. *European Journal Education Studies 3*(3):505 -511.

Olive, J. (1997). *Technology as a catalyst for change in teaching of mathematics.The role of technology in the mathematics classroom.* Proceedings of working Group 16 at the 8th international congress on Mathematics Education, Seville, Spain: UNESP.

Oredein, A. O. & Oloyede, D. O. (2007).Supervision and quality of teaching personnel effects on student academic performance. *Educational Research and Review, 2* (3): 032-035.

Owoeye, J. S. & Yara, P. O. (2011). School location and academic achievement of secondary school in Ekiti State, Nigeria *Asian Social Science Vol. 7*, No. 5;pp 170-175.

Palmer, D. H. (2009). Student interest generated during an inquiry skills lesson. *Journal of Research in Science Teaching, 46* (2),147-165.

Reio, Jr., Thomas, G. & Kidd, A. (2006). *An exploration of the impact of employee job satisfaction, affect, job performance, and organizational financial performance*: *A review of the literature.* Kentucky: University of Louisville.

Rice, J. K. (2003). *Teacher quality: Understanding the effects of teacher attributes.* Washington, D.C.: Economic Policy Institute.

Richardson, A. R. (2008). *An examination of teacher qualifications and student achievement in mathematics*

*etd.*auburn.edu/etd/bitstream/handle/.../Richardson_Antoine_8.pdf

Rivkin, S. G., Hanushek, E. A, & Kain, J. F. (2005). *Teachers, schools, and academic achievement. Retrieved:* http://www.utdallas.edu/research/tsp/pulications.htm.

Roberts, B. J; Jones, C., & Lynn, M. (2004). Job satisfaction of new baccalaureate nursing teachers. *Journal of Nursing Administration, 34*(9):428-435.

Rockoff, J. E. (2004). The impact of individual teachers on student achievement*:* Evidence from panel data, *American Economic Review 94*(2), 247–252.

Rothstein, J. (2010). Teacher quality in educational production: Tracking, decay, and student achievement. *Quarterly Journal of Economics 125* (1): 175-214.

Rowan, B., Chaing, R., & Miller, R. (1997). What large scale survey research tells us about teacher effects on student achievement*:* Insights from the prospects study of elementary schools. *Teachers College Record, 104*(8), 1525–1567.

Ruthland, S. K. & Bremer, C. D. (2002). *„Alternative teacher certification procedures and professional Development Opportunities for Career and Technical Education Teachers'* Washington D.C: ERIC Clearinghouse on Teacher Education.

Sanders, W. L., Ashton, J. J., & Wright, S. P. (2005). *Comparison of the effects of NBPTS certified teachers with other teachers on the rate of student academic progress*. Arlington: National Board for Professional Teaching Standards. Retrieved from http: //www.nbpts.org/userfiles/file/SAS-final-NBPTS-report-D-Sanders.pdf.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15(*2), 4–14.

Simkins, C. (2013). Performance in the South African Educational System: What do we know? Centre for development and enterprise. S. A; Johannesburg.

Skaalvik, E. M., & Skaalvik, S. (2006). *Self-concept and self-efficacy in mathematics: relation with mathematics motivation and achievement.* Proceedings of the International Conference on Learning Sciences, Bloomington, Indiana.

Spector, P. E. (2000). *Industrial and organizational psychology*: *Research and Practice* (2nd ed.). New York: John Wiley & Sons.

Tanner, K. (2009). *Approaches to life sciences teaching and learning*. Retrieved from http://www.lifescied.org/cgi/content/full/8/2/89 on 20/9/2012.

Tella, J., Indoshi, F. C. & Othuon, L. A. (2010). Relationship between students‟ perspectives on the secondary school English curriculum and their academic achievement in Kenya. *Journal of Educational Research, Vol. 1,* No. 9, pp. 382-389.

Tremblay, S., Ross, N., & Berthelot, J. (2001). Factors affecting grade 3 student performance in Ontario: A multilevel analysis. *Education Quarterly Review*, *7* (4), 1–12. Retrieved from http://www.geog.mcgill.ca/faculty/grade3ontario.

UNESCO. (1991). *World education report*. Paris: UNESCO.

UNESCO. (2006). *EFA Global monitoring report 2006: Literacy for Life*: Paris, UNESCO.

Vandervoort, L., Amrein-BeardSley, A., & Berliner, D. (2004). National board certified teachers and their students‟ achievement. *Education Policy Analysis Archives*, *12*(4), 131-145. Retrieved from http://epaa.asu.edu/epaa/v12n46/.

Vansteenkiste, M., Zhou, M., Lens, W., & Soenens, B., (2005). Experiences of autonomy and control among Chinese learners: Vitalizing or immobilizing? *Journal of Educational Psychology, 97*(3), 468–483.

Viadero, D. (2007). Holes found in United States rules on teachers. *Education Week, 27*(2), 16-17.

WAEC. (2002). *Chief Examiners reports for WASSCE Biology*. Ghana; Accra.

WAEC. (2003). *Chief Examiners reports for WASSCE Biology*. Ghana; Accra.

WAEC. (2004). Chief *Examiners reports for WASSCE Biology*. Ghana; Accra.

WAEC. (2005). *Chief Examiners reports for WASSCE Biology.* Ghana; Accra.

WAEC., (1996). *Chief Examiners reports for WASSCE Biology.* Accra: Ghana.

Watson, M., (2003). *Learning to trust: Transforming difficult elementary classrooms Through developmental discipline.* San Francisco: Jossey-Bass.

Wayne, A. J., & Young, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research, 73*(3), *89*-122. Retrieved from http://web.ebscohost.com/ehost/delivery/sid-7d60bbb9.

Weiss, H. M. & Cropanzano, R. (1996). Affective Events Theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In Staw, B. M. and Cummings, L. L. (Ed). *Research in organizational behavior: An annual series of analytical essays and critical reviews, Vol. 18*, (pp. 1-74). Retrieved from https://msu.edu/course/psy/962/Weiss%20&%20Cropanzano%20(1996)%20-%20AET.pdf

William, D., (2007). Content then process: Teacher learning communities in the service of formative assessment. In Reeves, D. B. (Ed). *Ahead of the curve: The power of assessment to transform teaching and learning.* Bloomington: Solution Tree.

Wilson, S. M., Floden, R. E., & Ferrini-Mundy, J. (2001). *Teacher preparation research: current knowledge, gaps, and recommendations. A research report.* Washington DC: Center for the Study of Teaching and Policy, in collaboration with Michigan State University, University of Washington.

Worthington, A., (2001). An empirical survey of frontier efficiency measurement techniques in education. *Education Economics, 9*(3): 245-268.

Wößmann, L. (2004). *Institutions for Better Education*. *CESifo DICE Report 4.*

Yala, P. O. & Wanjohi, W. C. (2011). Performance determinants of KCSE in mathematics in secondary schools in Nyamira Division, *Kenya. Asian Social Science,7*(20): 107-112.

Young, B. L., (1990). *Teaching primary science*. ELBS, London: Longman Group.

Zeeb, M. S., (2004). *Improving student success through matching learning and teaching styles*. Retrieved from http://www.creativelearningcentre.com

Zembylas, M. & Papanastasiou, E. (2006). Sources of job satisfaction and dissatisfaction in Cyprus. *British Association for International and Comparative Education. Vol. 36*, No. 2, 229-247.

Zuzovsky, R. & Libman, Z. (2003). *Standards of teaching and teaching tests*: Is this the right way to go? Paper Presented at The European Association For Research on Learning and Instruction Conference, Padova, Italy.

Zuzovsky, R. (2009). *Teachers' qualifications and their impact on student achievement: Findings from TIMSS 2003 data for Israel*. Retrieved from http://www.ierinstitute.org/IERI

APPENDIX A

Letters of correspondence

University of Education, Winneba
Department of Science Education
P.O. Box 25
Winneba.
25th January, 2016.

The Head of Department
Department of Science Education
University of Education, Winneba
P.O. Box 25
Winneba.

Dear Sir,

APPLICATION FOR AN INTRODUCTORY LETTER

I humbly wish to apply for an introductory letter from the department in order to administer my questionnaire in selected Senior High Schools in two districts of the Eastern Region during my research work.

I am a Master of Philosophy (Science Education) student. As part of the programme l am carrying out a research work on *‚influence of teacher related factors on s.h.s students' performance in biology'*.

I hope my application would be given the necessary consideration it deserves.

Thanks a lot for your cooperation.

Yours faithfully,

……

ISSAH IBRAHIM

(8140130004).

APPENDIX B

QUESTIONNAIRE FOR SCHOOL HEADS

Dear respondent, this study is purely for academic purposes. Kindly read through each of the items carefully and indicate the opinion that is the nearest expression of your views on each of the issues raised. Your anonymity is assured.

GENERAL INSTRUCTION

Please tick the box [ ] to the answer you have chosen fill in the blank space where necessary

Demographic Characteristics

1). Sex a. Male [ ] b. Female [ ]

2. Please indicate your age group. a. 15-30 yrs [ ] b. 31-45 yrs [ ]

c. 45-60 yrs [ ] d. 60 yrs and above [ ]

3. Marital status: a. Married [ ] b. Single [ ] c. Widow [ ]

5. What is your level of education? a. Diploma [ ] b. Bachelor„s Degree [ ]

c. Master‟s Degree [ ] d. Doctorate Degree [ ]

6. Please indicate your working experience.

a.1-5 years [ ] b. 6-10 years [ ] c. 11-15 years [ ] d. above 15 years [ ]

Factors that Influence the performance of students in Biology

7. Which of the following factors influence students‟ performance in Biology

a). Teacher related factors b). Inadequate teaching and learning materials b). Inadequate infrastructure d). Poor supervision

e). other specify……..

8. How does your choice above influence students‟ performance in Biology?

……

……

Teacher Related Factors on the Performance of students in Biology

9. Which of the following teacher related factors affects students‟ performance in Biology

a).. Motivation b. Job satisfaction c. Teacher Qualifications

d. Professional experience e. Instructional approaches f. Other Specify

.....……..

10. How does your choice above influence students‟ performance in Biology……...

……

11. What are the causes of teacher related factors that leads to non- performance of students in Biology

……

……

12. With reference to the question above, how has it contributed to students‟ non-performance? ……

……

……

Motivation of Teachers

13. Are teachers motivated in your school?

Yes [ ] No [ ]

14. Indicate how and the extent to which you motivated in your school.

Key SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Statement	**SA**	**A**	**U**	**D**	**SD**
Teachers are motivated very often in my school					
The school provides meals for its teachers					
The school has accommodation facilities for teachers					
The head teacher is concerned about teacher‟s social welfare					
The teaching staff usually has motivation trips and retreats at least once annually.					

15. Does motivation of teachers influence the performance of students in WASSCE?

Yes [ ] No [ ]

16. How does motivation influence students‟ performance in Biology?

……

Teacher Qualifications

17. Does teachers‟ qualifications influence students‟ performance in WASSCE?

Yes [ ] No [ ]

If Yes How …… …….

……

18. In the following statements indicate the extent to which you agree with the statements

Key SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Statement	**SA**	**A**	**U**	**D**	**SD**
i. The school provides for teachers opportunities to advance in knowledge and developed professionally.					
ii. Teachers with first degree and above demonstrate good mastery of the subject matter.					
iii. My school head provides funds to attend subject workshops, training and seminars.					
iv. Teachers professional qualification affects student achievement					
v. Teachers with teaching qualification teach the students better.					
vi. Teachers with teaching qualification evaluate their students better.					

Instructional Approaches

19. Does the teachers‟ instructional approaches influence students‟ performance in biology? Yes [ ] No [ ]

If yes How? ……...

20. In the following statements indicate the extent to which you agree with the statements

Statement	SA	A	U	D	SD
The school has biology laboratory for practical lessons					
Given students lessons that will enable them engage in inquiring activities.					
Given students the opportunities to utilize process skills.					
Providing opportunities for students learn collaboratively or					

cooperatively.					
Building upon my students‟ existing knowledge and experiences.					
Creating active learning situations in the classroom					

Professional Experience

21. Does professional experience of the teachers influence students‟ performance?

Yes [ ] No [ ]

If Yes why……..

22. In the following statements indicate the extent to which you agree with the statements

Key SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Statement	**SA**	**A**	**U**	**D**	**SD**
i. Students with experience teachers perform well in WASSCE.					
ii. Experienced teachers are effective.					
iii. Experienced teachers evaluate the students properly.					
iv. Experienced teachers are more understanding in dealing with student related matters					
v. Experience teachers teach better.					

Teacher Job Satisfaction

23. Are you satisfied with your Job? Yes [ ] No [ ]

If Yes how are you satisfied…….....

……

If No, why are you not satisfied?

……

…….....

24. In your opinion, what should be done to sustain and improve teacher job satisfaction

……

……

APPENDIX C

QUESTIONNAIRE FOR TEACHERS

Dear respondent, this study is purely for academic purposes. Kindly read through each of the items carefully and indicate the opinion that is the nearest expression of your views on each of the issues raised. Your anonymity is assured.

Please tick the box [ ] to the answer you have chosen fill in the blank space where necessary

Demographic Characteristics

1. Sex a. Male [ ] b. Female [ ]
2. Please indicate your age group: a.15-30 yrs [ ] b. 31-45 yrs [ ]
   c. 45-60 yrs [ ] d. 60 yrs and above [ ]
3. Marital status: a. Married [ ] b. Single [ ] c. Widow [ ]
5. What is your level of education?
   a. Diploma [ ] b. Bachelor‟s Degree [ ]
   c. Master‟s Degree [ ] d. Doctorate Degree [ ]
6. Please indicate your department and the subject you teach.

   ……

7. Please indicate your teaching experience

a. 1-5 years b. 6-10 years c. 11-15 years d. above 15 years

Factors that Influence the performance of students in Biology

8. Which of the following factors influence students‟ performance in Biology

a). Teacher related factors b. Inadequate teaching and learning materials

c. Inadequate infrastructure d. Poor supervision e. other specify……....

9. How does your choice above influence students‟ performance in Biology?

……

……

Teacher Related Factors on the Performance of students in Biology

10. Which of the following teacher related factors affects students‟ performance in Biology?

a). Motivation b. Job satisfaction c. Teacher Qualifications

d. Professional experience e. Instructional approaches f. Other Specify.....

11. How does your choice above influence students‟ performance in Biology?

……...

……

13. What are the causes of teacher related factors that leads to non- performance of students in Biology? ……..……

……

14. With reference to the question above, how has it contributed to students‟ non-performance?

……

……

Motivation of Teachers

15. Are teachers motivated in your school?

Yes [ ] No [ ]

16. Indicate how and the extent to which you are motivated in your school.

Key SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Item	Statement	SA	AA	UC	DA	SD
i	Teachers are motivated very often in my school					
ii	The school provides meals for its teachers					
iii	The school has accommodation facilities for teachers					
Iv	The head teacher is concerned about teacher‟s social welfare					
V	The teaching staff usually has motivation trips and retreats at least once annually.					

17. Does motivation of teachers influence the performance of students in WASSCE?

Yes [ ] No [ ]

18. How does motivation influence students‟ performance in Biology?

……

……

Teacher Qualifications

19.Does teachers‟ qualifications influence students‟ performance in WASSCE?

Yes [ ] No [ ]

If yes, how?……

……

20. In the following statements indicate the extent to which you agree with the statements

Key SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Item	Statement	SA	AA	UC	DA	SD
I.	The school provides for teachers opportunities to advance in knowledge and developed professionally.					
II.	Teachers with first degree and above demonstrate good mastery of the subject matter.					
III.	My school head provides funds to attend subject workshops, training and seminars.					
IV.	Teachers professional qualification affects student achievement					
V.	Teachers with teaching qualification teach the students better.					
VI.	Teachers with teaching qualification evaluate their students better.					

Instructional Approaches

21.Does the teachers‟ instructional approaches influence students‟ performance in biology?

Yes [ ] No [ ]

If yes How? ……...

22. In the following statements indicate the extent to which you agree with the statements. **Key** SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Statement	SA	A	U	D	SD
The school has biology laboratory for practical lessons					
Given students lessons that will enable them engage in inquiring activities.					
Given students the opportunities to utilize process skills.					
Providing opportunities for students learn collaboratively or cooperatively.					
Building upon my students‟ existing knowledge and experiences.					
Creating active learning situations in the classroom					

Professional Experience

23. Does professional experience of the teachers influence students‟ performance?

Yes [ ] No [ ]

If Yes why……..

24. In the following statements indicate the extent to which you agree with the statements

Key SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly Disagree

Statement	**SA**	**A**	**U**	**D**	**SD**
Students with experience teachers perform well in WASSCE.					
Experienced teachers are effective.					
Experienced teachers evaluate the students properly.					
Experienced teachers are more understanding in dealing with student related matters					
Experience teachers teach better.					

Teacher Job Satisfaction

25. Are you satisfied with your Job? Yes No

If yes, how are you satisfied? …….....

……

If No, why are you not satisfied? ……

……

27. In your opinion, what should be done to sustain and improve teacher job satisfaction

……

APPENDIX D

QUESTIONNAIRE FOR EDUCATIONISTS

Dear respondent, this study is purely for academic purposes. Kindly read through each of the items carefully and indicate the opinion that is the nearest expression of your views on each of the issues raised. Your anonymity is assured.

Please tick the box [ ] to the answer you have chosen fill in the blank space where necessary

Demographic Characteristics

3. Your sex: a. Male [ ] b. Female [ ]

4. Please indicate your age group. a. 15-30 yrs [ ] b. 31-45 yrs [ ]
c.45-60 yrs [ ] d. 60 yrs and above [ ]

3. Marital status. a. Married [ ] b. Single [ ] c. Widow [ ]

5. What is your level of education? a. Diploma [ ] b. Bachelor‟s Degree [ ]
c. Master‟s Degree [ ] d. Doctorate Degree [ ]

6. Please indicate your department ……

7. Please indicate your working experience

a. 1-5 years b. 6-10 years c. 11-15 years d. above 15 years

<u>Factors that Influence the performance of students in Biology</u>

8. Which of the following factors influence students performance in Biology

a). Teacher related factors b. Inadequate teaching and learning materials

c. Inadequate infrastructure d. Poor supervision e. other specify……..

9. How does your choice above influence students‟ performance in Biology?

……

Teacher Related Factors on the Performance of students in Biology

10. Which of the following teacher related factors affects students‟ performance in Biology

5. Motivation b. Job satisfaction c. Teacher Qualifications

d. Professional experience e. Instructional approaches f. Other

Specify.....

11. How does your choice above influence students‟ performance in Biology?

……...

……

13. What are the causes of teacher related factors that leads to nonperformance of students in

Biology…….

……

14. With reference to the question above, how has it contributed to students‟ nonperformance?

……

……

15. Does teacher qualification influence students‟ performance in Biology?

Yes [ ] No [ ]

If Yes how?

.....

.....……

If no how?

.....

.....

APPENDIX E

RELIABILITY STATISTICS OF QUESTIONNAIRE

Case Processing Summary

	N	%
Valid	30	100.0
Total	30	100.0

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.982	0.985	21

Item Statistics

Items	Mean	Std. Dev.	N	Items	Mean	Std. Dev.	N
Incentives	2.0667	0.73968	30	Experience	3.9000	0.80301	30
Meals	2.4333	1.10433	30	Skills	2.9333	1.28475	30
Materials	2.3667	0.96431	30	Empowered	3.2667	1.01483	30
Housing	2.4333	0.81720	30	Performance	3.7667	1.10433	30
Social	2.7333	0.94443	30	Competencies	3.6333	1.06620	30
Function	2.2333	0.62606	30	Styles	4.3333	0.66089	30
Trips	1.7333	0.82768	30	Methods	4.2000	0.76112	30
Develop	2.3000	0.95231	30	Stimulate	4.4333	0.67891	30
Service	2.6333	1.09807	30	Knowledge	4.3333	0.66089	30
Work	2.4333	1.00630	30	Create	4.0667	0.82768	30
Achievement	4.0333	1.12903	30				

Scale Statistics

Mean	Variance	Std. Dev.	N of Items
66.2667	280.202	16.73924	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Incentives	64.2000	259.821	0.832	.	0.982
Meals	63.8333	249.178	0.855	.	0.982
Materials	63.9000	252.645	0.869	.	0.981
Housing	63.8333	257.178	0.853	.	0.982
Social	63.5333	252.395	0.897	.	0.981
Function	64.0333	261.137	0.923	.	0.982
Trips	64.5333	258.740	0.780	.	0.982
Develop	63.9667	251.344	0.926	.	0.981
Service	63.6333	246.447	0.944	.	0.981
Work	63.8333	249.523	0.933	.	0.981
Achievement	62.2333	249.220	0.833	.	0.982
Experience	62.3667	257.275	0.865	.	0.982
Skills	63.3333	245.816	0.813	.	0.983
Empowered	63.0000	252.897	0.814	.	0.982
Performance	62.5000	248.121	0.887	.	0.981
Competencies	62.6333	249.206	0.887	.	0.981
Styles	61.9333	262.064	0.827	.	0.982
Methods	62.0667	258.547	0.861	.	0.982
Stimulate	61.8333	262.075	0.804	.	0.982
Knowledge	61.9333	262.064	0.827	.	0.982
Create	62.2000	256.166	0.881	.	0.981