UNIVERSITY OF EDUCATION, WINNEBA

A SURVEY OF THE STATE OF IMPLEMENTATION OF SCHOOL – BASED ASSESSMENT IN MATHEMATICS: THE CASE OF SENIOR HIGH SCHOOLS IN THE BIBIANI – ANHWIASO – BEKWAI DISTRICT

MICHAEL KWAN

8160110005

A thesis in the Department of Mathematics Education, Faculty of Science Education, submitted to the School of Graduate Studies in partial fulfilment of the requirements for the award of the degree of

Master of Philosophy
(Mathematics Education)
in the University of Education, Winneba

AUGUST, 2019

DECLARATION

STUDENTS' DECLARATION

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

SIGNATURE: ……

DATE: ……..…..…….…….

SUPERVISOR'S DECLARATION

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

NAME OF SUPERVISOR: MR. MICHAEL AMPPIAH

SIGNATURE: ……

DATE: ……..…..…….…….

DEDICATION

This piece of work is dedicated to my sweet mother, Mad. Ackah Sussana, who has been a pillar of support in my entire life.

ACKNOWLEDGEMENT

I humbly thank my supervisor Mr. Michael Amppiah for his constructive critique, suggestions and guidance that has made this work a success. It would be hard for me to forget his words of encouragement and inspirations during our countless encounters. I am also grateful to all lecturers at the Mathematics Education Department of UEW, whose rich experience in tuition and great thoughts have significantly contributed to this research. Again, I am thankful to all the administrators of the schools involved in the study, and to all my 2016/2017 mathematics education MPhil colleagues, especially Jackson Jessel Aboagye-Agbi, for his tremendous assistance in this research.

I wish to express my heartfelt gratitude to my family members, particularly my mother for their unique support, words of encouragement and the sacrifices they had to make at various stages of the preparation of this research work. I am thankful to all and sundry whose contributions have made my study a reality, I am highly grateful. Finally, I am deeply grateful to God Almighty, the source of my life and success. I praise you oh God!

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

This study investigated the current state of School-Based Assessment (SBA) implementation, factors that facilitate or hinder SBA implementation, what can be done to improve SBA implementation, and the relationship between students‟ SBA performance and their end of term examintion performance in mathematics in the Senior High Schools at Bibiani Anhwiaso Bekwai district. The study engaged 42 mathematics teachers and 204 students. A mixed method design was used to conduct the research. Data were collected through questionnaire (both close and open-ended). Frequency count, percentage, and Pearson‟s correlation coefficient were the statistical method used to analyze and present the data. Findings showed that most teachers were satisfied with the current state of the SBA implementation practices. Moreover, the analysis revealed that students‟ performance in SBA scores has a positive relationship on their performance in the end of term examination in mathematics. However, it was also unearthed that factors such as lack of training opportunities, workload on teachers, large class size and instructional content, lack of monitoring and supervision, time constrains, lack of resources, students attitudes, and few other mentioned hinder the effective implementation of SBA. Developing teachers‟ knowledge base on SBA through in-service training and workshops, intensifying monitoring and supervision in schools by school authorities, reducing large class sizes to normal and many other suggestions to improve SBA implementation were outlined in the study. The study concludes that the current state of SBA implementation is high and also a positive correlation do exist between students‟ SBA performance and their end of term examination performance in mathematics although it stand to be hindered by few factors.

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter comprises the background of the study, statement of the problem, purpose of the study, the objective for the study, research questions that guided the study and significance of the study.

1.1 Background

Mathematics is the key to all scientific research and discovery and also a discipline that has been identified as the tool for technological advancement (Anamuah-Mensah, 2007). This means that in our modern technological society where mathematics ability is important to the individual and to society, it is highly expected that mathematics standards as well as pupil‟s achievement in mathematics are uplifted. It is worth noting that factors that significantly determine the success of the school education system include the quality of the curriculum content, the assessment practices, and the activities that are carried out in the classroom by the teachers and their learners. Assessment, as a determining factor, still remains a powerful educational strategy. The Ministry of Education (MoE) has made assessment an integral part of the teacher education curriculum and places value on effective assessment practices in schools. The Ghana Education Service (GES) within the Ministry of Education has also instituted in-service fresher training programs for teachers to upgrade their knowledge in assessment practices. This intervention affirms MoE (2014) recommendation that teachers are to be “assessment literate” (p. 38). This is also in line with Nabie, Akayuure, & Sofo(2013) who stated that teachers ought to “know what they assess, why they assess, how to assess”, the possible problems associated with assessment, and how to ensure those problems are prevented (p. 48).

School- Based Assessment (SBA) can be explained as a form of assessment which is administered and marked by the learner‟s own teachers in the school. School-based assessment is a classroom technique administered by teachers to find out the knowledge, understanding and skills learners have attained (Awoniyi, 2016). SBA was introduced into Ghana‟s curriculum in the last curriculum review in 2007 as a substitute for the previous one which was called Continuous Assessment (CA). The motive was to make assessment more comprehensive in order to cover extensive applications profile dimensions (Mereku, Nabie, Appiah & Awanta, 2011). SBA has been formulated to expose schools to an internal assessment system capable of assisting institutions to come out with the expected standards of all subject areas including mathematics. Amoah (2012) explained School-based Assessment (SBA) as a kind of assessment carried out in schools by pupils‟ own teachers, with the prime purpose of improving pupils‟ learning. He added that SBA is a formative and diagnostic task assigned for the purpose of improving the quality of teaching, learning and the mode of assessment itself.

It is worthy to note that the introduction of SBA into the Ghanaian curricula resulted into several changes in the old CA. These changes were intended to minimize workload of teachers. In the Continuous Assessment, every term, the teacher was supposed to design and administer a variety of assessment techniques, marking and scoring the class tests, assignments, projects, student observations, providing updated records on each student and at the same time organize remedial sections for non performing students.

In situations of large classes, the workload became tedious and unbearable. Such situations made teachers resort to unfair means of coming out with the correct data for each student (Etsey, 2012). With regards to SBA, it involves tests for every 4 weeks, Home works (specifically designed for SBA) and project. With the CA, the summation of the class score obtained throughout the term was 30% but in the SBA it is 50%. Furthermore, there was 70% score for the end of term examination in the CA but in the SBA, the end of term examination carries 50%.

The SBA comes with 12 assessments in an academic year instead of the 33 assessments in the CA system, making a reduction by 64% of the work load. To ensure that there is tremendous improvement in assessment and grading as well as ensure uniformity in schools, there is a documented guidelines for marking the assessment tasks and the procedure to follow by teachers in grading students. Concerning report writing on an experiment or any kind of study, the students have to introduce the main issue in the study or investigation, being project or report. The introduction attracts 20% weight, Actual work- 40%, Conclusions and evaluation of results- 20%, Acknowledgement and other references- 20% ; Grade A: 80-100%, Grade B: 70-79%, Grade C: 60-69%, Grade D: 45-49% and so on (CRDD, 2007). The major changes to continuous assessment, which led to the introduction of SBA, are summarized in Table 1.0

Table 1.1: Major changes in CA as result of 2007 reform to now SBA

	Nature of changes	CA	SBA
Summary of major changes	i. Use of class exercises and assignment (home work)	Largely for CA	Formative evaluation purposes only
	ii. % contribution of Class Exercises/ Homework/project work to the total school assessment	30%	-
	iii. % contribution of SBA Tasks to the total school assessment (i.e. class tests and projects)	-	50%
	iv. % contribution of end of term exams to the total school assessment	70%	50%
	v. % contribution of scores form (I or II and III) to the total WASSCE score	30%	30%
	vi. Number of assessments tasks per a term	11	4
	vii. Number of assessments tasks per academic year	33	12
Changes in project	a) Number of project tasks given per term	4	1
	b) Term distribution of project tasks by individual or group	All individual tasks each term	Individual tasks in 1st terms 1 and 3rd term; Group work in term 2
	c) When should project task be given and completed?	At the teacher"s discretion (Any time)	Beginning of the term and forwarded for marking at the end of the term
	d) Written report required?	Optional, largely oral presentation	Yes, with references
	e) Scoring projects	5	20

(Source: MoE, 2014, p. 37)

The Curriculum Research and Development Division of GES (CRDD, 2010) has identified SBA, as one tool which bring about effective teaching and learning if

implemented properly. In addition, this internal assessment system will help schools to accomplish the following purposes:

- provide a standardized practices of internal school-based assessment in the country
- provide minimized assessment tasks for all subject studied in school
- introduce teachers to guidelines for constructing assessment items/questions and other assessment tasks
- introduce standards of achievement in all subjects and in all classes
- provide guidelines for teachers in marking and grading of assessment tasks
- introduce a system of moderation to help check accuracy and reliability of teacher‟s marks
- provide teachers with guidance on how to conduct remedial classes sections on difficult areas of the subject matter to help improve students‟ performance" (CRDD, 2010 p. xii).

Again, assessment is used for monitoring the quality of the school system, evaluating education policies and programs. It is also used for making important decisions about instruction and placement of students in the curriculum, and for certifying students‟ learning achievement (Bello & Tijani, 2008). Assessment offers the opportunity for teachers to gather, analyze and interpret information in order to tell how well students are doing on a particular subject (Ashie, 2009) and enables the students to see their achievement (McGraw, 2006) to help them develop an effective and productive learning habit. Etsey (2012) argues that, good assessment make teaching to a greater extent transparent and reliable.

The current educational reform has been in existence for almost a decade and also places value on SBA as a powerful instructional tool, especially in mathematics. For these reasons, it is therefore imperative to explore the current state of School- Based Assessment (SBA) in mathematics class in Senior High Schools. This will also include teacher‟s understanding of SBA, knowledge of the purposes of assessment, what to assess in mathematics, teacher‟s assessment practices, the analysis, interpretation and storage of assessment data, what action is taken on assessment data, challenges in implementing SBA and the possible ways of addressing the problems of SBA implementation in order to improve assessment practices in Ghanaian schools. This will help stakeholders to consider the effects of SBA on the mathematics achievement of students.

1.2 Statement of the Problem

My interest in the state of SBA practices and associated challenges in mathematics class stems from the fact that the 2007 educational reform which happens to be the major reform in Ghana place great importance on SBA counting it as an important aspect of teaching and learning process. Furthermore, assessment has been identified as a powerful tool for improving learning outcomes and education quality(Marzano,2000; McMillan, 2004; Shepard, 2000).In this light, SBA has become a major tool for stakeholders in education to monitor progress of education in the country and if there is the need to make changes in the curriculum. Also, teacher‟s professional skills can be monitored and assessed by their superiors and even by themselves. Assessment offers teachers insight into the impact of their professional skills, if there is the need to re-plan, re-strategize and diversify their practices in order to make significant impact in their teaching especially in mathematics class.

Unfortunately, available research reports (MoE, 2014; World Bank, 2013) suggests that teachers are still lacking in many aspects of the School Based Assessment (planning, developing and administering assessment methods, as well as scoring, analyzing, reporting and storing assessment data) leading to weak assessment and by extension low performance of students recorded in mathematics in the past years. Also, Student‟s poor performance in mathematics and teacher‟s weakness in their assessment practices are evident in the Trends in International Mathematics and Science Study (TIMSS) as recounted by (Anamuah-Mensah, Mereku & Ghartey-Ampiah, 2008). It is worthy to add that there is non-existence of technical properties of assessment such as validity and reliability prepared and documented by teachers to ascertain the usefulness and trustworthiness of assessment data. Again, some colleague teachers are in doubt about the effectiveness of the program as such still apply the traditional pen and pencil test without adopting the new approach as intended. Finally, I have observed that class size, resource availability, teachers load, instructional materials and the commitment of teachers, school administrators and other stakeholders form part of problems confronting effective SBA implementation. Furthermore, there exist several studies on SBA (Awoniyi, 2016;Kapambwe, 2010; Fook & Sidhu, 2010; Byabato & Kisamo, 2014), however, a study done to investigate the state of SBA practices and challenges with specific reference to teaching and learning mathematics in the Ghanaian context is almost non-existent. It is against these shortcomings that the researcher is motivated to carry out this study to addresses these weaknesses so that Ghana would be successful in achieving her aims for introducing SBA as part of her educational policies.

1.3 Purpose of the Research

Assessment is becoming more structured and rigid with the introduction of school based assessment and the use of assessment tasks which have to be administered at regular intervals irrespective of student"s readiness as stipulated by SBA procedures (Ghartey-Ampiah, 2012).In view of this, the purpose of this research was to investigate the implementation of SBA in the mathematics class of SHS in the Bibiani Anhwiaso Bekwai district in the western region of Ghana with regards to the current state of SBA practices, finding the factors that facilitate or hinder SBA practices, what can be done to improve the current state of SBA implementation and the relationship between students performance in SBA and their end of term examination performance in matheamtics. It is also to reveal and assist stakeholders to consider the effects of SBA on the mathematics achievement of students; so that they provide the needed attention and assistance in ensuring effective implementation of SBA in schools.

1.4 Objectives of the Study

The general objectives of this study was to examine the current situation of SBA implementation, conditions for the practices of School- Based Assessment, the factors that hinder or facilitate the practice and mechanisms to improve the current practices of School- Based Assessment in Senior High Schools at Bibiani Anhwiaso Bekwai district in the western region of Ghana. More specifically, the objectives included:

1. To explore the current state of School- Based Assessment practices in mathematics class
2. To explore those factors that facilitate or hinder the effective practices of School- Based Assessment in mathematics class
3. To provide suggestions to improve the current practices of School- Based Assessment in mathematics class

4. To establish if there exist a relationship between students‟ performance in SBA their end of term examination performance

1.5 Research Questions

The following research questions guided this study:

1. What is the state of School- Based Assessment practices in the mathematics class in Senior High Schools at Bibiani Anhwiaso Bekwai district?
2. What are the factors that facilitate or hinder the effective practices of School-Based Assessment in mathematics class in Senior High Schools at the Bibiani Anhwiaso Bekwai district?
3. What should be done to improve the current practices of School- Based Assessment in mathematics class in Senior High Schools at the Bibiani Anhwiaso Bekwai district?
4. Does student‟s performance in School-Based Assessment has a relationship with his / her end of term examination performance in mathematics?

1.6 Significance of Research

The main reason for this study was to investigate the implementation of SBA in the mathematics class of SHS in the Bibiani Anhwiaso Bekwai district in the western region of Ghana with regards to the current state of SBA practices, finding the factors that facilitate or hinder SBA practices, what can be done to improve the current state of SBA implementation and if there exist a relationship between students performance in the SBA and their end of term examination performance in matheamtics. The study provided information to all stakeholders in education about the current status of SBA and areas to be taken into account on policy decision making, the need to consider the

effects of SBA on the mathematics achievement of students, the need to emphasize on SBA implementation and how SBA is being implemented in the senior high schools. Furthermore, the study will highlight the existing challenges and provide suggestions to minimize problems in SBA implementation in Ghana especially Bibiani Anhwiaso Bekwai district in the western region. Finally, the study served as an additional source of information for further studies.

1.7 Operational Definitions of Key Terms

School – Based assessment: refers to a comprehensive, systematic, diagnostic and integrative teacher-directed assessment practice in the school in order to facilitate and enhance learning.

State of School – based assessment: refers to the degree to which the SBA activities are implemented in schools.

School – Based assessment practices: the overall efforts made in the implementation of SBA or any activity that was made in relation to SBA implementation.

1.8 Null Hypothesis

There is no relationship between students‟ performance in SBA and their performance in the end of term examination in mathematics.

1.9 Organization of the Study

The research is organized into five chapters. Chapter 1 presents the background to the study, statement of the problem, the purpose of the study, research questions, hypotheses, significant of the study, delimitations and limitations encountered, the definition of terms and lastly the organization of the rest of the study. The literature review in Chapter Two comprises of review of relevant literature and other sub-headings about the study. The research design and methodology are discussed in Chapter Three. Chapter Four covers the results and discussion of the results from the study. Summary, conclusions, and recommendations were presented Chapter Five.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

Stake (2008) contends that one of the prerequisites of all research works is to review the work or studies that have been conducted by other researchers in an academic discipline. The review is necessary to ensure that the fundamental goal of research is achieved, which is to make significant contribution to knowledge in a particular field of discipline. According to Chumun (2002), literature review serves three main purposes: First, to synthesize propounded knowledge which has been established by research and has also been published in the area of study; Second, to capture the present situation in a well captioned topic of interest and how the current study could review or improve on the existing ones; Third, to provide a basis for an investigation to be initiated or formulate a problem, adopt a research methodology and interpret the research findings.

The literature review of this study covers the following areas: concept of classroom assessment, School – Based Assessment, factors that affect School – Based assessment, influence of SBA on students‟ academic performance in mathematics, theoretical and educational foundation of SBA and conceptual design of the study.

2.1 The Concept of Classroom Assessment

Different scholars have expressed variety of opinions on the concept of Classroom assessment. Bc-Home (2008) defines classroom assessment as a process of determining the knowledge students have attained, the level of their understanding and what they are able perform. Classroom assessment offers both teachers and learners the opportunity to try to improve upon the teaching learning activity so that

achieving the set objectives of the lesson become a success. In addition, classroom assessment helps provide adequate information serving as a feedback to inform appropriately the need to effect changes in the teaching and learning activities.

According to Abdu (1998), properly planned and executed classroom assessment to a greater extent can provide immediate diagnostic feedback on students understanding and performance as against relying on only the summative. By putting all the shared views together, it is not far right to note that the main purpose of classroom assessment is to offer guidance on student‟s learning. Moreover, Classroom assessment contributes immensely to mechanisms on the way and manner the content of the curriculum and the teaching and learning activities impact learner‟s performance and achievement and provides accurate information about the learners with regards to their progress and competencies they have acquired to stakeholders (Abdu, 1998; USAID/BEP, 2006). It is therefore crucial for teachers to come up with fresh approaches or some innovations to assessment practices to help improve their instruction and help provide educational stakeholders with the best practices at high level.

In line with this fact, Abdu (1998) has stated that classroom assessment is rated to be the most crucial, trending and pervasive issue worthy for critical consideration in our educational systems to ensure quality of learning; how learners are able to gather knowledge, how efficiently are they able to apply what they have grasped in problem solving and what learning outcomes or behaviors have they mastered going into the future.

Classroom assessment as has been pointed earlier is usually carried out by teachers to improve teaching and learning base on the impressions that would be gathered

through a variety of assessment techniques they carry out. Nevertheless, this aspect of educational assessment is the most difficult with regards to teaching. The reason is that, assessing pupil‟s work focusing on the different educational learning domains is a continuous process that requires teacher‟s knowledge, skills, time and energy. It then follows that classroom assessment is administered by teachers on continuous basis alongside with teaching and learning activities. Performing all these activities simultaneously is vital to improve student‟s learning and teacher‟s instruction.

Popham (2009) asserts that, until quite recently, the teacher had little knowledge about educational assessment and its benefits because educational assessment concept was not included in their training program. According to (Amedahe, 2000), the training modules in assessment offered to teacher-trainees mostly centers on measurement and statistics. Also, it emphasizes more on technicalities of assessment, instead of adopting innovative means of using assessment to improve teaching and learning. In view of this, one would realize that teacher education (undergraduate and graduate) programmes have failed in providing the requisite training in assessment to teacher trainees to equip them to be assessment literate (MoE, 2014).

2.2 Purposes of Assessment

The recommended forms of assessment for schools in Ghana under the SBA system are the formative and summative assessments, in order to utilize the benefits of both assessments. According to Abell and Siegel (2011), purposes assessment is all about the reasons why teachers assess their students. They observe that the main reasons for assessment include assessing “to diagnose students‟ previous knowledge, to assess students‟ knowledge on the ongoing instruction, to document learning upon completion of a unit, and to assist learners diagnose their own learning” (p. 210). The following have been identified as the common reasons why teacher‟s conduct

assessment in the various literature. It is through assessment that teachers are able to gather adequate information, make analysis, interpretations and formulate meaningful decisions on the face of the evidence or information collected on a daily basis in the classroom to help improve instruction (Airasian, 1997; Dix, 2010) and the monitoring of the progress of what students have been mastering with regards to learning goals (Linn & Miller, 2005).

The following researchers: Black and Wiliam (1998); McGraw (2006); Stiggins (2005) as well as Wiliam and Thompson (2008) have shared that the purposes of assessment are to evaluate students, teachers, curriculum and resources; certification; predicting, controlling, and keeping standards; grading; and aiding communication and accountability. According to Jabbarifar (2009), assessment as a process involves four primary functions: First, measuring progress over time; second, motivating pupils to study; third, evaluating the teacher‟s pedagogy; and fourth, comparing student‟s capabilities to the entire group evaluation.

Furthermore, the purpose of classroom assessment and evaluation offer students the opportunity to exhibit what they have learned instead of just trying to expose their weakness or areas that students have challenges in understanding those concepts taught. The fourth function of assessment, in terms of comparing student‟s capabilities to the entire group evaluation as indicated by Jabbarifar (2009), is of two kinds; including Norm-referenced assessment and Criterion-referenced assessments. Harlen (2005) has stated that the purpose of assessment is to find the overall achievement of the learner in a particular area of learning at a particular point in time. Teachers use the information gathered through assessment to do critical analysis of their instruction and also careful plan for the next lesson or teaching session (Sethusha, 2014).

The MoE (2014) and Bello and Tijani (2008), agree that School Based Assessment (SBA) was introduced for the following purposes: first, to unearth the progress, strengths and weaknesses of learners in terms of performance; Second, for teachers to know and decide on what needs to be taught, how effective was classroom instruction and the entire class performance as compared to other teachers and schools; Third, to make genuine grading, selection and placement decisions concerning students with regards to grade based on merits, award students with certificates on learning achievement and to help give the desired feedback to all stakeholders on the quality of an educational reform or policies. With regards to grading, they opine that at every stage of learning, it is assessment that provides the basis for graduating students from one level to the other and the award of certificates of competence to successful students.

SBA scores compiled by teachers through classroom assessments included 30% of the final grading of students as against 70% of the external examination, which in the long run attest to students‟ learning, performance and achievement. Moreover, SBA plays keen role in student placement at the different levels of the school curriculum to help facilitate the development of their potential, when talking about the selection function of assessment. Furthermore, SBA scores could be used as predictive function to provide adequate information on students on how they are likely perform in the near future.

Policy makers or formulators in education are mostly interested in making sure that the best practices prevail by constantly reviewing the existing status of curriculum standards. These best practices can also be sustained through well planned instruction and assessment. Policymakers in Ghana most of the time rely solely on the external examination or assessment organized by the West African Examination Council

(WAEC) for the purpose of recommending the need to improve the national educational results (MoE, 2014). Also, Akunu (2012) contends that external assessment significantly impacts teacher‟s instruction vis-à-vis what and how they teach and assess learners in the classroom. A number of research, that investigated assessment practices of teachers, have found out some purposes of assessment as reported by teachers.

Philippou and Christou (1997) investigated Greek and Cypriot teachers on assessment practices. Their terms of reference were the role of assessment, grading criteria, the kind of commonly used test item format and the objectives tested, and the congruence between assessment and lesson delivery. Their findings revealed that teachers conception about the main purposes of assessment were to ascertain students‟ weaknesses and to estimate the effectiveness of instruction. Delandshere and Jones (1999) conducted a research on assessment conceptions of elementary teachers of which their findings showed that teachers perceived that there exist three main purposes of assessment: for placement of students in the right curriculum stage; for the defense of student‟s grading system and accurate description of their achievement; and, finally for grooming students ahead of all forms external examinations.

A research was conducted in Ghana by Bello and Tijani (2008) on the training needs of teachers in School Based Assessment (SBA). Their findings revealed that, the main purpose for teachers to administer assessment include the following: to find out student‟s learning progress; to determine the impact of teacher‟s pedagogy on students‟ understanding; and, to offer proper accountability.

2.2.1 Forms of assessment

Alberta (2005) is of the view that assessment is integral to the teaching–learning process, facilitating student learning and improving instruction, and can take a variety of forms. She then classified classroom assessment in to three generally forms namely assessment for learning (formative assessment), assessment of learning (summative assessment) and assessment as learning.

2.2.1.1 Assessment for learning (Formative Assessment)

Formative assessment strategies involve ways of gathering, interpreting, and taking action on information about students‟ learning in order to help improve their performance. According to Bell and Cowie (2001), formative assessment strategies may be formal or informal, and take place in the course of instruction. Formal formative assessment techniques are usually a kind of curriculum-embedded assessment which emphasizes on some particular area of learning, but they can also take the form of direct questioning, short tests, brainstorming, quizzes and so on. Conversely, informal formative assessment strategies are improvised and can take place in any student-teacher interaction at whole class, small group, or one-on-one levels. It can arise out of any teaching/learning activity at hand, and it is embedded in and strongly linked to learning and teaching activities (Bell & Cowie, 2001).

Formative assessment incorporates alternative assessment techniques into teaching and learning. The need to provide a holistic and comprehensive learning experience geared towards realizing the goals of education has led to the proposal to incorporate alternative, and not just the traditional, strategies of assessment in the teaching and learning process (Wiliam & Thompson, 2008). This proposal allows for the adoption and inclusion of wide-ranging teaching and assessment methods to elicit information to guide instruction. Alternative assessments are developed from classroom

instruction and activities which involve real-world problems or tasks that cannot be measured by the traditional assessments. Alternative assessment uses measurements and evaluation techniques which are of great significance to both the teacher and pupils (Herrera, Murry & Cabral, 2007). In alternative assessment techniques, students are allowed to display what they have acquired in terms of learning. This assessment strategy focuses on the growth and the performance of the student. That is, if a student fails to perform a given task at a particular time, she or he still has the opportunity to demonstrate his or her ability at a different time and different situation. Because alternative assessment, is administered in context and over a period of time, the teacher has the opportunity to assess the strengths and weaknesses of pupils in different aspects and situations (Atsu, 2011). In view of this, the teacher gets better understanding of how best students learn by considering the student product instead of relying on mere scores for gaining insights into the knowledge as well as skills students have acquired (Atsu, 2011).

2.2.1.2 Assessment of learning (Summative Assessment)

Summative assessment strategies, on another breadth, are administered intermittently to figure out what students know and do not know at a certain period of time. Summative assessment strategies point out the result of an assessment on what has been achieved at a particular stage of the curriculum. These strategies cannot provide immediate feedback because the results are known on time and information is not available to the pupils about their strengths or weaknesses with regards to their output (Stiggins, 2005). Summative assessment, as a strategy, concerns itself with summing up or summarizing achievement of students, which is usually reported at the end of a term or for purposes of certification at the completion of a course of study (Bello &

Tijani, 2008). That is, summative assessment strategies are limited to administrative decisions and assigning grades to the tests (Wiliam & Thompson, 2008).

2.2.1.3 Assessment as learning

Assessment as learning develops and supports students' metacognitive skills. This form of assessment is crucial in helping students become lifelong learners. As students engage in peer and self-assessment, they learn to make sense of information, relate it to prior knowledge and use it for new learning. Students develop a sense of ownership and efficacy when they use teacher, peer and self-assessment feedback to make adjustments, improvements and changes to what they understand.

2.2.2 Assessment reforms in Ghana

Ghana‟s educational system has undergone several reforms since her independence in 1957 from the Britain. There was an existing an educational system handed over to her by the British colonial government at the time of independence. It was described as the traditional education, which consisted of six years primary education plus four years middle school education, summing up to a total of 10 years of elementary school. Administratively, primary schools were segregated from middle schools, however, the mode of selection of students to middle schools depended on performance in teacher‟s assessments at Primary 6.

There was an examination called Middle School Leaving Certificate Examination (MSLC) which students were supposed to write at the end of the tenth year as has been expatiated below:

The pre-educational reform system of assessment comprised of teacher assessment and external examinations. Teacher assessment included classroom exercises, assignments, weekly class tests, end of term examination and end of academic year

examinations; these assessments were purposely meant for administrative and instructional decisions. Assessments such as classroom exercises, assignments and weekly tests were used for instructional purposes whereas the end of term and year examinations were used to give account on student‟s achievements and also to inform decisions as to who progresses to the next class. External examinations including the Common Entrance Examination (CEE) and the Middle School Leaving Certificate Examination (MSLCE) were purposely for selection and certification. The only body tasked to organize these external examinations was the West African Examination Council (WAEC). The Common Entrance Examination was purposely selecting students for secondary education. It is worthy to add that students in Primary 6 and Middle Forms 1, 2 and 3 (12-15 year olds) were those who qualified to partake in the Common Entrance Examination. The MSLC examination, on the other hand, meant for the middle form four students (16-years). The following are the assessment reforms practiced in Ghana are:

2.2.3 Assessment in the pre-reform education system in Ghana

Before Ghana‟s 1987 educational reforms, “one shot” examination in the form of „paper and pencil‟ was the adopted means of assessing students in Ghana. The paper and pencil mode of assessment was the most common evaluative practice adopted by various educational institutions. This mode of assessment was administered usually at the end of instructional session, course, term or year to help provide reliable information on the student or learner. The rationale for the Ministry of Education of Ghana to introduced continuous assessment during the 1987 reform was to serve as a supplement to the one shot examination.

2.2.3.1 Continuous assessment (CA) in Ghana

Ghana introduced the continuous assessment scheme in 1987 as a result of the recommendations proposed by the educational expects from International Monetary/World Bank (Kwawukume, 2006). Bartels (2003) explained that the rationale behind the introduction of the CA was to avoid to some extent the elements of risks associated with writing a single terminal examination. His philosophy was any student or learner who with all seriousness and conscientiously prepares well by studying hard in a particular course of study should not record failure at the end of the final certificate examination.

The nation‟s expectation of adopting the then continuous assessment system was that, the change would reduce the burden of learners who only depend on External-Terminal Assessments.

Based on a study conducted by WAEC, Accra, Ghana; the Ministry of Education reviewed the proportions of assessment by 30% internal and 70% external examination and is supposed to be applied in first and second cycle schools in the country (West African Examination Council, 1979 as cited by Kwawukume, 2006).

The techniques used in continuous assessment in Ghana takes the mode of class assignment, class test, and project at the basic level. With this policy, each teacher is supposed to conduct class assignment or exercise every two weeks and record four out of the lots of the student‟s performances and assigning each a minimum score of ten percent (10%). Thus, the sub-total is would be forty percent (40%). Moreover, teachers are supposed to give at least four projects or homework, also giving a sub-total of twenty percent (20%). In addition, teachers must give four class tests scoring each one ten percent (10%). The sub-total here too gives forty percent (40%). In the

end, the overall sum total of student‟s marks gives hundred percent (100%). This score is ultimately scaled down to forty percent (40%) to form the internal mark for the student. Whatever mark a student gets for the basic level can be computed to arrive at his or her final score with the forty percent (40%) for the final grading. Nonetheless, this internal grading system where the internal marks formed 40% of the final grading was changed to thirty percent (30%) while the external examination then carried seventy percent (70%) from the 1996/97 academic year (Bartels 2003). This happened to be the practice in our Junior High Schools up to date.

Although the proportions for both the CA and the external marks are clearly stated, it is still unclear whether the examining bodies actually incorporate continuous assessment in the overall grading of the students as it was suggested by its advocates and originators. Kwawukume (2006), again points out that a study by WAEC in Ghana, raised serious concerns about the reliability of the continuous assessment score alluding to the fact that, generally, some teachers abused the continuous assessment scores. The study again revealed that continuous assessment scores obtained by some students in certain subjects did not reflect any positive linear correlation with their external examinations marks. This earlier findings of WAEC was confirmed when WAEC cancelled 386 students‟ entries in Ghana citing forged continuous assessments scores (Atiku, 2008). A study by Bartels (2003) found that some tutors engage in favoritism and victimization of their students every now and then. He observes that either a student danced to the tune of tutors, or she/he has him or herself to blame. Although such finding cannot be generalized in conclusive statements, they however, point to the fact of possible existence of abuse in the use of continuous assessment scheme in our institutions.

2.3 School-Based Assessment (SBA)

School-Base Assessment refers to assessments administered in schools and marked by the students own teachers. Osunde and Ethe (2007) defined school-based assessment as an assessment practice that broadens and expands the form, mode, means and scope of assessment in the school in order to facilitate and enhance learning. Ukwuije and Opara (2013) in their work also defined SBA as a comprehensive, systematic, continuous, diagnostic and integrative teacher-directed assessment procedure. They further stated that school-based assessment needs to be continuous and integrate the three domains of cognitive, affective and psychomotor. SBA as has been pointed out earlier, was introduced into Ghana‟s curriculum in the 2007 educational reform which included review of the teaching syllabus. It replaced the then Continuous Assessment (CA) of which the aim was to ensure a comprehensive form of assessment i.e. assessment covering a greater number of applications profile dimensions (Mereku, Nabie, Appiah & Awanta, 2011).

Onward to the reform, what existed was that, teachers recorded class exercises, homework scores and quizzes as part of continuous assessment but in the new SBA, these assessment strategies are supposed to be done for the purpose of day to day formative assessment without contributing to the SBA score (Thus, teachers are supposed to conduct class test after the first 3 or 4 weeks in a term to cover those content or topics he /she has treated and record this as SBA Task1. Then in the next 3 or 4 weeks of the same term after SBA task1, the teacher conducts SBA Task2, and so on. Again, just as teachers assigned project works to students in a form of homework tasks in continuous assessment which sometimes can easily be completed within 24 hours or during weekend, with regards to SBA, projects are supposed to be completed in not less than six weeks. Teachers are expected to conduct SBA Task4, Task8 and

Task12 within the term in a reasonable time interval and submitted for marking at the end of the term whereas project for the second term are supposed to be undertaken as group work (projects).

Moreover, a project comprises of tasks or a series of tasks for students to perform employing one or more of the following processes: gathering data, observing, looking for references, analyzing, measuring, identifying patterns and correlations, pictorial representations and reporting findings. Tasks in a form investigation in the context of algebra, geometry and or measurements could also be assigned as projects. A project work requires that, students are allowed enough time for its completion. For instance, 4 weeks, or even two months duration could be given to students to finish.

Besides project-based learning, teachers are required to give students from time to time the opportunity to do presentation on progress reports in class for whole class to deliberate on it, get the necessary feedback and suggestions. With regards to scoring SBA, it is recommended that class test or class exercises should be scaled to the score 10, whereas project task to the score 20 (CRDD, 2007).

2.3.1 Nature of school-base assessment in Ghana

School – Based assessment, by its nature is systematic, comprehensive and guidance - oriented activity and that its effective implementation needs to fulfill such peculiar features (Adebowale et al 2008, cited in Birhanu 2004). In terms of it comprehensive nature, its practice requires the use of different methods and assessment techniques, so that teachers in the process of implementing SBA can address behavioral domains which could not be assessed by only terminal based assessments. In view of this, CRDD (2010) has outlined the following areas which the emphasis of SBA should be based on:

- Thinking skills. This stress on the understanding ability of the learner and also enable him/her generate ideas and develop new processes and strategies.
- Problem solving skills. This demands the individuals‟ ability to comprehend a problem, adopt divergent approaches and knowledge need to combat the problem.
- Cooperative learning which aimed at developing learners‟ interest in working with class mates in groups to carry out projects and learn in the process.
- Working with numbers. Being the basic necessity of education, the SBA emphasis on greater ability in working with numbers so as to acquire in-depth understanding and be able apply mathematical processes in addressing daily problems.
- Moral and spiritual development. The attitude of fairness and general positive attitude in life is activated as learners are exposed to SBA practices which emphasis of moral and spiritual development.
- Formal presentations skills. This skills cultivate the zeal needed for presentation before class mates and the public as a whole and also empowers the individual of defending his/her findings publically.

Comprehensiveness is not only in terms of the behavioral domains measured but also in terms of the assessment tools teachers employ in assessing those areas. According to Freedman (1998), assessment, other than tests or examinations must include varied assessment tools such as projects, presentation, interviews, observations, oral questions, home works, seat works and similar other kinds. Therefore, comprehensiveness in assessment is meant addressing multiple learning styles, variety in termly and weekly projects and variety in the thinking skills and inquires. Hence,

pupil‟s marks could then be a profile of many areas of competence rather than concentrating on a single behavioral domain (Ali & Akubue1988).

Assessment is not an end by itself but the means to an end (Gronlund & Linn, 1981; Nitko 2004), the guidance nature of SBA is driven form this general principles of measurement and evaluation. School-Based Assessment mainly focuses on monitoring and guiding pupils‟ progress throughout the content of the subject material taught. In the nature of school-based assessment, systematic planning is a mile stone of its practice. Planning school-based assessment ensures whether or not the proposed assessment scheme is progressive and properly integrated and that the different assessment vehicles are properly matched to the objectives and learning out comes that they intended to assess. So teachers are expected to plan the assessment activity with variety of techniques and methods in order to have a complete picture or performance level of their students.

2.3.2 Planning of school-base assessment activities

In Ghana, teachers make use of the national curriculum, the teaching syllabuses, and national approved text books to plan their lessons and also construct their schemes of work. At the commencement of every term teachers submit their schemes of work to the various departmental heads for vetting (Avoke, Hayford & Ocloo, 1999). In addition, Teachers make their lesson plan which is an individual teacher‟s responsibility available to their head of departments on weekly bases for vetting. In a study by Angbing (2001) engaging basic school teachers in the Bawku municipality in the upper east region of Ghana, found that head teachers and sometimes circuit (district) supervisors have been vetting lesson plans, lesson objectives, core points and evaluation procedures to ascertain that teachers actually assessed the intended learning targets or outcomes. Head teachers often times checked the student‟s exercise

books to assess the quality of assessment techniques and activities teachers gave to their students. This attests to the fact that there exist mechanisms for checking teachers to make sure they adhere to the guidelines in implementing any form of accepted assessment.

According to Pollard and Collins (2005), effective teaching and learning cannot be maintained without considering assessment as an integral component of planning. It is worthy to state that good planning promotes flexibility. Moreover, before planning, teachers should have fore knowledge or should be well informed about his /her student‟s formative assessment so that specific objectives can be reviewed, refined and differentiated to ensure positive learning outcomes. This view is supported by Clarke (2005) who argues that: A well planned lesson and assessment by teachers should be the one that provide adequate information for both learner and teacher about their progress towards learning goals. It should also be responsive and flexible enough to the initial and emerging ideas and skills. Planning should comprise techniques that ensure that students understand the learning goals of the lesson and the criteria that will be employed in assessing their work. Planning in addition should involve how learners will receive prompt feedback, how they would be involved in assessment process especially assessing their own learning and how they will be assisted to make further progress performance. p. 25). The main inference that could be deduced from the review so far is that: there exist a prescribed format for recording student‟s assessment and also for assessing their progress vis-à-vis the curriculum.

2.3.3 What to assess in learning mathematics

Abell and Siegel (2011), argue that, what to assess is closely connected to the teaching and learning goals and the school curricular. Thus, being able to identify what to assess is of significant importance because it makes the whole exercise more

meaningful in terms meeting the set goals of the curriculum and differentiates between "assessment of attainment or effort or ability or improvement or deterioration" (Chumun, 2002, p. 105). In the conduct of assessment, both cognitive and non-cognitive characteristic of students including attitudes and behaviors are considered. Teachers want to know about affective characteristics such as mathematical ability, interest, confidence, quietness and behavior, anytime they engage in teaching (Black & Broadfoot, 1982).

The character traits mentioned above can also be referred to as cognitive, affective and psychomotor behaviors. De Lange (1999) counted that, the characteristics of the affective domain including attitudes and interest do not necessarily mean that mathematical competence have been developed, however, these attributes are important pre-requisites for developing mathematical competences. De Lange (1999) continues that for mathematical competence to be attained, teachers ought to design competent test items that seek to examine skills which have been constituted in three levels. He contends that the first level involves reproduction, definition and computation; the next level involves connections and integration for problem solving, and the final level involves mathematical thinking, generalization and insight. These three levels have been well expounded by De Lange (1999) as follows: level one comprises of the aspect the deals with performance expectation in with regards to "knowing" and using "routine procedures" employed in TIMSS study (p. 14).

De Lange (1999) added that what to access in Mathematics concerns the following: The "knowledge of facts,… being able to recall mathematical objects, properties and rules, performing routine algorithms…, and being able to tackle statements and expressions that involve symbols and formulas" (p. 14).

The second level is comparably related to the TIMSS "investigating and problem solving category" consisting of "formulating and classifying problems and situations, developing strategy, solving, predicting, and verifying" (p. 14). Level three constitutes "mathematical reasoning" (p. 15) and performance expectation in relation to developing notations or symbols and vocabulary, algorithms development, conjecturing and generalizing. He admitted that the third level, which play keen role in mathematics and mathematical literacy for that matter, is unwieldy to test. He goes on to emphasize that level three is in three folds dimensions, including: the "content or domains of mathematics ... mathematical thinking and understanding, and ...difficulty of questions posed from simple to complex" (p. 15).

TIMSS-2007 employed an assessment framework which involving two organizing dimensions: a content dimension and a cognitive dimension. The content dimension determines the domain relating subject matter to be assessed in a particular subject whereas the cognitive dimension covers the domains relating to assessment of how student"s think. In every subject, there exist three cognitive domains – Knowing, Applying and Reasoning (Mereku, Ghartey, Anamuah-Mensah and Ampiah, 2008).

The official curriculum for teaching and assessing mathematics competences in Ghana at the pre – tertiary levels; precisely senior high school level is the mathematics syllabus. The syllabus emphasizes that in planning assessment procedures, teachers must first make it a point to select specific objectives capable of assessing a representative sample that reflects syllabus objectives (CRDD, 2010). The School Based Assessment (SBA) as practiced in Ghana is structured in such a way that it focuses on the cognitive aspects of learning, which comprises of knowing, application and reasoning (Anamuah-Mensah, Mereku & Ghartey-Ampiah, 2008).

As such, Ghana‟s curriculum developers have designed the mathematics syllabus by ensuring that both instruction and assessment are grounded on specified profile dimensions which comprise: Knowledge and Understanding and Knowledge Application. It is instructive to note that the seven areas of subject matter include: Number and Numeration, Algebra, Plane Geometry, Mensuration, Statistics and Probability, Trigonometry, and Vectors and Transformation in the coordinate Plane (CRDD, 2010).

It is worthy to note that these profile dimensions are in line with both Knowledge and Cognitive Process dimensions of the revised Taxonomy (Krathwohl, 2002) and what mathematical competence entails as explained by De Lange (1999). The table below gives the marks allocations of the profile dimensions suggested for SBA and end of term examination in Senior High Schools.

Table 2.1: Distribution of marks of Profile Dimensions for End of term examination and SBA

Dimensions	**Paper I**	**Paper II**	**SBA**	**Total Marks**	**Total Scaled to 100**
Knowledge and Understanding	30	20	10	60	30
Application of Knowledge	10	80	50	140	70
Total	**40**	**100**	**60**	**200**	
% proportion of Exam Papers	20	50	30		100

It is evident in the mathematics syllabus, SBA policy document and from De Lange (1999) that mathematics assessment ought to assess the finished outcome of students and also the process of learning. Assessment nowadays highlights more on acquiring skills and abilities rather than mere attainment of knowledge. It is in this light that

makes it imperative for teachers to take into account as to whether assessment should centre on the finished outcome or product of students learning or the process of learning or both. The concern expressed however is that teachers may focus too much on grading the finished activity after considering the finished outcome, instead of focusing more on the way it was produced, the way the students set out organizing knowledge and interpreting information. This is because their preoccupation is finishing the syllabus (MoE, 2014). In product of work, attention is paid to the ideas presented, the quality and quantity of work, its relevance to the subject set and to evidence of originality. In process, the attention is on how the work was carried out, planned, executed and demonstrated. It must be noted that process and product are intimately related and that process leads to product.

Some studies have shown what most teachers assess in their assessment of students. In Delandshere and Jones‟ (1999) study which examined the assessment conceptions of elementary teachers, they found out that teachers distinguished between formal assessment which resulted in grades, and informal assessment that were not used for grading. As a result, teachers adhered to testing skills and procedures. Their assessment practices where primarily summative similar to the mandated state assessments. They reported that teachers‟ assessments were aligned with their instruction since both were skill and procedure based. Cooney and Shealy (1995) also hold similar views to that of Delanshere and Jones (1999). Cooney and Shealy (1995) report that teachers had assessment conceptions and practices that were aligned with their mathematics and learning conceptions. Majority of the teachers in their study believed that mathematics is basically computation, problem skills and concepts. As a result, their tests were primarily computational in nature. Other teachers in their study, viewed mathematics as a puzzle which consisted of challenging and analytical

patterns and so engaged students regularly in projects and activities that focused on process than procedure (product). According to Brown (2003), teachers who used computational tests used assessment as a tool to measure surface learning since they only assessed skills and concepts. On the other hand, teachers who focused on process and used open-ended projects, viewed assessment as a means to influence learning and improve the education of pupils.

2.3.4 School-base assessment strategies in mathematics

An assessment strategy involves "knowledge of assessment formats, understanding of assessment types and specific instruments" (Abell & Siegell, 2011, p. 534). Assessment Strategies refers to how a teacher assesses students on particular concepts, both formatively and summatively (Abell & Siegel, 2011). NCTM (2000) states that

> "because different students show what they know and can do in different ways, assessments should allow for multiple approaches, thus giving a well-rounded picture and allowing each student to show his or her best strengths" (p. 23).

2.3.5 Mathematics assessment tools

It is evident in literature that some specific instruments or tools are used as formative and summative in assessments. Some formative assessment tools used in assessments and their descriptions include: Observations of students during in-class activities: Observation is a process of systematically viewing and recording students while they work, for the purpose of making programming and instruction decisions… it provides information on students' strengths and weaknesses, learning styles, interests, and attitudes (Ontario, 2005, p. 1).

Interviews: An interview is a face-to-face interaction whereby teacher and student use "inquiry to share their knowledge and understanding of a topic or problem… used by the teacher to explore the student‟s thinking; assess the student‟s level of understanding of a concept or procedure; gather information or obtain clarification" (Ontario, 2005, p. 1). Interviews provide immediate feedback.

Questions and Answers (Oral Discussion): In the question-and-answer strategy, "the teacher poses a question and the student answers verbally, rather than in writing… this strategy helps the teacher to determine whether students understand what is being, or has been, presented, and helps students to extend their thinking". This could be both formal (planned) and informal (spontaneous). Homework exercises could be used as review for class discussions (Ontario, 2005, p. 2).

Performance Tasks/Projects: During a performance task, students "create, produce, perform, or present works on real world issues. The performance task can be used to assess a skill or proficiency, and provides useful information on the process as well as the product" (Ontario, 2005, p. 2). Performance tasks can be in the form of projects. Projects encourage time on academics outside of class, and can be used to assess transfer of skills and integration of content (Hanna & Dettmer, 2004). Projects involve tasks or a series of tasks for students to carry out using one or more of the following processes: gathering data, observing, looking for references, measuring, analyzing, identifying patterns and or correlations, graphing, reporting or doing presentations. With regards to SBA, project work has been modified in terms of its structure and now it is centered on encouraging pupils to apply the knowledge and skills they have acquired whilst in school to perform authentic assessment tasks and write comprehensive analytic reports or apply mathematics in problem-solving (MoE, 2014).

Classroom Presentation: This is In-class activity whereby students are allowed to informally do a presentation of their results. A classroom presentation is when students "verbalize their knowledge, select and present samples of finished work, and organize their thoughts about a topic in order to present a summary of their learning…this could provide the basis for assessment after completion of a student"s project" (Ontario, 2005, p. 1). Project-based learning in the SBA requires that, teachers allow their students to periodically submit progress report in a form of presentation to the class for colleagues to critique and add their suggestions (MoE, 2014).

Some summative assessment tools used in assessments and their descriptions are:

Quizzes, Tests, Examinations: A quiz, test, or examination requires "students to respond to prompts in order to demonstrate their knowledge in writing or their skills (e.g., through performance). Quizzes are usually short; examinations are usually longer… quizzes, tests, or examinations can be adapted for re-teaching" (Ontario, 2005, p. 2). Quizzes, Tests or Examinations could be objective (multiple choice questions) or subjective (essays). These assessment tools can be tailored to match instructional objective and are known to yield results quickly. However, weaknesses identified with tests or examinations are: they are vulnerable to student theft and distribution; they tend to dominate the syllabus rather than reflect them; and learning in the classrooms is restricted to examinable activities only (Dery & Addy-Lamptey, 2010).

Multiple Choice Questions or Selected Responses are a part of quizzes, tests, and examinations. Selected responses require students to "identify the one correct answer. The strategy can take the form of multiple-choice or true/false formats…selected

response is a commonly used formal procedure for gathering objective evidence about student learning, specifically in memory, recall, and comprehension" (Ontario, 2005, p. 2). Its disadvantage is that students‟ success is largely determined by a great element of chance (Dery & Addy-Lamptey, 2010).

Essay: Ontario (2005) explained essay as a

> "writing sample in which a student constructs a response to a question, topic, or brief statement, and supplies supporting details or arguments…the essay allows the teacher to assess the student's understanding and/or ability to analyze and synthesize information" (p. 1).

Philippou and Christou (1997) researched into the role of assessment, grading criteria, most common item format and objectives tested, and alignment of assessment and instruction. They investigated Greek and Cypriot teachers‟ assessment practices. They reported that teachers used a variety of strategies to determine students‟ mathematics grades including class participation, performance on class work, test scores and student effort. Teachers reported using a variety of test items formats including but not limited to items for understanding novel problems and items requiring applying to concepts to novel situations.

The Ghanaian mathematics syllabus recommends that teachers use class tests, homework, projects, quizzes, oral questions, group exercise, end-of-term tests etc developed in a manner that will compel students to apply their knowledge to issues, and develop observational and investigative skills (CRDD, 2010). Nabie, Akayuure and Sofo (2013) researched into Ghanaian teachers‟ assessment practices and challenges of integrating problem solving and investigations in teaching mathematics. Their results reveal that many practicing teachers integrated and used a variety of assessment techniques in their problem solving and investigation lessons. They added

that majority of teachers adopted traditional assessment techniques instead of alternative assessment techniques comprising class exercise, tests, homework, discussion, observation, project work and group work as recommended by the syllabus.

Abell and Siegel (2011) contends that teachers who are assessment literate use techniques beyond the traditional multiple choice and true/false type test items. Being conversant with different types of assessment techniques give teachers the opportunity to choose the most appropriate and relevant instruments to achieve an intended learning goals. According to Lowery (2003), traditional tools are indispensable as their role in assessments in measuring some aspects of achievement such as factual recall cannot be done in any other option. He suggests that alternative assessments help in directing attention away from the computational, speed and accuracy of mathematics, which characterizes traditional assessments, to strategies that encourage mathematical thinking. This develops understanding rather than developing a student‟s memory. He further states that alternative assessment strategies like building portfolios, open-ended questions, focused observations and performance tasks offer more opportunities to students mastery of subject matter by asking them to create, perform, or produce; tap higher-level thinking; and involve problem-solving skills.

2.3.6 Interpreting school-base assessment data

Grading is the “process of judging the finality of a student‟s work or performance in which scores and descriptive evidence are converted into marks or letters (grades), which indicate how well each child has learned” (Airasian, 1997). Grades are traditional and universal means of documenting students‟ learning performance. Although students and other stakeholders place such importance on grades, few teachers have had formal training for it. Only teachers on marking duties for the West

African Examination Council‟s conducted exams are taking through the process of marking and scoring, while the majority of teachers do not have this training. Ekwueme and Meremitwu (2013) observed that students taught by teachers with WAEC marking experience committed fewer errors than their counterparts taught by teachers without WAEC marking experience. Grades are formal and important element of students‟ record. Grading is a difficult task for teachers because teachers tend to be bias instead of being objective. In grading students‟ end-of-term test, SBA scores account for 30% of the final score as shown in Table 2.0

In Ghana, investigations carried out on SBA by the Curriculum and Research Development Division of the Ghana Education Service show that significant differences existed in teachers scoring of test. The findings also show that marking schemes were not used to score students responses to tests (Dery & Addy-Lamptey, 2010). The West African Examination Council (1997) study reported that some teachers scored school based subjective tests without marking schemes, a situation it described as worrying (Bello & Tijani, 2008). This is worrying as it could lead to wrong analysis and reporting of assessment data. School Based Assessment data is analyzed quantitatively and qualitatively to determine students‟ performances for continuous assessment purposes.

2.3.7 Action-taking on school-base assessment results

This important phase is characterized by communicating assessment results to various stakeholders. Teachers are the main users of the evidence gathered. They use assessment to check the effectiveness of instruction (Sethusha, 2012). According to Sethusha (2012), teachers use assessment data to make decisions about students‟ needs in the next term, to tell how well their students reached well-defined goals and achieved outcomes. Thus, they evaluate students‟ progress or achievement. Moreover,

teachers use the evidence gathered to do more careful planning for the next teaching cycle.

Reporting assessment data to students provides them with clear feedback as to their progress and makes them more accountable for their own learning. Students are able to reflect on what they have learned. As a result, students can take more active roles in making decisions about what their needs are for the next lessons. Parents also play a prominent role in classroom assessment. Assessment results communicated to parents provide them with concise feedback and explicit evidence of their children‟s progress so that they can monitor and supervise their children‟s work. They are also able to assist the teacher in internal decision-making. Finally, school administrators need reports to make a variety of decisions about assessment-related issues such as curriculum planning and assessment policy (Sethusa, 2012).

2.4 Factors that affects School-Base Assessment Practices in Mathematics Class

2.4.1 Factors that facilitate SBA practices

Teacher is the principal implementer of the School-Based Assessment policy (Opara, Onyekuru, & Njoku, 2015). Effrim & Eshun (2014) point out that as a requirement for implementing the SBA policy, Ministry of education expects teachers to give class assignments/exercises, conduct class tests and give pupils projects/homework in a term. They continue and argue that, to attain a successful implementation practices of the SBA, teachers must perform some lay down roles as outlined below:

1. The teacher must accept the guiding principles of SBA. Effrim and Eshun (2014) hold the believe that when teachers are convinced beyond all reasonable doubt that SBA is a better form of accessing student‟s academic

attainment than the traditional summative, it will facilitate the way and manner in which it is implemented.

2. Moreover, the teacher needs to be knowledgeable about SBA. They argue that having adequate knowledge about the characteristics of SBA, the strength and weakness of the system as a procedure for accessing student‟s knowledge, attitude, and manipulative skills facilitates the implementation practice. This can be achieved when stakeholders and school administrators engage teachers in productive in-service training and workshops concerning the implementation of SBA policies so that they clearly understand and accept the role and responsibility as outlined by the program and be willing to contribute to its successful implementation.
3. The teacher must break the learning program of the period of instruction into smaller, specific and well defined units. The mode and time for administering the SBA is 4th week, 8th week, 11th week and one to be collected on the 12th week. This demands for the breaking down of learning program of the period to suit the schedule dates for the SBA implementation.
4. The teacher must assess the learning outcomes and performance at the end of each unit of instruction. He must follow the timetable laid out for assessment but should allow some degree of flexibility.
5. The teacher must spread the assessment over all areas of student‟s behavior. These are cognitive, effective and psychomotor domains. Appropriate assessment instruments such as pencil – and – paper tests, observation, autobiographies, questionnaire, check lists, rating scales and inventories should be used.

6. The teacher must formulate measurable, specific and attainable instructional objectives for each unit of instruction. This helps him to make his teaching more effective and meaningful. It also makes his assessment easier since these are based on the objective set out.
7. The teacher must provide constant feedback. Class assignments and exercises, projects, tests and home work must be promptly scored and returned to the students. This helps to direct and motivate student learning.
8. The teacher must record all the assessment of the student in all the areas of learning and instruction in the appropriate records. This must be done promptly at the end of each measurement. The records must well-kept and maintained.
9. The teacher must be involved in remedial and individualized teaching. At the end of teaching, the teacher should find out whether the whole class attained the required level of mastery. Remedial programs should be organized if the requisite level of mastery was not reached. In addition, the teacher must also devote time to individuals who do not perform well in the class assignment, exercises and tests and have difficulties.

2.4.2 Factors that hinder SBA practices

According to Lawal (2009) cited in Ebhomien, Paul, Oriahi, Chrstie, Diahi and Smart (2012) there are many factors that hinder the practices of SBA in mathematics. These are: inadequate supply of teaching aids, lack of instruments for non-cognitive behavior, inadequate recruited mathematics teachers, lack of technical knowledge on the part of teachers, heavy teaching loads, inadequate time for test and recording, lack of interest and avoidance of test. Moreover, Abera, Kedir and Beyabeyin (2017) in their study to investigate the implementation and challenges of SBA in public high

schools identified lack of feedback, large class size, shortage of time, lack of (facilities, awareness, opportunities, assessment tactics, assessment specification, theory-practice, authentic assessment policies, and portfolio design) as the main factors that hinder the school-based assessment practices in public high schools. However, Siyum (2016) asserted that general large class size, shortage of time and low readiness of students are the main factors that hinder the effective implementation of SBA.

2.5 Influence of SBA on Students Academic Performance in Mathematics

In a real sense, school-based assessment scores in any subject for a particular student should reveal his or her achievement in the external examination. Obviously, some researchers such as Orubu (2013) and Ogunkola (2007) investigated on SBA scores as predictors of students‟ final grades in Delta and Ogun States respectively, and found out that SBA scores predicted students‟ performance in Junior Secondary Certificate Examination mathematics and integrated science respectively. Omole (2007) also did a comparative study of students‟ performance in SBA and certificate examination in the Federal Capital Territory (FCT). He found out that students‟ scores in SBA are significantly higher than their scores in Certificate examination in English and Mathematics at the upper basic education. The gap in this study, to the best of the researchers‟ knowledge is that most of the studies in this regard are actually outside Ghana.

Opara, Onyekuru & Njoku (2015) conducted a study on the predictive power of SBA scores on students achievement in Junior secondary external examination in English and mathematics. The study adopted an ex-post facto research design with a sample of 250 students randomly selected from ten (10) schools out of twenty (20) Junior Secondary Schools in Obio-Akpor Local Government Area in Rivers State. The

instrument used for data collection was Students Academic Record Inventory (SARI) which involves the students SBA score for JS 1, JS 2, JS 3, and JSCE scores in English and Mathematics. Multiple regression analysis was generated. The result revealed that the combination of the SBA scores significantly predicted students‟ English and Mathematics achievement in JSCE, and there are relative effectiveness of SBA scores in students‟ English and Mathematics achievement. Based on the finding, their recommendations were made including that school-based assessment should be encouraged and made compulsory for every secondary schools especially in core subjects.

2.6 Theoretical and Educational Foundation of SBA

The theoretical foundation of SBA lies on Jean Piaget‟s and Vygotsky‟s learning theories. Piaget suggests that individuals must adapt to their environment. He described two processes for adaptation which is an organism‟s ability to fit in with its environment, assimilation and accommodation. Assimilation is the process of using or transforming the environment so that it can be placed in preexisting cognitive structures. Accommodation is the process of changing cognitive structures in order to accept something from the environment. It changes the schema, so it can increase its efficiency. Applying Piaget‟s theory in teaching and learning is of great benefit to teachers and students in a number of ways. Teachers are able to gain understanding and in-depth insight into their student‟s thinking. They also plan by aligning their teaching techniques with their student‟s cognitive level in terms of motivation, modeling, and assignments. The teacher‟s goal is to assist his students construct knowledge.

Conservation of constancy, as defined by Garner (2008, p.34), “is the ability to understand how some characteristics of a thing can change, while others stay the

same". In other words, it is the realization that even though an object can be changed physically, some of the characteristics for that object remain the same. For instance, if you give students modeling clay and tell them to mold it, the shape will change, but the color of the modeling clay will remain the same. Conservation of constancy "identifies relationships and makes sense of physical and abstract information" (Garner, 2008, p.47).

Educators create, implement, and assess the curriculum being taught, assuming throughout the process that students can conserve constancies. If students lack this ability, they will not benefit academically because they have limited concrete sensory data and literal interpretations. Thus, they will experience difficulty in thinking abstractly, problem-solving, planning, and discerning relevance (Garner, 2008). For example, if the student is studying fractions, he or she may not be able to recognize that one-third and three-ninths are equal.

In order for students to develop their conservation of constancy skills, teachers must provide their students with opportunities to recognize similarities and differences at both the physical and abstract Visualization and reflective awareness are crucial to students‟ understanding of conservation of constancy. By encouraging students to identify similarities and differences in objects, they increase their conservation of constancy.

According to Vygotsky‟s Theory, Social interaction plays crucial role in student learning. It is through social interaction that students learn from each other, as well as adults. Vygotsky‟s theory suggests that we learn first through person-to-person interactions and then individually through an internalization process that leads to deep understanding. Vygotsky explores three different types of speech: social, private, and

internal. He refers to social speech as the instructions given by adults to children. Private speech allows children to process what the adult has said and try to apply it to similar situations. For example, a teacher tells the class to keep their hands to themselves. Self-control is an example of private speech because children are using for themselves the same language that adults use to regulate behavior. So, since their teacher has informed to keep their hands to themselves, the students do not hit or punch each other in class. Both teacher and student share the responsibility of developing students‟ private speech. Vygotsky‟s central topic was the Zone of Proximal Development (ZPD), which uses social interaction with more knowledgeable others to move development forward. A more capable person, such as teacher or peer, provides assistance to the student; the student is able to complete the task with this assistance. Students, who are in the ZPD, need active teaching. Therefore, Vygotsky‟s theory promotes the belief, “What is learned must be taught.” Teachers should be explaining, modeling, and using guided practice in the classroom. By modeling what they want their students to do, students will be better able to work through their assigned tasks.

Think-aloud, an instructional strategy that allows students to talk through new steps of an endeavor aloud can be used with upper elementary and middle school students, who are in the ZPD. This strategy assists students‟ thinking about how they make meaning. During think-aloud, students listen to a skilled reader using “strategies to comprehend text and their teachers‟ thinking become visible to them”. Students need time to try out various strategies, so they can develop answers or responses. At the same time, teacher questioning techniques should guide the social interactions implicitly or explicitly.

Think-aloud help teachers determine why and how students are experiencing difficulty in reading. In addition, students can analyze their own thinking about their reading. Educationally, continuous assessment is based on the constructivist epistemology which assures knowledge as something produced through the meaningful interaction between the learner and the world around him/her.

This would be possible when pupils are made to actively involved in the entire system of the teaching learning process.

The insights from the learning theories and emerging educational philosophies led to a set of changes in the classroom assessment. One area of change is the assessment trolls and frequency of the assessment itself. Regarding this change (Liu cited in USAID/BEP, 2006) asserted that pupils don‟t need to acquire a vast amount of information, typically the focus on traditional assessment but rather the ability to think and organize the information for specific purpose. The implication is that assessment should move away from the narrow focus on simple tests to assessment methods that address the overall development of pupils. The other area of change is the form of regularly monitoring the teaching learning process and using varied ways of assessment and providing frequent and constructive feedback on how learning is progressing rather than merely auditing learning (USAID/BEP, 2006).

Generally, the foundations that continuous assessment established itself on the contemporary development is cognitive and constructivist theory which in turn change educational practitioners‟ view of knowledge acquisition and competence.

2.7 Conceptual Design of the Study

School Base Assessment practice as has been reviewed from existing literature has shown that it has its own principles, guidelines and features which facilitate its implementation and practices. The theoretical background highlighted earlier in this chapter forms the basis of the conceptual design upon which the study is grounded. Assessment is therefore a set of teaching strategies that are carried out by teachers and their students to evaluate the learning activity and identify challenges that derail their efforts in achieving the set learning objectives through School Base Assessment.

In this regard, proper planning of assessment activities must be ensured in order to achieve the desired learning outcomes in students learning. The following were highlighted in the various research materials reviewed under this chapter including: SBA policy and guidelines, teachers attitude, knowledge, workload and their teaching experience, student‟s attitude, intellectual level and active participation, school‟s administration management style, supervision and monitoring as well as nature of assessment type, assessment technique adopted and duration. Therefore, these areas are taken as the model which researcher used throughout the study to investigate the status of School Based assessment practices in Senior High schools.

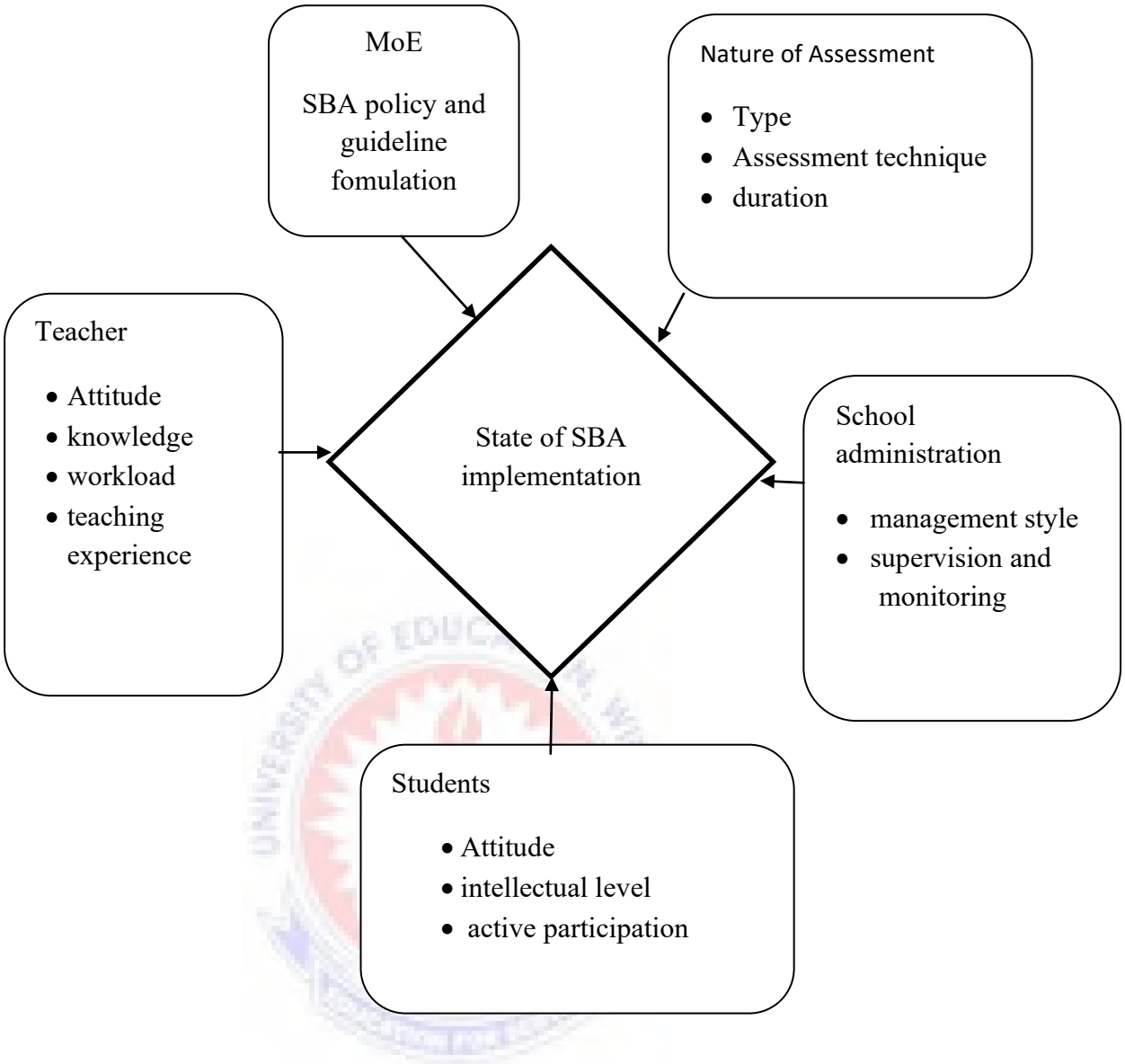

Figure 2.1: Conceptual model/ pictorial representation of the study.

2.8 Summary

In chapter two (2), emphasis was placed on the concept of classroom assessment, school-based assessment, factors that affects school-based assessment practices in mathematics class, influence of school-based assessment practices in mathematics, theoretical and education foundation of SBA and conceptual design for the study.

Classroom assessment was found to contribute enormously to the learner‟s performance and achievement and was rated to be the most crucial, trending and

pervasive issue worthy for critical consideration in the educational systems ensuring quality of learning (Abdu, 1998). The review revealed that continuous assessment was one of the major assessment practices employed in Ghana for ages until it was substituted by school-based assessment in 2007 after an educational reform which reviewed the syllabus was made.

School-based assessment according to Ukwuije and Opara (2013) was defined as a comprehensive, systematic, continuous, diagnostic and integrative teacher-directed assessment procedure incorporated four tasks within a term comprising of two quizzes, and two projects of which one is a group project to build cooperative working attitude among learners.

Although SBA was found by some researchers to have an influence on students‟ academic performance to the extent of predicting students‟ achievement in external examination (Opara, Onyekuru & Njoku, 2015) there is the need to do more research on its implementation practices to ensure, encourage and make it compulsory for every secondary school in Ghana especially in core subjects.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter focusses on the research design, population for the study, population sample and sampling technique, instrument used for data collection, validity and reliability, ethical issues, field work and how data was analyzed in this study.

3.1 Research Design

According to Denzin and Lincoln (2000, p. 22), research design is "a flexible set of guidelines that connect theoretical paradigms; first, to strategies of inquiry followed by methods of collecting empirical material." Maree (2010) stated that a good research design equips the researcher with procedures and guidelines necessary to answer the research questions and it is useful for connecting research elements together. Research design is a plan and procedures for conducting an investigation. The plan is a guide to the whole process and help reveal how the researcher is going to test, measure or observe a phenomenon of interest. The design describes the procedures for carrying out the study, including when, from whom, and under what conditions the data will be collected. To attain greater control of a study requires a research design (Burns & Grove, 2001). The study was designed to investigate the implementation of SBA in the mathematics class of SHS in the Bibiani Anhwiaso Bekwai district in the Western Region of Ghana with regards to the current state of SBA practices, finding the factors that facilitate or hinder SBA practices, what can be done to improve the current state of SBA implementation and the influence of students performance in the SBA on their end of term examination performance in matheamtics.

In this regard, collection of both qualitative and quantitative data for such a study was more appropriate. As such the researcher employed mixed method design. A mixed method approach "combines quantitative and qualitative strategies within one study, collects both numeric (numbers) and text (word) data in a sequence" (Creswell, 2003, p. 262).

Qualitative data is a type of data gathered from open-ended information such as interviews, document analysis and so on in a form of words (text) while quantitative data includes closed-ended information (numeric data) gathered from questionnaire, test scores etc. (Creswell, 2006). The qualitative approach places more emphasis on meanings of experiences in order to develop an understanding, while the quantitative approach provides a set of descriptive statistical analyses carried out with the numeric data.

The researcher identified that mixed method strategy was suitable for this study because according to Creswell (2006) mixed method provides a better understanding of the problem than if either data set had been used alone. Thus quantitative research method was used to analyze data that was quantitative in nature whereas, qualitative research was used to analyze those data which was not quantitative in nature so that the weakness of one method was complemented by the strength of the other method.

Also, the adoption of mixed method can be considered as a form of triangulation of data (Bazeley, 2004) in terms of data that would be obtained from various data collection techniques. Triangulation adds to both the validity and reliability of the results. Moreover, Hammersley (1992) argued that mixed method research considers the knowledge for both what is happening and why or how it happens and could be used in large scale projects as both breadth and depth of a research topic can be

undertaken. In using a mixed method strategy, the questionnaire provides the breadth and the interview provides the depth (Cameron, 2009). Finally, Tashakkori and Teddlie (2003) suggested that the mixed method design gives the researcher better opportunities for attaining detailed information available for the study.

3.2 Population

VanderStoep and Johnson (2009) refer to population as to the universe of people to which the study could be generalized. A research population is a large well-defined collection of individuals or objects having similar characteristics (Castillo, 2009). The target population according to Burns and Grove (2001) is the entire aggregation of respondents that meet the designated set of criteria. It is a group of potential participants to whom the researcher wants to generalize the results of a study (Owu-Ewie, 2012). The target population is the group of interest to the researcher.

The study was limited to the Senior High Schools in the Bibiani Anhwiaso Bekwai District. The target group or population for this study comprised of all students and mathematics teachers in the Senior High Schools in the Bibiani Anhwiaso Bekwai District in the Western North region of Ghana. There are four (4) public Senior High schools in the district. Senior High Schools in the Bibiani Anhwiaso Bekwai District were considered by the researcher due to their proximity to the researcher, convenience, accessibility of the participants to the researcher and the researcher being familiar with academic activities in the district. Moreover, the researcher having taught in the district for close to ten (10) years had colleagues in almost all the target schools which he relied on for a good work and so the researcher had the full cooperation and support for this study. It is also worthy to note that the characteristics of the schools the researcher targeted in this district are comparable to the SHSs

across the country in terms of teaching and learning and for that matter, outcomes from the study was worthy for generalization.

3.3 Sample and Sampling Techniques

According to VanderStoep and Johnson (2009), sample refers to the subset of people from the population who will participate in an ongoing study. In similar sense Tayie (2005) shares the view that a sample is a fraction of the population comprising all individuals of interest to the research that is taken to be representative of the entire population. Castillo (2009) defined sampling techniques as strategies that researchers employ during the sampling process. These are methods used by researchers to select a sample from the target population. Examples include simple random sampling, purposive sampling, systematic sampling, snowball sampling and so on.

All the mathematics teachers from the four SHSs in the research setting made up 42 were engaged in the study.

Participating students were sampled from the four SHSs using simple random sampling technique. The aim was to create equal opportunity for the population to reflect in the sample. The table below shows the schools and the respective number of students involved in this study.

Table 3.1: ***Sample Size of Students***

School	Total Enrolement	Male Sample	Female Sample	Total Sample Size
A	1194	61	24	85
B	1350	70	27	97
C	325	7	6	13
D	123	-	9	9
Total	**2992**	**138**	**66**	**204**

3.4 Instrument for Data Collection

According to Hudelson (1994), data collection instrument (the „toolbox" as she terms it) refers to the tools that are available to the researcher in choosing and combining methods in the most appropriate way for particular information needs. They are the fact finding techniques which include Questionnaire, Interviews, Documentary analysis, Observation, Reading and so on. It could then be concluded that the instrument is the device used by the researcher for collecting data. Salkind (2010) claims that data collection strategies involves instrument design, selection, construction and measurement and also the conditions under which the designated instruments are administered. It is worthy to add that the validity and the reliability of any research depend greatly on the appropriateness of the instrument.

The researcher employed a variety of data collecting instruments such as open and closed – ended questionnaire, and excel files containing student"s assessment scores to gather all relevant data.

The open and closed – ended questionnaire administration were meant to answer research questions one (1) to three (3) whereas the excel files containing student"s assessment scores were meant to answer research question four (4).

3.4.1 Questionnaires

It is a form of inquiry document, which contains a systematically compiled and well organized series of questions meant to gather information which will provide insight into the nature of the problem under study. Cohen, Manion and Marrison (2007) argue that the questionnaire is an instrument for collecting data about the problem of statement from the respondents. Dawson (2002) states that questionnaire is the most appropriate data collection method for the research for gathering information required

in the study from the respondents. Kothari (2004) also states that questionnaire is composed of number of questions in sequential order given to the individuals concerned with the request to answer the questions and return the questionnaire. In addition, a questionnaire is a systematically prepared form or document with a set of questions deliberately designed to elicit responses from respondents or research informants for the purpose of collecting data or information.

The researcher developed fifty nine (59) close-ended and six (6) open – ended questions for the participants in this study. Close-ended or Dichotomous questions were assigned to allow respondents to respond to questions that are basically short and required the respondents to provide a „yes" or „no" response, or had to check an item out of a list of given responses. It is worthy to point out that with regards to close-ended questionnaire, some control or guidance was given for the responses.

The researcher considered questionnaire as very useful and important data collecting instrument because it helps in obtaining sufficient primary data. Also administering questionnaire helps researchers gather substantial information within shortest possible time and help to reach large group of responders (Kothari, 2004). Moreover, administering questionnaire enable researchers achieve a high response rate in a short time and at relatively low cost (Hayford, 2008).Furthermore, questionnaire provides structured, often numerical data, able to be administered without the presence of the researcher, and often being comparatively straightforward to analyze (Wilson & McLean 1994). Questionnaire offered the researcher a relatively simple and straightforward approach to gather the needed in-depth information on the state of School-Based Assessment practices, challenges and how those challenges can be addressed. Robson (2002) affirms that questionnaire allows anonymity which encourages frankness in responses on certain important but sensitive issues.

Questionnaire Description

The set of questionnaire was designed for the teachers and the purpose of this questionnaire was to obtain information about the practice and state of SBA in Bibiani Anhwiaso Bekwai District. It also focused on their understanding about SBA, and how they practice it in the classroom teaching learning process. The questionnaire was divided into three (3) parts. Part I dealt with respondent‟s demographic information. (See Appendix C). Under Part II, the researcher designed two types of close-ended items with 3-point Likert scale and 5-point Likert scale as shown in Tables 3.2 and 3.3.

Table 3.2: The Categories and Coding of the 5-Point Likert Scale

Strongly Agree (SA)	Agree (AG)	Undecided (UND)	Disagree (DA)	Strongly Disagree (SD)
5	4	3	2	1

Table 3.3: The categories and coding of the 3-point Likert Scale

Use Always (UA)	When Necessary (WN)	Never Used (NU)
3	2	1

The third section involved challenges they face in practicing SBA and it composed of closed ended five point Likert-Scaled type.

In addition, the questionnaire contained five (5) open – ended items. (See Appendix C)

3.5 Reliability and Validity Issues

Golafshani (2003) points out that validity is concerned with whether the research instruments are able to measure what they intended to measure. Validity is all about examining the quality, trustworthiness of a research process and accuracy of the outcome (Brink, 2007; Golafshani, 2003). In line with the above views, validity could be referred to the extent to which the study accurately answers the questions it is intended to answer. Cohen, Manion and Morrison (2003), claims that it is impossible for researcher to ensure hundred percent optimism of perfection or validity. However, validity might be improved through careful sampling, adopting the right instrument and appropriate statistical treatments of the data According to Gravetter & Forzano (2006), reliability refers to the degree of consistency of results. In ensuring reliability of the instrument, the researcher conducted a pilot study at different schools and was satisfied with the instrument adopted before proceeding to conduct the main survey. The researcher adopted the suggestion from Hill (1998) that a pilot study should involve 10 to 30 participants in survey research. Robson (2002) suggests that the validity and reliability of an instrument in terms of interview and questionnaire data depend greatly on the researcher‟s knowledge and skill to design. For this reason the researcher presented a sample of a draft questionnaire to the supervisor who has enormous experience in research to seek an advice and suggestions to ensure a great deal of technical proficiency or validity. Proper arrangements were made to ensure high response rate from respondent which is directly proportional to validity (Robson, 2002). These measures included meeting the participants promptly on the scheduled time, assuring them of high professionalism in the conduct of the research, assuring the participants of no potential risks, anonymity and confidentiality in the whole process.

3.6 Data Collection Procedure

According to Weimer (1995), accurate data collection is essential to maintaining the integrity of research. Data collection is the process in which data of a study is gathered (Economic Commission for Europe of the United Nations UNECE, 2000). Data collection can therefore be referred to as the process of collecting and measuring information on targeted variables in an accepted systematic method. Data are intended to represent facts and without proper preservation of the context of collection and interpretation, may become meaningless (Boston University Library, n.d.a). The collection of data and its analysis assist researchers with discovering answers to their research questions and hypothesis.

Having sought proper permission to conduct the study in the targeted schools and the permission granted, the researcher met with the respondents in the various participating schools on the scheduled date for the questionnaire administration. The participants were briefed on the purpose of the study and its educational implications and also given the opportunity to ask the researcher questions to clarify issues they did not understand with regards to challenges in responding to the questionnaire items. After that, the questionnaires were distributed to them to answer. No pressure was put on the respondents to complete the questionnaire, they were allowed to complete them at their own convenience. All the questionnaires were collected back upon completion at the end of the day. Besides the questionnaire, the researcher respectively requested the records of student‟s assessment scores (secondary data) from the assistant headmaster (academics) office for analysis pertaining to research question four (4) of which the researcher was given excel files containing student‟s assessment scores.

3.7 Data Analysis Techniques

Bogdan and Biklen (1982) explains that data analysis is the process of "working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others" (p. 62). Data analysis can also be defined as the process of converting raw data that have been gathered into meaningful and usable information.

This study employed both quantitative and qualitative data analysis methods. The quantitative data was collected through the closed – ended questionnaire administered to the respondents. These data were organized, tabulated and described quantitatively, using percentage, frequency, and Pearson correlation test. Those data that were gathered through the open – ended questionnaire were also put together and analyzed qualitatively to supplement the information gathered through the closed – ended questionnaire. All these were meant to answer research questions one (1) to three (3). Also, the excel files containing student"s assessment scores handed down to the researcher were also analyzed in respect of answering research question four (4).

3.8 Ethical Issues

Ethics are described as a set of moral principles that offer rules and behavioral expectations about the most correct conduct (Strydom, 2005). Ethics provide a researcher with a guideline to moral conduct and to prevent scientific misconduct. In ensuring that the study is ethical, a letter of introduction (See a copy in Appendix A) and a concern letter (see Appendix B) was taken from the Head of Department of Mathematics of the University of Education, Winneba. The letter was then forwarded to the heads of the schools where the research was targeted.

The heads then informed their teachers and students of the study. Before the researcher administered the instruments, the respondents were briefed about the purpose of the study and were also assured of no potential risks, anonymity and confidentiality in the whole process. However, none of them was forced to participate. They reserved the right to voluntarily participate or decline.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Overview

The primary purpose of this study was to investigate the implementation of SBA in the mathematics class of SHS in the Bibiani Anhwiaso Bekwai district in the western region of Ghana with regards to the current state of SBA practices, finding the factors that facilitate or hinder SBA practices, what can be done to improve the current state of SBA implementation and the relationship between student‟s performance in SBA and their end of term examination performance in mathematics. The results are presented in three main parts. First, descriptive statistics which comprises

- demographic information of the teachers engaged in the study,
- analysis of teachers‟ responses on issues related to the current state of the implementation of SBA in teaching and learning mathematics,
- analysis of teachers‟ responses on assessment techniques teachers use in mathematics class,
- analysis of teachers‟ responses on the challenges they face in the implementation of SBA.

These results were used to answer research question 1 and part of research question 2 of the study.

The second part is an inferential statistics which comprises a correlation among students‟ performances in SBA and their performance in the terminal examination in mathematics. This analysis was used to answer research question 4.

Moreover, the third part comprises the analysis of results from the open ended questions. These analyses were used to support some of the findings from the

quantitative analysis and also to achieve the purpose of triangulation as well as answer part of research question 2 and the whole of research question 3.

4.1 Demographic Information

The demographic characteristics of teachers engaged in the study consist of gender, age category, academic qualification, teaching experience, and teaching load per week. Frequencies and percentages were used for the analysis of demographic information of respondents.

4.1.1 Gender

Table 4.1: Gender Distribution of Teacher Respondents

Gender	Frequency	Percentage
Male	32	76.2%
Female	10	23.8%
Total	**42**	**100%**

The gender distribution of respondents was represented in Table 4.1 Findings from the analysis shows that approximately 76.2% of the respondents were males and 23.8% were females.

4.1.2 Age category

Table 4.2: Distribution of Teacher Respondents by Age

Age category	Frequency	Percentage
26 – 30 years	3	7.1%
31 – 35 years	20	47.6%
36 – 40 years	11	26.2%
41 years and above	8	19.0%
Total	**42**	**100%**

The analysis in Table 4.2 shows ages of respective respondents. Out of a total of 42 teachers engaged in the study, it was observed that majority of them were between the

ages of 31 – 35 years representing 47.6% approximately. Moreover, 26.2% of the respondents were between the ages of 36 – 40 years, 19.0% were 41 years and above, and only 7.1% were 30years and below.

4.1.3 Teachers' academic qualification

Table 4.3: Distribution of Teachers by Academic Qualification

Qualification	Frequency	Percentage
B.Ed	27	64.3%
BSc	13	31.0%
BA	2	4.8%
Total	**42**	**100%**

The analysis in Table 4.3 revealed that all the teachers engaged in the study were first degree holders as 64.3% of them had B.Ed in mathematics as their highest academic qualification and 31.0% had BSc. Mathematics qualification. However, few teachers representing 4.8% of the respondents also acquired BA in mathematics as their academic qualification.

4.1.4 Teaching experience

The result on teaching experience of participating teachers is presented in Table 4.4.

Table 4.4: Distribution of Respondents by teaching experience

Teaching experience	Frequency	Percentage
3 years and below	5	11.9%
4 – 7 years	20	47.6%
8 – 11 years	8	19.0%
12 – 16 years	5	11.9%
17 years and above	4	9.5%
Total	**42**	**100%**

From Table 4.4, out of the 42 mathematics teachers surveyed, just few 21.4% had teaching experience of 12 years and above. However, more than half of the

respondents admitted to have been teaching mathematics for 11 years and below of which 4 to 7 years teaching experience was leading with 47.6%.

4.1.5 Teaching workload per week

Table 4.5: Distribution of Respondents by teaching load per week

Gender	Frequency	Percentage
10 – 15 periods	5	11.9%
16 – 21 periods	2	4.8%
22 periods and above	35	83.3%
Total	**42**	**100%**

It was also unveiled from the findings in Table 4.5 that 83.3% of these teachers engaged had 22 periods and above as teaching load in a week as against 5.9% who had less than 22 periods per week. Thus, the work load of majority of the teachers per week is within the GES approved which is 20 periods minimum and 28 periods maximum.

4.2 Research Question 1

What is the state of School- Based Assessment practices in mathematics class in Senior High Schools?

This section sought to identify the current situation of School-Based Assessment practices in mathematics class in Senior High Schools. This helped in detecting whether the state of SBA is “High”, “Moderate” or “Low” to teachers observation. The responses were collected in two categories of a three-point Likert-scale which included disagree, undecided and agree as shown in Table 4.6 as well as use always, when necessary, and not use in Table 4.7.

Table 4.6: Distribution of Current State of the Implementation of SBA in Teaching and Learning Mathematics

No.	Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1	I understand SBA and its guidelines for implementation.	20 47.7%	16 38.1%	3 7.1%	3 7.1%	0 0.0%
2	I had training on SBA during the pre – service training.	8 19.0%	8 19.0%	2 4.8%	12 28.6%	12 28.6%
3	I have attended workshop training on SBA.	8 19.0%	8 19.0%	0 0.0%	14 33.4%	12 28.6%
4	I always include SBA in planning my lessons.	14 33.3%	19 45.3%	6 14.3%	3 7.1%	0 0.0%
5	I use SBA during the teaching and learning of mathematics.	16 38.1%	20 47.7%	3 7.1%	3 7.1%	0 0.0%
6	I assess my students on knowledge or mastery of basic concepts.	20 47.6%	19 45.3%	3 7.1%	0 0.0%	0 0.0%
7	I assess my students on routine procedures.	10 23.8%	29 69.1%	0 0.0%	3 7.1%	0 0.0%
8	I assess my students on problem-solving or investigation.	12 28.6%	21 50.0%	6 14.3%	3 7.1%	0 0.0%
9	I assess my students on mathematical reasoning/understanding in subjective test.	16 38.1%	23 54.8%	3 7.1%	0 0.0%	0 0.0%
10	I plan my SBA in line with taxonomy of educational objective: cognitive, affective and psychomotor.	14 33.4%	16 38.1%	9 21.4%	3 7.1%	0 0.0%
11	I plan my SBA in line with the Mathematics syllabus: content, teaching and learning activities.	24 57.1%	15 35.8%	0 0.0%	3 7.1%	0 0.0%
12	I involve my students in planning my SBA in terms of lesson objectives, content of test, and time schedule	6 14.4%	8 19.0%	16 38.1%	9 21.4%	3 7.1%

No.	Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
	for the conduct of the test.					
13	I use different SBA techniques like project work, assignment, class exercise, homework, group work etc. regularly to assess my students.	14 33.4%	19 45.3%	3 7.1%	3 7.1%	3 7.1%
14	I do not use only mid exam and final exam in order to assess my students.	24 57.1%	12 28.7%	0 0.0%	3 7.1%	3 7.1%
15	I assess my student‟s progress in their day to day activities rather than at the end of the term.	16 38.1%	23 54.8%	3 7.1%	0 0.0%	0 0.0%
16	After assessing my students I used the achieved results as a feedback to evaluate my instruction.	16 38.1%	26 61.9%	0 0.0%	0 0.0%	0 0.0%
17	I give immediate and frequent feedback for my students about their achievement after scoring.	14 33.3%	28 66.7%	0 0.0%	0 0.0%	0 0.0%
18	I do develop standard marking scheme for questions before scoring.	20 47.6%	22 52.4%	0 0.0%	0 0.0%	0 0.0%
19	I have been analyzing student‟s achievement data (quantitative & qualitative) and provide interpretation.	10 23.8%	6 14.3%	17 40.5%	9 21.4%	0 0.0%
20	I have been reporting scores on student‟s performance.	8 19.0%	28 66.7%	6 14.3%	0 0.0%	0 0.0%
21	I have been keeping or storing assessment data for future references.	12 28.6%	30 71.4%	0 0.0%	0 0.0%	0 0.0%
22	I encourage peer assessment between	10 23.8%	16 38.1%	7 16.7%	9 21.4%	0 0.0%

No.	Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
	students.					
23	I encourage and motivate my students to do assessment task.	16 38.1%	23 54.8%	3 7.1%	0 0.0%	0 0.0%
24	I severely punish my students for not doing their assessment task.	12 28.6%	14 33.3%	2 4.8%	8 19.0%	6 14.3%
25	My students do not engage in copying work and cheat in tests.	8 19.0%	20 47.7%	8 19.0%	6 14.3%	0 0.0%
26	I take my students on for engaging in assessment malpractice.	22 52.4%	14 33.3%	0 0.0%	0 0.0%	6 14.3%
27	I include SBA mark in the total promotion mark.	20 47.6%	22 52.4%	0 0.0%	0 0.0%	0 0.0%
28	The implementation of SBA is not different from teacher to teacher and there is uniform practice between classes in teaching and learning mathematics.	6 14.3%	16 38.1%	14 33.4%	3 7.1%	3 7.1%
29	Mathematics department teachers meet to discuss the strength and weakness of the implementation of SBA and take corrective measures.	6 14.3%	20 47.6%	7 16.7%	0 0.0%	9 21.4%
30	In case of our school, SBA is implemented in teaching and learning mathematics effectively.	6 14.3%	20 47.6%	10 23.8%	6 14.3%	0 0.0%

Findings from Table 4.6 indicated that 85.7% of the teachers engaged established they understand SBA and its guidelines for implementation, 78.6% said they always include SBA in planning their lessons, and 85.7% admitted that they use SBA during their teaching and learning process in mathematics class. Also, in planning the SBA, 71.4% of the teachers testified that their SBA goes in line with taxonomy of

educational objective, and 92.8% said they plan in line with the mathematics syllabus considering its content, and teaching and learning activities.

Furthermore, 92.8% teachers asserted that they assess their students on knowledge or mastery of basic concepts as well as on routine procedures in the SBA implementation practices, 78.6% confirmed that their assessment items comprises more of problem-solving or investigation and 92.9% indicated that they based the SBA assessment on students‟ reasoning or understanding in subjective test. In addition to that, 78.5% of the teachers admitted that they uses different SBA techniques like project work, assignment, class exercise, group work etc. to regularly assess the students, 92.8% agreed that they assessed students‟ progress in their day to day activities rather than at the end of term while 85.7% confirmed that they do not use only mid exam and final exam in assessing students.

Moreover, all the teachers said they develop standard marking scheme for questions before scoring, give immediate and frequent feedback for their students‟ about their achievement after scoring the SBA implemented, used the achieved results as a feedback to evaluate their personal instruction, and keep or store assessment data for future reference. Besides that, 85.7% of the respondents said they have been reporting scores on students‟ performance.

In addition to that, 61.9% of the teachers encourages peer assessment between students, 92.1% encourages and motivates students to do assessment tasks, 66.6% do not encourage students‟ in copying work or cheating in tests, 61.9% severely punish students who fails to do their assessment tasks and 85.7% takes students who indulged in assessment malpractices on with much seriousness.

However, 57.2% of the teachers reported that they had no training on SBA implementation practices during their pre-service training programme and was confirmed when 62.0% held that they have not attended workshop training on SBA implementation.

Table 4.7: Distribution of Assessment Techniques Teachers use in Mathematics Class

No.	Assessment Tools/types	Use always	When necessary	Not use
1	Class test	20	22	0
		47.6%	52.4%	0.0%
2	Class Exercise	36	6	0
		85.7%	14.3%	0.0%
3	Assignment	26	16	0
		61.9%	38.1%	0.0%
4	Project Work/ Practical Skills Test	3	21	18
		7.1%	50.0%	42.9%
5	Discussion	14	25	3
		33.4%	59.5%	7.1%
6	Oral Presentation	10	18	14
		23.8%	42.9%	33.3%
7	Group Work	18	21	3
		42.9%	50.0%	7.1%
8	Assessment by interview	0	24	18
		0.0%	57.1%	42.9%
9	Observation	10	23	9
		23.8%	54.8%	21.4%
10	Report writing with references	3	17	22
		7.1%	40.5%	52.4%

From Table 4.7, all the teachers disclosed that they used class test, class exercises and assignments much as SBA techniques in mathematics class. In addition to that, more than fifty percent of the teachers also stated that they employed to a larger extent other SBA techniques such as project work/ practical skills test, discussion, oral

presentation, group work, and observation. However, it was obvious from the analysis that none of the teachers always used assessment by interview as SBA technique in mathematics class but rather mostly when necessary. More to that, majority of the teachers do not place much emphasis on report writing with references as a SBA technique in mathematics class.

After critically looking at the findings from Table 4.6 and 4.7, the summary analysis of the responses for determining the state of SBA is represented in Figure 2. This was done by accumulating the scores of each respondent individually and then categorizing them into three states. Detailed description of the categories is presented in Table 4.8.

Table 4.8: Categories of the State of SBA

Category	Frequency	Percentage	State
85 and above	36	86%	High
Between 85 and 60	3	7%	Moderate
60 and below	3	7%	Low
Total	**42**	**100**	

The analysis shows that majority of the respondents, 86% (*f=36*) perceived that the state of SBA implementation was high. Others 7% (*f=3*) were of the notion that the state of SBA was moderate whilst approximately 7% (*f*=3) of the participants perceived that the state is low (see Figure 2 below). This means the School-Base Assessment practices in mathematics class in our education system is perceived to be in high state of implementation.

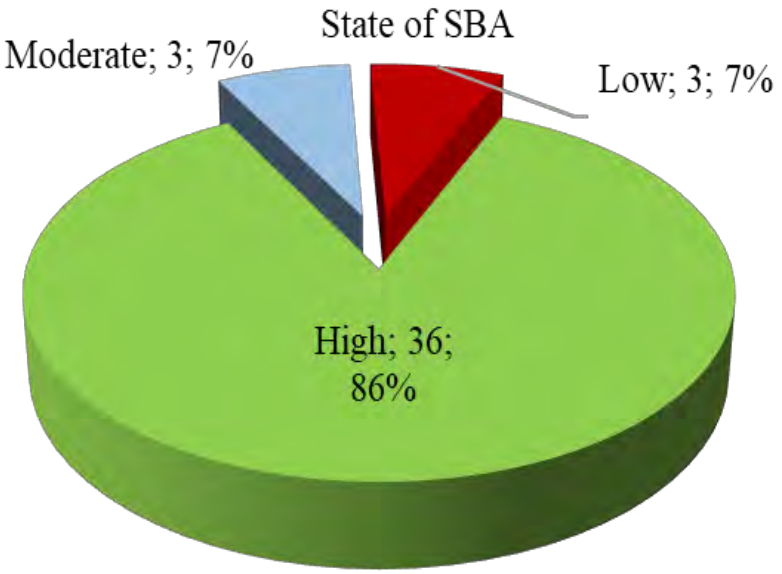

Figure 4.1: Frequency distribution of the current state of SBA

Responses from the open ended question: *What is the state of SBA practice in your school currently?*

With regards to the above question, 30 teachers managed to respond to this question representing approximately 71% of teacher sample response. Responses to the open ended question above were then classified according to the theme: state of SBA practice in mathematics class. Representative responses showed different viewpoints. Thus, whilst one group of teachers shared one another‟s views of the state of SBA implementation, others held contrary views to those teachers. Some group of the teachers express these views in writing:

One teacher wrote, "*SBA is implemented in this school apart from having individual teachers' assessment. So to me it has a good state*".

Another wrote, "*SBA is implemented fully in my school and most especially in mathematics the subject I teach"*. In line with the above views, other teachers wrote the following:

"I am a new teacher posted to the school but I came to realized that for my few years of being here that the SBA has really been in use and in a good state".

"SBA is practiced in my school so it is in a high state of implementation".

"Irrespective of it challenges, we are tirelessly implementing SBA in this school".

"The state of its implementation is good and making assessing students easier".

However, the other group of teachers who shared contrary view had these to say:

One teacher wrote, "*Although a number teachers from other subject areas still hold on to the old system (Continuous Assessment) practices, I implement SBA in fullness in mathematics class and think it is moderately used in my school*".

Another teacher wrote, "*SBA is used in my school currently but not as effective as expected by me, so I may say its state is moderate".* In line with the above views, other teachers wrote the following:

"Moderate because we implement the SBA in my school and in my subject as well but not satisfactory to me".

"It is practiced in my school, however, there is more room for improvement in terms of monitoring and supervision attention".

"It is implemented by individual teachers who have interest in it because the school does not have strict supporting system for monitoring its implementation".

"It is implemented but moderately".

Responses from the open ended questions revealed that most teachers in the various schools surveyed have been implementing the SBA as expected. The researcher found out that few schools still hold on to the continuous assessment. The reason being that

most of the teachers there do not have the requisite training and knowledge on the guidelines towards the implementation of SBA. Moreover, the implementation of SBA has not been satisfactory in few schools because of lack of supervision and monitoring as well as insufficient in-service training to update the teachers on the current implementation of the SBA.

However, majority of the teachers confirmed that the implementation of SBA has made assessing of students easier, reliable and accurate. Also, most of the respondents asserted that although few teachers implement the SBA based on their interest, and irrespective of the challenges they encounter, the implementation is diligently going on and it has attained good state in its current implementation.

4.3 Research Question 2

What challenges do teachers face in implementing School- Based Assessment in mathematics class in Senior High Schools?

Literature underpin challenges that hinder the effective implementation of SBA in mathematics class in Senior High School (Webb, 2005; Airasian, 1997; Chumun, 2002). To this end, the researcher posed 19 possible factors related to challenges teachers face in implementing SBA in our SHS to the teachers and the results are shown in Table 4.9 below.

Table 4.9: Descriptive Statistics of Teachers' Responses on Questions Related to the Challenges faced in the Implementation of SBA

No.	Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1	I do not understand SBA concept.	3 7.1%	0 0.0%	0 0.0%	25 59.5%	14 33.4%
2	I lack the basic skills of recording and documenting student"s SBA achievement.	0 0.0%	0 0.0%	0 0.0%	28 66.7%	14 33.3%
3	Lack of training opportunities on the implementation of SBA at my school.	14 33.3%	12 28.6%	4 9.5%	12 28.6%	0 0.0%
4	Heavy teaching workload (above 28 periods per week) affects my SBA practices.	10 23.8%	20 47.7%	0 0.0%	9 21.4%	3 7.1%
5	Large instructional content affect my SBA.	6 14.3%	10 23.8%	10 23.8%	13 31.0%	3 7.1%
6	Overloaded classes (a class of above 35 students).	14 35.9%	19 48.7%	0 0.0%	6 15.4%	0 0.0%
7	Lack of SBA coordination and monitoring mechanism in my school.	8 19.0%	14 33.3%	6 14.4%	0 0.0%	14 33.3%
8	In my school, there is lack of support for teachers by school administration in implementing SBA in terms needed resources.	6 14.4%	16 38.1%	8 19.0%	9 21.4%	3 7.1%
9	Little attention and lack of insistence on SBA implementation by my school authorities.	3 7.1%	21 50.1%	9 21.4%	9 21.4%	0 0.0%
10	There is no guideline for preparing/implementing SBA in my school.	3 7.1%	19 45.3%	6 14.3%	14 33.3%	0 0.0%
11	There is lack of interest from parents in the schoolwork of their children.	14 33.3%	8 19.0%	6 14.4%	14 33.3%	0 0.0%

No.	Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
12	There is insufficient time to carry out SBA.	0	14	6	22	0
		0.0%	33.3%	14.3%	52.4%	0.0%
13	Absenteeism on the part of my learners affect SBA.	18	12	6	6	0
		42.8%	28.6%	14.3%	14.3%	0.0%
14	I face challenges in invigilation.	3	15	4	17	3
		7.1%	38.8%	9.5%	40.5%	7.1%
15	I have difficulty in marking.	6	2	10	21	3
		14.3%	4.8%	23.8%	50.0%	7.1%
16	I have difficulty in helping weaker students.	0	3	5	22	12
		0.0%	7.1%	11.9%	52.4%	28.6%
17	In my school some teachers input fake results or marks for students because of their relationship with them or student‟s parents.	14	4	2	16	6
		33.3%	9.5%	4.8%	38.1%	14.3%
18	I think SBA has no influence on the academic achievement of students rather than wastage of resource and time.	0	0	3	13	26
		0.0%	0.0%	7.1%	31.0%	61.9%
19	Some teachers are just stubborn on resisting change to new assessment scheme (SBA) and still practice old scheme (Continuous Assessment).	6	12	4	11	9
		14.3%	28.6%	9.5%	26.2%	21.4%

From the responses, more than half of the respondents identified lack of training opportunity on the implementation of the SBA, heavy teaching work load, large instructional content, overloaded class, lack of coordination and monitoring mechanism, lack of administrative support and some individual teachers attitude of resistance towards the implementation practice as common challenges faced which hinders the implementation of SBA.

Moreover, 52.3% of the respondents were also of the view that instances such as lack of parents interest in the schoolwork of their children also hinders the implementation practices. Also, 57.1% of the teachers percived little attention and lack of insistence on SBA implementation by their authorities could also be a factor that hinders the implementation. Likewise, 92.9% of the respondents disagreed with the notion that SBA has no influence on the academic achievement of the students rather than wastage of resource and time and thus cannot be considered as a challenge to its implementation.

However, all the respondents disagreed that lack of basic skills of recording and documenting students‟ SBA achievement is not their challenge, 92.8% also, disagreed that understanding of SBA concept is not a challenge to them, and 52.4% were in agreement that insufficient time to carry out SBA is a challenge. In addition to that, 81.0% of the respondents differed that instances such as helping weaker students does not hinder the implementation as 57.1% were of the view that difficulty in marking is not their challenge. Howerver, 71.5% of the agreed that students absenteeism is a contributing factor the hinders effective SBA implementaton.

Responses from the open ended question: *What are the factors that facilitate or hinder the effective practice of SBA in your school?*

With regards to the question above, 27 teachers managed to respond to this question representing approximately 64% of teacher sample response. Responses to the open ended question above were then classified according to the theme: factors that facilitate or hinder the effective practice of SBA. Representative responses to this item included:

With regards to factors that facilitate SBA implementation, most of the teachers were of the view that: normal class size help facilitate the SBA implementation, Students intelligence level is also a facilitating factor, when measureable tasks are set the implementation becomes easier and faster and students‟ punctuality is a crucial facilitating factor.

Moreover, one of the teachers wrote, "*the support I get from my administration help facilitate the implementation of SBA for me"*.

Another teacher also wrote, "*my students willingness to participate fully in the exercises facilitates the SBA practice"*.

Other teachers wrote the following:

> *"The normal class size and students comportment are the major factors that facilitates the implementation for me in my current school".*
>
> *"When students cooperate with each other in doing projects it also facilitate the implementation practice".*
>
> *"Students were made to understand the need to participate in the implementation of SBA".*
>
> *"Some end of term examination are based on the questions in the SBA within the term".*

With regards to factors that hinder SBA implementation, majority of the teachers were of the view that: lack of supervision is my major problem, lack of SBA resources to implement the SBA, students absenteeism also hinders the practices in my school and students attitude in terms of submission of records hinder the practice.

Furthermore, one teacher wrote that*, "time constraint since I have to teach a particular number of topics within specific term".*

Another teacher had this to say, "*we also have limited resources available which hinders the implementation practices"*.

Another teacher wrote, "*my large class size does not enable me to implement the SBA effectively as I wish"*.

Another teacher commented that, "*my administrators do not provide assistance in implementing the SBA"*.

Other teachers wrote the following:

> *"Students inability due to their laziness"*.
>
> *"We were not given any training opportunities on SBA implementation in the training school"*.
>
> *"We don't get motivation especially when students embark on project work"*.
>
> *"They have been no in-service training for us on how to implement the SBA"*.

The responses show that some factors such as small or normal class size, administrative support, nature of the assessment task and the linkage between the SBA items and the end of term examination questions helps in facilitating the implementation practices. Further to this, students related factors such as their intelligence level, cooperative atittude, punctuality, willingness, commitment level, understanding of the need to participate, etc. also facilitates the SBA implementation practices.

Moreover, the results have also unearthed ineffective supervision, time constrians, limited resources for SBA implementation, large class size, students attitude towards submitting project works, laziness at the side of students, lack of training, students‟ absenteeism and so on as factors that hinders the SBA implementation.

4.4 Research Question 3

What should be done to improve the current practices of School- Based Assessment in mathematics class in Senior High Schools?

The researcher sought to collate teachers‟ opinion of intervention for improving the SBA practices in the school system. As a result to that an item in the open ended question was designed to collect teachers‟ view which most of the respondents responded to.

Responses from the open ended question: *What should be done to improve the current practices of SBA in your school?*

35 managed to respond to this question representing approximately 83% of the respondents. With regards to the above question, majority of the teachers were of the view that: resources should be made available prior to the implementation period, training should be intensified for all teachers, more in-service training for teachers, supervision and monitoring should be taken seriously, student should be encouraged to come to school regularly and students‟ absenteeism should be checked.

Moreover, one of the teachers wrote, "*it would be better, in terms of students getting the needed attention, for GES to revert to its own policy on ideal class size if possible; I know that to be around 35*". He added, "*…so that teachers can adequately cater for the needs of students through instruction and assessment*".

Another teacher wrote, "*students must be motivated to take part in SBA practices since it will arouse the interest of other students*".

Another teacher commented that, "*workshops should be organized regularly in the schools to upgrade and update teachers' knowledge on SBA implementation".*

Other teachers wrote the following:

"Authorities (administration) must insist that all teachers practice the SBA".

"All teachers must be encourage and motivated to use SBA".

"More classrooms should be created to enable teachers have reasonable number of students to assess".

The participants‟ responses appear to confirm the research finding of Malakolunthu, and Hoon (2010) when they reported that developing teachers‟ knowledge base on SBA, monitoring of teachers‟ SBA practices and providing teachers with well-designed professional development programmes could have effective impact on the successful implementation of the School-Based Assessment practice.

Moreover, participants were of the view that reducing the class size and employing more teachers to assist in implementing the SBA will lead to its effective practice. Further, students related factors such as absenteeism, students‟ encouragement and motivation, cooperative attitude, and commitment level should be critically looked at since students also play a vital role in the implementation process. However administration should design a monitoring and supervision scheme to monitor and supervise the activities that are involved in the SBA implementation and all related assessment practices. Moreover, school administration must support teachers in terms of logistics, encourage and motivate them in order to enhance effective implementation of SBA at the SHS level.

4.5 Research Question 4

Does student's performance in School-Based Assessment has a relationship with his / her end of term examination performance in mathematics?

After determining the state and factors that influences or hinders SBA practices, correlational analysis of students‟ SBA scores and their end of term examination scores in mathematics was conducted to determine if their performance in SBA has an influence on their end of term performance in mathematics. A Pearson product-moment coefficient was computed to assess if there is any influence on or relationship between students‟ performance in SBA and their performance in the end of term examination in mathematics.

A Pearson correlation is appropriate only when a linear relationship exists between the two variables. To determine if a linear relationship existed between the primary variables of interest a scatter plot (Figure 3) was generated between the independent variable (students SBA scores) and the dependent variable (student end of term examination score in mathematics). The relationship approximated a correlation which suggests that there exist a relationship between the two variables. Hence, the assumption of linearity has not been violated.

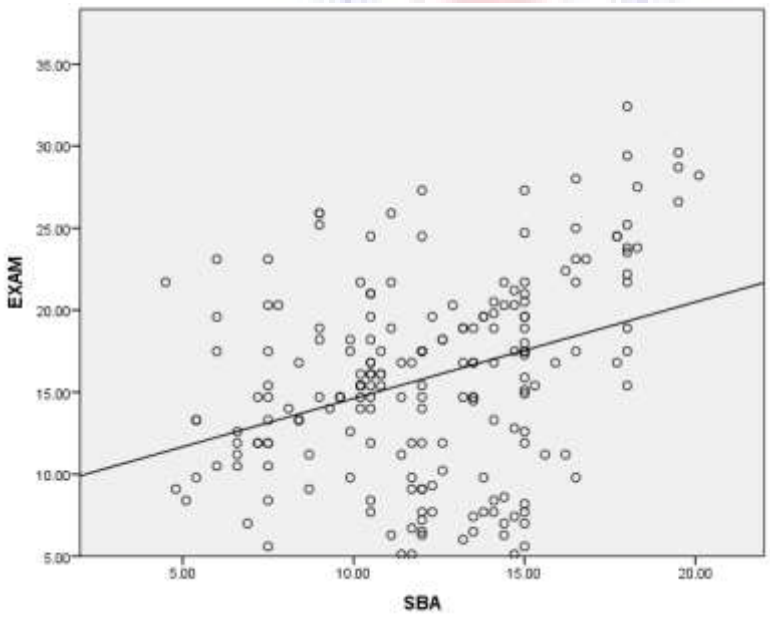

Figure 4.2: Scatter Plot

Next, the assumption of bivariate normality was evaluated. Both variables were tested for normality using the skewness coefficients.

Table 4.10: Descriptive Statistics

	N	Skewness	
	Statistic	**Statistic**	**Std. Error**
Examination Score	204	-.230	.170
SBA score	204	-.013	.170
Valid N (listwise)	204		

From Table 4.10, the absolute value of the skewness coefficients for both variables are less than two times their standard errors which is consistent with the data being normal. Moreover, Kolmogorov-Smirnov test of normality was also computed to further verify the normality state of the data set. As represented in Table 6, both SBA scores, D(204) = .059, p = .200, and exam score, D(204) = .050, p = .200, did not deviate significantly from normal.

Table 4.11: Test of Normality

	Kolmogorov-Smirnov[a]		
	Statistic	**df**	**Sig.**
SBA	.056	204	.200*
EXAM	.050	204	.200*

Hence, we can confirm that the test for normality has not been violated and can continue with the correlation analysis.

Table 4.12: Correlations

		SBA	EXAM
SBA	Pearson Correlation	1	.345**
	Sig. (2-tailed)		.000
	N	204	204
EXAM	Pearson Correlation	.345**	1
	Sig. (2-tailed)	.000	
	N	204	204

**. Correlation is significant at the 0.01 level (2-tailed).

From Table 4.11, the results indicate a significant very strong positive relationship between the two variables, $r = .345, p < .05$. This result suggest that students‟ performance in the SBA has positive influence on their academic performance in mathematics (see Figure 3). Therefore, we can reject the null hypothesis stating that students‟ performance in the SBA has no influence on their academic performance in the end of term examination in mathematics.

4.6 Discussion of Findings

The primary purpose of this study was to investigate the current state of the SBA implementation practices in the senior high school. This is extended to finding the factors that facilitate or hinder, what can be done to improve the current state of SBA, and the influence of students performance in the SBA on their end of term examination performance in matheamtics. From the descriptive analysis, 246 participants from three schools made up of 204 students and 42 teachers were engaged in a survey. Demographic information of teachers indicate that 32 were males while 10 were females. The reason for such a large portion of male respondents to female was due to the selected schools engaged as the study area and the limited number of females who teaches mathematics in the various schools. Nevertheless, the

gender distribution was not biased since the difference between the numbers of male to female was not too large.

Moreover, none of the participants aged below 26 years, with majority of the teachers being within 31 to 40 years and just few teachers were above 41 years. This age category is the youthful age of which people within this category are classified as the work force, where more working effort is demanded to increase productivity. All the teachers were first degree holders with majority of them having B.Ed in mathematics, followed by approximately one-third of them having BSc. Mathematics and few of them with Bachelor in Arts (BA) in mathematics all from recognized universities within Ghana.

Findings from the descriptive analysis also revealed that majority of these teachers were in the service teaching mathematics in these schools for the past 4 to 11. This shows that all of the teachers engaged in this study have in one way or the other met the implementation period of the SBA since the SBA was introduced in the education system in 2007 after the educational reform. To add to that, the findings uncovered the workload per week on teachers where more than 80% of the teachers had 22 periods and over as workload in a week. This academic workload also coupled with other responsibilities such as house master, teachers on duty, extra classes, co-curricular activities etc. in the school.

Research question one investigated the current state of SBA implementation in the senior high school in teaching and learning mathematics. The analysis revealed that the state of SBA as per the perception of teachers was good as 86% of teachers who responded to the items emphatically stated. This was also supported by the responses from the open ended questions where respondents testified that SBA really made

assessing students easier, faster, reliable and accurate as compare to the continuous assessment. They also asserted that irrespective of the individual challenges involved in the implementation, it is diligently going on and it has attained a good state in its implementation. According to Begum and Farooqui (2008), teacher gets very cheerful about the SBA practices although most of them have not gotten proper training necessary for its implementation. They further stated that, due to the nature of the policy, untrained teachers who do not acquire adequate training in the implementation practices will have poor understanding of the ideas which will lead to their inability to distribute the marks effectively. Opara, Onyekuru & Njoku (2015) in their study found out that the SBA implementation was good and has led to better performance of many students. They then recommended that all secondary schools should adopt the effective use of the SBA most especially in core subjects.

In relation to these findings, research question two sought to identify factors that facilitate or hinder the effective implementation of the SBA in the secondary schools. The outcome of the analysis revealed that, lack of training opportunities on the implementation of the SBA for teachers, workload on teachers, large class size and instructional content, lack of monitoring and supervision, lack of administrative support, time constrains, lack of resources in implementing SBA, students attitudes such as laziness to class work, absenteeism, lack of cooperation, delay in submitting projects, and few other mentioned were major factors which hinder the effective implementation of SBA practice in the various secondary schools. Nair, Setia, Samad, Zahri, Luqman, Vadeveloo & Ngah (2014) in their study identified similar factors such as shortage of teachers, teachers biasness and time constraints to be responsible for hindering the SBA implementation. In addition to that, these findings relates to that of Malakolunthu & Hoon (2010) when they discovered that insufficient

guidelines, poor knowledge-base of teachers, and lack of external motivation also hinders the effective implementation of SBA in our various schools. However, respondents were of the opinion that small class size, administrative support, status of assessment tasks and the linkage between the SBA items and the end of term examination questions helps in facilitating the implementation practices.

Moreover, research question three followed up to hunt for the opinion of teachers on what should be done to improve the current practices of SBA in mathematics class in senior high schools. Respondents posed their views and it was established that developing teachers‟ knowledge base on SBA, monitoring of teachers‟ SBA practices, providing teachers with well-designed professional development programmes, reducing the enrolment in classes and employing more teachers to assist in the implementation practices could help improve the current practices of the SBA (Malakolunthu & Hoon 2010).

Lastly, research question four tend to find out if there is any relationship between students‟ performance in SBA and their performance in the terminal examination in mathematics. The null hypotheses which stated that students‟ performance in SBA has no influence on their performance in the end of term examination in mathematics was rejected. This means students‟ performances in SBA affects their end of term examination performance. Further, a Pearson correlation coefficient, $r = .345$ was obtained which signified a positive relationship between students‟ performance in SBA and the academic performance. This confirmed that good performance in SBA leads to better academic performance in mathematics.

CHAPTER FIVE

SUMMARYOF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Overview

This chapter presents the summary of the study, conclusions on the finding and recommendations of the study.

5.1 Summary

The primary objective of this research was to to investigate the current state of the SBA implementation in the senior high schools at Bibiani Anhwiaso Bekwai District, in the Western North Region of Ghana. Specifically, the study intended to identify the current state of the SBA practices, factors that facilitate or hinder the implementation of the SBA in mathematics class, how the current state can be improved in teaching and learning mathematics and the influence of students‟ SBA performance on their academic achievement in the end of term examination in mathematics.

Mixed method was the overall design of this research. In this study, a set of both close-ended and open-ended questionnaire were prepared and administered to mathematics teachers and a secondary data on students‟ SBA scores and their end of term mathematics examination scores was also collected from the examination officers. All mathematics teachers and 204 students from four schools in the district were selected to participate in the study using purposive and random sampling techniques respectively.

In this research, the data were gathered through closed and open ended questionnaire, and score sheet. Qualitative and quantitative methods were employed to analyze data.

The close – ended questionnaire which was a Likert-scale item was analyzed quantitatively whereas the open ended questionnaire was analyzed qualitatively.

The results of the study showed that the majority of teachers were satisfied with the current state of the SBA implementation practice. This was verified when over 80% of the teachers indicated that the current state of the SBA implementation practices was good. It was also unveiled that factor such as lack of training opportunities on the implementation of the SBA, workload on teachers, large class size and instructional content, lack of monitoring and supervision, lack of administrative support, time constrains, lack of resources in implementing SBA, students attitudes such as laziness to class work, absenteeism, lack of cooperation, delay in submitting projects, and few other mentioned were major factors which hinder the effective implementation of SBA in the Bibiani Anhwiaso Bekwai District. The result also identified small class size, administrative support, nature of assessment tasks and the linkage between the SBA items and the end of term examination questions as facilitating factors to the SBA implementation practices.

Further to this, the findings of the study obtained from the analysis of the open ended questionnaires discovered that developing teachers‟ knowledge base on SBA through in-service training and workshops, monitoring and supervising teachers‟ SBA practices by well-trained authorities, providing teachers with well-designed professional development programmes, reducing the enrolment in classes to the normal or average size and employing more qualified and experienced teachers to assist in the implementation practices will help improve the current practices of the SBA in the district and in the nation as a whole.

Finally, the findings from the analysis also revealed that students‟ performance in SBA scores has a positive influence on their academic performance in the end of term examination in mathematics. Therefore when a student do well in SBA he/she is more likely to perform well in the terminal examination ending up improving his or her academic achievement in general.

5.2 Conclusions

Based on the discussions and summary of findings of the study, the following conclusions were drawn.

The results of the research showed that the current state of the SBA implementation practices is good. Moreover, lack of training, workload on teachers, large class size, lack of monitoring and supervision, lack of administrative support, time constrains, lack of resources in implementing SBA, and some students attitudes negatively affect SBA implementation while small class size, administrative support, status of assessment tasks and linking the SBA items to the end of term examination questions help improve the implementation of the SBA in mathematics classroom in the senior high schools at Bibiani Anhwiaso Bekwai District in the western region of Ghana.

The findings also indicated that developing teachers‟ knowledge of the SBA practice, monitoring and supervising implementation practices, providing teachers with well-designed professional development programmes, reducing class size to the normal or average and engaging more qualified and experience teachers in the implementation practices will help improve the current state of the SBA implementation practices. Finally, the study discovered that students‟ performance in SBA has a positive effect of their terminal examination performance in mathematics. Meaning students who

perform well in SBA are highly likely to excel in their terminal examination in mathematics.

5.3 Recommendations

In light of the findings and conclusions drawn above, the researcher would like to recommend the following points to be taken into consideration.

- Mathematics teachers should be given enough training on the implementation practices of SBA in other to ensure successful implementation of the SBA in mathematics classroom. For instance, the district and regional education secretariat should arrange the training program or workshop about the current implementation practices of the school-based assessment in mathematics classes. It will be better if the regional or district educational office carry out the training at school level.

- As the finding of this research showed, the educational authorities should put monitoring and supervision techniques in place and also provide adequate resources needed at the right time for the implementation of the SBA practice.

- The study also discovered that time constrains and workload on teachers has been a challenge. The SBA practices time should be included in the school time table and teachers should be encourage to also fused it in their lesson plans and scheme of work. Moreover there should be frequent notices to alert the school body of the implementation period. Also, average classes should be encourage in all schools. The school authorities should work with Ministry of Education so that more teachers will be posted into the various senior high schools. In a way this will also address the problem of workload on teachers.

- School administrators should offer the necessary support in terms of encouraging SBA implementation in their schools, teacher motivation, termly evaluation of the policy at the school level, and keeping an updated records of the state of SBA implementation in their schools.

- The school should put up some disciplinary measures to address students‟ bad attitudes such as laziness, absenteeism, failure to submit project on time etc. It is the responsibility of teachers and the school authorities to instil discipline in the institutions. If it becomes necessary the PTA or a prominent personality can be involve to council the students.

- Large class size should be minimized for the successful implementation of the SBA in mathematics classroom.

- Finally, it is hoped that the result of this study would encourage other researchers to conduct studies on the other issues of the implementation of SBA in mathematics classroom. For instance, if the SBA performances of our students can predict their academic performance in an external examination.

REFERENCES

Abdu, H. (1998). Developing continuous assessment framework and implementation strategy in line with improving primary education in Amare Asgedom et, al (eds) proceeding of the national conference on quality education in Ethiopia version for the 21st century (271-286) AAU College of education.

Abell, S. K., & Siegel, M. A. (2011). Assessment literacy: What science teachers need to know and be able to do. In *The professional knowledge base of science teaching* (pp. 205-221). Springer, Dordrecht.

Abera, G., Kedir, M., & Beyabeyin, M. (2017). The implementations and challenges of Continuous Assessment in public universities of Eastern Ethiopia. *International Journal of Instruction*, *10*(4), 109-128.

Adebowale D.F, Alao, K.A (2008). Continuous Assessment Policy implementation in selected local Gov"t areas of state (Nigeria), *Journal of Education Policy*, 5(1) 3-18

Airasian, P. W. (1997). *Classroom assessment,* (3rd ed) New York: McGraw- Hill Companies, Inc.

Akunu, A. (2012). *University of Sussex.* Retrieved April 20, 2015, from University of Sussex website: http://sro.sussex.ac.uk/

Alberta (2005). Assessment Consortium. Refocus: Looking at Assessment for Learning. 2nd ed. Edmonton, AB. Retrieved May, 2019 from: http://www.learnalberta.ca/content/ssass/html/index.html

Ali, A., & Akubue, A. (1988). Nigerian primary schools' compliance with Nigeria national policy on education: An evaluation of continuous assessment practices. *Evaluation Review*, *12*(6), 625-637.

Amedahe, F. (2000). *Continuous Assessment. Tutor Handbook.* University of Cape Coast, Ghana.

Amoah, A. K. (2012). When School-Based Assessments Are Defective Retrieved May, 2019 from: https://www.ghanaweb.com/GhanaHomePage/features/When-School-Based-Assessments-Are-Defective-234820.

Anamuah-Mensah, J. (2007). The Educational Reform and Science and Mathematics Education. In *A Keynote Address at the Stakeholders of Nuffic Practical Project Meeting*

Anamuah-Mensah, J., Mereku, D. K., & Ghartey-Ampiah, J. (2008). *TIMSS 2007 Ghana Report.* Accra: Ministry of Education, Science and Sports.

Angbing, D. H. (2001) *Teachers' Perception and Practice of Continuous Assessment in JSS in the Bawku East District*. Master"s Thesis. University of Cape Coast.

Ashie, J. (2009). *Modern Ghana.* Retrieved march 1, 2015, from Modern Ghana website: m.modernghana.com/news/245678/1/jss-exams-and-assessment-in-ghanaian schools.html

Atiku, I. (2008) W*AEC Cancels 386 Students' Entries Citing Forged Continuous Assessment Scores*. Accra Mail (Accra). (Retrieved on June 12, 2008, from allafrica.com).

Atsu, M. A. (2011). University of Education,Winneba. Retrieved March 20, 2015, from University of Education, Winneba, website: ir.uew.edu.gh:8080

Avoke, M., Hayford, S. & Ocloo, M. (1999) *Principles and methods in special education*. Accra: Primex Press.

Awoniyi, F. C. (2016). The understanding of senior high school mathematics teachers of school based assessment and its challenges in the Cape Coast Metropolis. *British Journal of Education*, 4(10), 22-38. [7].

Bartels, E. K. (2003). The practice of continuous assessment in teacher training colleges in Ghana. *Journal of Educational Development and Practice, 1(1),* 59-72.

Bazeley, P. (2004). Issues in mixing qualitative and quantitative approaches to research. *Applying qualitative methods to marketing management research*, *141*, 156.

Bc Home, (2008). Literacy in Class room assessment what does this involve, retrieved on May, 2012.http;www.beed,gov.bc

Begum, M., & Farooqui, S. (2008). School based assessment: Will it really change the education scenario in Bangladesh? *International Education Studies*, *1*(2), 45-53.

Bell, B., & Cowie, B. (2001). *Formative Assessment and Science Education*. Dordrecht, Netherlands: Kluwer Academic Publishers.

Bello, M. A., & Tijani, A. (2008). *iaea organisation.* Retrieved April 22, 2015, from iaea.info: www.ieae.info/paper_2fb24ab5.pdf

Birhanu, M., (2004*). Teacher's assessment of students' performance in selected high school of Arsi Zone with emphasis on continuous assessment*. Unpublished MA Thesis AAU. Faculty of education. Addis Ababa.

Black, H. D., & Broadfoot, P. (1982). *Keeping track of teaching: Assessment in the modern classroom.* London: Routledge & Kegan Paul.

Black, P., & Wiliam, D. (1998). *Assessment and classroom learning*. *Assessment in Education, 5*(1), 7-74.

Bogdan, R. C., & Biklen, S. K. (1982). *Qualitative Research for education: An introduction to theory and methods*. Boston: Allyn and Bacon, Inc.

Boston University Libraries (n.d.a). What is research data? Retrieved from http://www.bu.edu/datamanagement/background/whatisdata/

Brink, H. L. (2007). *Fundamentals of research methodology for health care professionals*.(2nd ed.). Cape Town: Juta.

Brown, G. T. L. (2003). *Teacher's instructional conceptions: Assessment's relationship to learning, teaching, curriculum, and teacher efficacy*. Paper presented to the Joint Conference of the Australian and New Zealand Associations for Research in Education (AARE/NZARE), Auckland, NZ, November, 28-December 3, 2003.

Burns, N. & Grove, S. (2001). *The practice of nursing research: conduct, critique and utilization (4th ed)*. W. B. Saunders: Philadelphia, Pennsylvania, USA.

Byabato, S., & Kisamo, K. (2014). Implementation of school based continuous assessment (CA) in Tanzania ordinary secondary schools and its implications on the quality of education. *Developing Country Studies*, *4*(6), 55-61.

Cameron, R. (2009). 'A sequential mixed model research design: design, analytical and display issues', *International Journal of Multiple Research Approaches*, *3(2)*, 140-152.

Castillo, J. J. (2009). *Research Population*. Retrieved November 23, 2009, from http://www.experiment-resources.com/research-population.html

Chumun, S. (2002). *Classroom Assessment in Mauritian Primary Schools*. Retrieved September 21, 2015, from bura.brunel.ac.uk/handle/2438/5154

Clarke, S. (2005). *Formative assessment in action: Weaving the elements together*. London: Hodder Murray.

Cohen, L., and Manion, L., and Morrison, K. (2003) *Research Methods in Education*. 5th Edition, London: Routledge Falmer.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education* (6th ed.). 270 Madison Avenue, New York, NY: Routledge.

Cooney, T. J. & Shealy, B. E. (1995). *Teachers thinking and rethinking assessment practices.* Paper presented at the Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (Columbus, OH, October 21-24, 1995).

CRDD. (2007). *Teaching syllabus for senior high school mathematics*. Curriculum Research and Development Division, Ghana Education Service. Accra.

CRDD. (2010). *Mathematics Syllabus for Senior High School.* Accra: Ghana Publishing Corporation.

Creswell, J. W. (2003) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches.* Thousand Oaks, California: SAGE publication.

Creswell, J. W. (2006). *Understanding mixed methods research.* Retrieved July 9, 2012, fromhttp://www.sagepub.comupm-data10981_Chapter_1.pdf

Dawson, C. (2002). *Practical research methods: A user-friendly guide to mastering research techniques and projects*. How to books Ltd.

De Lange, J. (1999). *Ohio Resource Centre.* Retrieved September 26, 2015, from www.fi.uu.nl/catch/products/framework/de_lange_framework.doc

Delandshere, G. & Jones, J. H. (1999). Elementary teachers‟ beliefs about assessment in mathematics: A case of assessment paralysis. *Journal of Curriculum and Supervision, 14*(3), 216-40.

Denzin, N. K., & Lincoln, Y. S. (2008). *Strategies of qualitative inquiry* (Vol. 2). Los Angeles: Sage.

Denzin, N. K., and Lincoln, Y. S. (eds.) (2000) *Handbook of Qualitative Research*.(2nd ed*)*, Thousand Oaks, California: Sage Publications Inc.

Dery, R. G., & Addy-Lamptey, W. (2010). *The International Association for Educational Assessment.* Retrieved March 1, 2015, from The International Association for Educational Assessment website: www.iaea.info/documents/paper_4d53997.pdf.

Dix (2010). *The Essential Guide to Classroom Assessment*. Great Britain, United Kingdom: Pearson Education Limited.

Ebhomien, A., Paul, Oriahi, Chrstie, A. Diahi & Smart (2012). Influence of continuous assessment in the teaching of mathematic in secondary school of Edo state. Nigeria. *Current Research Journal of Social Sciences* 4(5), pp. 350-354

Economic Commission for Europe of the United Nations (UNECE) (2000), "*Glossary of Terms on Statistical Data Editing*", Conference of European Statisticians Methodological material, Geneva.

Effrim, P., & Eshun, P. (2014). *Basics in Measurement, Evaluation & Statistics in Education.* Ghana: Richblank Publications.

Ekwueme, C. O., & Meremikwu, A. N. (2013). Teacher's Characteristics and Students' Degree of Errors in Different Content Areas in Senior Secondary Certificate Examination In Mathematics. *Journal of Educational Practice* , 57-62.

Etsey, Y. K. A. (2012): *Notes on educational measurement and evaluation*. (Unpublished lecture notes). University of Cape Coast, Ghana.

Fook, C. Y., & Sidhu, G. K. (2010). *School-Based Assessment among ESL Teachers in Malaysian Secondary Schools.*Retrieved June 10, 2015, from www.medc.com.my/medc/journals/ volume9/chan%20yuen.pdf

Freedman, R. L. (1998). Constructivist Assessment practices, Retrieved on November19, 2003 from http/www. *Ed psued /CI journals* (1998 sets) T 1-7 Freedom, RTF

Garner, (2008), *Standards of care: Investments to improve children's educational outcomes in Latin America*. Paper presented at the "Year 2008 Conference of Early Childhood Development" sponsored by the World Bank, Washington, D.C., April, 2008.

Ghana Ministry of Education, (1996) 48th Annual New Year School - Report on Seminar: Educational Reforms and Teacher Education.

Ghana, Ministry of Education and Culture (1987) *The school reform programme*, Accra, Ghana Publishing Corporation

Ghartey-Ampiah, J. (2012). *Pathways to effective school and classroom assessment: The case of Ghana.*Retrieved July 3, 2015, from www.gsid.nagoya u.ac.jp/syamada/Dr.% 20Ghartey_PPT_assessment.pdf

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, *8*(4), 597-606. Retrieved January 15, 2011, fromhttp://www.nova.edu/ ssss/QR/QR8-4/golafshani.pdf

Gravetter, F. J., & Forzano, L. B. (2006). *Research Methods for the Behavioral Sciences (2nd ed.)*. Belmont, CA: Wadsworth.

Gronlund, N. E., & Linn, R. L. (1981). *Measurement and evaluation in education*. New York Macmillan Publishing C.D. INC

Hammersley, M. (1992) Deconstructing the qualitative-quantitative divide. In Brannen, J. (ed.) *Mixing Methods: Qualitative and Quantitative Research.* London: Avebury.

Hanna, G. S., & Dettmer, P. (2004). *Assessment for effective teaching: Using context-adaptive planning*. Allyn & Bacon.

Harlen, W. (2005). Teachers‟ summative practices and assessment for learning - tensions and synergies. *The Curriculum Journal, 16*(2), 207–223.

Hayford, S. K. (2008). *Continuous assessment and lower attaining pupils in primary and junior secondary schools in Ghana* (Doctoral dissertation, University of Birmingham).

Herrera, S.G., Murry, K. G., & Cabral, R.M. (2007). *Assessment accommodations for classroom teachers of culturally and linguistically diverse students.* Boston, MA: Pearson Education Inc.

Hill, R. (1998). What Sample Size is "Enough" in Internet Survey Research? Interpersonal Computing and Technology. *An Electronic Journal for the 21st Century* , 3-4.

Hudelson, P. M. (1994). *Qualitative research for health programmes* (No. WHO/MNH/PSF/94.3. Unpublished). World Health Organization.

Jabbarifar, T. (2009). The Importance of Classroom Assessment and Evaluation in Educational System. *2nd International Conference of Teaching and Learning (ICTL)* (pp. 1-9). Malaysia: INTI University College.

Kapambwe, W. (2010). The implementation of school based continuous assessment (CA) in Zambia. *Educational Research and Reviews* , 99-107.

Kothari, C. R., (2004). Research Methodology. Methods and Techniques. (2nd ed). New Age International (P) Ltd. New Delhi. Krathwohl, D. (2002). Retrieved August 12, 2015, from http://www.unco.edu/cetl/sir/stating_outcome/documents/Krathwohl.pdf

Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory into practice*, *41*(4), 212-218.

Kwawukume, V. (2006) *Assessment for improving Learning*. Accra, Ghana: WAEC

Linn, R. L., & Miller, M. D. (2005). *Measurement and assessment in teaching* (9th ed.) Upper Saddle River, NJ: Prentice Hall.

Lowery, N. V. (2003). *Assessment insights form the classroom*. The Mathematics Educator, 13(1), 15-21.

Malakolunthu, S., & Hoon, S. K. (2010). Teacher perspectives of school-based assessment in a secondary school in Kuala Lumpur. *Procedia-Social and Behavioral Sciences*, *9*, 1170-1176.

Maree, K. (2010). *First steps in research*. Pretoria: Van Schaik.

Marzano, R. (2000). *Transforming classroom grading.* Alexandria, VA: ASCD.

McGraw, B. (2006). *Assessment fit for purpose.* Keynote presentation at the 32nd IAEA annual conference held in Singapore.

McMillan, J. (2004). *Classroom assessment: Principles and practice for effective instruction*. New York, NY: Pearson Education.

Mereku, D. K., Nabie, M. J., Appiah, J. & Awanta, E. K. (2011). *Report on the work shop on use of child friendly pedagogy in teaching JHS mathematics*. Accra: Plan International Ghana.

MoE. (2014). *Reforming Science and Mathematics Education in Basic Schools in Ghana.* Accra: Ministry of Education.

Nabie, M. J., Akayuure, P., & Sofo, S. (2013). Integrating Problem Solving and Investigations in Mathematics: Ghanaian Teachers' Assessment Practices. *International Journal of Humanities and Social Sciences* , 47-56.

Nair, G. K. S., Setia, R., Samad, N. Z. A., Zahri, R. N. H. B. R., Luqman, A., Vadeveloo, T., & Ngah, H. C. (2014). Teachers' Knowledge and Issues in the Implementation of School-Based Assessment: A Case of Schools in Terengganu. *Asian Social Science*, *10*(3), 186.

National Council of Teachers of Mathematics. (2000). *Principles and Standards for School Mathematics*. Reston, VA: NCTM.

Nitko, J.A, (2004). *Educational Assessment of Students* (4th ed.), Englewood. Prentice Hall, Inc

Ogunkola, B. J. (2007). School-Based Assessment Scores as Predictors of Student"s final grades in Integrated Science. In *Proceedings of the 9th National Conference of the National Association of Evaluators and Researchers*.

Omole, D. O. K., (2007). Comparative Study of Students‟ Performance in School-Based Assessment and Certificate Examination at the Upper Basic Education Level in FCT. Nig. *Journal of Educational Research and Evaluation*. Vol. 7, No 1, Pp 50-56

Ontario, (2005). *Assessment Strategies*. Retrieved november 29, 2015, from eworkshop.on.ca: eworkshop.on.ca/edu/pdf/ Mod21_assessment_strgs.pdf

Opara, I. M., Onyekuru, B. U., & Njoku, J. U. (2015). Predictive Power of School Based Assessment Scores on Students' Achievement in Junior Secondary Certificate Examination (JSCE) in English and Mathematics. *Journal of Education and Practice*, *6*(9), 112-116.

Orubu, M.E.N. (2013). School-based assessment as predictors of students‟ performance in Junior school certificate mathematics examination in Delta State. Nigerian *Journal of Educational Research and Evaluation* 12(1) 37-44.

Osunde, A. U., & Ethe, N. (2007). Assessment of the Competency Level of Primary School Mathematics Teachers in Designing Assessment Tools. *Nigerian Journal of Educational Research and Evaluation*, *7*(1), 78-85.

Owu-Ewie, C. (2012). *Introduction to Traditional Action Research. Ghana*: Vision Express Sec. Service.

Philippou, G., & Christou, C. (1997). Cypriot and Greek primary teachers‟ conceptions about mathematical assessment. *Educational Research and Evaluation*, *3*(2), 140-159

Piaget, J., & Inhelder, R. (1987). The construction of reality. *Cognitive development in infancy*, 165-169.

Pollard, A., & Collins, J. (2005). *Reflective teaching*. A&C Black.

Popham, W. J. (2009). Assessment literacy for teachers: Faddish or fundamental? *Theory into practice*, *48*(1), 4-11.

Robson, B. (2002). *U.S. Patent No. 6,434,488*. Washington, DC: U.S. Patent and Trademark Office.

Salkind, N. J. (2010). *Encyclopedia of Research Design.* Thousand Oaks, CA: SAGE Publication, Inc.

Sethusha, M. J. (2012). Retrieved november 30, 2015, from uir.unisa.ac.za: uir.unisa.ac.za/ bitstream/handle/10500/8128/thesis_sethusa_mj.pdf?sequence=1

Sethusha, M. J. (2014). Communicating Assessment Results: Teachers‟ Views of Recording and Reporting Classroom Assessment. *Mediterranean Journal of Social Sciences*, *5*(2), 273.

Shepard, L. A. (2000). The role of assessment in a learning culture. *Educational researcher*, *29*(7), 4-14.

Siyum, B. A. (2016). Implementation of Continuous Assessment and Its Effectiveness in Adwa College of Teacher Education, Ethiopia. *International Journal of Education, Culture and Society*, *1*(1), 16-22.

Stake, R. E. (2008). Qualitative case studies. In N. K. Denzin, & Lincoln, Y. S. (Eds.), *Strategies of qualitative inquiry* (pp. 119-149). Los Angeles: Sage.

Stiggins, R. (2005). From formative assessment to assessment for learning: A path to success in standards-based schools. *Phi Delta Kappan*, *87*(4), 324-328.

Strydom, H. (2005). *Ethical aspects of research in the social sciences and human service professions.* In A. S. De Vos, H. Strydom, C. B. Fouche, & C. S. L.

Tashakkori, A. & Teddlie, C. (2003), Major Issues and Controversies in the Use of Mixed Methods in the Social and Behavioral Sciences in: A. Tashakkori, & C. Teddlie (Ed.) *Handbook of Mixed Methods in Social & Behavioral Research,* (London, Sage Publications), pp. 3 - 47.

Tayie, S. (2005). *Research methods and writing research proposals*. Pathways to Higher Education.

The West African Examinations Council. (1979, March) *Report of the Ad Hoc committee on methods of examining*.

Ukwuije R.P.I. & Opara, I. M. (2013). School based assessment-implications for educational transformation. *Nigerian Journal of Educational Research and Evaluation* 12(2); 9-18

USAID/Basic Education Program, (August 2006 Revision). *A concise Manual for developing and implementing continuous assessment in teacher education institution and primary Schools*

VanderStoep, S.W. and Johnston, D. (2009), *Research methods for real life: Blending Qualitative and quantitative approaches*. Jossey-Bass, San Francisco, CA.

Vygotsky, L.S. (1962). *Thought and language.* Cambridge, MA: MIT Press.

Webb, D.C. (2005). *Classroom assessment as a research context: variations on a theme of pedagogical decision making.* Madison, WI: University of Wisconsin Press.

Weimer, J. (1995). Developing a research project. *Research techniques in human engineering*, 20-48.

Wiliam, D., & Thompson, M., (2008). Integrating assessment with learning: What will it take to make it work? In C. A. Dwyer (Ed.). *The future of assessment: Shaping teaching and learning.* (pp. 53-82). New York: Lawrence Erlbaum Associates.

Wilson, N. and McLean, S. (1994) *Questionnaire Design: A practical introduction.* Newtown Abbey, Co. Antrim: University of Ulster Press.

World Bank (2013). *SABER students' assessment: Ghana Country Report*. Washington, DC: World Bank. Downloaded April 28, 2015 at http://wbgfiles.worldbank.org/documents/hdn/ed/saber/supporting_doc/CountryReports/SAS/SBER_SA_Ghana_CR_Final_2013.pdf

APPENDIX A

INTRODUCTORY LETTER

UNIVERSITY OF EDUCATION, WINNEBA
FACULTY OF SCIENCE EDUCATION
DEPARTMENT OF MATHEMATICS EDUCATION
P. O. Box 25, Winneba, Ghana
+233 (020) 2041076

July 5, 2017

TO WHOM IT MAY CONCERN

LETTER OF INTRODUCTION

I write to introduce to you the bearer of this letter KWAN MICHAEL, a postgraduate student in the University of Education, Winneba who is reading for a Master of Philosophy degree in Mathematics Education.

As part of the requirements of the programme he is undertaking a research titled – *The state of School Based Assessement Practices in the Senior High Schools at Bibiani Anhwiaso Bekwai District in the Western Region of Ghana.*

He needs to gather information to be analysed for the said research and he has chosen to do so in your institution. I would be grateful if he is given the needed assistance to carry out this exercise. Thank you.

Yours faithfully,

SIGN

Prof. Dr. [illegible]
Head of Department

APPENDIX B

RESEARCH CONSENT FORM

UNIVERSITY OF EDUCATION, WINNEBA

Faculty of Science Education

Department of Mathematics Education

RESEARCH CONSENT FORM

(To the Head of institution where the research will take place)

Name of Researcher: Kwan Michael (Mphil. Mathematics Education Student)

Title of study: The implementation of School – Based Assessment in mathematics class in Senior High Schools at Bibiani Anhwiaso Bekwai district

Please, I humbly request that you read and complete this form, which seeks to obtain permission from you to conduct the above research in your institution.

Description: This research is a survey which my respondents will involve 50 students and all the mathematics teachers in the school. The respondents will be required to respond to some unstructured interview questions and also answer some questionnaires. Relevant documents with regards to SBA would be inspected.

The exercise will last for a maximum of one week and I must state that proper arrangements will be made with the respondents so that classes sections or school activities will not be affected. Moreover, I assure you and respondents of no potential risks, anonymity and confidentiality in the whole process. It is purely for academic purposes. However, the information that would be gathered will help improve assessment practices in the Senior High Schools in the district. Also, should this research result meet educational policy requirements, your institution will become part of a study that generated a policy change.

Please sign and date the declaration at the end. You may contact the researcher on 0244-036-682 or michaelkwan151@gmail.com for any clarification on this form. Please keep a copy of the filled form.

I SAMUEL SEFA SAM ..... give my consent to this study in my school.

Signature: ..... **Date:** 05/12/2017

HEADMASTER

UNIVERSITY OF EDUCATION, WINNEBA

Faculty of Science Education

Department of Mathematics Education

RESEARCH CONSENT FORM

(To the Head of institution where the research will take place)

Name of Researcher: Kwan Michael (Mphil. Mathematics Education Student)

Title of study: The implementation of School – Based Assessment in mathematics class in Senior High Schools at Bibiani Anhwiaso Bekwai district

Please, I humbly request that you read and complete this form, which seeks to obtain permission from you to conduct the above research in your institution.

Description: This research is a survey which my respondents will involve 50 students and all the mathematics teachers in the school. The respondents will be required to respond to some unstructured interview questions and also answer some questionnaires. Relevant documents with regards to SBA would be inspected.

The exercise will last for a maximum of one week and I must state that proper arrangements will be made with the respondents so that classes sections or school activities will not be affected. Moreover, I assure you and respondents of no potential risks, anonymity and confidentiality in the whole process. It is purely for academic purposes. However, the information that would be gathered will help improve assessment practices in the Senior High Schools in the district. Also, should this research result meet educational policy requirements, your institution will become part of a study that generated a policy change.

Please sign and date the declaration at the end. You may contact the researcher on 0244-036-682 or michaelkwan151@gmail.com for any clarification on this form. Please keep a copy of the filled form.

I GLAMFI MATTHEW ..... give my consent to this study in my school.

Signature: ..... **Date:** 22/11/17

UNIVERSITY OF EDUCATION, WINNEBA

Faculty of Science Education

Department of Mathematics Education

RESEARCH CONSENT FORM

(To the Head of institution where the research will take place)

Name of Researcher: Kwan Michael (Mphil. Mathematics Education Student)

Title of study: The implementation of School – Based Assessment in mathematics class in Senior High Schools at Bibiani Anhwiaso Bekwai district

Please, I humbly request that you read and complete this form, which seeks to obtain permission from you to conduct the above research in your institution.

Description: This research is a survey which my respondents will involve 50 students and all the mathematics teachers in the school. The respondents will be required to respond to some unstructured interview questions and also answer some questionnaires. Relevant documents with regards to SBA would be inspected.

The exercise will last for a maximum of one week and I must state that proper arrangements will be made with the respondents so that classes sections or school activities will not be affected. Moreover, I assure you and respondents of no potential risks, anonymity and confidentiality in the whole process. It is purely for academic purposes. However, the information that would be gathered will help improve assessment practices in the Senior High Schools in the district. Also, should this research result meet educational policy requirements, your institution will become part of a study that generated a policy change.

Please sign and date the declaration at the end. You may contact the researcher on 0244-036-682 or michaelkwan151@gmail.com for any clarification on this form. Please keep a copy of the filled form.

I MERCY E. GYATEAH give my consent to this study in my school.

Signature:.....**Date:**.....

UNIVERSITY OF EDUCATION, WINNEBA

Faculty of Science Education

Department of Mathematics Education

RESEARCH CONSENT FORM

(To the Head of institution where the research will take place)

Name of Researcher: Kwan Michael (Mphil. Mathematics Education Student)

Title of study: The implementation of School – Based Assessment in mathematics class in Senior High Schools at Bibiani Anhwiaso Bekwai district

Please, I humbly request that you read and complete this form, which seeks to obtain permission from you to conduct the above research in your institution.

Description: This research is a survey which my respondents will involve 50 students and all the mathematics teachers in the school. The respondents will be required to respond to some unstructured interview questions and also answer some questionnaires. Relevant documents with regards to SBA would be inspected.

The exercise will last for a maximum of one week and I must state that proper arrangements will be made with the respondents so that classes sections or school activities will not be affected. Moreover, I assure you and respondents of no potential risks, anonymity and confidentiality in the whole process. It is purely for academic purposes. However, the information that would be gathered will help improve assessment practices in the Senior High Schools in the district. Also, should this research result meet educational policy requirements, your institution will become part of a study that generated a policy change.

Please sign and date the declaration at the end. You may contact the researcher on 0244-036-682 or michaelkwan151@gmail.com for any clarification on this form. Please keep a copy of the filled form.

I MR. JOSEPH KWAKU ADJEI give my consent to this study in my school.

Signature: ..... **Date:** 15/11/2017

HEADMASTER
BIBIANI SENIOR HIGH

APPENDIX C

QUESTIONNAIRE FOR TEACHERS

The purpose of this questionnaire is to obtain information about the current status of the implementation of SBA in teaching and learning mathematics in Bibiani Anhwiaso Bekwai district.

The researcher pleads with you to cooperate in giving your response towards the stated question.

Thank you.

Part I. General Information

1. Name of the school……

2. Gender: Male…….Female……..

3. Age: a) 20-25 yrs b) 26-30 yrs c) 31-35 yrs d) 36-40 yrs e) 41yrs and above

4. Indicate your qualification (e.g. B.ed, Bsc, MA, M.ed etc)……

5. Teaching experience in the high school

   a) 0-3yrsb) 4-7yrs c) 8-11yrs d) 12-16yrs e) 17yrs and above

6. Teaching load per week

   a) below 10 b) 10-15 c) 16-21 d 22 and above

Part II. The main data information

Questions in relation to the current status of the implementation of SBA in teaching and learning mathematics

Table 1a.

Indicate by tick "√" to show your level of agreement under one of the five scales of measurement for each question. Strongly agree (SA) = 5, Agree (Ag) =4, undecided (Und) =3, Disagree (DA) =2 and Strongly disagree (SD) = 1

No.	Item	(SA)=5	(Ag)=4	(Und)=3	(DA)=2	(SD)=1
1	I understand SBA and its guidelines for implementation.					
2	I had training on SBA during the pre – service training.					
3	I have attended workshop training on SBA.					
4	I always include SBA in planning my lessons.					
5	I use SBA during the teaching and learning of mathematics.					
6	I assess my students on knowledge or mastery of basic concepts.					
7	I assess my students on					

No.	Item	(SA)=5	(Ag)=4	(Und)=3	(DA)=2	(SD)=1
	routine procedures.					
8	I assess my students on problem-solving or investigation.					
9	I assess my students on mathematical reasoning/understanding in subjective test.					
10	I plan my SBA in line with taxonomy of educational objective: cognitive, affective and psychomotor.					
11	I plan my SBA in line with the Mathematics syllabus: content, teaching and learning activities.					
12	I involve my students in planning my SBA in terms of lesson objectives, content of test, and time schedule for the conduct of the test.					
13	I use different SBA techniques like project work, assignment, class exercise,					

No.	Item	(SA)=5	(Ag)=4	(Und)=3	(DA)=2	(SD)=1
	homework, group work etc. regularly to assess my students.					
14	I do not use only mid exam and final exam in order to assess my students.					
15	I assess my student‟s progress in their day to day activities rather than at the end of the term.					
16	After assessing my students I used the achieved results as a feedback to evaluate my instruction.					
17	I give immediate and frequent feedback for my students about their achievement after scoring.					
18	I do develop standard marking scheme for questions before scoring.					
19	I have been analyzing student‟s achievement data (quantitative & qualitative)					

No.	Item	(SA)=5	(Ag)=4	(Und)=3	(DA)=2	(SD)=1
	and provide interpretation.					
20	I have been reporting scores on student‟s performance.					
21	I have been keeping or storing assessment data for future references.					
22	I encourage peer assessment between students.					
23	I encourage and motivate my students to do assessment task.					
24	I severely punish my students for not doing their assessment task.					
25	My students do not engage in copying work and cheat in tests.					
26	I take my students on for engaging in assessment malpractice.					
27	I include SBA mark in the total promotion mark.					
28	The implementation of SBA is not different from teacher					

No.	Item	(SA)=5	(Ag)=4	(Und)=3	(DA)=2	(SD)=1
	to teacher and there is no uniform practice between classes in teaching and learning mathematics.					
29	Mathematics department teachers meet to discuss the strength and weakness of the implementation of SBA and take corrective measures.					
30	In case of our school SBA is implemented in teaching and learning mathematics effectively.					

Table 1b.

Questions related to SBA techniques you use in mathematics class

Indicate by tick "√" to show the SBA technique you use in mathematics class under one of the three scales of measurement for each question. Use Always (UA) = 3, When Necessary (WN) =2, and Not use (NU) =1

No.	Assessment Tools/types	(UA)=3	(WN)=2	(NU)=1
1	Class test			
2	Class Exercise			
3	Assignment			
4	Project Work/ Practical Skills Test			
5	Discussion			
6	Oral Presentation			
7	Group Work			
8	Assessment by interview			
9	Observation			
10	Report writing with references			

Table 2

Questions related to the challenges facing the implementation of SBA

Indicate by tick "√" to show your level of agreement under one of the five scales of measurement for each question. Strongly agree (SA) = 5, Agree (Ag) =4, undecided (Und) =3, Disagree (DA) =2 and Strongly disagree (SD) = 1

No.	Item	(SA)=5	(Ag)=4	(Und)=3	(DA)=2	(SD)=1
1	I do not understand SBA concept.					
2	I lack the basic skills of recording and documenting student"s SBA achievement.					
3	Lack of training opportunities on the implementation of SBA at my school.					
4	Heavy teaching workload (above 28 periods per week) affects my SBA practices.					
5	Large instructional content affect my SBA.					
6	Overloaded classes (a class of above 35 students).					
7	Lack of SBA coordination and monitoring mechanism in					

No.	Item	(SA)=5	(Ag)=4	(Und)=3	(DA)=2	(SD)=1
	my school.					
8	In my school, there is lack of support for teachers by school administration in implementing SBA in terms needed resources.					
9	Little attention and lack of insistence on SBA implementation by my school authorities.					
10	There is no guideline for preparing/implementing SBA in my school.					
11	There is lack of interest from parents in the schoolwork of their children.					
12	There is insufficient time to carry out SBA.					
13	Absenteeism on the part of my learners affect SBA.					
14	I face challenges in invigilation.					
15	I have difficulty in marking.					
16	I have difficulty in helping					

No.	Item	(SA)=5	(Ag)=4	(Und)=3	(DA)=2	(SD)=1
	weaker students.					
17	In my school some teachers input fake results or marks for students because of their relationship with them or student‟s parents.					
18	I think SBA has no influence on the academic achievement of students rather than wastage of resource and time.					
19	Some teachers are just stubborn on resisting change to new assessment scheme (SBA) and still practice old scheme (Continuous Assessment).					

INTERVIEW QUESTIONS FOR TEACHERS

Give your response clearly

a. What is the state of SBA practice in your school currently?

……

……

……

……

b. SBA requires students to do project presentation; where they would be engaged in project work, allowed to write a report with references and do presentation on it each term.

i. Do you allow your student to do it all?.....

ii. If yes, what has been the impart on students mathematics learning

……

……

……

……

……

iii. If no, why?

……

……

……

iv. How do your students react to project work and presentations?

……

……

……

……

c. What are the factors that facilitate or hinder the effective practice of SBA in your school?

i) Positive Factors

……

……

……

……

ii) Negative Factors

……

……

……

……

d. What should be done to improve the current practice SBA practice in your school?.....

.....

.....

.....

.....

d. What action do you or your school take on assessment data?

….....

.....

.....……

……

e. Is there any point that you would like to raise in relation to the assessment of students in the SHS?

……

……

……

……