UNIVERSITY OF CAPE COAST

FORMATIVE ASSESSMENT PRACTICES OF SENIOR HIGH SCHOOL TEACHERS IN THE UPPER WEST REGION OF GHANA

SAURI SONGNALLE

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BY

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Thesis submitted to the Department of Education and Psychology of the Faculty of Educational Foundations, College of Education Studies, University of Cape Coast, in partial fulfillment of the requirements for the award of Master of Philosophy degree in Measurement and Evaluation.

AUGUST 2019

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature……..…… Date……

Name: ……

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature …… Date ……

Name: ……

Co-supervisor's Signature ……..…… Date ……..

Name: …….

ABSTRACT

The study investigated the formative assessment practices of senior high school teachers in the Upper West Region of Ghana. In order to achieve the purpose of the study, the mixed methods design was used. Survey questionnaire for teachers, semi-structured interview and lesson observation guides were used to collect data from a sample of 309 senior high school (SHS) teachers who were selected through simple random and purposive sampling. Inferential and descriptive statistics were used to analyse the data that were gathered. The key findings of the study revealed that SHS teachers had low knowledge in the practice of formative assessment. In terms of formative assessment practices, formative feedback was found to be the prevalent formative assessment practice of the SHS teachers. The study further revealed oral questioning as the dominant formative assessment technique used by SHS teachers. Large class size, examination-oriented culture/impact of summative assessments (for example, WASSCE), lack of assessment materials, among others, were identified as the major challenges that SHS teachers face in their practice of formative assessment. The results indicated a significant difference between male and female teachers with respect to their practice of formative assessment. Also, significant differences existed in SHS teachers' formative assessment practices with respect to their years of teaching experience. Finally, SHS teachers' knowledge of formative assessment was the best predictor of their practice of formative assessment. It was recommended that Ghana Education Service should organise regular in-service training for SHS teachers on formative assessment, build more infrastructure so as to reduce the large class size in schools, among others.

KEYWORDS

Formative assessment knowledge

Formative assessment practices

Formative assessment techniques

Formative assessment challenges

Formative assessment practices by gender

Teachers' years of teaching experience

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DEDICATION

To my mother, Asi Sumani and my siblings

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CHAPTER ONE

INTRODUCTION

Educators have recognised that summative assessment systems such as end-of-term examinations and high-stakes tests do not give appropriate feedback on students' learning outcomes to teachers to enable them improve students' learning (Mkpae & Obowu-Adutchay, 2017). In the view of Trumbull and Lash (2013), summative assessment feedback in the form of marks and grades also lack strong linkage with instruction. According to Amua-Sekyi (2016), this is as a result of the fact that summative assessments do not provide direction for next steps in the instructional process. Due to these weaknesses, educators, policymakers and educational researchers have shifted their attention to formative assessment practices (Oz, 2014). This is because, formative assessment if effectively implemented in the classroom, improves students' learning as it provides feedback that brings to bear the strengths and weaknesses of students' learning on daily basis (McManus, 2008; Mkpae & Obowu-Adutchay, 2017).

Unfortunately, research around the globe indicates that teachers do not seem to understand the practice of formative assessment, and as a result do not effectively implement it in their classrooms (Ababio & Dumba, 2013; Kankam, Bordoh, Eshun, Bassaw, & Korang, 2014; Awoniyi, 2016; Quyen & Khairani, 2017). These findings are of critical concern to educators, policymakers and educational researchers worldwide. In response to these concerns, this study sought to investigate the formative assessment practices

of senior high school teachers in the Upper West Region of Ghana using a mixed methods study.

Background to the study

Globally, there has been an increasing criticism in the educational field on summative assessments of having negative consequences that do not support teaching-learning process and that it should be reduced to a minimum (Kapambwe, 2010). In response to this widespread dissatisfaction with summative assessment practices, educators around the globe are beginning to pay more attention to formative assessment as a reliable instructional tool for raising students' achievement (Wei, 2010). As a result of this, formative assessment strategies and approaches are now strongly advocated for use in educational interventions, including teacher professional development initiatives and changes in classroom instructional practice (Kingston & Nash, 2011; McMillan, Venable, & Varier, 2013).

In Africa and in the year 2011, 18 out of 41 World Bank projects that promoted student assessment included formative assessment components (Liberman & Clarke, 2011). Many countries and agencies are now developing formative assessment policies and initiatives to promote life-long learning among students (Clarke, 2012; Kapambwe, 2010; Kuze & Shumba, 2011). The focus of assessment should no longer be on the end results but on the monitoring of growth in learning (Malaysia Examination Syndicate, 2007). Assessment tasks need to be integrated with instruction and focus on developmental aspects of the learner but not just measurement-oriented (Careless, 2008).

Thus, in order for instruction to be effective, teachers must assess their students while learning is ongoing to gain information about their progress and understanding so that instruction can be adapted accordingly (Bordoh, Bassaw, & Eshun, 2013). Educators need to move from traditional paper-and-pencil assessment that focuses on specifics, standards and immediate outcomes to more sustainable assessment that can aid students to become more active learners not only in managing their own learning but also assessing themselves to life beyond the end of the course (Kankam, et al., 2014).

With this global trend in assessment, the 2007 education reform in Ghana strongly recommended a reduction in the traditional tests and examination-oriented education and sought to replace it with education that enhances critical thinking and problem-solving (Oduro, 2015). As a result, various assessment techniques such as projects, portfolios, observations, tests and examinations were recommended by the Curriculum Research and Development Division in 2008 to assess students' learning in Ghana. These assessment techniques were intended to be used in all stages of students' development, in line with modern global trends of formative assessment practices (Akyeampong, Djangmah, Oduro, & Seidu, 2007; Oduro, 2015).

Though these reforms are laudable, there are concerns on implementation strategies as to how teachers actualise these assessment practices in the Ghanaian schools (Akyeampong, Djangmah, Oduro, & Seidu, 2007). The reason being that, in a study by Anane (2008), it was revealed that on the average, teachers spent 28% of their weekly instructional time in preparing students on test taking skills. He asserted that testing affects the

teaching-learning process through instructional time being devoted to direct test preparation strategies.

Similarly, a study by Ababio and Dumba (2013) revealed that, pen-and-paper testing remains the more dominant continuous assessment strategy among Ghanaian teachers. Educators have reached a point of believing that one cannot assess without using the traditional paper-and-pencil and therefore assign grades (Kankam, et al., 2014). Also, Oduro (2015) reported that in Ghanaian classrooms, teachers use a series of tests to assess their students' progress and that classroom assessment has come to mean testing. Due to inadequate understanding, teachers see "continuous assessment" to mean "continuous and frequent tests" (Oduro, 2015, p. 92). Meanwhile, Oduro (2015) recommended that, if Ghana wants to move towards a knowledge-based society, then there is the need for a second look to be taken at the assessment strategies. In effect, the culture and practice of traditional memory-based learning is to be transformed to the kind of education that stimulates thinking and creativity which is necessary to match the challenges of the 21st Century (MOE as cited in Oduro, 2015).

For a successful achievement of the above, education needs to change from the conventional methods of assessment to formative assessment where teachers are encouraged to gather information about students' learning to inform instructional decisions (Hollingsworth, 2012). Thus, teachers need to have regular contact with students, encourage active learning, and provide prompt feedback which is demonstrated effectively and meaningfully through formative assessment (Hollingsworth, 2012). As formative assessment encompasses all those activities undertaken by teachers, and/or by their

students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged Black and Wiliam, (as cited in Wei, 2010). This particularly includes teachers' observation of students at work, classroom discussions, evaluation of student assignments, review of homework, and analysis of test scores.

The distinctive feature of formative assessment is when these activities and the data sources resulting from student-teacher interactions are used to adapt teaching tactics for the specific purposes of meeting identified student learning needs; providing activities to support struggling students and providing opportunities for deeper learning to occur (Heritage, 2013). In Ghana, the types of formative assessment being practiced in include continuous assessment introduced into the Ghanaian educational system in 1987 (Etsey, 2012), which was replaced with school-based assessment in 2008 (Awoniyi, 2016).

In line with this, Tunstall and Gipps as cited in Awoniyi (2016) noted that formative assessment requires teachers to use their judgments about learners' knowledge, understand how to include feedback in the teaching process, decide how to meet students' varying learning needs and learn how to share decision making about learning and teaching with colleagues, parents and students. However, even in Cyprus, where teachers seem to have positive attitudes towards formative assessment, only a limited number of the teachers were reported to have actually implemented such practices in their teaching (Creemers, Kyriakides, & Antoniou, 2013). So, the obvious question to ask is, do Ghanaian teachers, as part of implementing formative assessment in their classrooms comply with the required practices and ultimately integrate the

formative assessment data into their instruction to improving students' learning?

In view of the roles that formative assessment plays such as improving student learning; instructional practices, and enhancing the quality and quantity of teacher-student interactions in the teaching and learning environment, researchers have emphasised the need to investigate how well teachers conduct this form of assessment and how well teachers integrate the outcome of formative assessment to improve teaching and learning (Filsecker & Kerres, 2012; Heritage, 2013; McMillan, 2013; Smith, 2013; Awoniyi, 2016; Quyen & Khairani, 2017). In line with this global research need, it is necessary to investigate how well Ghanaian SHS teachers conduct formative assessment in their classrooms. For according to Lendrum and Humphrey (2012), there is the need to study these formative assessment strategies in the context in which they take place as variations may occur depending on when, where, how, and why certain strategies are used.

Empirical evidence globally pointed to similar conclusion that teachers do not practice formative assessment in their classrooms (Kankam, et al., 2014; Bordoh, et al., 2013; Awoniyi, 2016; Quyen & Khairani, 2017). For instance, in a study of the educational assessment profile of 3,557 grades 5-12 teachers in the Sultanate of Oman, Alkharusi, Aldhafri, Alnabhani and Alkalbani (2014) found that the teachers used a variety of assessment techniques in their classrooms primarily for assigning grades. In Turkey, Oz (2014) investigated 400 Turkish teachers' practice of formative assessment in the English as a Foreign Language classroom and found that most of them rely on conventional methods of assessment rather than formative assessment

processes. Also, Abejehu (2016) examined the continuous assessment practices of seventy-two primary school teachers in Ethiopia. The study revealed that teachers continue to use mainly paper-and –pencil tests to assess their students' learning outcomes.

In Ghana, a study by Amua-Sekyi (2016) revealed that most Ghanaian teachers see dialogic feedback on formative assessment as a challenging role and as a result, these teachers tend to grade their students' work. This leads students to compare themselves against others rather than focusing on the difficulties in the task and on making efforts to improve (Amua-Sekyi, 2016). This thus, makes assessments in schools more normative than formative.

It must, therefore, be emphasised that, it is likely these global issues raised above exist in Ghana, especially among the senior high school teachers. In accordance with the necessity of formative assessment practices in the classroom, this study sought to investigate the formative assessment practices of senior high school teachers in the Upper West Region of Ghana.

Statement of the Problem

From relevant literature, ample evidence exist indicating that formative assessment forms an essential part in improving student learning; instructional practices, and ensuring high performance standards (Black & Wiliam, 2010). However, with the researcher's six years of teaching at the senior high school level in Ghana, he has observed that most senior high school teachers in Ghana especially in the UWR do not seem to effectively implement formative assessment practices in their classrooms. Teachers mostly conduct what is termed as mid-term test, which is mainly paper-and-pencil, and the scores from these tests are usually added to the end-of-term examination scores to

enable them grade their students. This seems to suggest, for instance, that the teachers do not understand the school-based assessment guidelines introduced into the Ghanaian education system in 2008 where in a term a teacher is supposed to conduct two individual tests, one group exercise and a project (Awoniyi, 2016).

This notwithstanding, when i contacted some of the teachers in the Upper West Region, they indicated that the mid-term and end-of-term examinations were enough to measure how much knowledge a student has gained in the term or academic year. This seems to suggest that these teachers do not formatively assess their students, and in situations where formative assessment seems to be carried out, it does not conform to the reasons behind it. Research conducted in the western world (for example, United States of America) indicate that formative assessment improves achievement for all students and assists students in understanding how to bridge the gap in their learning (Holingworth, 2012). SHS teachers in Ghana continue to use only summative assessments in the form of tests as their commonest methods to evaluate students' learning (Ababio & Dumba, 2013; Kankam, et al., 2014). Meanwhile, Anane (2008) concluded that in current assessment practice, tests are misguided tools because they do not give an accurate estimate of students' learning.

As indicated by Popham (2009), one deterrent to the practice of formative assessment has to do with the considerable confusion among educators regarding what formative assessment actually is. It is thus unclear whether or not SHS teachers in Ghana especially in the UWR understand the concept and practices of formative assessment and whether they implement

such practices within their instruction. This is because it appears that findings from studies around the globe indicate that teachers do not seem to understand formative assessment practices. For instance, in Hashim, Rusli, Hashim and Hua (2015) in a study observed that teachers have limited skills and knowledge to conduct formative assessment and lack best practices in testing and assessment. Quyen and Khairani (2017) reviewed twenty-one published studies on the challenges of implementing formative assessment practices in Asian classrooms and found that teachers lacked knowledge to effectively implement formative assessment. Again, they indicated that teachers do not understand the concept of formative assessment or how to implement it in the Asian classrooms. The question one has to ask is, do Ghanaian teachers understand the concept of formative assessment or how to implement it in their classrooms?

In Ghana, a study by Obeng (2011) in the assessment practices of SHS mathematics teachers in the Eastern Region of Ghana found that the teachers lacked knowledge in the principles of assessment practices. The researcher recommended the need for a research into the SHS teachers' assessment practices in other subjects or regions in Ghana. Also, in a study by Ababio and Dumba (2013) on the value of continuous assessment strategies in students' learning of Geography in SHS in Cape Coast Metropolis and Cape Coast North District in the Central Region of Ghana it emerged that the teachers had limited knowledge in the development of rubrics for the varied forms of continuous assessment strategies in their professional practice and as a result they employed mainly written tests in assessing their students learning.

Similarly, Eshun, Bordoh, Bassaw and Mensah (2014) in a study

observed that most teachers do not use assessment techniques that involve students in teaching and learning process because incorporating formative assessment into the teaching and learning process remains a challenging role for teachers.

Moreover, a study by Kankam, et al. (2014) on the formative assessment practices of social studies teachers in ten senior high schools in the Central Region found that teachers lacked knowledge in formative assessment practices. They asserted that this lack of expertise led to teachers not involving their students in self-assessment and peer assessment practices. In another study, Oduro (2015) identified that Ghanaian teachers do not implement formative assessment in their classrooms due to their poor working conditions (that is inadequate resources, large classes and lack of collaboration) and weak knowledge in assessment practices.

The GES Assessment Services Unit (ASU), in 2008 documented the situation in Ghana about teacher assessment practices in Ghanaian schools. The information indicates that teachers experience difficulty in assessment administration according to NEA (as cited in Oduro, 2015). In addition, Awoniyi (2016) in a study on senior high school mathematics teachers' understanding of School-Based Assessment and its challenges in ten senior high schools in the Cape Coast Metropolis found that the teachers did not understand the School-Based Assessment guidelines as majority of the teachers were yet to see students' tests scores as a means for identifying the strengths and weaknesses of the students and for remedial teaching. With these findings, the researcher recommended the need for a research on assessment practices in the areas of the use of school-based assessment guidelines,

construction of test items, administration, scoring and use of test scores to enhance teaching and learning. This suggests that classroom implementation of formative assessment remains an ongoing challenge for Ghanaian teachers too.

Earlier study in Ghana by Bordoh, et al. (2013) revealed that little evidence exists that teachers actually use formative assessment data to inform their instructional planning and teaching. It appears from this literature that Ghanaian teachers' ability to use formative evidence from students' learning to take corrective instructional steps to facilitate learning in the classroom remains a difficult task to master (Heritage, Kim, Vendliski, & Herman, 2009; Bordoh, et al., 2013). It is in line with this that, Tolley (2016) recommended the need to explore how teachers use the data they gather from their students' assessment procedures to inform their instruction. This justifies the purpose of this study among the SHS teachers in Ghana especially in the UWR.

Thus, there seems to be lack of knowledge, understanding and effective practice of formative assessment in the classroom globally. This lack of knowledge and understanding could lead to inappropriate effect on teaching and learning in the classrooms. There is therefore the need to build the capacity of teachers in formative assessment administration through research. Meanwhile, to the best of the researcher's knowledge, whether or not senior high schools teachers in the Upper West Region of Ghana apply appropriate formative assessment procedures in support of students' learning remains unanswered.

With reference to this inadequate understanding and practice of formative assessment, it was recommended that there is the need to investigate

teachers' formative assessment practices to develop teachers' skills regarding the conduct and practice of formative assessment in the classroom (McMillan, 2013; Smith, 2013; Awoniyi, 2016), hence the essence of this study.

Apart from the research gap identified, a careful analysis of literature has underscored that numerous studies have been conducted on formative assessment practices in the western world but very limited of these studies have been conducted in Ghana (McManus, 2008; Stingins, 2010; Heritage, 2010; Black, 2013). Interestingly, none of the limited studies conducted in Ghana on the variables has touched on the formative assessment practices of senior high school teachers in the UWR of Ghana. In addition, most of these limited studies are about assessment in general making them not comprehensive and contextual enough to a specific type of assessment. Moreover, most of these studies were conducted using predominantly quantitative research design which may not give a comprehensive picture of the issues under study.

Moreover, relevant literature reveals contradictory findings on formative assessment practices by gender (Ndalichako, 2015; Umugiraneza, Bansilal, & North, 2017), and teachers' years of teaching experience (Sach, 2011; Umugiraneza, Bansilal, & North, 2017). The current study sought to set the record straight whether there is significant difference in the practice of formative assessment by gender and teachers' years of teaching experience and finally to explore the influence of teachers' formative assessment knowledge, teachers' years of teaching experience and gender on formative assessment practice.

Reflecting on the issues raised above such as global lack of formative assessment knowledge on the part of teachers, teachers inability to implement formative assessment practices in their classrooms, their (teachers) inability to develop rubrics for the varied forms of formative assessment techniques, contradictory findings in existing literature, among others, there is the need to scientifically investigate how Ghanaian teachers practice formative assessment in their classrooms. To obtain a comprehensive picture of the issues under study, the researcher deems it fit to use a mixed methods approach to investigate the formative assessment practices of senior high school teachers in the Upper West Region of Ghana

Purpose of the Study

The purpose of the study was to investigate the formative assessment practices of senior high school teachers in the Upper West Region of Ghana. Specifically, the study sought to:

1. examine the level of senior high schools teachers' knowledge in formative assessment;
2. explore the prevalent formative assessment practice of senior high school teachers;
3. explore the formative assessment techniques used by senior high school teachers;
4. identify the challenges senior high schools teachers face in implementing formative assessment practices in their classrooms;
5. identify differences in formative assessment practices between female and male teachers;

6. identify the differences in teachers' formative assessment practices in relation to their years of teaching experience;
7. identify the contribution of senior high school teachers' formative assessment knowledge, years of teaching experience and gender to formative assessment practices.

Research Questions

The following research questions were formulated in accordance with the specific objectives of the study:

1. What is the level of senior high schools teachers' knowledge in formative assessment?
2. What is the prevalent formative assessment practice of senior high school teachers?
3. What formative assessment techniques do senior high school teachers use in their classrooms?
4. What are the challenges senior high school teachers face in implementing formative assessment practices in their classroom?

Hypotheses

The following hypotheses were formulated in line with the objectives to guide the study:

1. Ho: There is no statistically significant difference in formative assessment practices between female and male teachers.

   H_1: There is statistically significant difference in formative assessment practices between female and male teachers.

2. Ho: There is no statistically significant difference in teachers' formative assessment practices in relation to their years of teaching experience.

   H_1: There is statistically significant difference in teachers' formative assessment practices in relation to their years of teaching experience.

3. Ho: Senior high school teachers' formative assessment knowledge, years of teaching experience and gender do not jointly or independently predict teachers' formative assessment practices.

   H_1: Senior high school teachers' formative assessment knowledge, years of teaching experience and gender do jointly or independently predict teachers' formative assessment practices.

Conceptual framework for the study

The conceptual framework that was used for the study is depicted in Figure 1.

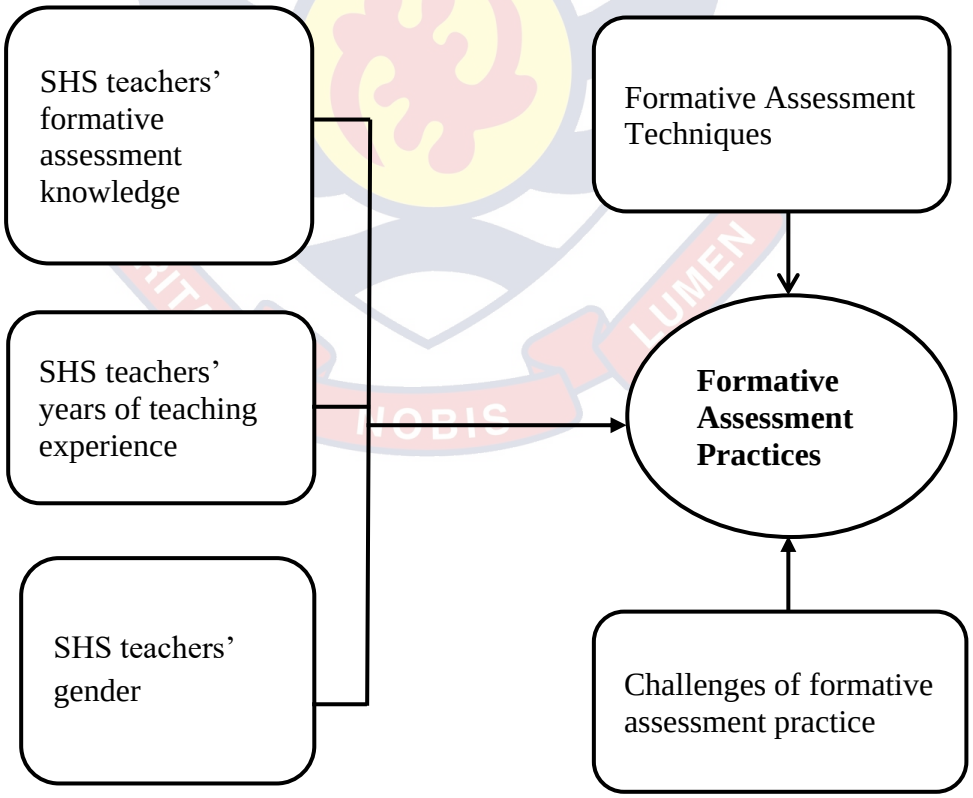

Figure 1: Conceptual framework of the formative assessment practices of senior high school teachers in the Upper West Region of Ghana

From Figure 1, it is clear that the predictor variables which are SHS teachers' formative assessment knowledge, SHS teachers' gender, and SHS teachers' years of teaching experience predict teachers' formative assessment practice (criterion variable). It can also be observed from Figure 1 that teachers' formative assessment techniques and the challenges teachers face in practicing formative assessment affect teachers' practice of formative assessment.

Significance of the Study

The findings from this study would contribute towards a clearer understanding and knowledge of what actually happens in the practice of formative assessment in the classroom at the senior high school level in Ghana especially in the Upper West Region. The study would serve as an important reference source for teachers, school administrators, and other stakeholders in education in their bid to improve the practice of formative assessment in the schools. In addition, challenges in the practice of formative assessment were identified and constructive suggestions were given as a means of improving the practice of formative assessment in the classrooms.

The results of the study have the potential to inform teacher education reform, in-service professional development, and capacity building efforts geared at transforming classroom assessment practices. Finally, although the results of this research are specific to the population under study, it is expected that the findings would contribute to ongoing classroom assessment research, particularly formative assessment research. Thus, the study helped to fill the literature gap on formative assessment practices regarding senior high school teachers in Ghana especially in the Upper West Region.

Delimitations of the Study

Issues concerning the practice of formative assessment are so numerous that it is not feasible for only one study to capture all of them. The scope of this study was therefore delimited to senior high school teachers' formative assessment practices in the Upper West Region of Ghana. The scope of the study is delimited to teachers in public and private senior high schools. Specifically, the scope of the study is delimited to variables like teachers' knowledge in formative assessment, the prevalent formative assessment practice, the formative assessment techniques senior high school teachers use, the challenges teachers face in implementing formative assessment in their classrooms, differences in the practice of formative assessment by gender, differences in formative assessment practices by teachers' years of teaching experience and the contribution of teachers' formative assessment knowledge, years of teaching experience and gender to formative assessment practices but not students' knowledge on the variables identified. Due to the nature of the scope, the generalisation of the results regarding the study should be done with care.

Limitations of the study

Almost every study conducted is characterised by limiting factors and this study was not an exception. The study suffered a few setbacks. In the first place, using questionnaire to collect data has a number of challenges. In this situation the researcher had no control over how respondents interpreted the questions on the questionnaire. In addition to possible wrong interpretations, it was a self-report measure which may produce untrustworthy results because respondents may not be completely truthful in their responses.

Again, the interview used was also a self-report measure. Here too, there was the likelihood that some of the responses from the teachers might not reflect the actual situation on the ground which could affect the validity of the data obtained from them. In addition, the researcher identified three sources of bias that could affect the validity of the results of the lesson observations. These are observer bias, reactivity and observer effects.

Organisation of the Study

This study was organised into five chapters. The first chapter focused on the introduction which highlights the background to the study, statement of the problem, purpose of the study, research questions and hypotheses, the significance of the study as well as the delimitations and the limitations of the study. Chapter two discussed existing literature related to the study. The chapter specifically reviewed relevant literature on three thematic areas namely conceptual, theoretical and empirical reviews on the variables identified. The third chapter described the methodology that was used in the study. Specifically, the chapter emphasised the research design, population, sample and sampling procedures, data collection instruments, pilot testing of the instruments, validity and reliability of instrument, data collection procedure as well as data analysis procedures. The results and discussions are captured in the fourth chapter whereas the final chapter emphasises the summary, conclusions and recommendations based on the findings of the study. The chapter also makes recommendations for further studies.

CHAPTER TWO

LITERATURE REVIEW

This study investigated the formative assessment practices of senior high school teachers in the Upper West Region of Ghana. This chapter was designed to acquaint the reader with existing studies on formative assessment practices. The chapter reviewed facts about what other researchers and writers have documented about formative assessment in the classroom. In this study, an effort was made to gather information from both primary and secondary sources in accordance with conceptual review, theoretical review, and empirical studies.

The Concept of Formative Assessment and its Relevance in the Classroom

Formative assessment encompasses all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged (Black & Wiliam as cited in Wei, 2010; Romeo, 2008). This means formative assessment involves the teacher collecting information from his/her students using multiple sources over time that shows evidence of learning and which is used to guide/modify instruction. According to Boston (as cited in Eshun, et al., 2014), employing formative assessment methods helps the classroom teacher gain an understanding of what the students can do and where they have difficulties so that they can make necessary instructional adjustments, such as re-teaching, trying alternative instructional approaches, or offering more opportunities for practice.

According to Heritage, et al. (2009), formative assessment is a systematic process to continuously gather evidence and provide feedback about learning while instruction is under way. Similarly, Popham (2008) sees it as a planned process in which assessment-elicited evidence of students' learning status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their current learning tactics. This assessment-elicited evidence serves as feedback which identifies the gap between a student's current level of learning and a desired learning goal (Heritage, Kim, Vendlinski, & Herman, 2008). It is an ongoing process and focuses on improving students' learning rather than simply testing and grading (Greenstein, 2010).

Any assessment, activity, or task can be formative, if the information that it provides is used to improve student's learning (Heritage, 2007; Heritage et al., 2008). Similarly, Clark (2015) noted that assessment can be called formative only if evidences of students' learning and progress are collected, and used to identify gaps in students' understanding, then adjusting learning strategies to close these gaps. This means, any instrument may be used formatively, regardless of its original intended purpose as long as the results are used to change instruction (Wiliam & Thompson as cited in Bennett, 2011).

Formative assessment is directly linked with instructional objectives of the lesson and is integrated within each aspect of teaching and learning at the classroom level where both the teacher and the students are actively involved in the assessment process (Stiggins & DuFour, 2009). Formative assessment informs, affects and supports instruction while learning is taking place (Clark,

2011; Heritage, 2010), and maps future improvement in instructional practices. Formative assessments are constructed to monitor students' progress during the ongoing learning process (Stiggins, 2008).

Trumbell and Lash (2013) described formative assessment as the tool the educator uses to identify the specific misconceptions and mistakes made by the students while the instruction is ongoing. It helps the teacher to recognise the differences between what students know and need to know and where instruction will be most effective to meet the desired learning needs of the student (Brandt & Pinhok, 2009).

Black and Wiliam (2009) opined that a practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited. Similarly, Black and Wiliam (2009) and Stiggins (2010) noted that formative assessment involves; creating high-quality assessment tasks before instruction, eliciting student learning, interpreting the evidence gathered of student learning, communicating assessment results to students during instruction, and making adjustments to subsequent instruction after instruction.

This means that during formative assessment process, a teacher interprets any classroom activity to gain information about student learning and adjust instruction accordingly. Formative assessment seeks and interprets evidence for learners and their teachers to decide where the learners are in

their learning, where they need to go and how best to get there (Dell'Olio & Donk, 2007; Popham, 2008).

Formative assessment provides opportunity for teachers to have a continuous feedback loop to adjust ongoing instruction and close gaps in learning (Stiggins & DuFour, 2009; Filsecker & Kerres, 2012). It is intended to assist students in the identification of understanding; clarify what comes next in the learning process; become part of an effective system of intervention for struggling students; help students monitor their own progress towards attainment of standards; and to motivate students by building confidence in themselves as learners.

It also allows instructors to evaluate the effectiveness of their instructional practice (Stiggins & DuFour, 2009) and provides a focus on students' progress as they navigate the curriculum from day-to-day. With it, teachers monitor students' progress to decide how to proceed in a unit and immediate adjustments are made to help students learn (Shepard, 2008).

Formative assessment supports the purpose of education by encouraging collaboration between teachers and students. It enhances the quality and quantity of teacher-student interactions (Keeley, 2008; Moss & Brookhart, 2009) because; both teachers and students collect evidences together to advance students' learning and achievement (Heritage, 2007; Greenstein, 2010; Heritage, 2011). According to Popham (2008), formative assessment is used as a way to open the lines of communication between the teacher and students and allow that information to shape instructional strategies and improve students learning. As an ongoing instructional process, it is a critical aspect of the teaching practice (Popham, 2008; Wiliam &

Thomson, 2008; Black & Wiliam, 2009; Shepard, 2008) because information about students is constantly obtained and is used in a short period of time to improve learning (Wiliam & Thompson, 2008; McManus, 2008; Bennett, 2009).

The goal of formative assessment is not to eliminate failure, but rather to minimise it (Stiggins, 2007). This is because, research evidences show that formative assessment is vital to generate students' confidence, high self-esteem, positive self-efficacy, self-regulation and motivation to learn, ensure all students experience success and make all of them competent learners (Irons, 2008; Moss & Brookhart, 2009).

Characteristics of Formative Assessment

Assessment Reform Group as cited in Etsey (2008) identified seven key characteristics of formative assessment which are: it is embedded in a view of teaching and learning of which it is an essential part; involves sharing learning goals with learners; helps students to know and to recognise the standards for which they are aiming; involves students in self-assessment and peer assessment; provides feedback that leads to students recognising their next steps and how to take them; it is underpinned by the confidence that every student can improve and involves both teacher and students in reviewing and reflecting on assessment data.

According to Black and Wiliam (2009), Popham (2008, 2011) and Heritage (2013), the distinctive feature of formative assessment is when the data obtained from the students are actually used to inform teaching and learning. Thus, to decide the next course of action in instruction, either for remediation or acceleration. According to Popham (2008), formative

assessment is less about testing and more about good instruction.

Similarly, Council of Chief State School Officers (CCSSO, 2007) characterises it as a process and not a test; used by both teachers and students; occurs during instruction; provides immediate feedback; and helps teachers and students make immediate adjustments to instruction and learning. Roeber (2014) characterises it as an on-going instructional improvement; occurs more frequently; and planned integration with instruction. According to Black and Wiliam (as cited in Wei, 2010), formative assessment is characterised by multi-assessors; multi-assessment techniques; is more comprehensive in assessed contents but not for comparison or selection.

Teachers' Knowledge of Formative Assessment

According to Fan, Wang and Wang (2011) and Koh (2011**),** teachers generally lack adequate knowledge in educational assessment. In Ghana, Kankam, et al. (2014) revealed that teachers lacked knowledge in formative assessment practices as such did not involve their students in the assessment process. Ababio and Dumba (2013) in a similar study found that teachers did not employ varied forms of formative assessment strategies in their classrooms because of their limited knowledge of these strategies in their professional practices.

Again, Alkharusi, Aldhafri, Alnabhani and Alkalbani (2012) found that the teachers have low level of knowledge in educational assessment. They asserted that these teachers tend to use the assessment results for assigning grades. In addition, Mohamed, Kamis and Ali (2016) studied the assessment literacy of two hundred Malaysia's home economics teachers. The study revealed that the teachers' literacy in educational assessment was inadequate.

In addition, Stiggins (2009) opined that teachers came into the profession with little or no pre-service preparation in assessment, let alone formative assessment. For these reasons, the teachers frequently used a series of tests which were simple to score and assess students' memorisation of facts (Moss & Brookhart, 2009). According to Moss & Brookhart (2009), most teachers misunderstood formative assessment as a series of tests administer to audit students' learning rather than a way to improve their day-to-day instructions. In a literature review by Quyen and Khairani (2017) on the challenges teachers face in implementing formative assessment in Asia, found that, teachers did not understand the concept of formative assessment and as a result did not know how to implement it in their classrooms. Teachers therefore relied heavily on summative assessments to judge students' acquisition of knowledge

Literature has identified the quality of teacher preparation programmes as a factor that impacts teachers' knowledge and use of formative assessment. With this, Dufresne, Gerace, Leonard and Mestre (2011) noted that teachers usually leave teacher education programmes without an appropriate understanding of formative assessment. If even some teacher education programmes provided skills and knowledge in formative assessment, they do not provide time for application of and reflection on the formative assessment practice (Marsh, 2007). Similarly, Stiggins and Chappuis as cited in Kankam, et al. (2014) opined that teachers do not have the opportunity to learn to apply the principles of formative assessment during their preparation for teaching practice because Colleges of Education often fail to include this kind of

assessment training in their programmes (Campbell & Collins as cited in Kankam, et al., 2014).

Relevant literature further suggests that there are not much formal formative assessment training programmes for teachers in the Ghanaian educational context (Kankam, et al., 2014). Kankam, et al. (2014) contended that most teacher education programmes skim over classroom assessment, leaving teachers to assess in the way they were assessed when they were in school. It was therefore, recommended that planning and implementing formative assessment practices should be part of teacher training in Colleges of Education (Kankam, et al. 2014).

In Ghana, a study by Oduro (2015) revealed that the study participants (teachers) did not receive training in formative assessment during their initial training programmes. In line with this, Izci (2016) noted that newly graduated teachers come to school without having the understanding of and experience in the practice of formative assessment. Notwithstanding this, research indicates that in-service training can sharpen teachers' assessment skills (Alkharusi, 2011). This indicates that in Ghana, Ghana Education Service and other stakeholders in education should organise regular in-service training for teachers on formative assessment.

According to Black (2007), teachers still have difficulty in determining what constitutes formative assessment. This is due to a frequent misunderstanding that any assessment by teachers, and in particular the use of a weekly test to produce a record of marks, constitutes formative assessment. Unless some learning action follows from the outcomes, such practice is merely frequent summative assessment (Black, 2007). Hilya (2007) argued

that poor implementation of formative assessment seems to be as a result of the poor understanding of the principles of it by teachers. To support this, Popham (2009), indicated that educators are still confused about the meaning and practice of formative assessment.

Formative Assessment Practices

Literature identified sharing learning intentions and success criteria; questioning; formative feedback, peer assessment; self-assessment (Wiliam & Thompson, 2008; Wiliam, 2010; Wei, 2010; Bennett, 2011; Quyen & Khairani, 2017), formative use of summative assessments (Taras, 2008; Dunn & Mulvenon, 2009; Stiggins, 2009; Burke, 2010) and integrating formative assessment data into instruction (Fautley & Savage, 2008) as the practices of formative assessment because they define the territory of formative assessment practice in the classroom (Leahy, Lyon, Thompson, & Wiliam, 2005).

Sharing Learning Intentions and Success Criteria with Students

A student who is aware of learning intentions and success criteria is better able to set goals, develop a variety of learning strategies, develop meta-cognitive skills (Keeley, 2008) and control and evaluate his or her own learning process (Torrance, 2007; Bloxham & Boyd, 2007).

The establishment of learning intentions is the first step in the whole formative assessment process (Council for the Curriculum Examinations and Assessment [CCEA], 2007; Moss & Brookhart, 2009). This is because, students can only achieve learning objectives if they understand those objectives. Students who have a clear understanding about learning intentions and the criteria by which their work will be assessed are better able to take

responsibility for their own learning (CCEA, 2007; Fautley & Savage, 2008; Moss & Brookhart, 2009), and these have a significant impact on what teachers teach and what students learn (Keeley, 2008).

To implement formative assessment productively, learning intentions and success criteria should be made clear to the learner (Fautley & Savage, 2008; Moss & Brookhart, 2009; Havnes, Smith, Dysthe, & Ludvigsen, 2012). Therefore, teachers should share learning intentions and success criteria using appropriate assessment tasks and actively involve students in the assessment process starting from planning (Havnes, et al., 2012). Learning intentions and success criteria should be planned in advance to reduce workload, shared with learners using appropriate language (CCEA, 2007) that are fully understood and used by students because learning intentions and success criteria provide the standard against which evidence is elicited, performance is compared, and feedback is generated to close the gap between current learning and desired outcomes (CCEA, 2007).

The learning intentions need to be visually available throughout the entire lesson to remind the students of the goals of the lesson (Fautley & Savage, 2008). Learning intentions are shared with the students in order for them to understand what the teacher is looking for and hoping to achieve. While learning intentions need to be written and visually available to all the students at the start of a lesson (Fautley & Savage, 2008), it is important to note that sharing learning intentions needs to be more than simply declaring what is written on the teacher's lesson plan because the language needs to be understandable (Fautley & Savage, 2008).

Researchers identified some effective strategies that can help teachers to explain learning intentions for students to increase their own learning ownership. These include providing carefully defined learning intentions and success criteria; discussing and reflecting assessment criteria and standards in class (CCEA, 2007); involving students in peer and self-assessment in relation to defined criteria and standards; conduct collaborative workshops and show sample or model of good work and further explanation (CCEA, 2007; Wiliam, 2008; Dysthe, Engelsen, Madsen, & Wittek, 2008; Moss & Brookhart, 2009).

The most crucial step in sharing learning intentions is providing success criteria (rubrics), which is helpful in showing students how to handle a task successfully (Fautley & Savage, 2008). Reddy and Andrade (2010) and Jonsson (2014) noted that, students consider rubrics useful as they use rubrics as a guide for their performance and for self and peer assessments. The rubrics should be shared with students prior to assessment tasks with careful explanations about items and their references. It is also suggested that involving students in the development and active use of rubrics is important to enhance its effectiveness (Jonsson, 2014). To maximise the value of rubrics, providing appropriate exemplars, which illustrate specifically how assessment criteria and standards are achieved, is recommended in practice (Hendry, Bromberger, & Armstrong, 2011; Jonsson, 2010).

In education, the transparency of assessment can be achieved through the use of a rubric. A rubric is a document that describes the assessment expectations to students by listing assessment criteria and different levels of quality (Panadero & Jonsson, 2013). Thus, rubrics provide a list of expectations as well as a method for assessing what level of development

those expectations were or were not met (Barney, Khurum, Petersen, Unterkalmsteiner, & Jabangwe, 2012). This means rubrics list the criteria against which an assessment will be marked and the different marks or performance levels for those criteria. Providing the rubric in advance when the assessment is set helps to clarify expectations, provides guidance and ultimately enhances academic performance of students. When used as a feedback mechanism, rubrics help students to understand the basis of their mark and areas to improve which may, in turn, reduce queries or disputes over marks (Reddy & Andrade 2010; Smith, Sadler, & Davies as cited in Francis., 2018). The rubrics help to reduce students' anxiety in assessment; to recognise where they should invest more time and effort to produce higher quality work.

However, students sometimes have difficulty understanding the meaning of the terms used in rubrics and this limits their positive impact on learning (Panadero & Jonsson, 2013). Also, the validity and reliability of rubrics are compromised when the process of creating rubrics is not clearly described (Reddy & Andrade, 2010). To tackle these problems, Jonsson (2014) suggested that rubrics should be designed clearly to enable students' accurate understanding.

Questioning

A major element of formative assessment employed regardless of the degree of technology support, is the role of teacher questioning and the resulting classroom discourse (Ribbens, 2007). Researchers emphasize that, increased discussion occurs among students as they respond to question prompts during instructions (Ribbens, 2007; Yourstone, Kraye, & Albaum, 2008).

Studies have identified effective strategies for productive questioning (CCEA, 2007; Moss & Brookhart, 2009; Bloxham & Boyd, 2007; Fautley & Savage, 2008; Heritage, 2010; Popham, 2008). These are: encouraging students questions; planning questioning; asking effective questions; asking questions better; giving enough time to think, and dealing with answers productively (CCEA, 2007; Moss & Brookhart, 2009). Questions should be challenging, because they promote deep thinking, provoke discussion, explore the full range of learning targets, and build up from previous learning. The questioning strategy should involve dialogue between teacher and student as this increases students' learning and for teachers to respond and direct students thinking (Bloxham & Boyd, 2007).

Questioning is a skill that needs careful planning. For instance, Moss and Brookhart (2009) opined that strategic questions are not asked 'on the fly' rather they are planned in relation to the learning targets. Questions that are carefully planned encourage classroom discussions, actively engage students in the learning of skills and increase teachers listening ability (Moss & Brookhart, 2009).

There are two major types of questions that teachers use in classrooms. These are open questions and closed questions (Briggs, et al., 2008). Open questions ask for more extended explanations, while closed questions usually require very brief answers (Briggs, et al., 2008). It has been established that questioning takes up a large part of the teacher's lesson, however, most of these questions are closed (Fautley & Savage, 2008). In order to offer students the opportunity for deeper discussions that provoke thinking, open questions need to be utilised more often in the classroom (Fautley & Savage, 2008). To

elicit evidence of current understanding or misconceptions, teachers need to ask questions that promote thinking and lead to richer discourse with their students (Heritage, 2010; Popham, 2008). Questions phrased simply to establish whether students know the correct answers are of little value for formative purposes (Heritage, 2010).

Another essential aspect of questioning that teachers should consider is, allowing students time to answer questions (Fautley & Savage, 2008). The amount of time between the student providing an answer and the teacher's evaluation of that answer is equally important, especially when the question requires deeper thought rather than a simple matter of recalling facts (Wiliam, 2007). The time teachers wait to hear student responses can impact the level of classroom discourse. This means 'wait time' is considered as a vital factor in effective questioning. Students' poor responses occur because teachers have not given sufficient time for students to think and form their answers (Black, Harrison, Lee, Marshall, & Wiliam, 2005).

Thus, if 'wait time' is utilised appropriately, then students will give more thoughtful answers. Teachers must, therefore, demonstrate willingness to provide adequate time for students to answer posed questions. Increasing 'wait time' can help more students become participants in class discussions (Black, Harrison, Lee, Marshall, & Wiliam, 2004) and encourages students to answer questions (Kirton, Hallam, Peffers, Robertson, & Stobart, 2007; Webb, & Jones, 2009). Again, when 'wait time' is increased, more suitable answers may be offered by students, fewer students may not respond to the posed question(s), students may have more confidence in their responses with

different explanations and students are able to add more responses to that of their peers (Fautley & Savage, 2008; Webb, & Jones, 2009).

The use of follow-up activities is suggested as an essential technique for effective questioning. Black, et al. (2005) identified that teachers may have poor teaching practices because they do not have effective follow-up activities after asking questions and receiving answers from their students. Teachers should use incorrect answers from their students to challenge students' thinking and to provoke whole-class discussions (Black, et al., 2005).

Another good questioning strategy is when a teacher calls upon students randomly to answer questions. Jones and Wiliam (2008) argue that giving students the chance to decide whether or not to raise their hand 'increases the achievement gap between the lowest and highest-achieving students. Choosing students to give answers at random raises the level of class participation as a whole. This strategy might help to involve students who suffer from lack of confidence. Also, Jones and Wiliam (2008) pointed out that, this helps to provide the teacher with a better idea of the class's development, as answers which are taken randomly are likely to be more representative. Its implementation can be problematic because many teachers often tend to choose students who are able to provide the right answer, so that they can quickly move on with their teaching (Jones & Wiliam, 2008).

Formative Feedback

Feedback is conceptualised as information communicated directly by the teacher to the learner with the purpose of modifying the learner's thinking or behaviour to improve learning (Hattie & Timperley, 2007). Effective feedback must answer what learning goals students must reach, what progress

is being made to reach these goals and what they must do next to make better progress. For feedback to be formative, it must help students to identify the gap in their learning and indicate next steps to fill the gaps (Heritage, 2010). Effective feedback is descriptive, criterion-referenced, constructive (not judgmental), incremental, positive, clear, specific, supportive in tone and focuses on the work and the process (Norton, 2007; Brookhart, 2008). Feedback to any student should be about the particular qualities of his or her work, with advice on what he or she can do to improve, and should avoid comparisons with other students (Wiliam, 2010).

The feedback should be timely and provide conducive classroom environment to encourage dialogue among teachers and students; and students and their peers (Irons, 2008; Heritage, 2010). Feedback provided through dialogue enhances students understanding rather than simple transmission of information (Fautley & Savage, 2008; Sadler, 2010). The emphasis shifts from memorization of facts to life-long learning (Sadler, 2010). This means, the most important type of feedback is the one that invites the student to engage in a dialogue. Effective feedback is specific and clearly linked to learning intentions, provides task-specific information to fill a gap between what is understood and what is aimed to be understood, provides information and cues on how to improve rather than correct answers and is given after students have responded to initial instruction (Hattie & Timperley, 2007).

The language used to communicate feedback also affects the way a student receives it. For instance, evaluative feedbacks have no room for improving students learning as they can cause anger, and actually have negative effects on students' desire to learn and self-esteem (CCEA, 2007;

Stobart, 2008). Also, if a teacher's feedback focuses on praise, reward, criticism and punishment, it has low impact on students learning (Stobart, 2008). As Hattie and Timperley (2007) argued, praise makes students afraid of failure, and rather than putting in more effort, they avoid the risk of dealing with challenging tasks which may only lead to failure. Feedback has the potential to have a significant effect on students learning when the information in the feedback is about a task, descriptive, constructive, give guidance on how to do it more effectively (Gamlema & Smith, 2013), and is clearly related to the learning goals (Swaffield, 2011; Havnes et al., 2012). This means feedback comments should be concrete, contextualised and related to the student's work (Hattie & Timperley, 2007).

Studies have also shown that marks and grades have little or no value to improve students' learning (Stobart, 2008; Fautley & Savage, 2008; Heritage, 2010) because, such feedbacks do not provide direction for next steps, do not encourage students to set and revise learning goals and do not provide specific guidance they need to learn (Kvale, 2007; Wiliam, 2008; Stobart, 2008). In addition, focusing on grades and marks can create a competitive culture in the classroom as students focus on their performance compared to others rather than on their learning (CCEA, 2007). However, according to Moss and Brookhart (2009), many teachers perceived that giving marks, grades and detailed corrections are effective feedbacks. Feedback improves learning when it gives students information about strengths and weaknesses of their work (Popham, 2007).

Feedback, however, is a complex issue as it does not always lead to further learning. This is because, students may not understand the feedback,

and therefore not know how to act on it (Mumm, Karm, & Remmik, 2015). Complexities in giving feedback also arise from the fact that students have their own personalities and learning style (Havnes, et al., 2012), and therefore, there is no best type of feedback for all learners (Shute, 2008). With this, Nurmukhamedov and Kim (2010) stated that, in order for teachers' written comments to make the greatest impact on student revisions, teachers should not only carefully select what to comment on but should also consider which commentary type would be the most effective way to convey this comment. Another problem is lack of timeliness as students often need assessment feedback as quickly as possible (Poulos & Mohany, 2008; Bayerlein, 2014). Feedback should therefore be timely, ongoing, embedded in the learning process and focus on the learners' work (Irons, 2008; Peterson, 2008; Fisseha, 2010).

Feedback can be written or oral, or it can be given in the form of demonstration in the case of pre-school (Brookhart, 2008; Moss & Brookhart, 2009). Written feedback is normally intended to give suggestions for correcting mistakes in students' work without deep negotiation of meaning between the teacher and the student. However, it has a significant advantage since students can refer to it many times because they may forget what was said in oral feedback (Irons, 2008). Oral feedback, on the other hand, provides students with thorough explanations, personalised and individualised support, thus engaging students in the learning process. It appears to be more constructive than written feedback in terms of additional information that could be presented through teacher-student or teacher-whole class conversation (Lunt & Curran, 2010; Voelkel & Mello, 2014).

Self-Assessment

It is a process by which students reflect on the quality of their work, judge the degree to which their work meets the criteria and then revise it accordingly. Its involvement in the assessment process enables students to take more responsibility and ownership for their own learning (Romeo, 2008) which is essential for effective learning (Popham, 2009), form meta-cognitive skills and act as autonomous learners (Allal, 2010; Lew, Alwis, & Schmidt, 2010). To become effective life-long learners, students need to be self-assessors (Cassidy, 2007). Self-assessment helps students identify specific problems in their understanding and set realistic targets to remedy these problems (Wiliam, 2007). Researchers pointed out that self–assessment saves instructional time and reduce workload (CCEA, 2007; Irons, 2008) and practiced when there is resource constraint (CCEA, 2007).

However, it is hard for students to be objective about their own learning and that many students do not have a clear picture of the expected performance. These facts are more likely to reduce the effectiveness of self-assessment (Sadler, 2010). In addition, research has identified that inexperienced students, tend to either overestimate or underestimate their performance. This requires students to be trained with appropriate self-assessment skills (Sadler, 2010, 2013). For this reason, making the criteria and the assessment process transparent, and engaging students in assessment activities, are important to develop self-assessment capacity (Sadler, 2013).

To ensure successful implementation of self-assessment in the classroom, the teacher should make students aware of the importance of self-assessment, and that learning intentions, success criteria (rubrics) and

assessment tools should be made clear to students. Also, the teacher should teach students how to apply the criteria; provide students with a certain assignment or performance to assess; and provide students with clues regarding when it is suitable to assess themselves. In addition, good self-assessment models or examples should be shown to students (CCEA, 2007; Andrade (2011). Moreover, time should be given to students to practice and refine their self-assessment skills. Students should not be required to assign marks to their own work, timely and descriptive feedback should be given on their work (Moss & Brookhart, 2009), and students should be trained and guided in self-assessment skills (Bloxham & Boyd, 2007). Also, Andrade and Valtcheva (2009) recommended that students should be given sufficient revision time after the self-assessment practice.

Peer Assessment

In addition to teachers, students' peers are also sources of feedback for learning. According to Wiliam and Leahy (2007), what students say and write about each other's work can show how well they understand the learning goals and the depth of their current knowledge as well as deepen understanding of their own learning. Peer assessment motivates students to learn together in a collaborative environment (Pham, 2014). It makes students accept critiques of their work from peers rather than teachers. It helps students to develop skills such as teamwork and meta-cognition (Topping, 2009). It is considered as an opportunity for students to become learning facilitators and also it is used as a tool for instructors to obtain a more clear and obvious picture of learner's performance (Cheng & Warren as cited in Karami & Rezaei, 2015). During

this peer assessment process, peers play the role of assessors or/and assesses (Van Zundert, Sluijsmans, & van Merriënboer, 2010).

There are several conditions for organising effective peer assessment. Teachers should create a classroom culture in which students feel comfortable to voice their views, and encourage their students to cooperate and support one another (Stobart, 2008). Students must be trained in peer assessment skills to effectively engage in peer assessment (Tillema, 2014) because it has to do with a student assessing another student's work to consider the amount, level, value and worth of the performance (Tillema, 2014).

To make peer assessment productive and valuable, students must work as a group or team and need to be trained in the skills of collaboration in peer assessment (CCEA, 2007). Also, learning intentions, success criteria and assessment tools should be made clear to students, good peer assessment models should be shown to the students (CCEA, 2007), time should be given to practice and refine their peer assessment skills, students should not be required to assign marks to their peers work, timely and descriptive feedback should be given on their work (Moss & Brookhart, 2009), and students should be trained and guided in peer assessment skills (Bloxham & Boyd, 2007).

Again, Carless (2013) identified oral presentations as common and useful tools and strategies for peer assessment and suggested that teachers should use them in their classrooms to enhance peer assessment practice. In addition, Karami and Rezaei (2015) noted that strategies that can improve learners' perception towards peer-assessment are more involvement of students in peer-assessment; providing students with enough training and support; and make a clarification of peer-assessment criteria.

However, its efficacy depends on a number of factors such as students' attitudes, language levels, familiarity with assessment criteria, the type of skill being assessed and the possible presence of bias such as gender and friendship (Azarnoosh, 2013). Peer assessment is difficult or even unfair to put into practice within a competitive working environment between students (Kvale, 2007). One major issue is students' lack of trust in peers as assessors (Gennip, Segers, & Tillema, 2009; Topping, 2009). Also, the 'equal' status makes peer feedback less convincing to students. Students find it difficult to rate their peers' work because they perceive that they are unqualified to assess.

Reliability of results of peer assessment is another concern. McConlogue (2012) noted that students' are skeptical on the fairness and accurateness for the assessment comments and feedback given by some of their peers. McConlogue (2012) further argued that some peer assessments lack fairness and accuracy; as a result of which students develop a sense of doubt on the practicality of peer assessments and comments. Peer assessment can be difficult to organise in a large class as it usually takes time for students to think, analyse, and communicate their ideas.

Formative Use of Summative Assessments

The use of graded or summative assessment for formative purposes is an area of assessment often described as underused but with much potential for improving student learning (Stiggins, 2009; Taras, 2008). Although a large body of the assessment literature today aims to delineate the differences between summative and formative assessment, Taras (2008); Dunn and Mulvenon (2009); Stiggins (2009); Burke (2010), agreed that the same assessments could be used for both summative and formative purposes.

Summative assessment data can be used to inform and adjust teaching and learning strategies (Dunn & Mulvenon, 2009; Torrance, 2012). Therefore, summative assessments should be seen to be, a positive part of the learning process (Taras, 2009).

However, many educators argued that summative assessment happens too far along in the learning process to make instructional adjustments possible (Burke, 2010). To ensure effective formative use of summative assessments, teachers should require students to structure their reviewing and revision to focus on areas of weaknesses, students should prepare for examinations by generating, answering and marking their own questions. This improves students' performance by helping them understand the assessment process and focus their efforts on improving. Also, teachers should ask students to re-work examination questions in class (Taras, 2009).

Integrating Formative Assessment Data into Instruction

Formative assessment and the teaching and learning process must be viewed as inseparable and teachers must recognise that one cannot happen without the other (Heritage, 2007). According to Cowie (2012), teachers should view assessment as an integral part of instruction, student-centered and a powerful means to improving teaching and learning. Integrating assessment with daily instruction and using multidimensional assessment methods provides useful and comprehensive insights about students' progress (Fautley & Savage, 2008), improves the quality of teaching and raises students' achievement (Keeley, 2008; Crisp, 2012).

Assessment must be comprehensive, continuous and integrated into instruction to provide evidences and to identify what comes next in the

learning rather than given at the end of teaching (Stiggins, 2008; Stiggins & DuFour, 2009; Tucker, Fermelis, & Palmer, 2009; Martínez, Stecher, & Borko, 2009; Greenstein, 2010). Integrating assessment and instruction helps teachers to learn more about what students need in order to be successful learners. An integration of different assessment methods during lesson delivery provides a complete picture of students and to improve learning (Crisp, 2012). In line with this, Wiliam (2007) argued that minute-by-minute and day-by-day assessment is an essential aspect of formative assessment because it helps to raise students' attainment.

Teachers need to assess students regularly and many times during a lesson in order to know what their students have learned (Wiliam, 2007). It is only through this information that teachers might be able to make adjustments to their teaching. These changes and adjustments in instructions need to be made during the lesson planning because it has been identified that assessing students at the end of a chapter or a term might not have a major impact on their achievement (Wiliam, 2007).

In integrating assessment with instruction, Wiliam and Thompson (2008) outline five key strategies that teachers should practice in their classrooms during the teaching and learning process. These strategies include clarifying and sharing learning intentions and criteria for success; engineering effective classroom discussions; providing feedback that moves learners forward; activating students as the owners of their own learning; and activating students as instructional resources for one another

According to Conderman and Hedin (2012), formative assessments can be employed at any of three distinct points in the instructional cycle: before

instruction, during instructions, and after instruction. In using formative assessments before instruction, teachers can assess students' prior knowledge of the subject matter. This prior knowledge then informs the teacher's instructional decisions. During instruction, formative assessment requires that teachers ask relevant and thoughtful questions. Through intentional and meaningful questioning, teachers can make alterations to their instruction based on students' responses. Teachers can also use formative assessment at the conclusion of a lesson. These assessments can take the form of exit slips. Through gathering student data after several days of instruction, but before the end of the unit, teachers can identify student errors and re-teach these misconceptions prior to administering summative assessments (Conderman & Hedin, 2012). These data inform teachers' instructional decisions for the remainder of the instructional unit.

However, the use of assessment information to plan subsequent instruction is observed to be the most difficult task for teachers (Heritage et al., 2009). Bordoh, et al. (2013) identified that little evidence exists that teachers actually use formative assessment data to inform their instructional planning and teaching. This means in Ghana, teachers do not integrate formative assessment data into their instruction. Meanwhile for assessment to function formatively, the results have to be used to adjust teaching and learning (Black & Wiliam, 2010).

Formative Assessment Techniques used by Senior High School Teachers in their Classrooms

According to Heritage (2007), assessment becomes formative if it uses various techniques such as classroom dialogue, questioning, homework assignments, formal tests, less formal quizzes, projects, portfolios to gather evidence about students' learning continuously throughout the instruction. These techniques particularly include teachers' observation of students at work, classroom discussions, evaluation of student assignments, review of homework and analysis of test scores (Wei, 2010; Eshun, et al., 2014). Other techniques include projects, questionnaires, interviews, checklists, written tests, recap exercises and take-home assignments as well as oral presentations, practical tests, scoring rubrics, concept mapping, scaffolding and portfolios (Etsey, 2008; Bekoe, Eshun, & Bordoh, 2013; Ababio & Dumba, 2013).

Also, Davidson (2007) encouraged teachers to use various techniques such as quizzes, question and answer sessions, short writing, drama and role-play to assess students' learning outcomes. Similarly, according to Guskey (2007), quizzes, tests, written assignments and other assessments administered by teachers on a regular basis are the best guide to improve student learning. The Department of Basic Education, Republic of South Africa (as cited in Umugiraneza, Bansilal and North, 2017) encouraged teachers to use formal assessments such as tests, examinations, projects, assignments and investigations in their teaching and learning process.

Again, Umugiraneza, et al. (2017) noted that classroom dialogue, exercises and peer assessments are forms of formative assessment, which make students to become active learners and are ready to take responsibility

for their own learning. In addition, Okonkwo (as cited in Alufohai and Akinlosotu, 2016) identified that formative assessment data can be obtained from various instruments and techniques such as tests, projects, rating scale, checklist, observation, interviews and other possible techniques

In Oman, Alkharusi, et al. (2014) identified that teachers used a variety of formative assessment techniques such as short written or oral tests, quizzes, performance-assessment tasks, projects, student self-assessment and end of unit test to assess their students' learning. In addition, the students can also be assessed using classroom activities such as oral presentations, written activities, practical exercises; and non-classroom activities such as research projects and portfolios. Also, in keeping with current trend in educational assessment, Oz (2014) opined that formal evaluation of learners should be carried out through the application of written and oral exams, quizzes, homework assignments, projects, portfolio, and self- or peer-assessment.

However, Etsey (as cited in Ababio and Dumba, 2013) noted that project, checklists and questionnaires are rarely used by teachers as formative assessment techniques. In addition, Bekoe, et al. (2013) identified that most teachers do not use scoring rubrics, concept mapping, scaffolding and portfolio as tools in formative assessment process. Meanwhile, to minimise memorisation in the classrooms, assessment strategies need to include more than the traditional practice of relying on end-of-unit tests and mid-unit quizzes, both of which tend to focus on knowledge recall and procedural learning (Stobart, 2008). Mwebaza (as cited in Ababio and Dumba, 2013) reported that written tests, take-home assignments and recap exercises dominated teachers' continuous assessment strategies. They further reported

that checklist and observation were rarely used while oral tests and questionnaires were never used all.

Again, Ababio and Dumba (2013) investigated 25 Geography teachers and 220 Geography students on the value of continuous assessment strategies in students' learning of Geography in senior high schools in Ghana. The study revealed that Geography teachers mostly used take-home assignment, oral and written tests, and recap exercises as their continuous assessment strategies in Geography lessons. It was, however, found that projects, questionnaires, observations, interviews and checklists were rarely used by Geography teachers to assess students' learning of geographical knowledge. In addition, in a study of the teachers' formative assessment practices of 140 3rd- through 12th-grade teachers in a Midwestern state, Lawrence in Kansas, Frey and Schmitt (2010) found written assignments as the most used assessment techniques by the teachers.

Moreover, Alsarimi (as cited in Alkharusi, 2011), in a survey of the assessment practices of 246 third preparatory science teachers from 112 schools in Oman found that the teachers used four main sources of information when assigning grades to students. These sources were final examinations, mid-term examinations, class participation, and oral questioning. Besides, in investigating 400 Turkish teachers' practices of assessment for learning in the English as a Foreign Language classroom, Oz (2014) identified oral examinations, group work, project, portfolio, performance assessment, essay type exam and oral presentation as the preferred assessment techniques among the teachers. Oz (2014), however, identified rubric, self-assessment and peer

assessment, observation, drama, and structured grid as the least assessment method preferred among the teachers.

Furthermore, in an investigation of the assessment practices of 211 elementary general music teachers in Iowa, Swanson (2017) found that 96.7% of the respondents indicated that they frequently used observations to gather evidence of student learning, whereas 77.7% indicated having never used portfolios to gather evidence of student learning. Reflecting on the formative assessment techniques used by teachers globally, one can conclude that pen-and-pencil tests and exercises are what teachers use most to the neglect of non-traditional assessment techniques.

Challenges of Formative Assessment Practice in the Classroom

Despite the research that exists to support the practice of formative assessment in the classroom, there remain obstacles to its implementation (Dorn, 2010). The greatest threat to the practice of formative assessment is the dominance of traditional forms of summative (high-stakes) assessment on the teaching and learning process (Stobart, 2008; Hill, 2011; Baird, 2011). In many countries including Ghana, secondary school assessment system is dominated by summative assessments such as end-of-topic, mid-term, end-of-term, end-of-year and high-stakes tests (Kankam, et al., 2014; Amua-Sekyi, 2016,; Awoniyi, 2016).

According to Amua-Sekyi (2016), where the stakes attached to the assessment are high, they influence what is taught, how it is taught, what is learned and how it is learned. This results in teaching focusing on isolated facts and skills that are easy to test, and teaching focusing mainly on the tests content; students focus their learning on what they think they will be tested on;

conventional teacher-centred methods become dominant in classrooms; teachers devote considerable time to prepare students on how to pass and get good grades and assessment depends only on paper-and -pencil items rather than using a wide variety of assessments techniques (Walport, Goodfellow, McLoughlin, Post, Sjovoll, Taylor, & Waboso, 2010). Again, assessment activities are not aligned with real problems; (Harlen, & Gardner, 2010); and do not measure higher order thinking skills (Race, 2007). Even curriculum materials such as syllabuses and teachers source books generally focus on knowledge acquisition and promotion of summative assessment activities (Marsh, 2007).

Again, reasons which aggravate the tension of summative assessment today include evaluation of teachers' efficiency largely based on students' results from standardised tests (Nusche, Radinger, Santiago, & Shewbridge, 2013). According to Popham (2008), when teacher performance is measured solely by high-stakes student achievement tests, teachers resign themselves to finding techniques to boost test scores rather than utilizing their professional expertise to teach and assess for meaningful student growth.

Also, lack of time, extra workload and crowded curriculum also limit some teachers' ability to adopt formative assessment (Sutton, 2010). The pressure on teachers to cover whole curriculum to prepare their students for external and end-of-term examinations affect teachers use of formative assessments Box (as cited in Izci, 2016). Their time-consuming nature and the additional and demanding workload are the two primary challenges of formative assessment practice (Quyen & Khairani, 2017; Akom, 2010; Asghar, 2009; Falk, 2011; Jackson & Marks, 2015). Thus, most teachers see

lack of time as the main obstacle that they face when implementing formative assessment (Taber, Riga, Brindley, Winterbottom, Finney, & Fisher, 2011).

In addition, it has been established that using formative assessment is more difficult in large classes because teachers are challenged to evaluate each student's current level of learning and to have suitable interventions for every student (Carless, 2011). Therefore, most teachers consider large class size as the main obstacle that they face in formative assessment implementation process (Taber, et al., 2011). Etsey, as cited in Ababio and Dumba (2013) stated that large class sizes do not permit teachers to use class tests, assignment, projects as well as observations to assess students' learning. With large class size, new or inexperienced teachers are more concerned with classroom management issues than trying out formative assessment strategies that will help students learn (Wei, 2010).

Oduro (2015) in a study also identified large class size, time constraints, high-stakes examinations and lack of professional training in formative assessment as the major challenges affecting the implementation of formative assessment in the Ghanaian classroom. With large class size, giving effective individual feedback will be difficult for any teacher even if the teacher is personally acquainted with all the students in the class (Wang, 2007; Miller, 2009; Sutton, 2010; Hung, Lin, & Hwang, 2010; Hwang & Chang, 2011; Chen, May, Klenowski, & Kettle, 2014; Ludvigsen, Krumsvik, & Furnes, 2015).

Kankam, et al (2014) identified four reasons why teachers do not practice formative assessment in their classrooms. These reasons include teachers having limited knowledge in the different techniques of formative

assessment; teachers having no time to create different techniques of formative assessment; teachers having little or no professional training in assessment, therefore, they (teachers) are not confident enough to try out other forms of assessments; and it is usually not part of the demands of the state or nation. Zou and Cai (2006) also identified inadequate technical and professional training for teachers in formative assessment, low reliability of formative assessment data as some of the challenges facing teachers in formative assessment implementation process.

Similarly, Chen, et al. (2014) also identified teachers' lack of knowledge and training in formative assessment, being time-consuming, an examination- oriented culture and heavy workload as some of the challenges of formative assessment. They are of the view that most teachers do not understand the concept of formative assessment. Inadequate funding for teachers to participate in professional development programmes relating to formative assessment, professional conferences, and purchasing of assessment materials has also been identified as a major factor that affects teachers' adoption of formative assessment (Izci, 2016).

Moreover, according to Izci (2016), teachers working conditions also affect their adoption of formative assessment. The physical conditions of most schools are miserable such as poor classroom environment, poor furniture (inappropriate, broken and inadequate), insufficient (or non-existent) library and laboratory facility cannot support formative assessment practice in the classroom. Also, the lack of collaboration among teachers in the school environment affects the implementation of formative assessment in the classroom (Carless, 2011). In addition, lack of school funds to purchase

teaching and learning materials to support teaching, overcrowded classrooms, absenteeism of some learners and poor attitude of learners towards formative assessment tasks also affect the implementation of formative assessment practices in the classroom (Carless, 2011).

Furthermore, teachers have difficulty in integrating formative assessment data into their instructions. Even when teachers are able to draw reasonable inferences about students' levels of understanding from assessment evidence, teachers struggle to take the necessary action to adapt instruction to meet students' learning needs (Shepard, 2008). With this, Heritage, et al. (2009) opined that using formative assessment data to inform instruction is difficult for some teachers. The teachers' do not have the ability to use formative evidence to take corrective instructional steps to facilitate learning. Thus, the use of assessment information to plan subsequent instruction is seen to be the most difficult task for some teachers (Heritage, et al., 2009). In confirming this, Bennett (2011) noted that teachers have difficulty integrating formative assessment data into their instructional delivery.

Moreover, literature identified that students' attitude, mistrust and resistance also affect teachers' formative assessment practice. Poor attitude, excessive absenteeism, unsupportive approaches and a variety of students' ability discourage teachers from adopting formative assessment **(**Remesal, 2007**).** For instance, students prefer teacher feedback as they feel it is more accurate and detailed than peer-assessment (Chen, et al., 2014; Ng, 2014; Tepsuriwong & Bunsom, 2013). Also, students do not have adequate knowledge on how to do self-assessment and peer-assessment as it seems

difficult to compare their own work with that of their peers (Pham & Renshaw, 2015; Yin & Buck, 2015).

Differences in Formative Assessment Practice by Gender

Relevant literature available revealed differences in formative assessment practice between female and male teachers. For instance, in a study of the educational assessment profile of 3,557 grades 5-12 teachers in the Sultanate of Oman, Alkharusi, et al. (2014) found that on the average, male teachers tended to practice formative assessment than the female teachers. In a similar study by Umugiraneza, et al. (2017) on the formative assessment practices of 75 mathematics and statistics teachers in KwaZulu-Natal schools in South Africa, found that male teachers tended to practice formative assessment more as compared to their female counterparts. This finding suggests that male teachers are more likely to be trying different assessment methods; or it could mean that male teachers may just be more confident about reporting their teaching and assessment practices.

Again, a study by Frey and Schmitt (2010) on the teachers' formative assessment practices of 140 3rd- through 12th-grade teachers in a Midwestern state, Lawrence in Kansas also revealed differences in formative assessment practice by gender. However, this study revealed that female teachers tended to use formative assessment about 50% more than their male counterparts. In addition, Ndalichako (2015) in a study of secondary school teachers' perceptions of assessment, found differences in teachers' perception of assessment by gender. The study revealed that female teachers tended to use assessment data often to facilitate and support teaching and learning than the male teachers. This finding actually depicts formative assessment practice,

thus where the data obtained are actually used by the teacher to inform instruction or by the student to improve learning. Likewise, Alkharusi, et al. (2012) in a study of the educational assessment knowledge of 165 Muscat teachers in the Sultanate of Oman found gender differences in formative assessment practices.

The study revealed that female teachers tended to practice formative assessment more effectively than their male counterparts. The study also revealed that female teachers tended to use non-achievement factors such as effort, ability, interest and motivation in grading more frequently than male teachers. They asserted that these practices, however, did not align with the recommendations of assessment experts. The findings of Frey and Schmitt (2010), Alkharusi, et al. (2012) and Ndalichako (2015) seem to contradict that of Alkharusi, et al. (2014) and Umugiraneza, et al. (2017) where the former found female teachers to practice formative assessment more than the male teachers which could mean that the male teachers were not confident in reporting their formative assessment practice unlike that of Alkharusi, et al. (2014) and Umugiraneza, et al. (2017).

Teachers' Years of Teaching Experience and their Formative Assessment Practice

Research indicates that teachers' years of teaching experience have influence on their appreciation and adoption of formative assessment practices in their classrooms. According to Sach (2011), teachers who have more experience of teaching including experiences of the topic, of the students as learners and having taught the unit of work before tend to use formative assessment strategies in their classroom practices.

However, in a study of the formative assessment practices of 75 Mathematics and Statistics teachers in KwaZulu-Natal schools in South Africa, Umugiraneza, et al. (2017) found that less experienced teachers implemented and used a variety of formative assessment techniques and strategies in their classrooms than the more experienced teachers. This finding suggests that not all experienced teachers practice formative assessment in their classrooms. In line with this, Kini and Podolsky (2016) argued that not every inexperienced teacher is less effective, and not every experienced teacher is more effective. But the benefits of teaching experience will be best realised when teachers are well-prepared at the point of entry into the teaching profession. Kini and Podolsky (2016) seemed to suggest that both pre-service and in-service trainings should be organised for teachers at every stage of the teaching profession to sharpen their formative assessment skills and practices. Oz (2014) commenting on similar issue noted that "the optimism of young teachers may be somewhat tarnished when confronted with the realities and complexities of the teaching task" (p. 782).

Teachers' Formative Assessment Knowledge, Years of Teaching Experience and Gender as Predictors of their Formative Assessment Practice

According to Koloi-Keaikitse (2012), teachers with varying characteristics such as level of assessment knowledge, years of teaching experience, gender, teaching level and subject taught, have different explanations for their varying assessment practices. In confirming this finding, Alkharusi, et al. (2012), in a study on educational assessment attitudes, competence, knowledge, and practices of 165 Muscat teachers in the Sultanate

of Oman revealed that teachers' assessment knowledge, years of teaching experience and gender do influence teachers' formative assessment practices. Alkharusi, et al. (2012) based on their study concluded that teaching experience contributes a lot to the variations in teachers' assessment practices.

Also, educators have long recognised that teachers' assessment knowledge might influence their formative assessment practices (Calderhead; Green (as cited in Alkharusi, et al., 2012). Consistent with this, Mohamed, et al. (2016), opined that teachers' knowledge of assessment influences their formative assessment practices. This was earlier reported in a research done by Vitali (as cited in Mohamed, et al., 2016) that teachers' knowledge of assessment can influence their formative assessment practices. This statement is supported by Popham and Stiggins (as cited in Mohamed, et al., 2016) that strong knowledge of fundamentals of educational assessment is a basic requirement for effective formative assessment practices in the classroom. These researchers agreed that a teacher's formative assessment knowledge has an influence on his/her formative assessment practice in the classroom.

Again, according to Armstrong (2011), what teachers know about assessment is a significant factor that influences their assessment practices and what they do with the data they collect from students' assessment. This means that, teachers who are knowledgeable in classroom assessments are more likely to practice formative assessments effectively because they will also be able to integrate assessment data into their instruction in order to improve teaching. In addition, Calderhead (as cited in Alkharusi, et al., 2012), noted that the effectiveness of formative assessment practice in the classroom

depends on teachers' assessment knowledge. This means teachers' assessment knowledge has a lot of influence on their assessment practices.

However, a study of the formative assessment practices of 408 primary school teachers from 10 districts in Malaysia, Talib, et al. (2014) found that formative assessment practices were not significantly influenced by teachers' years of teaching experience and their assessment knowledge. This means teachers' years of teaching experience and their formative assessment knowledge cannot predict their practice of formative assessment in their classroom.

Furthermore, Umugiraneza, et al. (2017) in a study of the formative assessment practices of 75 mathematics and statistics teachers in KwaZulu-Natal schools in South Africa, found that gender and teaching experience predict the teachers' choice of a variety of assessment techniques and for that matter, formative assessment practice in the classroom. They asserted that gender and teaching experience do influence teachers' formative assessment practices. Similarly, Nneji, Fatade, Awofala and Awofala, (2012) investigated the attitudes of 305 Science, Technology and Mathematics (STM) teachers towards assessment practices in Lagos State, Nigeria. The study revealed gender and teaching experience as factors that influenced the teachers' formative assessment practices.

In another study, Alufohai and Akinlosotu (2016) examined the knowledge and attitude of 543 secondary school teachers towards formative assessment practices in Esan Central Senatorial District of Edo, Nigeria. The study revealed that teachers' years of teaching experience was a significant predictor of teachers' formative assessment practices. However, the formative

assessment practices of the teachers in secondary schools did not differ by gender.

The findings of Alufohai and Akinlosotu (2016) differed from that of Nneji, et al. (2012) and that of Umugiraneza, et al. (2017) where in the latter both gender and teachers' years of teaching experience are significant predictors of teachers' formative assessment practice in the classroom. These inconsistencies in the results of previous studies indicate that it has not been established as to which of the variables (teachers' formative assessment knowledge, years of teaching experience and gender) best predicts teachers' formative assessment practice. Therefore, with reference to this inconsistencies in the results of these previously conducted studies, there is the need for a research to investigate whether teachers' formative assessment knowledge, years of teaching experience and gender are significant predictors of teachers' formative assessment practices, hence the essence of this study. .

School-Based Assessment Practice: The Case of Ghana

School-Based Assessment is an assessment administered in schools and marked by students' own teachers (Awoniyi, 2016). It is a form of assessment which is planned, administered, scored and reported by the subject teachers (Ghazali, 2016). The main objectives of its implementation are to get an overall picture of individual students' potential, to monitor individual student's development and to help them to increase their potentials as well as to make a meaningful reporting on individual students (Ghazali, 2016).

In Ghana, School-Based Assessment (SBA) is a new transformational movement in the Ghanaian educational system which focuses on the teacher's assessment of students' learning for better improvement. It was introduced

into the curriculum in the last curriculum review in 2007 to replace what used to be called continuous assessment with the aim of making assessment comprehensive so as to cover more applications profile dimensions. The introduction of the SBA led to several changes in the continuous assessment system. These changes were necessary for pertinent reasons, among which was to bring about a reduction in the workload of teachers (Awoniyi, 2016). The major changes to assessment which came with the reforms are summarized in table 1.

Table 1-*Major changes to assessment which came with the 2007 reforms*

	Nature of changes	CA	SBA
Overall changes in project	i. Use of class exercises and home work	Largely for CA	For formative evaluation only
	ii. % Contribution Of Class Exercises/Homework/project work to overall school assessment	30%	-
	iii. % contribution of SBA Tasks to overall school assessment (i.e. class tests & project)	-	50%
	iv. % contribution of end of term exams to overall school assessment	70%	50%
	v. % contribution of (i or ii and iii) to final WASSCE score	30%	30%
	vi. Number of assessments per term	11	4
	vii. Number of assessments per year	33	12
	a. Number of project tasks given per terms	4	1
	b. Term distribution of project tasks by individual or group	All individual tasks each term	Individual tasks in terms 1 and 3; Group task in term 2
	c. When is project task given and completed	Any time, i.e. teachers discretion	Beginning of the term ad submitted
	d. Written report required?	Optional, largely oral presentation	Yes, with references
	e. Scoring projects	5	20

Adopted from Awoniyi (2016).

Observing from table 1, School-Based Assessment consists of 12 assessments in a year instead of the 33 assessments in the previous continuous assessment system, that is, a reduction by 64% of the workload compared to the previous continuous assessment system (Etsey, 2012; Awoniyi, 2016). The 12 assessments are labeled as Task 1-12, where Tasks 1-4 will be administered in term 1, Tasks 5-8 will be administered in term 2 and Tasks 9-12 will be administered in term 3. Again Tasks 1, Tasks 5 and Tasks 9 will be individual test and administered in term 1, 2 and 3 respectively. Then, Task 2, Task 6 and Task 10 will be group exercise administered in term 1, 2 and 3 respectively and after the second month into each term. These group exercises will consist of two or three instructional objectives the teacher considers difficult to teach and learn. The selected objectives could also be those objectives considered very important and which therefore need students to put in more practice. Task 3, Task 7 and Task 11 will also be administered as individual test in term 1, 2 and 3 respectively under the supervision of the class teacher. Finally, Task 4, Task 8 and Task 12 will be project to be undertaken throughout the term and submitted at the end of the term 1, 2 and 3 respectively (Etsey, 2012; Awoniyi, 2016).

According to Etsey (2012), this new School-Based Assessment system is designed to provide schools with an internal assessment system that will help Ghanaian schools to achieve the following purposes: standardise the practice of internal school-based assessment in all schools in the country; provide reduced assessment tasks for each of the primary school subjects; provide teachers with guidelines for constructing assessment items/questions and other assessment tasks; introduce standards of achievement in each subject

and in each class of the school system; providing guidance in marking and grading of test items/questions and other assessment tasks; introduce a system of moderation that will ensure accuracy and reliability in teachers' marks; and provide teachers with advice on how to conduct remedial instruction on difficult areas on the syllabus to improve students' performance.

Despite the fact that the revised syllabuses were sent to schools in 2008 and all Ghanaian teachers were expected to start implementing its contents, research by Awoniyi (2016) revealed that majority of teachers in Ghana do not understand the School-Based Assessment guidelines and its implementation process due to lack of training of teachers in it. The findings showed that teachers continue to carry out the bad continuous assessment practices such as giving more than the required number of exercises to students, manufacturing marks for students and emphasising low level of skills in test construction (Awoniyi, 2016). This means that the assessment of students' achievement at the senior high schools level is not substantially different from the traditional modes of assessment which they were meant to replace.

According to Awoniyi (2016), many teachers do not use test scores of School-Based Assessment to identify students' strengths and weaknesses and for remedial teaching of students. It is worth noting that though School-Based Assessment is a powerful instructional strategy, successful implementation cannot be achieved unless teachers understand the concept of SBA and are equipped with the right knowledge, skills and attitudes to practice it effectively (Awoniyi, 2016).

Empirical Review

Obeng (2011) studied the assessment practices of senior high school mathematics teachers in the Eastern Region of Ghana. A descriptive survey design was used for the study. A purposive sampling was used to select two hundred and sixty mathematics teachers for the study. Questionnaire was used to collect data for the study. The study revealed large class sizes, large number of teaching periods, lack of assessment materials and facilities and lack of knowledge on both assessment theory and practice as the major challenges affecting the teachers' assessment practices in the classroom.

Also, Ababio and Dumba (2013) conducted a study on the value of continuous assessment strategies in students' learning of geography in senior high schools in the Central Region, Ghana. A cross sectional survey design was used to carry out the study. A census survey was used to collect data from all the 25 geography teachers with simple random sampling used to select 220 students for the study. Two sets of structured questionnaire were developed and used to collect data from both groups of respondents. The study revealed that most geography teachers do not employ varied forms of continuous assessment techniques to evaluate their students' learning of geography.

The findings clearly showed that majority of the respondents (16) representing 80% of the geography teachers indicated that they mostly used take-home assignment to assess their students, 15 (75%) and 13 (65%) of the respondents were of the view that they mostly used test (oral/written) and recap exercise respectively to assess their geography students. Thus, it emerged from the study that test, take-home assignment and recap exercise were the most used continuous assessment techniques in geography lessons.

The study further revealed that 50% of geography teachers never used oral test to assess students whilst 55% of the respondents indicated that they often used written test to assess their students' learning. This means that although geography teachers have been using test as a continuous assessment strategy, they often use written test instead of oral test to assess students' knowledge of geography. It was, however, found that project work, questionnaire, observation and checklist were rarely used by geography teachers to assess students' learning. They asserted that though geography teachers at the senior high school level might have been introduced to alternate continuous assessment techniques like the use of projects, observations, questionnaires, interviews and checklists during their pre-service teacher training, they often used written test, recap exercise and take-home assignment to assess their students. Again, the study revealed that teachers have limited knowledge in the varied forms of continuous assessment techniques in their professional practice.

Again, Kankam, et al. (2014) conducted a study on the formative assessment practices of social studies teachers in the senior high schools in the Central Region of Ghana. Simple random sampling technique was used to select twenty social studies teachers and ten senior high schools for the study. Interview and documentary analysis were used to collect data for the study. This study revealed that teachers lacked knowledge in formative assessment practices. They asserted that due to this lack of knowledge the teachers did not involve their students in self and peer assessment practices. The study also revealed that the practice of formative assessment was also limited by inadequate time, resources constrains, large class size, pressures from internal

tests/examinations, national external examinations, lack of proper school facilities and equipment, poor attitudes and lack of commitment on the part of teachers, and lack of assessment policy of the individual schools. They recommended that if classroom teachers are to become effective practitioners of formative assessment then they must have a better theoretical understanding of it.

In addition, Awoniyi (2016) conducted a study on the understanding of senior high school mathematics teachers of School-Based Assessment and its challenges in the Cape Coast Metropolis. The study adopted the descriptive research design which involves using a sequential mixed method strategy where questionnaire and interview were used. The sample for the study was made up of one hundred and ten teachers from ten senior high schools in the Cape Coast Metropolis out of which twelve took part in the interview session. The study revealed that the teachers did not understand School-Based Assessment guidelines which means these teachers are not abreast with new trends and development relating to assessment practices. The study further revealed that majority of the teachers were yet to see students' tests scores as a means for identifying the strengths and weaknesses of the students and for remedial teaching. It was also found that 20% of the teachers sampled mentioned lack of assessment materials as their challenge to the practice of School-Based Assessment. Almost all the interviewees were of the view that lack of time is one of the challenges affecting assessment practices in the schools.

Furthermore, Alufohai and Akinlosotu (2016) investigated the knowledge and attitude of secondary school teachers towards continuous

assessment practices in Esan Central Senatorial District of Edo State, Nigeria. The study used the descriptive research design where simple random sampling technique was used to draw 543 teachers for the study. A four-point Likert scale questionnaire titled "Teachers' Continuous Assessment Knowledge and Attitude Questionnaire" was used to collect data for the study. The means and standard deviations were used to analyse the research question measuring teachers' knowledge in continuous assessment. It was concluded that majority of the teachers in secondary schools in Esan Central Senatorial District of Edo State did not have adequate knowledge in continuous assessment.

Moreover, Alkharusi, et al. (2012) studied the educational assessment attitudes, competence, knowledge, and practices of 165 Muscat in-service teachers in the Sultanate of Oman. A questionnaire was used to collect data for the study. The study revealed that the teachers demonstrated a low level of knowledge in educational assessment. Teachers used a variety of assessments in the classroom primarily for grading. Teaching load and teaching experience accounted for some of the variations in teachers' educational assessment practices.

Similarly, Amua-Sekyi (2016) studied the assessment, student learning and classroom practice of 12 tutors and 18 student-teachers in three Colleges of Education in Ghana. A case study design was employed where focus group interviews with tutors and students were conducted. The study revealed that the tutors provided feedback on students' work in the form of marks and grades. According to Amua-Sekyi (2016), feedback in the form of grades and marks encourages students to focus on performance goals (passing the test) rather than learning goals (understanding the subject). With this, students also

tend to compare themselves against others rather than focusing on the difficulties in the task and on making efforts to improve (Attwood as cited in Amua-Sekyi, 2016).

Finally, Quyen and Khairani (2017) reviewed twenty-one published research studies on the challenges of implementing formative assessment in Asia. The findings revealed two primary barriers to the implementation of formative assessment in the classroom, which are its time-consuming nature and demanding workload.

The study also revealed that over 80% of the reviewed papers (17/21) claiming that teachers lacked knowledge in the practice of formative assessment in Asian classrooms, poor attitude of students towards learning accounting for 42.8% (9/21), teacher beliefs, and being time-consuming accounting for 33.3% (7/21), and an examination- oriented culture and heavy workload accounting for 28.5% (6/21).

The review further revealed that teachers did not understand the concept of formative assessment or how to implement it in their classrooms and as a result there was lack of student involvement in self-assessment or peer-assessment It was also found that Asian students had poor attitude towards the principles of formative assessment, particularly in self-assessment and peer-assessment as the students favour teacher feedback as more accurate and detailed than peer-assessment and self-assessment.

The review again found large class sizes to interfere with Asian teachers' efforts to implement formative assessment in their classrooms because teachers need to spend more time and attention in order to provide feedback to individual students. School authorities do not support teachers'

attempts at formative assessment techniques because school authorities did not accept solely formative feedback on student work.

Theoretical Framework

The theoretical framework for this study is based on classical true-score theory, theory of reliability and theory of validity.

Classical Test Theory

According to Schumacker as cited in Bichi (2016), Classical Test Theory (CTT) is an emancipation of the early 20th century approach to measuring individual differences. CTT was born after the following three achievements or ideas were conceptualised: recognition of the presence of errors in measurements; a conception of that error as a random variable, and a conception of correlation and how to index it. According to Allen and Yen as cited in Bichi (2016), in 1904, Charles Spearman figured out how to correct a correlation coefficient for attenuation due to error measurement and how to obtain the reliability index needed in making the correction. His finding is considered to be the beginning of Classical Test Theory.

According to Allen and Yen (2002), most of the standard procedures for creating and evaluating test are based on a set of assumptions, commonly called classical (or weak) true-score theory. A test theory or test model is a symbolic representation of the factors influencing observed test scores and is described by its assumption. Classical test theory is a simple, quiet useful model that describes how errors of measurement can influence observed scores (Marcoulides as cited in Bichi, 2016). Classical test theory is a body of related psychometric theory that predicts outcomes of psychological testing such as the difficulty of items or the ability of test-takers. The aim of classical

test theory is to help us understand and improve the reliability of psychological tests (Allen & Yen, 2002).

According to Bichi (2016), classical test theory has been used for decades to determine reliability and other characteristics of measurement instruments. Hambleton and Jones as cited in Bichi (2016) noted that, classical test theory is a theory about test scores that introduces three concepts: test score (often called the observed score); true score, and error score. Thus, classical test theory assumes that each person has a true score, *T*, that would be obtained if there were no errors in measurement. A person's true score is defined as the expected number-correct score over an infinite number of independent administrations of the same test on the same examinee. Unfortunately, test users never observe a person's true score, only an observed score, *X*. Classical true score theory states that an examinee's observed score (*X*) is equal to the sum of our true score, or true underlying ability (*T*), plus the measurement error (*E*) associated with estimating the observed scores, or $X = T + E$. Error of measurement is an unsystematic, or random, deviation of an examinee's observed score from a theoretically expected observed score. Systematic errors are not called errors of measurement in classical true-score theory.

Classical test theory is concerned with the relationship among these three variables *X*, *T*, and *E* in the population. These relationships are used to describe the quality of test scores. In this regard, the most important concept here is that of the reliability of the test. The reliability of the observed test scores X, is defined as the ratio of true score variance to the observed score

variance. The relationship among these three components are underlined by several assumptions as explained below (Allen & Yen, 2002).

Assumptions of Classical True Score Theory

Assumption 1, X = T + E, states that this observed score is the sum of two parts: T, the true score, and E, the error score, or an error of measurement. In classical true score theory, the true scores and the error scores are assumed to add (rather than to have some other relationship, such as a multiplicative one).

Assumption 2, Ɛ(X) =T, states that the expected value (population mean) of X is T. This assumption is the definition of T: T is the mean of the theoretical distribution of X scores that would be found in repeated independent testings of the same person with the same test.

Assumption 3, ρET=0, states that the error scores and the true scores obtained by a population of examinees on one test are uncorrelated. This assumption implies that examinees with high true score do not have systematically more positive or negative errors of measurement than examinees with low true scores.

Assumption 4, $\rho E_1E_2 = 0$. Here E_1 is the error score for Test 1 and E_2 is the error score for Test 2. This assumption states that the error scores on two different tests are uncorrelated. This means that, if a person has a positive error score on Test 1, he/she is not more likely to have a positive or a negative error score on Test 2. This assumption is not reasonable if the test scores are greatly affected by factors such as fatigue, practice effect, the examinees mood, or effects of the environment.

Assumption 5, $\rho E_1T_2 = 0$, states that the error scores on one tests (E_1) are uncorrelated with the true scores on another test (T_2). This assumption would be violated if Test 2 measures a personality trait or ability dimension that influences errors on Test 1. It would also be violated under the same conditions that lead to violation of Assumption 3.

Assumption 6 presents the definition of parallel tests. If X is an observed score for one test, T is the true score, and σ^2E is the error variance for that test. This error variance is the variance of error scores for the test among the examinees in a particular population. And if XI, T^I , and σ^2E^I are the observed score, the true score, and the error variance, respectively, for a second test. Assumption 6 therefore states that the two tests are parallel if $T=T^I$ and $\sigma^2E = \sigma^2E^I$, for every population of examinees taking both tests.

Assumption 7 states the definition of essentially τ–equivalent tests. The Greek letter τ *(tau)* represent the true score, T. Tests that are essentially τ-equivalent have true scores that are the same except for an additive constant, c_{12}. Unlike parallel tests, essentially $\boldsymbol{\tau}$-equivalent tests can have unequal error variances; true scores may be measured more accurately by one of the $\boldsymbol{\tau}$-equivalent test than by the other.

In summary, classical true-score theory involves an additive model. An observed test scores X is the sum of two components: a stable true score T and a random error score, E. The true scores and error scores are unobservable theoretical constructs. Only X can be observed. The true score is the average taken over repeated independent testings with the same test. This score will not completely reflect the "true" characteristic of interest unless the test has perfect validity.

Classical true score theory is a useful model that describes how errors of measurement can influence observed score. The aim of classical test theory is to help us understand and improve the reliability of psychological tests (Allen & Yen, 2002). Relating this to formative assessment where the main objective is good instruction in the classroom, a reliable test results will help the teacher to make good instructional decisions and then help the students to adopt learning strategies that will improve their leaning in the classroom.

According to Schumacker as cited in Bichi (2016), the benefits that a classroom teacher can obtain through the application of proper instructional objectives and item writing using classical test analysis include: first, using classical test theory analyses can be performed with smaller representative samples of examinees, this is particularly important when field-testing a measuring instrument; secondly, it employs relative simple and straightforward mathematical procedures and model parameter estimations are conceptually easy, and thirdly, its assumptions are easily met by traditional testing procedures and as a result of this, classical test analysis is often referred to as "weak models".

Theory of Reliability

Reliability is the degree to which students' assessment results are the same when: (a) they complete the same task (s) on two different occasions; (b) they complete different but equivalent or alternative tasks on the same or different occasions and; (c) two or more assessors score (mark) their performance on the same task(s). This definition means reliability as applied to test refers to the consistency of the scores obtained by the same individuals when examined with the same test on different occasions or with the alternate

form of the test. This implies reliability refers to the exactness with which a trait is measured over time (Amedahe & Asamoah-Gyimah, 2016).

Nature of Reliability

Reliability refers to assessment results or scores, not to the assessment instrument itself; it is a group characteristic not an individual one; it is a matter of degree; it is an aspect of validity; and finally, if test scores fluctuate widely the scores are unreliable. The methods of estimating reliability include test-retest reliability which estimates the stability of test scores from one occasion to another, alternate/equivalent form reliability which measures the degree to which generalisations about student performance from one assessment to another are justified, split-half reliability measures the internal consistency of a test, kuder-Richardson reliability is also used to estimate the internal consistency of the test and inter-rater reliability is concerned with how consistent independent scorers or raters have been.

Factors that Affect Reliability of Assessment Results

These factors include characteristics of the test, test difficulty, test length, time allocated to the test, subjectivity in scoring, testing conditions and group variability. Other factors include motivation, attitude of testees, guessing, familiarity of the particular test form, the health of the examinee/testee at the time of taking the test, fluctuations of memory and the amount of practice or experience of the testee of the specific skill being measured affect the consistency of students' performance over time and occasion.

This is the second major characteristic of a test (Amedahe & Asamoah-Gyimah, 2016). In the classroom when test scores are consistent the classroom

teacher will be able to make informed instructional decisions such as proceeding with a lesson as planned, increasing or decreasing the pace of instruction, re-teaching, regrouping students, among others, based on whether the students have met the learning objective(s) or not. Also, by becoming aware of the factors that can affect the reliability of test scores, the teacher can put in place the necessary measures during assessment process in order to obtain reliable results.

Theory of Validity

Validity is the degree to which evidence and theories support the interpretations of test scores entailed by proposed uses of tests (American Educational Research Association, American Psychological Association and National Council on Measurement in Education as cited in Amadehe & Asamoah-Gyimah, 2016). It has to do with the soundness or appropriateness of your interpretations and uses of students' assessment results. Validity emphasizes the assessment results which we interpret and not the instrument or procedure itself. The process of validation, therefore, involves accumulating evidence to provide a sound scientific basis for the proposed score interpretations and uses (Amadehe & Asamoah-Gyimah, 2016). It has to do with the meaning of the scores and the way one uses the scores to make decisions rather than with the test used to produce the scores.

Nature of Validity

In using the term validity in relation to testing and assessment, Etsey (2008) and Amadehe and Asamoah-Gyimah, (2016) opined that five points would have to be borne in mind: Validity refers to the appropriateness of the interpretations of the results of an assessment procedure for a group of

individuals. It does not refer to the procedure of instrument itself; it is a matter of degree. Results have different degrees of validity for different purposes and for different situations. Assessment results may have high, moderate or low validity; it is always specific to some particular use or interpretation. No assessment is valid for all purposes; is a unitary concept that is based on various kinds of evidence; and finally, it involves an overall evaluative judgment. Several types of validity evidence should be studied and combined.

Principles of Validity

Nitko (as cited in Amadehe and Asamoah-Gyimah, 2016) pointed out four principles that help a test user/giver to decide the degree to which his/her assessment results are valid. These principles include: The interpretations (meanings) you give to your students' assessment results are valid only to the degree that you can produce evidence to support their appropriateness and correctness; the uses made of assessment results are valid only to the degree that evidence can be produced to support their appropriateness and correctness; the interpretations and uses of assessment results are valid only when the educational and social values implied by them are appropriate; and finally, the interpretations and uses made of assessment results are valid only when the consequences of these interpretations and uses are consistent with appropriate values.

Categories of Validity Evidence

Measurement experts recommend that validity is a unitary concept with the others providing the necessary evidence (Messick; American Educational Research Association, et al; Nitko as cited in Amadehe &

Asamoah-Gyimah, 2016). In general, you can use three major kinds of validity evidence to establish the validity of your assessment results (Etsey, 2008; Amadehe & Asamoah-Gyimah, 2016). These are:

Content-related evidence refers to the content representativeness and relevance of tasks or items on an instrument. Judgments of content representativeness focus on whether the assessment tasks are a representative sample from a larger domain of performance. One way to ascertain content-related validity of a test is to use the table of specification, when developing test items, which is a two-way chart showing the content coverage and the instructional objectives to be measured, by an expert (Etsey, 2008; Nitko as cited in Amadehe & Asamoah-Gyimah, 2016).

Criterion-related evidence pertains to the empirical technique of studying the relationship between the test scores or some other measures (predictors) and some independent external measures (criteria) such as intelligence test scores and university grade point average. Criterion-related evidence answers the question, how well the results of an assessment can be used to infer or predict an individual's standing on one or more outcomes other than the assessment procedure itself. The outcome is called the criterion (Etsey, 2008; Nitko as cited in Amadehe & Asamoah-Gyimah, 2016).

Construct-related evidence, which refers to how well the assessment results can be interpreted as reflecting an individuals' status regarding an educational or psychological trait, attribute or mental process. Examples of constructs are mathematical reasoning, reading comprehension, creativity, honesty and sociability (Etsey, 2008; Nitko as cited in Amadehe & Asamoah-Gyimah, 2016).

Factors Affecting Validity

There may be certain factors in the items that can prevent the items from functioning as intended by the assessor. These factors tend to lower the validity of the uses and interpretation of the results. These factors are discussed by Etsey (2008) and Amadehe and Asamoah-Gyimah (2016) as follows: unclear directions, too difficult reading vocabulary and sentence structure, ambiguous statements in assessment tasks and items, inadequate time limit, and inappropriate level of difficulty of the test items. The rest are poorly constructed test items, test items being inappropriate for the outcomes being measured, test that is too short, improper arrangement of items, identifiable pattern of answers, cheating, unreliable scoring, and students' emotional disturbances which may interfere with their performance thus reducing validity.

Teachers make a number of decisions including instructional decisions using tests or assessment scores. Formative assessment seeks and interprets evidence for learners and their teachers to decide where the learners are in their learning, where they need to go, and how best to get there. So before the teacher comes to a conclusion about the validity of a proposed interpretation or use of the test scores such as making instructional decisions, the teacher needs to collect evidence to support its appropriateness. For instance, before a teacher classifies some category of students based on assessment results as weak in class and need remediation, then the teacher concern should be able to produce evidence to support that decision.

Chapter Summary

The chapter reviewed literature from both primary and secondary sources in accordance with the conceptual basis, empirical basis and theoretical basis on formative assessment practices of senior high school teachers in Ghana. This review chapter covers the concept and relevance of formative assessment in the classroom; characteristics of formative assessment; level of senior high schools teachers' knowledge in formative assessment practices; formative assessment practices of senior high school teachers; formative assessment techniques used by senior high school teachers; challenges senior high schools teachers' face in implementing formative assessment practices in their classrooms; differences in formative assessment practices by gender; differences in teachers' formative assessment practices in relation to their years of teaching experience; and contribution of senior high school teachers' formative assessment knowledge, years of teaching experience and gender to their formative assessment practices.

The concept of formative assessment practice was supported by classical test theory where it helps teachers to understand and improve upon the reliability of their tests in order to enhance rational instructional decision-making. Then the theory of reliability where the teacher needs to obtain consistent test scores about the students so as to be able to make informed instructional decisions, and finally the theory of validity where the teacher needs to support the proposed uses of test results with scientific evidence. The next chapter deals with the methods used for the study.

CHAPTER THREE

RESEARCH METHODS

The study investigated the formative assessment practices of senior high school teachers in the Upper West Region of Ghana. This chapter describes the methodology used in the study. The chapter explains the research design, population, sample and sampling procedures, data collection instruments, pilot testing, data collection procedures, validity and reliability of instruments as well as data analysis procedures.

Research Design

The study employed the mixed methods design where both quantitative and qualitative approaches were used in data collection and analysis. In this study, concurrent mixed methods approach was used where both quantitative and qualitative data were simultaneously collected on SHS teachers' formative assessment practices for the study. According to Johnson, Onwuegbuzie and Turner (2007), a mixeds method research is the type of research in which a researcher or team of researchers combine elements of qualitative and quantitative research approaches (for example, use of qualitative and quantitative view points, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and collaboration.

In this study, both quantitative and qualitative data were collected using a questionnaire and semi-structured interview guide respectively to obtain information on SHS teachers' formative assessment knowledge, their formative assessment practices, the formative assessment techniques the

teachers use in their classrooms, and the challenges they face in implementing it in their classrooms so as to produce a more comprehensive understanding of SHS teachers formative assessment practices in the Ghanaian classroom. Again, these quantitative and qualitative data were collaborated with lesson observation data gathered on SHS teachers' formative assessment practices, the formative assessment techniques they use in their classrooms, and challenges that they face in implementing formative assessment in their classrooms.

Similarly, according to Gray (2009), a mixed methods research is where the researcher collects and analyses both quantitative and qualitative data and integrates the two forms of data concurrently or sequentially and gives priority to one or both forms of data in a single study or in multiple phases of research. This study employed the concurrent mixed methods approach where quantitative data were combined with the qualitative data at the data interpretation stage where priority was given to both forms of data. In this study, the researcher collected both quantitative and qualitative data on SHS teachers formative assessment practices simultaneously during the study and then integrated the evidence gathered from both data sources in the interpretation and discussion of the overall results (Lopez-Fernandez & Molina Azorin, 2011).

Justification for using the Mixed Methods Design

Mixed method research draws on the strengths and minimises the weaknesses of both quantitative and qualitative types of research and their combination provides an expanded understanding of the research problem such as SHS teachers formative assessment practices (Connelly, 2009). This

study, therefore, drew on the strengths and minimised the weaknesses of each of the three types of data collection techniques (questionnaire, semi-structured interview guide and lesson observation guide) and their combination provided a comprehensive understanding of SHS teachers' formative assessment practices in the Upper West Region of Ghana.

Thus, the combination aimed to provide strengths that offset the weaknesses of each of the three types of data collection techniques (questionnaire, semi-structured interview guide and lesson observation guide) used in this study (Creswell & Plano Clark, 2011). Their combination eliminated different kinds of bias, explained the true nature of SHS teachers' formative assessment practices in Ghana and improves various forms of validity or quality criteria in the study (De Vos et al., 2011). The mixed methods employed in this study produced a more comprehensive understanding of the SHS teachers' formative assessment practices in Ghana in order to inform decision making (Creswell, 2009).

Also, previous studies on the issue of teachers' formative assessment practices were conducted using either a quantitative survey design or a qualitative design (for example, Ababio & Dumba, 2013; Kankam, et al., 2014). While large scale quantitative study allows generalisation of the findings, the method is not designed for in-depth understanding of a phenomenon such as SHS teachers' formative assessment practices in the classroom (Johnson & Christensen, 2008). In contrast, although qualitative methods provide information relevant to an in-depth understanding of the phenomenon, such as SHS teachers' formative assessment practices, they cannot be generalised to other people or settings (Johnson & Christensen,

2008; Degbey, 2009; Noor, Muniandy, Krishnan, & Mathai, 2010; Remesal, 2011). Therefore, using both qualitative and quantitative data in this study produced a more comprehensive understanding of SHS teachers' formative assessment practices required to inform decision making (Creswell, 2012).

It must, however, be noted that the mixed methods approach is time consuming (Creswell & Plano Clark, 2007; Johnson & Christensen, 2008). In addition, the interpretative nature of the qualitative phase carries a risk of investigator's bias when analysing the findings. Notwithstanding these shortfalls, the mixed methods approach is most appropriate as the data will be triangulated from the different data sources (questionnaire, interview and lesson observation).

Study Area

The Upper West Region is one of the sixteen regions of Ghana located in the north-western corner of Ghana. The Upper West Region shares borders to the north with Burkina Faso, to the east with the Upper East Region, to the south with the Northern Region and with Côte d'Ivoire to the west. The region covers a geographical area of 18,476 square kilometres, which is about 12.7% of the total land area of Ghana (Ghana Statistical Service, 2013). It is located between latitude 9.8°- 11.0° North and longitude 1.6°- 3. 0° West.

Since its creation in 1983, the Upper West Region has had Wa as its capital and seat of government. The Upper West Region of Ghana contains 11 districts consisting of 1 municipal and 10 ordinary districts as follows: Daffiama-Bussie-Issa, Lambussie-Karni, Jirapa, Lawra, Nadowli-Kaleo, Sissala_East, Sissala-West, Wa-East, Wa-West, Wa Municipal and Nandom (Ghana Statistical Service, 2013).

In education, Upper West Region has 708 primary schools (642 public and 66 private), 472 Junior High Schools (450 public and 22 private), 35 Senior High Schools (28 public and 7 private), 16 technical and vocational training institutes (MOE, 2016/2017 School Year Data) and some tertiary institutions such as the Wa campus of University for Development Studies and Wa Polytechnic. The geographical map of the Upper West Region showing all the districts is shown in figure 2.

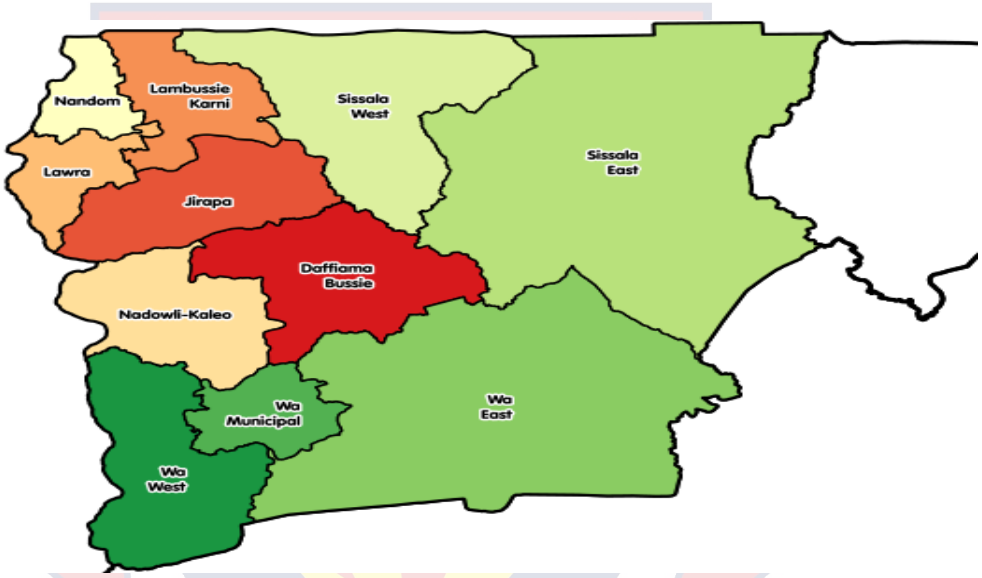

Figure 2: The geographical map of the study area

Sources: Ghana Statistical Service (2013)

Population

The population was made up of one thousand one hundred and thirty-nine (1139) teachers from thirty-five (35) senior high schools (public and private) in the Upper West Region of Ghana. Out of the 1139 teachers, nine hundred and sixty-five (965) were males and one hundred and seventy-four (174) were females. From the population, 1052 were professionally trained teachers and eighty-seven (87) non-professional teachers (Ghana Education

Service, 2017). The distribution of the population for the study is shown in Appendix N.

Sample and Sampling Procedures

In selecting the sample for this study, the simple random sampling technique, specifically the table of random numbers method was used in the selection of respondents for the quantitative section of the study. This method gives all elements of the target population an equal and independent chance of being selected for the study (Amedahe & Asamoah-Gyimah, 2014). In using this method, the researcher constructed a sampling frame. Thus, a list of all the SHS teachers in the Upper West Region. Appropriate table of random numbers which contained all the numbers included in the sampling frame was obtained. The researcher then entered the table randomly. Here, the researcher started at a point on the table of random numbers. The researcher picked the numbers from the table randomly and registered, the names in the sampling frame which corresponded to the numbers being picked. The researcher proceeded vertically using the appropriate number of digits. This process continued until the 315 respondents were obtained.

The technique was used because it has a high rate of reliability, high degree of representativeness and the findings can be generalised (Amedahe & Asamoah-Gyimah, 2014). Also, it was appropriate because the population of study was similar in characteristics of interest (Amedahe & Asamoah-Gyimah, 2014).

For the quantitative section, three hundred and fifteen (315) teachers were selected to participate in the study. The sample was selected based on the Krejcie and Morgan (1970) table of sample size determination that indicates

that the appropriate sample size for a population of 1100 is 285. However, to cater for any eventuality such as high attrition rate, the researcher added thirty teachers and thus making the sample three hundred and fifteen (315). This oversampling reduces the impact of high attrition rate on the statistical analysis and hence increases the power of the test and deals with the issue of multicollinearity in the multiple linear regression analysis (Etsey, 2016; Huch, 2012; Heiman, 2011). The sample distribution of the respondents for the study is shown in Appendix O.

For the qualitative section, purposive sampling method was used to select six teachers to participate in the interview. This sample comprises male and female teachers with 1-5 years of teaching experience, male and female teachers with 6-10 years of teaching experience and male and female teachers who have above 10 years of teaching experience at the senior high school level. According to Merriam (as cited in Oduro, 2015), in qualitative research, sampling should be purposeful and the sample size should be small. Purposive sampling allows the researcher to choose a required sample that will provide the best possible information. This sample size was reached based on available literature. For Onwuegbuzie and Leech (2007) suggests that qualitative researchers use at least six participants in investigations where the goal is to understand the essence of experience such as SHS teachers' formative assessment practices. In the view of Fusch and Ness (2015), in qualitative research, data saturation may be attained by as little as six interviews and as many as twelve.

In addition, six teachers were purposively selected for the lesson observation session of the study. Again, here the sample comprised a male and

a female teacher each with 1-5; 6-10 and above 10 years of teaching experience at the senior high school level. These teachers were professionally trained who I perceived could have some experience in formative assessment practice.

Data Collection Instruments

The instruments that were used to collect data for the study were: survey questionnaire on the formative assessment practice; semi- structured interview guide on formative assessment, and Lesson observation guide.

Survey Questionnaire on Formative Assessment Practice

In this study, the researcher employed a survey questionnaire (See Appendix A) developed by the researcher in order to investigate teachers' formative assessment practices. The items in the questionnaire were written based on the literature reviewed on the variables of the study. It was validated by my supervisors who are experts in measurement and evaluation taking into consideration the objectives of the study and the research questions as well as the variables of interest of the study. In addition, it was pilot tested where its overall internal consistency was computed to be 0.95. This questionnaire composed of five sections; A to E. Section A covered information on the background characteristics of respondents, Section B composed of items that sought to assess teachers' knowledge on formative assessment practices, Section C consisted of items that were used to collect data on teachers' formative assessment practices and Section D consisted of items that were used to collect data on formative assessment techniques, and Section E consisted of items that were used to collect data on the challenges teachers

face in formative assessment implementation process. The total number of items in the questionnaire was 148.

The use of the questionnaire gave the researcher an opportunity to reach a large representative sample of respondents who lived at widely dispersed geographical locations and also it was associated with low cost of data collection (Cohen, Manion, & Morrison, 2007). It enabled the researcher to conduct statistical analysis in order to answer the research questions and hypotheses. However, with this approach, the researcher had no control over how respondents interpreted questions on the questionnaire. It might produce untrustworthy results because some respondents might not be completely truthful in their responses. Also, the data might be influenced by the respondents' characteristics (Robson, 2011; Denscombe, 2010) such as experience, knowledge and literacy. Another challenge that faced the researcher for using this approach was some respondents' failure to return the completed questionnaire as low return rate may affect the validity and trustworthiness of the conclusions to be drawn (Gay, Mills, & Airasian, 2009)

Semi-Structured Interview guide on Formative Assessment

A semi-structured interview guide (See Appendix B) developed by the researcher based on the research questions was used to examine more closely SHS teachers' formative assessment practices in the classroom. With this semi-structured interview guide, the researcher had the opportunity to clarify questions that were not understood and probe further in case of an incomplete answer. Thus, it allowed the researcher to maintain discretion to direct the discussion and to make sure important topics were addressed (Cohen, et al., 2007; Creswell, 2007; Amedahe & Asamoah-Gyimah, 2014). It also yielded

in-depth information on teachers' formative assessment practices and offered the respondents the opportunity to say what they think with greater richness and spontaneity (Cohen, et al., 2007).

However, according to Gay, et al. (2009), challenges facing researchers who employ this approach are respondents' unwillingness to be interviewed and their inability to attend interview sessions as scheduled. Specifically, the interview guide comprised fourteen items covering the following concepts: teachers' knowledge in formative assessment; formative assessment practices in the classroom; formative assessment techniques teachers use in the classroom, and challenges of the practice of formative assessment.

Lesson Observation Guide

A Lesson observation guide (See Appendix C) developed by the researcher was also used to collect data of teachers' formative assessment practices in their natural classrooms settings. The observation process allowed the researcher to observe classroom interactions and events as they actually occurred (Burns as cited in Zohrabi, 2013). In affirming this, Amedahe and Asamoah-Gyimah (2014) noted that observation offers first-hand information without the researcher having to rely on the reports from other sources such as questionnaire and interview. It also helped to obtain data which the respondents were not willing to offer through interview (Amedahe & Asamoah-Gyimah, 2014).

According to Ary, Jacobs and Razavieh as cited in Oduro (2015), the best way to enhance validity of observation data is to carefully define the behaviour to be observed. Specifically, the observation guide had eight items

covering the following key areas: formative assessment practices in the classroom; formative assessment techniques teachers use in the classroom, and challenges of the practice of formative assessment.

Pilot Testing

Before conducting the actual data collection from the field, the data collection instruments were pilot tested on fifty teachers randomly selected for the quantitative session, three teachers purposively selected for the interview session and one lesson was observed from four senior high schools in the Northern Region of Ghana. This sample was independent and similar in characteristics (for example, they are literates and for that matter can read and write, and have similar teaching experience at the SHS level) to the study sample and therefore suitable for the pilot testing.

The pilot testing checked the clarity of the instruments especially the questionnaire (items, instructions and layout), helped eliminated ambiguities, helped established the time taken to complete the questionnaire, enabled the researcher to try out the coding system for data analysis and to identify omissions, redundant and irrelevant items in the instruments (Cohen, et al., 2007), and established the reliability of the final questionnaire. To achieve this, plain sheets of paper were added to the questionnaire for respondents to pass comments on the clarity, weaknesses, inadequacies, ambiguities and problems in all aspects of items on the questionnaire and interview guide. As a result of such comments, statements felt to be ambiguous, misleading or redundant were either removed or revisited for clarity before the actual data collection took place. For example, an item which read as 'I ask questions of individual students at random' was corrected to 'I call upon individual

students at random to answer questions'. Also, an item which read as 'Difficulty in preparing lesson plans based on formative assessment data' was moved from Section C (Formative assessment practices) to Section E (Challenges in formative assessment implementation process). From the pilot testing, a respondent could spend between 13 and 18 minutes to complete the questionnaire; with the interview it was between 14 and 44 minutes while the lesson was 2 hours per session.

Validity of the Data Collection Instruments

Validity refers to the soundness or appropriateness of the interpretations, inferences and uses of test scores (Amedahe & Asamoah-Gyimah, 2016). The validity of the instruments was assessed by my supervisors who are experts in measurement and evaluation taking into consideration the objectives of the study and the research questions as well as the variables of interest of the study. For according to Gay, et al. (2009), content validity of data collection instruments can be determined by expert judgment. The instruments (questionnaire, interview guide and the lesson observation guide) were also piloted tested on sample with similar characteristics as the study sample so as to assess the variables the instrument was intended to measure.

In addition, the researcher identified three sources of bias that could affect validity of the results of the lesson observation. These are observer bias, reactivity and observer effects (Zohrabi, 2013). Observer bias occurs when the observer's own perceptions and beliefs influence the observations and their interpretations; while observer effects occur when the people being observed behave differently just because they are subjected to scrutiny (Ary, Jacobs, &

Razavieh as cited in Oduro, 2015). To avoid these, the researcher reflected on his actions constantly throughout the data collection process and remained non-judgmental. Also, to reduce reactivity and observer effect, the researcher observed each participant twice (two hours per observation session).

Reliability

Reliability refers to the consistency or stability of the test scores (Gay, et al., 2009). Cronbach's Alpha reliability estimate was used to establish how reliable the questionnaire was because Kimberlin and Winterstein (2008) reported that it is used for Likert scale items. Since the questionnaire was predominantly Likert scale, the Cronbach's alpha was deemed the best method to estimate the reliability of the instrument. The Cronbach's alpha has a correlation coefficient ranging in value from 0 to 1. The closer a reliability coefficient value is to 1, the more reliable the test, while the closer the reliability coefficient value is to 0, the less reliable the test (Gay, et al., 2009). With this, Castillio (2009) provides the following rules of thumb for determining the appropriate reliability level for questionnaire: that a cronbach alpha of α>0.9 = Excellent, α>0.8 = Good, α>0.7 = Acceptable, α>0.6 = Questionable, α>0.5 = Poor and α<0.5 = Unacceptable. Muijs (2011) and Singh (2007) suggested that an alpha of 0.70 or more is an accepted reliability level. The questionnaire had an overall reliability of .95 with sub-scales of (.67 for SHS teachers' formative assessment knowledge, .95 for SHS teachers' formative assessment practices, .86 for techniques used by SHS teachers and .86 for challenges SHS face in implementing formative assessment).

Reliability in qualitative research is checked through conducting the same interview and observations at different times at different places (Cohen,

et al., 2007) and obtaining detailed written description from the interview (Creswell, 2007). Thus, in this study, semi-structured interview was conducted to get reliable data where the researcher obtained detailed written description from the interview. Again, lessons were observed to obtain first-hand information on the issue under study. Furthermore, in line with Gibbs (2007) concerning the reliability of qualitative research, all the transcripts were crosschecked to ensure there were no apparent mistakes. Also, the researcher ensured that the codes were well defined and used consistently throughout the study. For details, see Appendix I for the coding scheme.

Data Collection Procedure

A letter of introduction (See Appendix D) was obtained from the Head of Department of Education and Psychology. This enabled the researcher to get the needed assistance and cooperation from the heads of the schools and respondents in particular. A copy of the introductory letter was given to each head of the schools. At each school, the purpose or rationale of the study was explained to the participants, assured them of anonymity and confidentiality, and encouraged them to respond freely and as honestly as possible.

The questionnaire on the practice of formative assessment was personally administered to the respondents in the schools. The questionnaire was distributed to the participants and instructions pertaining to the items were carefully explained to them. There was time for them to ask questions after which they were asked to respond to the instruments within two weeks. The final sample size for the study was 309 out of 315 senior high school teachers. This means that, the response rate for the study stood at 98.1%.

For the qualitative section, all interviews were carried out face-to-face and at dates, times and venues convenient to the participants and each interview was conducted on a different day. Thus, even though the interviewees were given the option to choose where the interview should be conducted, all of them opted to be interviewed in their individual schools. To ensure accurate recordings of the interview sessions, the researcher sought permission from the interviewees to tape record the sessions. After each interview session, the tape was played back to each interviewee to enable him or her to correct comments, add additional information or validate what they said during the interview. Again, once an interview was transcribed, the transcript was returned to each participant for member checking which allowed them an opportunity to read through their transcriptions before officially including them in the research report. See a copy/sample of a transcribed interview in Appendix M.

Also, the lesson observations were done in the natural classrooms settings of the participating teachers. During this lesson observation process, the researcher wrote down his observations in key words based on the research questions as the teachers presented their lessons. In recording observations, Amedahe and Asamoah-Gyimah (2014) pointed out that a researcher can write down the information verbatim, in summary or in key words. The researcher observed each participant twice (two hours per observation session). The researcher adopted natural, open and nonparticipant observation because as Fraenkel and Wallen as cited in Zohrabi (2013) noted, researchers should not participate in the activity being observed but rather sit on the sidelines and watch. Similarly, Merriam as cited in Zohrabi (2013) noted that a researcher

loses sight of the teacher and students; and their activities when they are involved in the observation process.

Ethical Considerations

All forms of legal requirements and regulations were complied with. For instance, approval was obtained from the Institutional Review Board of the University of Cape Coast to conduct the research (See Appendix E). Also, the researcher sought to smooth the process by adopting major ethical considerations identified by Cohen, et al. (2007) which include informed consent (See Appendix K), confidentiality, and consequences of the interview. No participant was pressured or forced to participate in the study. Again, to ensure confidentiality, anonymity of the respondents were highly considered (Denscombe, 2010; Cohen, et al., 2007), which helped to establish trust between the researcher and the participants.

So, the questionnaire, interview guide and lesson observation guide excluded any identification details such as name and address of the respondent. Other forms of identifiers were replaced with pseudonyms immediately after the interview and lesson observation data were recorded (Creswell, 2009).

Data Processing and Analysis

The quantitative and qualitative data were analysed separately given the different nature of the data. However, after analysis the data were integrated and triangulated to answer the research questions in this study.

For the quantitative section, data collected from the respondents were coded, edited and cleaned after which descriptive (mean score and standard deviation) and inferential statistics in respect of the research questions and

hypotheses were applied in analysing the data. Specifically, frequencies and percentages were used to analyse the background characteristics of the respondents.

For research questions one and two, means and standard deviations were used to analyse the data gathered. For research question three, frequencies, percentages, means and standard deviations were used to analyse the data that were gathered for that research question and for research question four, frequencies and percentages were used to analyse the data that were gathered for that research question. Independent t-test was used to analyse the data that were gathered for hypothesis one. One way analysis of variance (ANOVA) was used to analyse the data gathered for hypothesis two. Multiple linear regression was used to analyse the data gathered for hypothesis three.

For the qualitative section of the study, specifically, the interview data were analysed based on thematic analysis by Braun and Clarke (2006). Thematic analysis, according to Braun and Clarke (2006) is a method for identifying, analysing, and reporting patterns (themes) within the data. It minimally organises and describes your data set in detail. Thematic analysis by Braun and Clarke (2006) has six phases which have been stated and described in Table 2.

Table 2-*Thematic Analysis*

1. Familiarizing yourself with the data:	Transcribing the data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code:
3. Searching for themes:	Collating codes into potential themes, gathering all the data relevant to each potential theme.
4. Reviewing themes:	Checking if the themes work in relation to the coded extracts (level 1) and the entire data set (level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	On-going analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names of each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid compelling abstracts examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

In doing this work, the procedure in table 2 by Braun and Clarke (2006) was not strictly followed. This was because the researcher used a semi-structured interview guide which had predefined main and some subthemes. However, the researcher was able to identify ten of the

subthemes that were not predefined. The section here describes how it was done.

(1) Familiarisation with the data

The audio recordings of the interviews were listened to several times for familiarisation purposes (Gay et al., 2009). Each respondent was given an alpha-numeric code (for example, Respondent 1) for easy referencing. Female teachers with 1-5, 6-10 and above 10 years of teaching experience at the senior high school level were coded Respondent 1, Respondent 2, and Respondent 3 respectively while male teachers with 1-5, 6-10 and above 10 years of teaching experience at the senior high school level were coded Respondent 4, Respondent 5, and Respondent 6 respectively. The recording of each interview was typed verbatim. The aim was to preserve originality and ensure that no information was misinterpreted or lost.

(2) Generating initial codes

Coding is part of analysing qualitative data and helps the researcher to think critically about the meaning of the data (Bryman, 2012). Coding, according to Taylor and Gibbs (2010), is the process of examining the data for themes, ideas and categories and marking similar passages of text with a code label so that it can easily be retrieved at a later stage for further comparison and analysis. Similarly, in describing the coding process, Creswell (2007) opined that it is the central steps in coding data (reducing the data into meaningful segments and assigning names for the segments), combining the codes into broader categories or themes, and displaying and making comparisons in the data graphs, table, or charts. These are the core elements of qualitative data analysis. Then the data were coded to enable easy retrieval at a

later stage for further comparison and analysis (See Appendix I for the coding scheme). According to Robson (2011), the segment of the raw data to which the codes will be applied should be meaningful and should have something of interest and be related to the study. This process was guided by the four research questions measuring teachers' formative assessment practices in the classroom.

To address coding of multiple issues in a single response, I split the response into segments and coded them under the appropriate sub-theme (s). For example, a response given by respondent 1 was coded as follows:

> *I don't actually have adequate knowledge or understanding of how this formative assessment practice should be carried out in the classroom* **{inadequate knowledge}**…. *Again, large class size also makes it difficult to practice* **{large enrolment}** *... there is no time to practice it* **{time constraint},** *it is time consuming* **{time consuming}** *and therefore interfere with teaching* **{interferes teaching}** *meanwhile, I want time to complete my syllabus to enable my students pass WASSCE, because, if you concentrate on practicing formative assessment and your students fail at the WASSCE, you will be queried by school authorities, so I teach for my students to pass WASSCE* **{impact of summative assessment}**. *Another serious challenge we have in this school is lack of stationery* **{lack of assessment materials}….**

Seven codes could be identified from this response. Where a response was based on a single issue, it was easier giving it a code. For example, respondent's 4 response, *'The time is not always enough for formative*

assessment practices to be followed in the classroom' was coded as *"time constraints"* (See Appendix L for a sample of the coded transcripts and Appendix I for the coding scheme).

(3) Searching for themes

According Braun and Clarke (2006), this process involves sorting the different codes into potential themes, and collating all the relevant coded extracts within the identified theme. Here, according Braun and Clarke (2006), the researcher starts to analyse his/her codes and considers how different codes may be combined to form a major theme. In this study, i analysed the codes and considered how different codes might fall under a major theme. The researcher at this stage thinks about the relationship between codes, themes, subthemes, and re-arranging and organising the coded extracts to be meaningful for the study. In doing this, the procedure outlined by Braun and Clarke (2006) in Table 2 was not followed. This was because I used a semi-structured interview guide which had predefined main themes and some subthemes that were closely linked to the research questions and the quantitative data. However, by the end of this stage I had ten additional subthemes that were not predefined but identified from the data. Thus, all the subthemes that fell under the main theme, challenges SHS teachers face in implementing formative practices in the classroom, were identified from the data (See Table 3 and Appendix I). The process of arriving at the final subthemes involved constant referral to the transcribed interviews and the predefined themes; if they matched existing ones l added them, if not, they were named and included in the analysis.

(4) Reviewing subthemes

The researcher adapted the model proposed by Braun and Clarke (2006) to help review, evaluate and refine some of the subthemes since the main themes were predefined. For example, respondent 3's response which read as *"I don't have adequate knowledge in practicing it"* was refined as *"I don't have adequate knowledge in practicing it (formative assessment).* Again, respondent 3's response which read as *"the working condition of the teacher too, hmmm, the conditions are very bad. For instance, it is not motivating, teaching learning resources are lacking, teaching so many subjects or even many periods; let us stop my brother, its ok* was reviewed, evaluated and refined as *"the working condition of the teacher too is very bad. For instance, it is not motivating, teaching learning resources are lacking, teaching so many subjects or even many periods."* I crosschecked the data and ensured that i had captured the relevant subthemes, their relevant verbatim examples and codes, and that they were concise, coherent, meaningful and that they all had meaningful information to present (See Appendix I for the coding scheme).

(5) Defining and naming subthemes

According to Braun and Clarke (2006), at this stage the researcher defines and further refines the themes one will represent for the analysis, and analyse the data within those themes. I again, adapted this process to the subthemes. I further read the coded data and the illustrative extract of the responses, and organised it into a coherent whole. I ensured that the names given to the subthemes were concise and immediately give the reader a sense of what the theme is about. For example, a subtheme which was named as *'supply of assessment materials'* was renamed as *'inadequate supply of*

assessment materials'. Then again, another subtheme which was named as *'lack of time'* was renamed as *'time constraints'*. By the end of the whole process, i had four main themes and sixteen subthemes. For the details and examples of the coded extracts, See Appendix I for the coding scheme and table 3.

Table 3-*Showing the Major Themes and Subthemes*

Major Themes	**Subthemes**
SHS teachers' knowledge of formative assessment	
SHS teachers' formative assessment practices	Sharing learning intentions and success criteria with students
	Questioning
	Formative feedback
	Self-assessment
	Peer Assessment
	Integrating formative assessment data into instruction
Formative assessment techniques used by SHS teachers	
Challenges SHS teachers face in implementing formative assessment in the classroom	Inadequate Knowledge
	Large class size
	Inadequate supply of assessment materials
	Examination-oriented culture
	Time constraints
	Time consuming
	Interfere with teaching
	More materials to cover in the syllabus
	Difficulty in marking/scoring
	Poor working condition

As shown in Table 3, the analysis conducted revealed four major themes, namely: (i) SHS teachers' knowledge of formative assessment; (ii) SHS teachers' formative assessment practices; (iii) formative assessment techniques used by SHS teachers; and (iv) challenges SHS teachers face in implementing formative assessment in the classroom. These major themes were chosen from the semi-structured interview guide which had predefined themes that were closely related to the research questions and data. In addition, sixteen (16) subthemes were also identified out of which six (6) predefined from the interview guide while ten (10) were identified using the thematic analysis approach. In all four major themes and sixteen subthemes were identified (See Appendix I and Table 3).

(6) Producing the report

According to Braun and Clarke (2006), writing the report is an important part of the analytic process. At this stage the researcher has to make sense of the raw data and present it in a way that it will be understood by others. It is also important that the analysis gives a concise, coherent, logical, non-repetitive and interesting account of the information the data tell within and across themes. Also, the write-up must provide sufficient evidence of the themes within the data (Braun & Clarke, 2006).

The predefined main themes which reflected in the research questions were selected and included in the final report. This offered the opportunity for the selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research questions (Braun & Clarke 2006). The selection of these verbatim extracts included in the final write-up were chosen from the pool of responses based on their detail, clarity,

relevance and vividness (See Appendix I for the coding scheme). Overall, the qualitative data were triangulated with the quantitative data at the discussion stage to answer the research questions.

Chapter Summary

This chapter described the methods that were used in the study. A mixed methods design with concurrent approach was used for the study. The profile of the study area was presented including a discussion on the population, the sample and sampling procedure which included the simple random sampling, specifically the random numbers method, data collection instruments (questionnaire, semi-structured interview guide and observation guide), pilot testing, validity and reliability of the instruments, data collection procedures, ethical considerations as well as data analysis procedures. The next chapter deals with the results and discussion.

CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

The purpose of the study was to investigate the formative assessment practices of senior high school teachers in the Upper West Region of Ghana. Looking at the purpose of the study, the mixed method approach was used in the study. Questionnaire, interview guide and lesson observation guide were used on senior high school teachers to collect data for the study. Descriptive and inferential statistics were used to analyse the gathered data in investigating the formative assessment practices of senior high school teachers in the Upper West Region of Ghana.

In the analysis, mean values above 2.5 ((1+2+3+4)/4 =2.5) apart from items 1, 4, 5 and 12 under SHS teachers' knowledge in formative assessment, show that the majority of the respondents agreed with the statement while a mean value below 2.5 shows that the majority of the respondents disagreed with the statement and the vice versa for items 1, 4, 5 and 12. In determining the dependent variable, 68 items that were related to formative assessment practices were made available to the SHS teachers to respond to them. Their responses were scored from 4 which indicated their highest agreement to the statements and 1 indicating their least agreement to the statement. The highest score one could obtain was 272 whereas the minimum score was 68.

Results

Demographic Characteristics of Senior High School Teachers

This section surveyed teachers' responses on their demographic characteristics including gender, highest academic qualification, status of SHS teachers and years of teaching experience. A summary of the responses on the demographic characteristics is presented in Tables 4 to 7.

Gender of SHS teachers

The gender of SHS teachers is presented in Table 4.

Table 4-*Gender of Teachers*

Teachers	Frequency	Percentage
Male	261	84.5
Female	48	15.5
Total	309	100.0

Source: Field survey (2018)

From Table 4, 84.5% (261) of the respondents were males while 15.5% (48) of the respondents were females. This indicates that, there were more males than females regarding the responses surveyed.

Highest Academic Qualification of SHS Teachers

The results of the analysis of the highest academic qualification of SHS teachers is presented in Table 5.

Table 5-*Highest Academic Qualification of SHS Teachers*

Highest academic qualification	Frequency	Percentage
Bachelor's degree	268	86.7
Master's degree	41	13.3
Total	309	100.0

Source: Field survey (2018)

From Table 5, 86.7% (268) of the respondents indicated that their highest academic qualification was bachelor's degree whereas 13.3% (41) of the respondents indicated that their highest academic qualification was a master's degree. This indicates that, respondents who had bachelor's degree as their highest academic qualification outnumbered those with master's degree.

Professional Status of SHS Teachers

The results of the analysis of the professional status of SHS teachers is presented in Table 6.

Table 6-*Status of SHS Teachers*

Status	Frequency	Percentage
Professional	275	89.0
Non-professional	34	11.0
Total	309	100.0

Source: Field survey (2018)

From Table 6, 89% (275) of the respondents were professional teachers whereas 11% (34) of the respondents were non-professional teachers. The results indicate that the majority of the respondents that were surveyed were professional teachers.

Years of Teaching Experience of SHS Teachers

The results of the analysis of the years of teaching experience of SHS teachers is presented in Table 7.

Table 7-*Years of Teaching Experience of SHS Teachers*

Years	Frequency	Percentage
1-5 years	127	41.1
6-10 years	105	34.0
Above 10 years	77	24.9
Total	309	100.0

Source: Field survey (2018)

From Table 7, 41.1% (127) of the respondents indicated that they have taught for 1 to 5 years while 24.9% (77) indicated that they have taught for above 10 years. The results indicate that the majority of the respondents that were surveyed had taught for `1 to 5 years. Looking at the results, more than half of the respondents that were surveyed had taught for 1 to 10 years.

Research Question One

What is the level of SHS teachers' knowledge in formative assessment practices?

The research question sought to examine SHS teachers' knowledge level in formative assessment practices. In this regard, SHS teachers were asked seventeen (17) questions that were related to their overall knowledge regarding their formative assessment practices. To achieve the objective of this research question, items were crafted and measured on a four-point Likert scale with 1- strongly disagree, 2- disagree, 3- agree and 4- strongly agree where 1 indicates the least agreement to the statement and 4 indicating the strongest agreement to the statements apart from items 1, 4, 5 and 12; which had a reverse coding. Means and standard deviation were used to analyze the responses of respondents. The overall mean was therefore computed and the result was compared to the standard of 2.5 to check whether or not SHS teachers had knowledge regarding their practice of formative assessment. A summary of the analysis of the results is presented in Table 8.

Table 8-*SHS Teachers' Knowledge in Formative Assessment Practices*

Statements	Mean	SD
Formative assessment is a series of test administered to evaluate students' learning	3.35	.78
Formative assessment uses a variety of assessment tools to gather evidence of students' learning	2.74	.79
Formative assessment assesses the effectiveness of teaching and learning than final examinations	2.26	.82
Formative assessment is used to evaluate quality of schools	2.50	.92
Formative assessment is used for grading students' work	2.83	.88
Formative assessment is integrated into instruction	2.10	.79
Formative assessment actively involves students in the assessment process	2.63	.93
Formative assessment identifies and bridges gaps in students' learning	2.53	.89
Formative assessment prepares and makes students confident for their final examinations	2.59	.87
Formative assessment reduces memorisation of concepts	1.80	.83
Formative assessment is carried out on a daily basis	1.89	.86
Formative assessment is used to compare students' performance with one another	2.85	.88
Formative assessment takes place while learning is ongoing	2.25	.82
Formative assessment involves any activity used to elicit evidence of students' learning	2.55	.80
Formative assessment shows direction of students' work in relation to learning goals	2.72	.79
Formative assessment occurs when assessment data are actually used to adjust instruction or inform teaching and learning	1.97	.69
Formative assessment improves every students' achievement	1.97	.69
Overall Mean	2.43	.83

N= 309 Source: Field survey (2018)

As shown in Table 8, the majority of the respondents agreed to statements "Formative assessment is a series of test administered to evaluate students' learning" (Mean = 3.35, SD = .78), "Formative assessment uses a variety of assessment tools to gather evidence of students' learning" (Mean = 2.74, SD = .79), "Formative assessment is used to evaluate quality of schools" (Mean = 2.50, SD = .92), "Formative assessment is used for grading students' work" (Mean = 2.83, SD = .88), "Formative assessment actively involves students in the assessment process" (Mean = 2.63, SD= .93), "Formative assessment identifies and bridges gaps in students' learning" (Mean = 2.53, SD= .89) and "Formative assessment prepares and makes students confident for their final examinations" (Mean = 2.59, SD= .87). A greater percentage of the respondents also agreed to the statements "Formative assessment is used to compare students' performance with one another" (Mean = 2.85, SD= .88), "Formative assessment involves any activity used to elicit evidence of students' learning" " (Mean = 2.55, SD = .80) and "Formative assessment shows direction of students' work in relation to learning goals" (Mean = 2.72, SD= .79).

Although it is evident from Table 8 that the majority of the respondents agreed to quite a number of statements to indicate their knowledge regarding their formative assessment practices, it can be shown from the overall mean (2.43) that the respondents that were surveyed had low knowledge regarding their practice of formative assessment. This is because, the overall mean (2.43) for the items was smaller than the standard mean of 2.5.

Research Question Two

What is the prevalent formative assessment practice of senior high school teachers?

The research question sought to explore the prevalent formative assessment practice of SHS teachers. In this regard, SHS teachers were asked to respond to a total of 68 items that were related to their practice of formative assessment. The areas covered as part of investigating SHS teachers' formative assessment practices were sharing learning intentions and success criteria, questioning, formative feedback, self-assessment, peer-assessment, formative use of summative test, and integrating formative data into instruction.

To achieve the objective of this research question, items were crafted and measured on a four-point Likert scale with 1-never, 2- not often, 3-often and 4-very often with 1 indicating the least agreement to the statement and 4 indicating the strongest agreement to the statements apart from the items for integrating formative data into instructional decisions which were measured on scale ranging from 1-never, 2-sometimes, 3-usually and 4-always. Means and standard deviations were used to analyse the responses of respondents. The overall mean was therefore computed for each of the categories of the domains and ranked in order to determine the prevalent formative assessment practice. A summary of the responses is presented in Appendix J.

The overall means of each of the domains are presented in Appendix J. Appendix J shows that for sharing learning intention and success criteria, the overall mean was 2.24, for questioning, the overall mean stood at 2.53, for formative feedback, the overall mean was 2.60, for self-assessment, the

overall mean was 2.11, for peer-assessment, the overall mean stood at 2.42, for formative use of summative assessment, the overall mean stood at 2.32 and for the purpose for formative assessment (integrating formative assessment data into instructional decisions), the overall mean was 2.38. For a meaningful determination of the prevalent formative assessment practice, the overall means for all the domains were ranked from the highest overall mean to lowest and the summary of the analysis of the results is presented in Table 9.

Table 9-*Rank of SHS Teachers' Formative Assessment Practices*

Domain	Mean	Rank
Formative feedback	2.60	1
Questioning	2.53	2
Peer-assessment	2.42	3
Integrating formative assessment data into instructional decisions	2.38	4
Formative use of summative test	2.32	5
Sharing learning intentions and success criteria	2.24	6
Self-assessment	2.11	7

Source: Field survey (2018)

From Table 9, it is evident that the most prevalent formative assessment practice of the SHS teachers was formative feedback. This was followed by questioning, peer-assessment, integrating formative assessment into instructional decisions, formative use of summative test, sharing learning intentions and success criteria with self-assessment being the least prevalent formative assessment practice.

Research Question Three

What formative assessment techniques do senior high school teachers use in their classrooms?

The research question sought to explore the formative assessment techniques SHS teachers use. In this regard, SHS teachers were asked to respond to a total of thirty-two (32) items that were related to the techniques they use. The techniques covered oral questioning, oral test/examinations, written tests, end of unit tests, weekly test, and monthly test as well as homework/assignments, among others. To achieve the objective of this research question, items were crafted and measured on a four-point Likert scale with 1-never, 2- not often, 3-often and 4-very often with 1 indicating the least agreement to the statement and 4 indicating the strongest agreement to the usage of techniques. Frequencies and percentages; and means and standard deviations were used to analyse the responses of respondents. In the analysis, a combined percentages of very often and often which is more the 50% indicates that the majority of the respondents used those techniques to assess their students learning. Also, mean values above 2.5 ((1+2+3+4)/4 =2.5) shows that the majority of the respondents used those techniques to assess their students learning. A summary of the analysis of the results is presented in Table 10.

Table 10-*Formative Assessment Techniques*

Techniques	F (%)					
	Very Often	Often	Not Often	Never	Mean	SD
Oral questioning	238 (77%)	70(22.7%)	0(0%)	1(3%)	3.76	.448
Mid-term tests	163(52.8%)	138(44.7%)	8(2.6%)	0(0%)	3.50	.550
Written tests (eg. Class tests, dictations etc)	170(55%)	119(38.5%)	18(5.8%)	2(0.6%)	3.48	.637
End of year examinations	221(71.5%)	59(19.1%)	18(5.8%)	11(3.6%)	3.59	.758
End of term examinations	223(72.2%)	54(17.5%)	30(9.7%)	2(0.6%)	3.61	.687
End of unit tests	108(35%)	149(48.2%)	43(13.9%)	9(2.9%)	3.15	.764
Homework/assignments	92(29.8%)	154(49.8%)	55(17.8%)	8(2.6%)	3.07	.759
Recap exercises	87(28.2%)	129(41.7%)	80(25.9%)	13(4.2%)	2.94	.841
Group assignments	47(15.2%)	161(52.1%)	84(27.2%)	17(5.5%)	2.77	.770
Graded quizzes	41(13.3%)	153(49.5%)	98(31.7%)	17(5.5%)	2.71	.765
Monthly tests	51(16.5%)	140(45.3%)	94(30.4%)	24(7.8%)	2.71	.834
Practical works/tests/exercises	76(24.6%)	108(35.0%)	88(28.5%)	37(12.0%)	2.72	.967
Observation of students at work	60(19.4%)	120(38.8%)	82(26.5%)	47(15.2%)	2.62	.964
Weekly tests	62(20.1%)	110(35.6%)	123(39.8%)	14(4.4%)	2.71	.836
Class participation	71(23.0%)	84(27.2%)	83(26.9%)	71(23.0%)	2.50	1.083
Oral tests/examinations	70(22.7%)	84(27.2%)	116(37.5%)	39(12.6%)	2.60	.974

Table 10-*continued*

Formative Assessment Techniques

Techniques	F (%)					
	Very Often	Often	Not Often	Never	Mean	SD
Oral presentations	36(11.7%)	111(35.9%)	121(39.2%)	41(13.3%)	2.46	.866
Classroom dialogue	50(16.2%)	95(30.7%)	63(20.4%)	101(32.6%)	2.30	1.092
Projects	32(10.4%)	85(27.5%)	125(40.5%)	67(21.7%)	2.27	.916
Ungraded quizzes	20(6.5)	67(21.7%)	148(47.9%)	74(23.9%)	2.11	.840
Role play	23(7.4%)	59(19.1%)	86(27.8%)	141(45.6%)	1.88	.967
Scoring rubrics	10(3.2%)	60(19.4%)	134(43.4%)	105(34.0%)	1.92	.812
Concept mapping	10(3.2%)	55(17.8%)	100(32.4%)	144(46.6%)	1.78	.852
Use of reflective journals	20((6.5%)	40(12.9%)	94(30.4%)	155(50.2%)	1.76	.913
Scaffolding	7(2.3%)	49(15.9%)	120(38.8%)	133(43.0%)	1.77	.794
Checklist	13(4.2%)	38(12.3%)	92(29.8%)	166(53.7%)	1.67	.850
Portfolios	6(1.9%)	44(14.2%)	107(34.6%)	152(49.2%)	1.69	.786
Admit slips	10(3.2%)	35(11.3%)	75(24.3%)	189(61.2%)	1.57	.818
Drama	13(4.2%)	31(10.0%)	104(33.7%)	161(52.1%)	1.66	.824
Interviews	3(1%)	33(10.7%)	123(39.8%)	150(48.5%)	1.64	.710
Exit slips	6(1.9%)	30(9.7%)	76(24.5%)	197(63.8%)	1.50	.750
Questionnaire	11(3.6%)	21(6.8%)	80(25.9%)	197(63.8%)	1.50	.776

N: 309 Source: Field survey (2018)

As shown from Table 10, the majority (with combined percentages of very often and often which is more than 50%) of the respondents that were sampled indicated that they use oral questioning, written tests, end-of-unit tests, weekly tests, monthly tests, mid-term tests, recap exercises, graded quizzes, homework/assignments, end-of-terms examinations, end of year examinations, group assignments, practical works/tests/exercises, observation of students at work and classroom participation to assess their students. Again, to further confirm this findings using mean values above 2.5, it is shown in Table 10 that the majority of the respondents sampled use oral questioning, Oral tests/examinations, written tests, end-of-unit tests, weekly tests, monthly tests, mid-term tests, recap exercises, graded quizzes, homework/assignments, end- of-term examinations, end of year examinations, group assignments, practical works/tests/exercises, observation of students at work and classroom participation.

Based on the results presented in Table 10, it is evident that out of the thirty-two (32) formative assessment techniques, only sixteen (16) of them were used by the SHS teachers that were sampled. Ranking these techniques from the most used to the least used techniques using a combined percentages of very often and often which is more than 50% and mean values above 2.5, these techniques included oral questioning, mid-term tests, written tests, end of year examinations, end-of-term examinations, end-of-unit tests, homework/assignments, recap exercises, group assignments, graded quizzes, monthly tests, practical works/tests/exercises, observation of students at work, weekly tests, classroom participation, and oral tests/examinations. From the

statistics presented in Table 10, the dominant formative assessment technique used by the SHS teachers is oral questioning.

Research Question Four

What are the challenges senior high school teachers face in implementing formative assessment practices in their classrooms?

The research question sought to identify the challenges senior high school teachers face in implementing formative assessment practices in their classrooms. In this regard, SHS teachers were asked to respond to a total of thirty-one (31) items that were related to the challenges they face in implementing formative assessment in their classrooms. The challenges included but not limited to large class size, number of teaching periods, insufficient instructional time, and lack of support from administration, among others.

To achieve the objective of this research question, items were crafted which demanded respondents to respond to the items by indicating 0 = no and 1 = yes. Frequencies and percentages were used to analyse the responses of respondents. A summary of the analysis of the results is presented in Table 11.

Table 11-*Challenges of Implementing Formative Assessment*

Challenges	F/%	
	Yes	No
Large class size (large enrolment)	278(90%)	10(10%)
Examination-oriented culture/impact of summative assessments (for example, WASSCE)	277(89.6%)	32(10.4%)
Lack of assessment materials	274(88.7%)	35(11.3%)
Much material to cover in syllabus	268(86.7%)	41(13.3%)
Formative assessment is time consuming	268(86.7%)	41(13.3%)
Difficulty in preparing lesson plans based on formative assessment data	267(86.4%)	42(13.6%)
Lack of instructional materials/resources (textbooks, lab equipment, etc.)	263(85.1%)	46(14.9%)
Lack of professional development activities such as in-service training	253(81.9%)	56(18.1%)
Formative assessment practices interfere with teaching	239(77.3%)	70(22.6%)
Difficulty in test item construction	237(76.7%)	72(23.3%)
Poor working conditions of teachers (e.g. lack of motivation)	231(74.8%)	78(25.2%)
Difficulty in conducting remedial lessons for the class (es)	230(74.4)	79(25.6%)
Students lack self and peer assessment skills	216(69.9%)	93(30.1%)
Many number of teaching periods per week/increase workload	216(69.9%)	93(30.1%)
Insufficient time for test item construction	210(68.0%)	99(32.0%)
Students do not use formative feedback to improve learning	207(67.0%)	102(33.0%)
Truancy/absenteeism on the part of the student	199(64.4%)	110(35.6%)
Insufficient instructional time	198(64.1%)	111(35.9%)

Table 11-*continued*

Challenges of Implementing Formative Assessment

Challenges	F/%	
	Yes	No
Formative assessment is labour intensive	194(62.8%)	115(37.2%)
Inadequate teacher knowledge and skills in formative assessment practices	190(61.5%)	119(38.5%)
Lack of support from administration	186(60.2%)	123(39.8%)
Poor attitudes of students towards formative assessment practices	180(58.3%)	129(41.7%)
Efficiency of a teacher being measured by the number of students who pass his/her subject in external examinations	176(57.0%)	133(43.0%)
Lack of professional development activities such as pre-service courses	168(54.4%)	141(45.6%)
Lack of school assessment policy	165(53.4%)	144(46.6%)
Difficulty in scoring/marking	147(47.6%)	162(52.3%)
Teaching of multiple subjects	123(39.8%)	186(60.2%)
Difficulty in adapting to new ideas such as formative assessment	117(37.9%)	192(62.1%)
Poor supervision of teachers	117(37.9%)	192(62.1%)
Difficulty in interpreting scores	96(31.1%)	213(68.1%)
Formative assessment data are not valid or reliable	75(24.3%)	234(75.5%)

N = 309; Source: Field survey (2018)

From Table 11, apart from items such as teaching of multiple subjects, difficulty in adapting to new ideas such as formative assessment, difficulty in scoring/marking, difficulty in interpreting test scores, formative assessment data are not reliable or valid and poor supervision of teachers, the majority (ranging from 50% to 90%) agreed to the rest of the statements as the challenges they face in implementing formative assessment in their classrooms.

From the results in Table 11, SHS teachers therefore face a number of challenges in implementing formative assessment in their classrooms. Ranking these challenges that SHS teachers face from the most to the least (ranging from 90% to 50%) included large class size (large enrolment), examination-oriented culture/impact of summative assessments (for example, WASSCE), lack of assessment materials, much material to cover in syllabus, formative assessment is time consuming, difficulty in preparing lesson plans based on formative assessment data, lack of instructional materials/resources (textbooks, lab equipment, among others), lack of professional development activities such as in-service training, formative assessment practices interfere with teaching, difficulty in test items construction, poor working conditions of teachers (for example, lack of motivation), difficulty in conducting remedial lessons for the class (es), students lack self and peer assessment skills, many number of teaching periods per week/increase workload, insufficient time for test items construction, students do not use formative feedback to improve learning, truancy/absenteeism on the part of the student, insufficient instructional time, formative assessment is labour intensive, inadequate teacher knowledge and skills in formative assessment practices, lack of

support from administration, poor attitudes of students towards formative assessment practices, efficiency of a teacher being measured by the number of students who pass his/her subject in external examinations, lack of professional development activities such as pre-service courses, and lack of school assessment policy. From the statistics presented in Table 11, the teachers' major challenge is large class size (large enrolment).

Research Hypothesis One

H_0: There is no statistically significant difference in formative assessment practices between female and male teachers.

H_1: There is a statistically significant difference in formative assessment practices between female and male teachers.

The hypothesis sought to identify if a significant difference exits between male and female teachers with respect to their formative assessment practices. In performing the analysis, the independent samples t-test was used to find out if a significant difference exists between the independent variable (gender which was made of male and female SHS teachers) and the dependent variable, scores that were obtained from teachers' formative assessment practices.

Before the conduct of the analysis, all the assumptions that underpin the conduct of independent samples t-test were strictly adhered to. Assumptions like normality, homogeneity of variance, the independent variable to be made up of two sub-categories, and the dependent variable being ratio or interval were duly conducted. After the test of the normality assumption, it was revealed that female scores was approximately normally distributed considering Shapiro-Wilk value with $\underline{p} = 0.6 > .05$ but male scores

was not normally distributed with p = 0.00<.05 (Appendix F). The normality assumption was further investigated graphically using the normal Q-Q plot and it was revealed that the distributions (male and female scores) did not deviate too widely from the diagonal and hence both female and male scores were approximately normally distributed (see Appendix F). After the normality assumption was fulfilled, the assumption that underlie the homogeneity of variance was also tested. Considering the Levene's test of equality of variances, it was revealed that p = 0.156 > 0.05 which meant that variances are assumed equal (see Appendix F). After all the assumptions were fulfilled, the independent samples t-test was conducted to test the null hypothesis and the summary of the analysis of the results is presented in Table 12.

Table 12-*Independent Samples t-test on Formative Assessment Practices of SHS Teachers with respect to Gender*

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Formative assessment practices	Equal variances assumed	2.025	.156	-2.836	307	.005	-12.957	4.569	-21.947	-3.968
	Equal variances not assumed			-2.594	61.063	.012	-12.957	4.996	-22.947	-2.968

Source: Field survey (2018)

It is evident from Table 12 that the test is significant and that the null hypothesis is rejected. This is because considering t(307) = 2.84, p = .005< .05 under equal variance assumed, it is evident that a significant difference exists in the means of the male and female teachers with respect to their practice of formative assessment. The difference between male and female SHS teachers in the practice of formative assessment is shown in the descriptive statistics which is presented in Table 13.

Table 13: *Descriptive Statistics showing a difference in the means of Male and female SHS teachers with respect to their formative assessment practices*

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Formative assessment practices	Female	48	156.29	32.391	4.675
	Male	261	169.25	28.452	1.761

Source: Field survey (2018)

From the descriptive statistics shown in Table 13, it is clear that with respect to the practice of formative assessment regarding the sampled respondents, male teachers have higher mean of 169.25 with a standard deviation of 28.45 whereas that of female teachers is 156.29 with a standard deviation of 32.39. The mean difference is 12.96 and this explains that male teachers do better when it comes to the practice of formative assessment in their classrooms than their female counterparts.

Research Hypothesis Two

H_0: There is no statistically significant difference in SHS teachers' formative assessment practices in relation to their years of teaching experience.

H_1: There is a statistically significant difference in SHS teachers' formative assessment practices in relation to their years of teaching experience.

The hypothesis sought to identify if a significant difference exits in SHS teachers' formative assessment practices in relation to their years of teaching experience. In performing the analysis, the one-way analysis of variance was used to find out if a significant difference exists between the independent variable (years of teaching experience which was made of three categories namely, 1-5years, 6-10years and above 10years) and the dependent variable, scores that were obtained from teachers' formative assessment practices.

Before the conduct of the analysis, all the assumptions that underpin the conduct of one-way analysis of variance was strictly adhered to. Assumptions like normality, homogeneity of variance, the independent variable to be made up of three or more sub-categories and the dependent variable being ratio or interval were duly conducted. After the test of the normality assumption, it was revealed that with respect to the formative assessment practices and considering Shapiro-Wilk values for 1-5years, 6-10years and above 10 years, the scores were not normally distributed with p = 0.019, 0.003 and 0.006 <.05 (see Appendix F). The normality assumption was further investigated graphically using the normal Q-Q plot and it was revealed that the distributions (for the scores obtained from the teachers) with respect to their years of teaching experience namely 1-5years, 6-10years and above 10 years did not deviate too wide from the diagonal and hence were approximately normally distributed (see Appendix F). After the normality

assumption was fulfilled, the assumption that underlie the homogeneity of variance was also tested. Considering the Levene's test of equality of variances, it was revealed that p = 0.520 > 0.05 which meant that variances are assumed equal (see Appendix F). After all the assumptions were fulfilled, the one-way analysis of variance was conducted to test the null hypothesis and the summary of the analysis of the results is presented in Table 14.

Table 14-*One-Way Analysis of Variance on Formative Assessment Practices of SHS teachers with respect to years of teaching experience*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	16264.296	2	8132.148	9.940	.000
Within Groups	250333.458	306	818.083		
Total	266597.754	308			

Source: Field survey (2018)

The result depicted in Table 14 shows a statistically significant difference in the means of SHS teachers' formative assessment practices with respect to their years of teaching experience. This is because, for the one-way analysis of variance that was conducted, F(2, 306) = 9.94, p = 0.000 and that explains that the null hypothesis is rejected. The results explain that teachers differ in the practice of their formative assessment with respect to their years of teaching experience. Looking at the nature of the results, a post hoc test was further conducted to tell the differences that occurred between the groups by conducting a multiple comparison. The summary of the results of the post hoc test using Tukey's test is presented in Table 15.

Table 15-*Multiple Comparisons*

(I) Years of teaching experience at the SHS Level	(J) Years of teaching experience at the SHS Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1-5 years	6-10 years	9.894*	3.773	.025	1.01	18.78
	Above 10 years	18.043*	4.131	.000	8.31	27.77
6-10 years	1-5 years	-9.894*	3.773	.025	-18.78	-1.01
	Above 10 years	8.148	4.291	.141	-1.96	18.25
Above 10 years	1-5 years	-18.043*	4.131	.000	-27.77	-8.31
	6-10 years	-8.148	4.291	.141	-18.25	1.96

*. The mean difference is significant at the 0.05 level.

Result from Table 15 shows a significant difference between teachers with 1-5years and 6-10years in their practice of formative assessment with a mean difference of 9.89 and p< .05. In addition, for 1-5years and above 10 years, the results show a significant difference in SHS teachers' practice of formative assessment with a mean difference of 18.04 and p< .05. The difference was further investigated from the descriptive statistics as shown in Table 16.

Table 16-*Descriptive Statistics showing a difference in the means of SHS teachers' formative assessment practices with respect to years of teaching experience*

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1-5 years	127	175.09	30.103	2.671	169.81	180.38	106	236
6-10 years	105	165.20	28.384	2.770	159.71	170.69	109	218
Above 10 years	77	157.05	26.250	2.991	151.09	163.01	106	207
Total	309	167.24	29.421	1.674	163.94	170.53	106	236

Source: Field survey (2018)

It is evident in Table 16 that SHS teachers with 1-5 years of experience had the highest mean of 175.09 with a standard deviation of 30.10 whereas teachers with above 10 years of teaching experience had the lowest mean of 157.05 with a standard deviation of 26.25. The results show that teachers with 1-5years of teaching experience do better in the practice of formative assessment and this is followed by teachers with 6-10 years teaching experience and teachers with above 10 years of teaching experience being the last.

Research Hypothesis Three

H_0: Senior High School teachers' formative assessment knowledge, years of teaching experience and gender do not jointly or independently predict their formative assessment practice.

H_1: Senior High School teachers' formative assessment knowledge, years of teaching experience and gender jointly or independently predict their formative assessment practice.

The hypothesis sought to identify the predictor variable (scores on teachers' formative assessment knowledge, years of teaching experience and gender) that best predicts SHS teachers' formative assessment practices (criterion variable). In performing the analysis, the linear multiple regression was used. In the conduct of the analysis, all the assumptions that underpin the conduct of linear multiple regression were strictly adhered to. These assumptions included, the criterion variable (scores obtained from teachers' formative assessment practices) being continuous and measured on the interval scale which was fulfilled, having more than two or more predictor

variables which was also fulfilled, linearity, multicollinearity, homoscedasticity and residual being normally distributed.

In particular, multicollinearity assumption was tested using the variance inflation factor (VIF) and it was revealed that the VIF value stood at 1.029, 1.012 and 1.026 for the predictor variables which were all less than 10 (see Table 18). In addition, homoscedasticity assumption was also checked and it was discovered that there was no clear pattern in scatter plots of residuals and the predicted values or the distribution (see Appendix H). Furthermore, the linearity assumption was checked and fulfilled as it was discovered that there was a linear relationship between the predictors and the criterion variable (see the normal p-p plot in appendix H). In addition, before the conduct of the multiple regression, correlations among all the variables was also conducted and it was noticed that there were some relationships (positive and negative) among the variables (see Appendix H). Multicollinearity, homoscedasticity and linearity are the assumptions and basic requirements that a research's data must meet before conducting multiple linear regression (Etsey, 2016; Huch, 2012; Heiman, 2011). After all the assumptions were fulfilled, the multiple regression was conducted to test the null hypothesis and the summary of the analysis of the results is presented in Table 17.

Table 17-*Multiple Linear Regression on SHS Teachers' Formative Assessment Knowledge, Years of Teaching Experience and Gender*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.532[a]	.283	.276	25.034	.283	40.128	3	305	.000	1.340

a. Predictors: (Constant), Teachers' knowledge in formative assessment practices, Years of teaching experience at the SHS Level, Gender

b. Dependent variable: Formative Assessment Practices

It is evident from the statistics presented in Table 17 that there is a significant positive relationship between the predictor variables (teachers' knowledge in formative assessment practices, years of teaching experience at the SHS Level and gender) and the criterion variable (formative assessment practices) but the relationship is moderate with R = .532, p = 0.00, and this explains the multiple correlation coefficient thereby rejecting the null hypothesis. It is also shown from Table17 that the predictor variables explain only 28.3% of the variations in the dependent variable with an R-square of .283. In order to determine the contribution of each of the predictor variables to the dependent variable, the standardized coefficient table was used and the summary of the results of the analysis is presented in Table 18.

Table 18-*Coefficients*

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	71.026	12.469		5.696	.000					
Gender	9.408	3.988	.116	2.359	.019	.160	.134	.114	.972	1.029
Years of teaching experience at the SHS Level	-8.469	1.799	-.230	-4.707	.000	-.247	-.260	-.228	.988	1.012
Teachers' knowledge in formative assessment practi	2.286	.255	.441	8.982	.000	.471	.457	.435	.975	1.026

a. Dependent Variable: Formative assessment practices

From the result depicted in Table 18, looking at the t-statistics which shows the individual contribution of each of the predictor variables, it can be observed that SHS teachers' knowledge in formative assessment practices is significantly the best predictor of SHS teacher' formative assessment practices with t = 8.982, p = 0.00. This is followed by teachers' years of teaching experience with t = -4.707, p = 0.00 whereas gender is the last predictor with t = 2.359, p = 0.019. From Table 18 the general regression model is given by:

SHS teachers' formative assessment practices = 71.026 + 9.408gender – 8.469years of teaching experience + 2.286 teachers Knowledge in formative assessment practices.

Discussion of Results

The discussion was done in accordance with the research questions and hypotheses of the study. The first research question sought to examine SHS teachers' knowledge in formative assessment practices. The finding for this research question revealed that SHS teachers had low knowledge regarding their practice of formative assessment. The finding is in line with the positions of Mohamed, et al. (2016) who concluded from a sample of 200 teachers in Malaysia that high school teachers' literacy and for that matter their knowledge in educational assessment is inadequate. This is evident because quite a number of teachers that were surveyed disagreed that formative assessment occurs when assessment data are actually used to adjust instruction or inform teaching and learning and that formative assessment should be done on a daily basis as well as formative assessment should be integrated into instruction.

Though a good number agreed among others that formative assessment uses a variety of tools to gather evidence of students' learning, actively involves students in the assessment process, in fact, the majority of the teachers further disagreed, among others, that formative assessment assesses the effectiveness of teaching and learning than final examinations. These instances as demonstrated by SHS teachers show that they lack the conception of what formative assessment is really about, hence the relevance of this result. The finding further confirm the results of Alufohai and Akinlosotu (2016) and Alkharusi, et al. (2012) who posited that teachers have inadequate knowledge of what constitutes continuous assessment. In addition, the finding collaborates the view of Awoniyi (2016) who brought to light that majority of teachers are yet to see students' tests scores as a means for identifying the strengths and weaknesses of the students and for remedial teaching and make teacher lack the knowledge they have in formative assessment. From the views of Ababio and Dumba (2013), Hilya (2007) and Heritage, et al. (2009) and Kankam, et al. (2014), the factors that affect teachers' knowledge include teachers' inability to involve their students in the assessment process, poor understanding of the principles of formative assessment by teachers, limited knowledge of the formative assessment strategies in their professional practices, among others and this might have resulted in the present result of the study.

In support of the fact that SHS teachers have low knowledge in their formative assessment practices, the interview data gathered revealed respondents' view of formative assessment to mean a series of tests or

frequent testing, happens after instruction and is used for grading of students' work. The following views buttress this point:

"Formative assessment is about a teacher conducting a number or series of tests at regular intervals or continuously or let's say frequently with the main purpose of evaluating student performance in the classroom"(**Respondent 1**).

"It (formative assessment) means judging the quality of a student's achievement after the instructional process" (**Respondent 2**).

Another respondent also said:

"Formative assessment is a regular process where a teacher uses a series of classroom activities such as testing students frequently to gather evidence about their learning at the end of a lesson, instruction or maybe at the end of the teaching of a topic to determine if what has been thought has really been understood. … And with this series of tests throughout the term, a percentage of the data from the tests that have been conducted is used to grade the students" (**Respondent 3**).

It can be inferred from the statements that, respondents viewed formative assessment to mean a series of tests or continuous/frequent testing, which happens after instruction and used for grading of students. This seems to suggest that teachers do not have adequate knowledge and understanding of what formative assessment means. This finding further confirms that of Abejehu (2016) who in a study revealed that teachers view formative assessment to mean continuous or frequent testing.

The second research question sought to explore the prevalent formative assessment practice of SHS teachers. The result of the study revealed that the prevalent formative assessment practice of the SHS teachers was formative

feedback and this was followed by questioning and peer-assessment with self-assessment being the least prevalent formative assessment practice. Looking at formative feedback being the prevalent, as indicated by Heritage (2010), feedback, whether from teachers to students, students to peers, or students to themselves is an essential part of effective formative assessment. This is because, effective feedback must answer what learning goals students must reach, what progress is being made to reach these goals and what they must do next to make better progress. In this regard, Bennett (2011) contended that students who receive effective feedback had a better opportunity to learn than students who are not offered this chance which makes feedback very important in bringing improvement in students' learning.

According to Brookhart (2008), formative feedback is descriptive, criterion-referenced, constructive, incremental, positive, clear and specific on the work and process of the work, and if such things are put into practice in the classroom, then students view "mistakes" as opportunities for learning, and they do not become afraid of asking for help as needed (Moss & Brookhart, 2009). The finding therefore agrees with the position of Kankam, et al. (2014) who posited that teachers rarely use self and peer assessment practices. This finding also agrees with Amua-Sekyi (2016) who was of the view that formative feedback is the most essential formative assessment practice in that it encourages students to focus on learning goals rather than performance goals. This is followed by questioning as it helps to provide the teacher with a better idea of the class's development, as answers which are taken randomly are likely to be more representative (Jones & Wiliam, 2008). The current study has revealed a similar finding in illustrating clearly the concepts of formative

feedback and questioning as the prevalent formative assessment practices as compared to the other practices.

In support of the prevalent formative assessment practice of SHS teachers, the following were revealed through the interview session:

On sharing learning intentions and success criteria, it was revealed that teachers do not share learning intentions and success criteria with their students. The following quote illustrates this assertion:

"I don't normally share learning intentions with the students. The intentions are only known to me, so when I enter the classroom, I only start teaching and at the end of it all, I have my own ways of finding out whether I have achieved my learning intentions or not. But, I don't disclose the learning intentions to the students before the learning begins" (**Respondent 6**).

For questioning, the majority of the respondents (teachers) use oral questioning a lot to assess their students' understanding of lessons in the classroom. The teachers use general classroom response to posed questions to determine whether students understand lessons taught or not. One of the respondents interviewed said that:

"I use questioning a lot to find out whether the students follow the lesson. ... Based on the responses and answers given by the students, I can judge whether the class is following the lesson or not" (**Respondent 1**).

However, teachers do not pre-plan and design their questions before their lessons as they ask their questions 'on the fly'. This finding contradicts the recommendation made by Moss and Brookhart (2009) when they opined that strategic questions are not asked 'on the fly' rather they are planned in relation to the learning targets. Also, the teachers do not allow long 'waiting time' between

when a question is asked and the expected response. Meanwhile, according to Fautley and Savage (2008), allowing students a long 'wait time' afford students the opportunity to provide quality and thoughtful answers to posed questions. To buttress this point, a participant said:

…"I frame my questions while I am teaching based on the lesson, so I don't plan my questions in advance before my lessons and when I ask the questions, I expect immediate responses from the students to enable me continue the lesson without wasting time." (Respondent 1).

For formative feedback, teachers communicate feedback to their students in the form of scores or marks, praises and grades. This seems to suggest that the type of feedbacks the teachers provide is summative in nature which lack strong linkage with instruction (Trumbull & Lash, 2013). The finding therefore agrees with the position of Amua-Sekyi (2016) who posited that teachers provide feedback on students' work in the form of marks and grades. With this, students tend to compare themselves against others rather than focusing on the difficulties in the task and on making efforts to improve (Amua-Sekyi, 2016; CCEA, 2007). This finding is reflected in the following responses by two of the respondents as:

"I am able to communicate feedback about student learning to students through the scoring of my students work. I score their work when I give them a test or any assignment for them to at least know what they have done. Apart from scoring their work, I also use praises such as well done, that is right, very good, to communicate feedback about student learning to students" (**Respondent 4**).

The other respondent added:

"When I give my students any assessment such as class test, midterm, exercises or homework, I mark and give out the books or scripts to them. When a particular student performs well, I remark good, very well as an expression of satisfaction and also to encourage them. I also praise a student who has performed well in a test or answered questions correctly and oral questions to be precise in class. At the end of a test and after I have finished marking, I give the correct answers to the students to enable them do their corrections. Again, 30% of the formative assessment data is added to the end- of-term exam mark for grading the student" (**Respondent 1**).

In addition, teachers are not able to provide dialogic feedback to the students. This finding is in line with that of Amua-Sekyi (2016) that most Ghanaian teachers see dialogic feedback on formative assessment as a challenging role and as a result the teachers tend to grade their students' work and discuss the results in general. The following quote illustrate this finding: *"I don't conference with individual students to provide feedback because of the large class sizes"* (Respondent 1).

For self-assessment, teachers do not practice self-assessment in their classrooms. The finding therefore agrees with the position of Kankam, et al. (2014) who posited that teachers rarely practice self-assessment in their classrooms. The teachers seem to believe that self-assessment is only about allowing a student to score/mark his/her own work. In addition, even the teachers seem to perceive that the marks that will be obtained from self-assessment will not even be reliable. Two respondents' comments clearly covered the views of other participants that:

"I don't practice self-assessment in my classroom. How can you ask a student to assess him or herself? No student wants to fail, every student wants a good grade, so the marks obtained from self-assessment will not be reliable as some will erase the wrong answers they wrote and write the right answers and mark them correct. So I don't practice it" (**Respondent 1**).

"In my classroom I do not practice self- assessment" (**Respondent 5**).

For peer-assessment, teachers practice peer assessment in their classrooms by allowing the students to score or mark their colleagues' work. This practice of peer assessment, however, contradicts the recommendations by measurement experts (Moss & Brookhart, 2009). They stressed that to make peer assessment productive and valuable, students should not be allowed to assign marks to their peers work. The following submission by two respondents illustrate that students are made mark each others' work:

"To an extent I do, usually when I conduct class tests or class exercises in each class I ask them to exchange their books and mark because of the large class size." (**Respondent 3**).

The other respondent had this to say:

"I believe to some extent, I say yes. Sometimes, I do conduct something like dictation and in the case of dictation or some simple test, I ask the students to exchange books.… and I will present the ideal answers or solutions and I ask that the book that is before you or the paper bears exactly what I have put on the board, you will mark that person correct and at the end of it all, then grade that person, write what the person has scored out of the total.… So this is the way by which I practice peer assessment in the classroom" (**Respondent 5**).

On integrating formative assessment data into instruction, here instead of using the data to make instructional decisions, teachers rather use it to grade their students' work. This finding agrees with Amua-Sekyi (2016) who revealed that teachers tend to grade their students' work, hence making assessment normative rather than formative and that of Awoniyi (2016) who posited that teachers are yet to see students' tests scores as a means for identifying the strengths and weaknesses of the students and for remedial teaching. The following quotes buttress this point:

"I use the data always to grade my students" (**Respondent 1**).

"You know the main purpose is to use it to grade my students at the end of the term or the academic year" (**Respondent 3**).

"I use the marks in grading my students. Most at times I use it in grading my students" (**Respondent 4**).

It can be deduced from the quotes from the above interview data that SHS teachers do not share learning intentions and success criteria with their students and that the majority of respondents (teachers) use oral questioning a lot to assess their students' understanding of lessons in the classroom. However, the respondents use general classroom response from questioning to determine whether students understand the lessons. It can also be inferred from the statements that teachers communicate feedback to their students in the form of scores or marks, praises and grades and that teachers do not practice self-assessment in their classrooms.

The teachers seem to believe that self-assessment is only about allowing a student to score/mark his/her own work. The teachers seem to perceive that the marks that will be obtained from self-assessment will not

even be reliable. In addition, teachers practice peer assessment in their classrooms by allowing the students to score or mark their colleagues' work. Majority of the teachers use formative assessment data to grade their students instead of integrating it into instruction. The results justify that the most prevalent formative assessment practice is formative feedback, then followed by questioning.

The findings were further supported by lesson observations that were made by the researcher and it was revealed that teachers do not seem to share learning intentions. This is because, teachers always entered the class, introduced the topic, and then started teaching without reference to any learning intentions. It was observed that teachers used oral questioning a lot during their lessons delivery. Teachers communicated immediate feedback to students' oral questions. However, the teachers did not communicate immediate feedback on students' written assessments with the exception of those the teachers asked the students to exchange their books and marked. There was no evidence of self-assessment during the lessons observation process. None of the teachers whose lessons were observed practiced self-assessment during the observation process but quite a number of them practiced peer assessment by allowing students to exchange books and mark one another's written exercises or class tests. It was observed that teachers did not re-adjust their lessons delivery after some students failed to answer correctly oral questions put up to them by the teachers, thus, teachers failed to integrate formative assessment data into their instruction.

The third research question sought to explore the formative assessment techniques SHS teachers use in their classrooms. The finding of the study

revealed oral questioning, mid-term tests, written tests, end of year examinations, end-of-term examinations, end-of-unit tests, homework/assignments, recap exercises, group assignments, graded quizzes, monthly tests, practical works/tests/exercises, observation of students at work, weekly tests, classroom participation, and oral tests/examinations. The dominant formative assessment technique used by the SHS teachers is oral questioning.

The finding of the study is in line with that of Ababio and Dumba (2013) who in their study using 25 teachers and 220 students concluded that the formative assessment techniques teachers use mostly are take-home assignment, test (oral/written) and recap exercises. As opined by Ababio and Dumba (2013), teachers rarely used questionnaire, observation and checklist as formative assessment techniques respectively. The finding also confirms the position of Abejehu (2016) who concluded from a sample of 191 primary school teachers that teachers continue to use mainly paper-and–pencil tests to the neglect of other formative assessment techniques to assess their students' learning outcomes and this among others, have been justified in this current study.

In support of the formative assessment techniques SHS teachers use in their classrooms, three respondents said:

"Very often I use midterm test in gathering evidence about student learning, I also use class test or class exercises at the end of the instructional process (**Respondent 3**).

The other two also said:

"I most at times use the mid-term test; I also use the end-of-term test and sometimes end-of-topic test. Apart from the tests, I use oral questioning to assess students learning" (**Respondent 4**).

"*I mostly use the mid-term tests"* (**Respondent 5**).

It can be inferred from the statements that the formative assessment techniques SHS teachers used were mid-term tests, oral questioning, assignments, exercises, project works and the end-of-term exams which confirm the quantitative results.

The findings were further supported by lesson observations that were made by the researcher and it was revealed that SHS teachers used oral questioning, observation of students at work, end-of-unit quizzes, group/oral presentations and class tests as their formative assessment techniques.

The fourth research question sought to identify the challenges senior high school teachers face in implementing formative assessment practices in their classroom. The study revealed that SHS teachers face challenges such as large class size (large enrolment), examination-oriented culture/impact of summative assessments (for example, WASSCE), lack of assessment materials, much material to cover in syllabus, formative assessment is time consuming, difficulty in preparing lesson plans based on formative assessment data, lack of instructional materials/resources (textbooks, lab equipment, etc.), lack of professional development activities such as in-service training, formative assessment practices interfere with teaching, difficulty in test items construction, poor working conditions of teachers (foe example, lack of motivation), difficulty in conducting remedial lessons for the class (es),

students lack self and peer assessment skills, many number of teaching periods per week/increase workload, insufficient time for test items construction, students do not use formative feedback to improve learning, truancy/absenteeism on the part of the student, insufficient instructional time, formative assessment is labour intensive, inadequate teacher knowledge and skills in formative assessment practices, lack of support from administration, poor attitudes of students towards formative assessment practices, efficiency of a teacher being measured by the number of students who pass his/her subject in external examinations, lack of professional development activities such as pre-service courses, and lack of school assessment policy. The teachers' major challenge is large class size (large enrolment).

Looking at the results, it is clear that SHS teachers have a lot of challenges to battle with when it comes to implementing formative assessment in their classrooms. The finding as shown in the present study is in line with the positions of Kankam, et al. (2014) who concluded from a sample of 20 social studies teachers that challenges such as teachers lack of formative assessment knowledge, inadequate time, resources constrains, large class size, pressures from internal tests/examinations, national external examinations, lack of proper school facilities and equipment, poor attitudes and lack of commitment on the part of teachers and lack of assessment policy affect the implementation of formative assessment in the classroom. The finding is also in line with Obeng (2011) and Quyen and Khairani (2017) who revealed similar variables as justified in the case of Kankam, et al. (2014) as affecting teachers' implementation of formative assessment. It is therefore clear that when SHS teachers are faced by these challenges as illustrated above, the end

result would be to abandon the entire implementation of formative assessment (Etsey as cited in Ababio & Dumba, 2013; Pham, 2014).

Drawing from the interview data from the respondents, it was clear that SHS teachers face similar challenges as revealed by the quantity data such as inadequate knowledge in formative assessment, large class size, inadequate supply of assessment materials, examination-oriented culture, time constraints, difficulty in marking/scoring, its time consuming nature, its interference with teaching, more materials to cover in the syllabus, and lack of motivation and these factors were evident in the quantitative results of the study. Quotes illustrating each of these follow:

On inadequate knowledge in formative assessment, two respondents said:

"I don't actually have adequate knowledge or understanding of how this formative assessment practice should be carried out in the classroom because it is when a teacher understands it and have adequate knowledge of it that you can appreciate and practice it" (**Respondent 1**).

"I don't have adequate knowledge in practicing it (formative assessment). It is confusing, so now that I don't understand it well, how do I practice it?" (**Respondent 3).**

Concerning large class size, two respondents said:

"Large class size also makes it (formative assessment) difficult to practice" (**Respondent 1**).

"The large class sizes even makes it (formative assessment) very difficult to practice" (**Respondent 3**).

On inadequate supply of assessment materials, a respondent said:

"I face a number of challenges, number one is inadequate resources, I mean here, stationery, probably I want to conduct class test that will be typed and printed, I may want to conduct midterm test, I want to conduct a take home test and I want everything to be typed and printed. Some time, you will be told there's no paper, there is no ink" (**Respondent 5**).

Concerning examination-oriented culture, a respondent said:

"If you concentrate on practicing formative assessment and your students fail at the WASSCE, you will be queried by school authorities, so I teach for my students to pass WASSCE" (**Respondent 1**).

Concerning time constraints, a respondent said:

"The time is not always enough for formative assessment practices to be followed in the classroom" (**Respondent 4**).

On difficulty in marking/scoring, a respondent said:

"I have so many students in each of the classes I teach so even if I give one class exercise marking becomes a headache" (**Respondent 3**).

On its time consuming nature, two respondents said:

"... it (formative assessment) is time consuming" (**Respondent 1**

"If you have to follow all the formative assessment practices, it will take a lot of time in the classroom" (**Respondent 4)**

Concerning its interference with teaching, a respondent said:

"... and therefore it(formative assessment) interferes with teaching" (**Respondent 1)**

On more materials to cover in the syllabus, a respondent said:

"The major challenge is the extensive nature of the syllabus, the syllabus is largely extensive, teachers are usually in a haste to finish their syllabus to the

extent that they don't have time for 'all these things' (formative assessment practices) .... The syllabus is too vast, which puts a lot of pressure on the teachers to the extent that you intend to cover more grounds whether the students understand or not" (**Respondent 6**).

Concerning lack of motivation for the classroom teacher, a respondent said:

"The working condition of the teacher too is very bad. For instance, it is not motivating, teaching learning resources are lacking, teaching so many subjects or even many periods" (**Respondent 3)**

The findings were further supported by a lesson observation that was made by the researcher and it was revealed that the enrolment in some of the classrooms were large. Also, some of the students were absent in the classes during the time of the observation. In addition, all the teachers whose lessons were observed placed emphasis on preparing students to pass their summative assessments particularly end-of-term and WASSCE to the neglect of formatively assessing the students.

The first hypothesis sought to identify if a significant difference exits between male and female teachers with respect to their formative assessment practices. The study revealed a significant difference between male and female teachers with respect to their practice of formative assessment and that male teachers do better in the practice of formative assessment in their classrooms than their female counterparts. The finding is in line with the positions of Alkharusi, et al. (2014) who concluded from a sample of 3557 grades 5-12 teachers in the Sultanate of Oman that on the average, male teachers practice formative assessment than female teachers. The finding of the study further agrees to the views of Umugiraneza, et al. (2017) who found that male

teachers practice formative assessment more as compared to their female counterparts and that male teachers are more likely to use varied assessment techniques and more confident about reporting their teaching and assessment practices.

On the other hand, the findings of the current study contradicts the revelations of Frey and Schmitt (2010) who from a sample of 140 teachers in Kansas revealed that female teachers use formative assessment about 50% more than their male counterparts. The finding of the current study further disproves the view of Ndalichako (2015) who also revealed that female teachers use assessment data often to facilitate and support teaching and learning than the male teachers. Looking at the sample for this current study, the male respondents outnumbered that of females and in my opinion the number of female which was relatively small might have brought about the difference. However, the significant nature of the test makes the finding very decisive.

The second hypothesis was to identify if a significant difference exits in SHS teachers' formative assessment practices in relation to their years of teaching experience. The study revealed a statistically significant difference in SHS teachers' formative assessment practices with respect to their years of teaching experience and that 1-5years of teaching experience with a mean of 175. 09 and a standard deviation of 30.10 do better in the practice of formative assessment. The finding contradicts the position of Sach (2011) who argued that teachers who have more experience of teaching tend to use formative assessment strategies in their classroom practices.

However, the finding of the study confirms the positions of Umugiraneza, et al. (2017) who from a sample 75 mathematics and statistics teachers in South Africa found that less experienced teachers implement and use a variety of formative assessment techniques and strategies in their classrooms than the more experienced teachers. As indicated by Kini and Podolsky (2016), not every inexperienced teacher is less effective, and not every experienced teacher is more effective. But the benefits of teaching experience will be best realised when teachers are well-prepared at the point of entry into the teaching profession. I believe that what might have resulted to the findings of this current study would be that teachers with 1-5 years of teaching experience are averagely young and are more likely to work with zeal, confident and with hard work than those with more teaching experience and this might have resulted to this outcome.

The third hypothesis sough to identify the predictor variable (scores on teachers' formative assessment knowledge, years of teaching experience and gender) that best predicts SHS teachers' formative assessment practices (criterion variable). The result of the study revealed a significant positive relationship between the predictor variables and the criterion variable ($\underline{R}$ = .532, $\underline{p}$ = 0.00). The finding of the study showed that SHS teachers' knowledge in formative assessment practices is significantly the best predictor of SHS teacher' formative assessment practices with $\underline{t}$ = 8.982, $\underline{p}$ = 0.00 as compared to teachers' years of teaching experience ($\underline{t}$ = -4.707, $\underline{p}$ = 0.00) and gender ($\underline{t}$ = 2.359, $\underline{p}$ = 0.019).

The findings of the current study is consistent with Mohamed, et al. (2016) who found that teachers' knowledge of assessment influences their

formative assessment practices. This is true according to Armstrong (2011), who posited that teachers' knowledge about assessment is a significant factor that influences their assessment practices and what they do with the data they collect from student assessment. It is in this regard that Popham, as cited in Mohamed, et al. (2016) noted that a strong knowledge of educational assessment is a basic requirement for effective formative assessment practices in the classroom. However, the finding contradicts Talib, et al. (2014) from a sample of 408 teachers in Malaysia who found that formative assessment practices were not significantly influenced by teachers' years of teaching experience and their assessment knowledge. The finding of the current study further disconfirms the positions of Umugiraneza, et al. (2017) and Nneji, et al. (2012) who concluded from samples of 75 mathematics and statistics teachers and 305 science, technology and mathematics teachers in South Africa and Nigeria respectively that gender and teaching experience influenced teachers' formative assessment practices.

Chapter Summary

The chapter has presented the results and discussion of the study. The findings of the study revealed that SHS teachers had low knowledge regarding their practice of formative assessment. The result of the study also revealed that the prevalent formative assessment practice of the SHS teachers was formative feedback and this was followed by questioning and peer-assessment, among others, with self-assessment being the least prevalent formative assessment practice. The finding of the study further revealed oral questioning, mid-term tests, written tests, end-of-year examinations, end-of-term examinations, end-of-unit tests, homework/assignments, recap exercises,

group assignments, graded quizzes, monthly tests, practical works/tests/exercises, observation of students at work, weekly tests, classroom participation, and oral tests/examinations as the formative assessment techniques SHS teachers use in their classrooms.

The study also revealed that SHS teachers face challenges such as large class size (large enrolment), examination-oriented culture/impact of summative assessments (for example, WASSCE), lack of assessment materials, much material to cover in syllabus, formative assessment is time consuming, difficulty in preparing lesson plans based on formative assessment data, lack of instructional materials/resources (textbooks, lab equipment, among others), lack of professional development activities such as in-service training, formative assessment practices interfere with teaching, difficulty in test items construction, poor working conditions of teachers (for example, lack of motivation), difficulty in conducting remedial lessons for the class (es), students lack self and peer assessment skills, many number of teaching periods per week/increase workload, insufficient time for test items construction, students do not use formative feedback to improve learning, truancy/absenteeism on the part of the student, and insufficient instructional time.

Other challenges included formative assessment is labour intensive, inadequate teacher knowledge and skills in formative assessment practices, lack of support from administration, poor attitudes of students towards formative assessment practices, efficiency of a teacher being measured by the number of students who pass his/her subject in external examinations, lack of professional development activities such as pre-service courses, and lack of

school assessment policy. In addition, the findings of the study revealed a significant difference between male and female teachers with respect to their practice of formative assessment and that male teachers do better in the practice of formative assessment in their classrooms than their female counterparts.

The study also revealed a statistically significant difference in SHS teachers' formative assessment practices with respect to their years of teaching experience and that 1-5years of teaching experience do better in the practice of formative assessment. The result of the study further revealed a significant positive relationship between the predictor variables and the criterion variable with SHS teachers' knowledge in formative assessment practices as significantly the best predictor of SHS teachers' formative assessment practices as compared to teachers' years of teaching experience and gender.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The chapter focuses on the summary of the key findings, conclusions drawn from the findings, and recommendations made in the study. The chapter also presents a suggestion for further research.

Overview of the Study

The purpose of the study was to investigate the formative assessment practices of senior high school teachers in the Upper West Region. To achieve the purpose of the study, four research questions and three hypotheses guided the study (See chapter 1).

The mixed method approach was used in the study. Questionnaire, interview guide and lesson observation guide were used to collect data from a sample of 309 senior high school teachers. Descriptive statistics, specifically, means, standard deviations, frequencies and percentages, and inferential statistics (independent samples t-test, one way analysis of variance and multiple linear regression) were used to analyse the data that were gathered for the quantitative section. For the qualitative section of the study, specifically the interview data were analysed based on thematic analysis by Braun and Clarke (2006).

Summary of Key Findings

The key findings are presented in line with the research questions and hypotheses of the study and they are as follows:

The first research question sought to examine SHS teachers' knowledge level in formative assessment practices. The finding for this research question revealed that SHS teachers had low knowledge regarding their practice of formative assessment. The interview data revealed respondents' view of formative assessment to mean a series of tests or continuous/frequent testing, which happens after instruction and used for grading of students. This showed that generally the teachers do not have adequate knowledge and understanding of what formative assessment means.

The second research question sought to explore the prevalent formative assessment practice of SHS teachers. The result of the study revealed that the prevalent formative assessment practice of the SHS teachers was formative feedback and this was followed by questioning and peer-assessment with self-assessment being the least prevalent formative assessment practice. However, the interview and lesson observation data revealed that teachers communicate feedback to their students in the form of scores or marks, praises and grades which are summative in nature. Again, teachers do not provide dialogic feedback to their students because of large class sizes.

The third research question sought to explore the formative assessment techniques SHS teachers use in their classrooms. Ranking these techniques from the most used to the least used, the finding of the study indicated that oral questioning, mid-term tests, written tests, end-of-year examinations, end-of-term examinations, end-of-unit tests, homework/assignments, recap

exercises, group assignments, graded quizzes, monthly tests, practical works/tests/exercises, observation of students at work, weekly tests, classroom participation, and oral tests/examinations were the major techniques used by the SHS teachers. The dominant technique used by the SHS teachers is oral questioning. The interview and observation data revealed similar techniques such as oral questioning, mid-term tests, class exercises, end-of-term exams, end-of-topic/unit tests/quizzes, observation and oral presentation.

The fourth research question sought to identify the challenges senior high school teachers face in implementing formative assessment practices in their classrooms. The study revealed that SHS teachers face a number of challenges in implementing formative assessment in their classrooms. Ranking these challenges that SHS teachers face from the most to the least (ranging from 90% to 50%) included large class size (large enrolment), examination-oriented culture/impact of summative assessments (for example, WASSCE), lack of assessment materials, much material to cover in syllabus, formative assessment is time consuming, difficulty in preparing lesson plans based on formative assessment data, lack of instructional materials/resources (textbooks, lab equipment, among others), lack of professional development activities such as in-service training, formative assessment practices interfere with teaching, difficulty in test items construction, poor working conditions of teachers (for example, lack of motivation).

The rest are difficulty in conducting remedial lessons for the class (es), students lack self and peer assessment skills, many number of teaching periods per week/increase workload, insufficient time for test items construction, students do not use formative feedback to improve learning,

truancy/absenteeism on the part of the student, insufficient instructional time, formative assessment is labour intensive, inadequate teacher knowledge and skills in formative assessment practices, lack of support from administration, poor attitudes of students towards formative assessment practices, efficiency of a teacher being measured by the number of students who pass his/her subject in external examinations, lack of professional development activities such as pre-service courses, and lack of school assessment policy. The teachers' major challenge is large class size (large enrolment). The first hypothesis sought to identify if a significant difference exits between male and female teachers with respect to their formative assessment practices. The study revealed male teachers do better in the practice of formative assessment in their classrooms than their female counterparts.

The second hypothesis was to find out if a significant difference exits in SHS teachers' formative assessment practices in relation to their years of teaching experience. The study revealed that teachers with 1-5years of teaching experience do better in the practice of formative assessment than the more experienced teachers.

The third hypothesis sought to find out the predictor variable that best predicts SHS teachers' formative assessment practices. The result of the study showed that SHS teachers' knowledge in formative assessment practices is significantly the best predictor of SHS teacher' formative assessment practices.

Conclusions

The following conclusions were drawn from the findings of the study: The fact that SHS teachers had low knowledge of formative assessment practices suggests that their pre-service and if any in-service training might have been inadequate or that they might have been practicing what they were taught to formatively assess their students. It can therefore be concluded that low knowledge might be because of inadequate pre-service/in-service training in formative assessment. In addition, SHS teachers are often taught questioning strategies during their pre-service training and they might have been practicing it overtime. Teachers used formative feedback such as praise and marks which are somewhat easy a task to practice and also serve as a way to reduce their workload. It can therefore be concluded that questioning and formative feedback might have been easy for teachers to do and that might have contributed to the results.

It can also be concluded that, the prevalent formative assessment techniques were predominantly the normal paper-and-pencil assessment techniques and thus, it might be that the teachers who were sampled might have been assessed using these methods and that might have influenced them (teachers) to use the traditional paper-and-pencil techniques of assessment. In addition, with respect to challenges teachers face in implementing formative assessment in their classrooms, it can be concluded that, numerous factors come together to impede the formative assessment practices of SHS teachers. In line with this, it is worth concluding from the findings that, male teachers are more likely to use varied assessment methods and are confident in

reporting their teaching and assessment practices and that might have happened in the case of the respondents that were surveyed.

The fact that teachers with 1-5 years of teaching experience practice formative assessment might mean that these teachers were relatively young in the profession and are more likely and able to practice what they might have learnt during their pre-service training. It can be concluded that the more the teaching experience of the teacher, the less the likelihood that he or she would practice formative assessment. In addition, it can be concluded from the findings that the knowledge one has serves as a solid and basic requirement for the practice of formative assessment and not necessarily one' experience or gender and this has been justified in the results of this current study.

Recommendations

From the findings of the study, the following recommendations were made:

1. The Ghana Education Service should organise regular in-service training for SHS teachers on formative assessment to refresh the minds of the professional teachers and as a way to offer the non-professional teachers the opportunity to learn and practice formative assessment.
2. The Ghana education service and school administrators should encourage and supervise teachers to practice formative assessment in their classrooms. In doing this, the Ghana education service should also encourage teachers to provide quality education to students by including the non-traditional assessment techniques in assessing their students' learning. As part of the encouragement, female teachers should clear their doubts about formative assessment practices and procedures from experts

in assessments and other resource persons they might find relevant in their assessment practices.

3. The Ministry of education through the Ghana Education Service, the Metropolitan/Municipal/District Assemblies should build more infrastructure so as to reduce the large class size in schools and employ more teachers to ease the work load of teachers at the senior high school level. The study further recommends that the Ministry of Education through the Ghana Education Service should ensure regular supply of instructional and assessment materials to schools to enhance their assessment practices.

Suggestions for Further Research

It is suggested that further studies should be conducted but focus on teachers at the basic school level in Ghana especially at the primary school.

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APPENDICES

APPENDIX A

UNIVERSITY OF CAPE COAST

DEPARTMENT OF EDUCATION AND PSYCHOLOGY

FORMATIVE ASSESSMENT QUESTIONNAIRE FOR TEACHERS

Dear Respondent,

I would be very grateful if you could find time to complete this questionnaire to assist me and as a way of playing your own professional role in this research. The purpose of this questionnaire is to obtain information for a study that investigates the ***formative assessment practices of senior high school teachers in Ghana: A mixed methods study.*** You are kindly requested to complete the questionnaire frankly and as honestly as possible. Your responses to the items in this questionnaire are invaluable in conducting the research. The questionnaire must be completed anonymously and your responses would be treated confidentially. All information provided is purely for research purposes. There is no incentive to be given to you, but this research will be helpful as it will deepen educators' assessment understanding and improve upon educational practices in Ghana.

SECTION A: Background Information

Instruction: Please indicate your response with a tick [√] in the box or where applicable write your response in the spaces provided.

1. Gender:

   Female [ ]

   Male [ ]

2. Your highest academic qualification:

Bachelor's Degree [ ]

Master's Degree [ ]

Phd [ ]

Others, specify ……

3. Status as a teacher:

Professional [ ]

Non-professional [ ]

4. Years of teaching experience at the SHS Level:

1 – 5 years [ ]

5 – 10 years [ ]

Above 10 years [ ]

SECTION B: Teachers' Knowledge in Formative Assessment Practices

Instruction: please indicate with a tick [√], the degree to which you agree with each of the following statements regarding your knowledge about formative assessment using the following scale categories:
SA = Strongly Agree; A = Agree; D= Disagree; SD= Strongly Disagree

No.	Item	SA	A	D	SD
1.	Formative assessment is a series of tests administered to evaluate students' learning				
2.	Formative assessment uses a variety of assessment tools to gather evidence of students' learning				
3.	Formative assessment assesses the effectiveness of teaching and learning than final examinations				
4.	Formative assessment is used to evaluate quality of schools				
5.	Formative assessment is used for grading of students' work				

6.	Formative assessment is integrated into instruction				
7.	Formative assessment actively involves students in the assessment process				
8.	Formative assessment identifies and bridges gaps in students' learning				
9.	Formative assessment prepares and makes students confident for their final examinations				
10.	Formative assessment reduces memorization of concepts				
11.	Formative assessment is carried out on daily basis				
12.	Formative assessment is used to compare students' performance with one another				
13.	Formative assessment takes place while lesson is ongoing				
14.	Formative assessment involves any activity used to elicit evidence of students' learning				
15.	Formative assessment shows direction of students' work in relation to learning goals				
16.	Formative assessment occurs when assessment data are actually used to adjust instruction or inform teaching and learning				
17.	Formative assessment improves every student's achievement				

SECTION C: Teachers' classroom formative assessment practices

How often do you carry out the following activities during a lesson as part of your formative assessment practices?

Please indicate by ticking [√] how regularly you practice the following formative assessment activities in your lesson, using the following scale categories: Very Often, Often, Not Often and Never.

No.	**Sharing Learning Intentions and Success Criteria**	**Very often**	**often**	**Not often**	**Never**
	Item/practice				
1.	I share learning intentions and success criteria with my students				
	I clearly communicate learning intentions and objectives to my students at the start of every lesson.				
	I refer to the learning intentions and success criteria throughout my lesson delivery				
	I involve students in the development and use of rubrics				
	I share rubrics with students prior to				

	assessment				
	I provide examples of quality work that shows the standards required during assessment				
	I assess using rubrics aligned explicitly with learning intentions				
	I give opportunities for students to study the criteria by which their work will be evaluated				
	My students use success criteria to judge one another's work				
	Questioning	**Very often**	**often**	**Not often**	**Never**
1.	Questioning is my main assessment tool during my instructional delivery				
2.	I plan, design questions and questioning practice for my lessons				
3.	I allow long waiting time during questioning to engage every student in answering				
4.	I use follow-up questions to ensure students understanding of concepts				
5.	I ask questions to determine how well students have understood a material (concept) taught				
6.	I ask questions to engineer a general classroom discussion				
7.	I encourage every student to ask questions				
8.	I call upon individual students at random to answer questions				
9.	I ask questions of students I think would be more likely to respond well				
10	I allow reflection on questions and students' answers				
11	I ask questions of the class as a whole				
12	I use closed questions to assess my students' learning				
13	I use open questions to assess my students' learning				
14	I use mixed questions type in my classroom				
	Formative Feedback	**Very often**	**Often**	**Not often**	**Never**
1.	I provide feedback in the form of				

	grades or marks on students' work				
2.	I provide general written comments on students' response papers				
3.	I give oral feedback to the entire students of a class				
4.	I provide oral feedback to students in groups				
5.	I provide feedback that identifies students' strengths and weaknesses				
6.	I provide judgmental feedback on students' work				
7.	I conference with individual students to give them feedback/ I provide teacher-student dialogue to give feedback				
8.	I use praises to express my approval for satisfactory performance				
9.	I provide detailed correct answers after each assessment task				
10.	My feedback suggests to students how to improve their learning				
11.	I give descriptive feedback that focuses on the process and product of learning				
12.	I link feedback to learning intentions and success criteria/assessment rubric				
	Self – assessment	**Very often**	**Often**	**Not often**	**Never**
1.	I give opportunities to my students to assess their own work				
2.	I get students to suggest ways in which they can improve upon their own work				
3.	My lesson plans provide time for student reflection on their individual work.				
4.	I do allow students to assign marks to themselves				
5.	I educate my students on self – assessment skills				
6.	I share rubrics with my students to enable them assess their own work				
	Peer Assessment	**Very often**	**Often**	**Not often**	**Never**
1.	I provide opportunities for my students to assess one another's work				

2.	I advise students to assess others' work against learning objectives				
3.	I encourage collaboration among students in their learning process				
4.	I get one student to help another				
5.	I do allow students to assign marks to their peers' work				
6.	I educate my students on peer assessment skills				
7.	I engage my students in group discussion and oral presentations				
8.	I allow peer-to-peer questions and dialogue/discussion				
9.	I allow students to comment on their peers' answers				
	Formative use of summative test	**Very often**	**Often**	**Not often**	**Never**
1.	I ask my students to use past examination questions to identify areas that they have weaknesses				
2.	I involve students in generating and answering their own questions				
3.	I ask my students to re-work past examination questions				
	Integrating Formative Assessment Data into Instructional Decisions. For what purpose do you use formative assessment data?				
1.	To plan what to teach next (to guide my next steps in instruction)				
2.	To modify my instructional strategies when a student does not perform well in a test or assessment				
3.	I modify my instructional strategies on the spot while teaching when a student or group of students do not seem to understand				
4.	To enable me grade my students				
5.	To identify errors in students' learning				
6.	To conduct remedial lessons for the class				
7.	To make instructional decisions				
8.	I use formative assessment results to prepare my lesson plans and learning goals				

9.	To record and monitor students' learning				
10.	To plan curriculum and assessment				
11.	To judge the effectiveness of teaching and learning				
12.	To modify ongoing teaching of students				
13.	I make little use of formative assessment data in my teaching				
14.	To identify students' prior knowledge of subject matter				
15.	To diagnose students' weaknesses				

SECTION D: Formative Assessment classroom techniques

How often do you employ the following assessment techniques to gather evidence about students' learning?

Please indicate your level of practice with a tick [√], using the following scale categories: Very Often, Often, Not Often and Never

No	Assessment technique	Very often	Often	Not often	Never
1.	Oral questioning				
2.	Oral tests/examinations				
3.	Written tests (eg. Class tests, dictations etc)				
4.	End of unit tests				
5.	Weekly tests				
6.	Monthly tests				
7.	Mid-term tests				
8.	Recap exercises				
9.	Graded quizzes				
10.	Ungraded quizzes				
11.	Homework assignments				
12.	Questionnaire				
13.	Interviews				
14.	Projects				
15.	End of term examinations				
16.	End of year examinations				
17.	Use of reflective journals				
18.	Oral presentations				
19.	Group assignments				
20.	Practical works/tests/exercises				
21.	Checklist				
22.	Observation of students at work				
23.	Concept mapping				

24.	Portfolios				
25.	Rubrics				
26.	Scaffolding				
27.	Drama				
28.	Role play				
29.	Classroom dialogue				
30.	Class participation				
31.	Admit slips				
32.	Exit slips				

SECTION E: Challenges in formative assessment implementation process

What challenges do you face in implementing formative assessment in your classroom? Please Tick [√] "**Yes**" to indicate it as a challenge and "**No**" as its not being a challenge you face in the classroom.

No	Challenges	Yes	No
1.	Large class size (large enrolment)		
2.	Many number of teaching periods per week/increase workload		
3.	Lack of instructional materials/resources (textbooks, lab equipment, etc.)		
4.	Inadequate teacher knowledge and skills in formative assessment practices		
5.	Insufficient instructional time		
6.	Difficulty in preparing lesson plans based on formative assessment data		
7.	Teaching of multiple subjects		
8.	Examination oriented-culture/Impact of summative assessments (e.g. WASSCE)		
9.	Efficiency of a teacher being measured by the number of students who pass his/her subject in external examinations		
10.	Lack of formal professional development activities such as pre-service courses		
11.	Lack of professional development activities such as in-service training		
12.	Lack of assessment materials		
13.	Lack of support from administration		
14.	Lack of school assessment policy		
15.	Much material to cover in syllabus		
16.	Students lack self and peer assessment skills		
17.	Formative assessment is time consuming		
18.	Formative assessment is labour intensive		
19.	Difficulty in conducting remedial lessons for the class (es)		
20.	Difficulty in adapting to new ideas such as formative		

	assessment		
21.	Insufficient time for test item construction		
22.	Difficulty in test item construction		
23.	Difficulty in scoring/marking		
24.	Difficulty in interpreting test scores		
25.	Formative assessment practices interfere with teaching		
26.	Formative assessment data are not valid and reliable		
27.	Poor attitudes of students towards formative assessment practices		
28.	Truancy/absenteeism on the part of students		
29.	Students do not use formative feedback to improve learning		
30.	Poor supervision of teachers		
31.	Poor working conditions of teachers (e.g. lack of motivation)		

Thank you for your contribution to this research work.

APPENDIX B

UNIVERSITY OF CAPE COAST
DEPARTMENT OF EDUCATION AND PSYCHOLOGY
SEMI-STRUCTURED INTERVIEW GUIDE

Dear Respondent,

I would be very grateful if you could find time to be interviewed to assist with information in completing a research which involves a mixed method design. The purpose of this interview is to obtain information for a study that investigates the formative assessment practices of teachers in the Senior High Schools. You are kindly requested to participate in the interview and provide your responses as frankly and honestly as possible. Your responses to the items in this interview guide are invaluable in conducting the research. The interview would be conducted **anonymously** and your responses would be treated confidentially. All information provided is purely for research purposes. The interviews will be audio recorded for onward transcription and analysis. There is no risk associated with participating in this research. This research is in no way connected to your efficiency. By participating, you are contributing to research to improve the practice of formative assessment and to improve upon the quality of education in general.

Introduction

1. Please tell me the subject(s) you teach and how many years you have been teaching at the senior high school level.

KEY QUESTIONS

2. Do you think teachers understand the practice of formative assessment in the classroom?
3. Have you ever received any training (coursework/pre-service, in-service/seminar/workshop) in formative assessment?
4. What does formative assessment mean to you?
5. In practicing formative assessment in your classroom, what do you do?
6. In your classroom, do you share learning intentions and success criteria with your students?
7. For what purpose do you use questioning in your classroom?
8. How do you communicate feedback about students' learning to the students?
9. Do you practice self-assessment in your classroom?/Do you give opportunities to your students to assess their own work?
10. Do you practice peer assessment in your classroom?/Do you give opportunities to your students to assess one another's work?
11. For what purpose do you use formative assessment data in the classroom?
12. What formative assessment techniques do you employ in gathering evidence about your students' learning?
13. What challenges do you face in implementing formative assessment in your classroom?

Closing

14. Suggest any way(s) of improving formative assessment practice in the classroom?

APPENDIX C

LESSON OBSERVATION GUIDE

Section A: School and classroom details

Date of observation …….

Name of School……

Time of observation: Start …… End……

Number of teaching periods per week …….

Number of students in class ……: Boys …… Girls ……

Number of students absent ……..

Classroom space: Crowded [ ] or adequate room [ ]

Teacher bio-data

Teacher's gender: Male [ ] Female [ ]

Teacher professional status/Qualifications: Trained [ ] Untrained [ ]

Number of years of teaching experience at the SHS level ……

Trained in formative assessment: Yes [ ] No [ ]

Section B: Lesson plan

Topic……

……

Objective(s) stated: Yes [ ] No [ ]

Comments

……

……

……

Section C: Description of lesson delivery

1. Sharing learning intentions and success criteria with learners

Observation(s)

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2. Questioning
Observation(s)

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3. Formative feedback
Observation(s)

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4. Self-assessment
Observation(s)

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5. Peer assessment
Observation(s)

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6. Formative Assessment Techniques used by the teacher during the lesson
Observation(s)

……

……

7. Integrating formative assessment data into instruction
Observation(s)

……

……

……

……

8. Challenges in formative assessment implementation process in the classroom
Observation(s)

……

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……

……

……

……

APPENDIX D

INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF EDUCATIONAL FOUNDATIONS
DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Telephone: 233-3321-32440/4 & 32480/3
Direct: 033 20 91697
Fax: 03321-30184
Telex: 2552, UCC, GH.
Telegram & Cables: University, Cape Coast
Email: edufound@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref:

Your Ref:

12th April, 2018

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

THESIS WORK
LETTER OF INTRODUCTION
MR. SONGNALLE SAURI

We introduce to you Mr. Sauri, a student from the University of Cape Coast, Department of Education and Psychology. He is pursuing Master of Philosophy degree in Measurement and Evaluation is currently at the thesis stage.

Mr. Sauri is researching on the topic:

"Formative Assessment Practices of Senior High School Teachers in Ghana: A Mixed Method Study".

We would be grateful if he is given all the needed assistance toward this necessary academic exercise. Please, any information provided will be treated as strictly confidential.

Thank you.

Yours faithfully,

Theophilus A. Fiadzomor **(Mr)**
Senior Administrative Assistant
For: **HEAD**

APPENDIX E

ETHICAL CLEARANCE

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
ETHICAL REVIEW BOARD

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref: CES/ERB/ucc.edu/V2/18-42
Your Ref: .....

Date: Jan 21, 2018

Dear Sir/Madam,

ETHICAL REQUIREMENTS CLEARANCE FOR RESEARCH STUDY

The bearer, Sauri Songnalle ....., Reg. No ED/MEP/16/0004 is an M.Phil. / ~~Ph.D.~~ student in the Department of Education and Psychology ..... in the College of Education Studies, University of Cape Coast, Cape Coast, Ghana. He ~~/She~~ wishes to undertake a research study on the topic:

Formative assessment practices of Senior High School teachers in Ghana
.....

The Ethical Review Board (ERB) of the College of Education Studies (CES) has assessed his~~/her~~ proposal and confirm that the proposal satisfies the College's ethical requirements for the conduct of the study.

In view of the above, the researcher has been cleared and given approval to commence his~~/her~~ study. The ERB would be grateful if you would give him~~/her~~ the necessary assistance to facilitate the conduct of the said research.

Thank you.
Yours faithfully,

Prof. Linda Dzama Forde
(Secretary, CES-ERB)

Chairman, CES-ERB
Prof. J. A. Omotosho
jomotosho@ucc.edu.gh
0243784739

Vice-Chairman, CES-ERB
Prof. K. Edjah
kedjah@ucc.edu.gh
0244742357

Secretary, CES-ERB
Prof. Linda Dzama Forde
lforde@ucc.edu.gh
0244786680

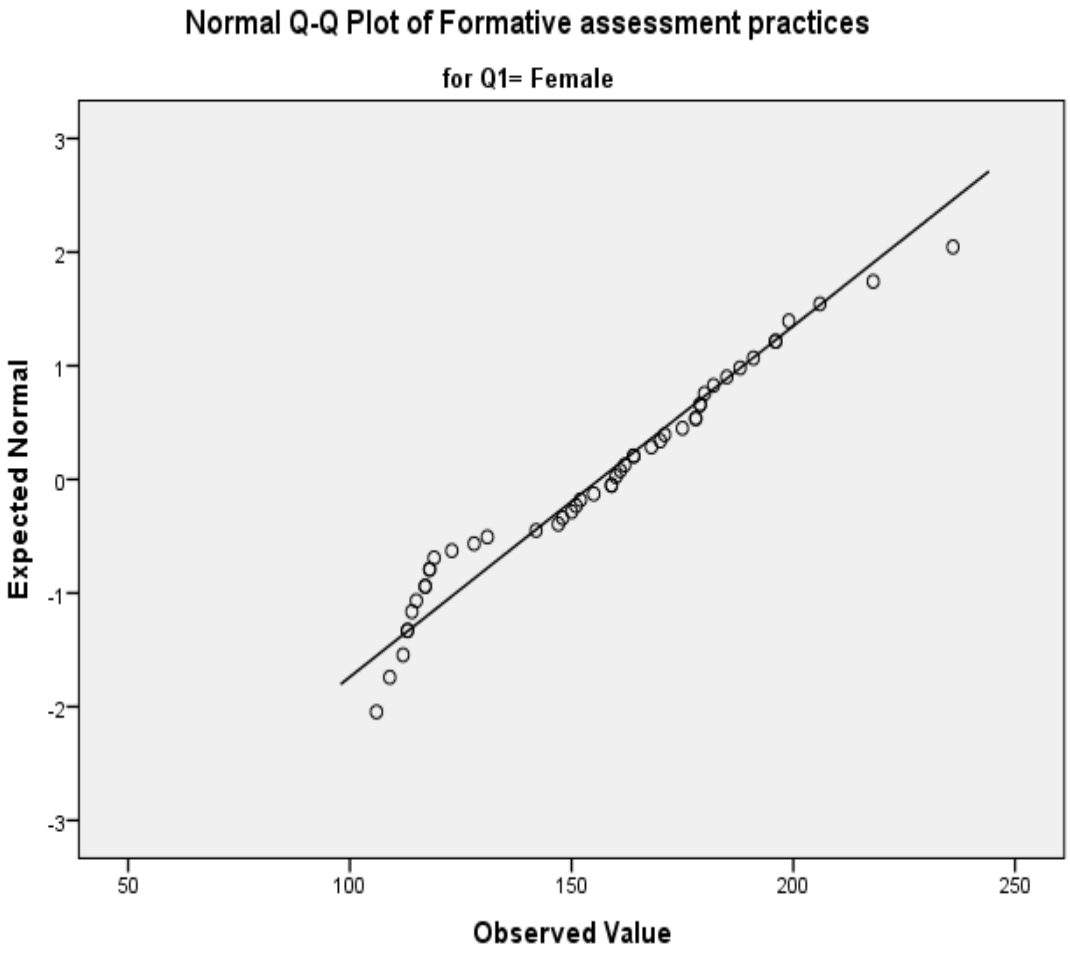
APPENDIX F

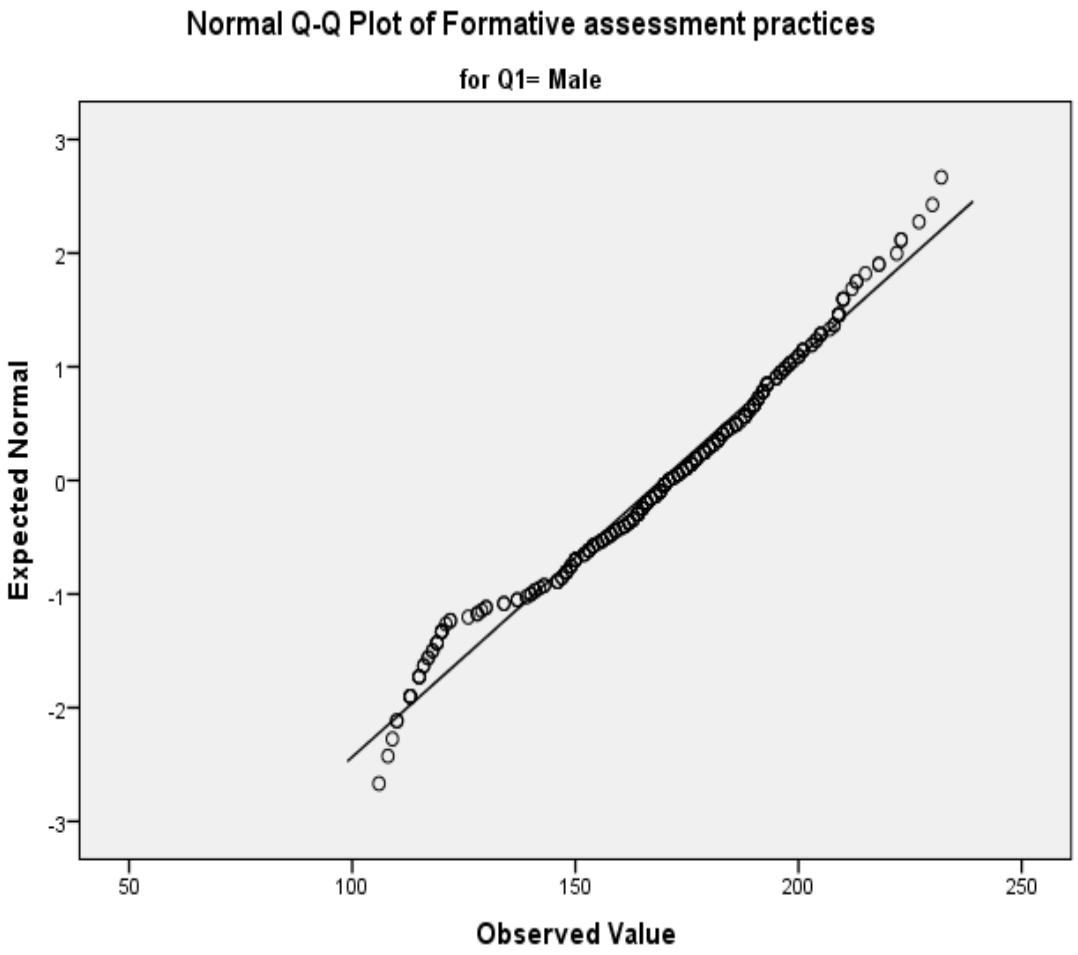
ASSUMPTIONS

Tests of Normality

	Gender	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Formative assessment practices	Female	.125	48	.058	.954	48	.057
	Male	.063	261	.015	.976	261	.000

a. Lilliefors Significance Correction





Test of Homogeneity of Variances

Formative assessment practices

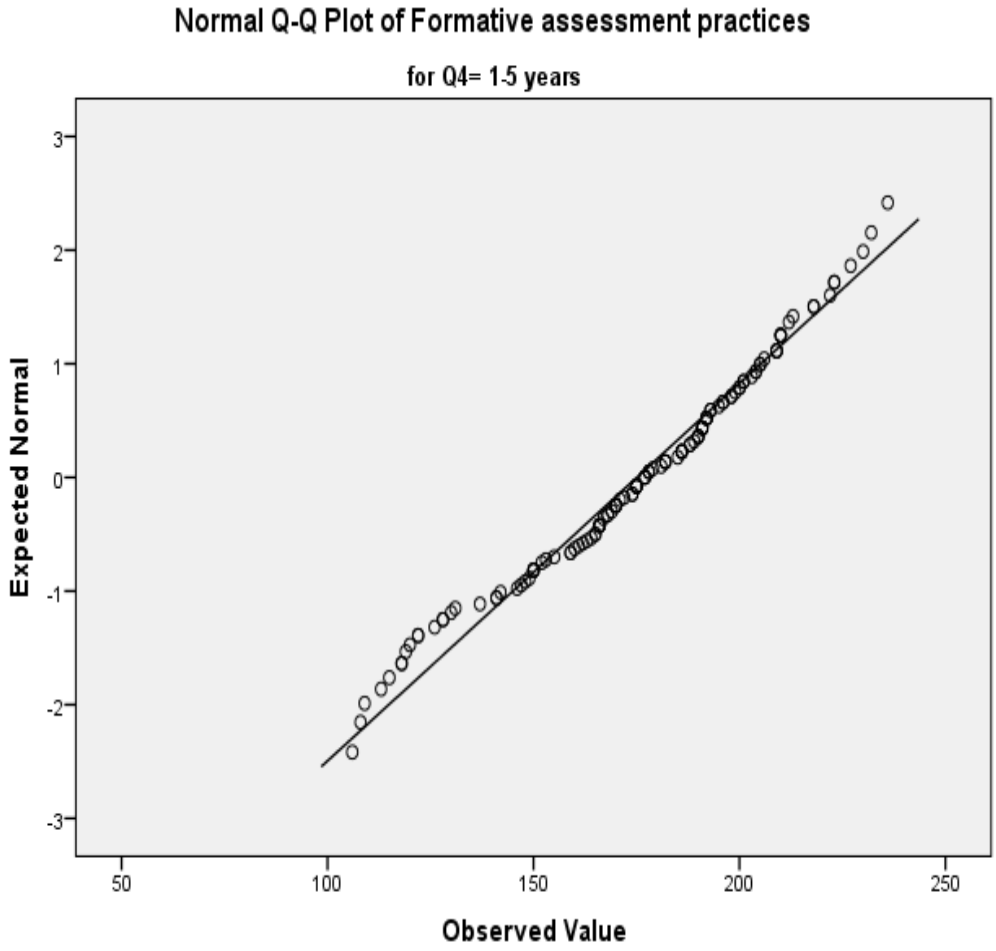
Levene Statistic	df1	df2	Sig.
2.025	1	307	.156

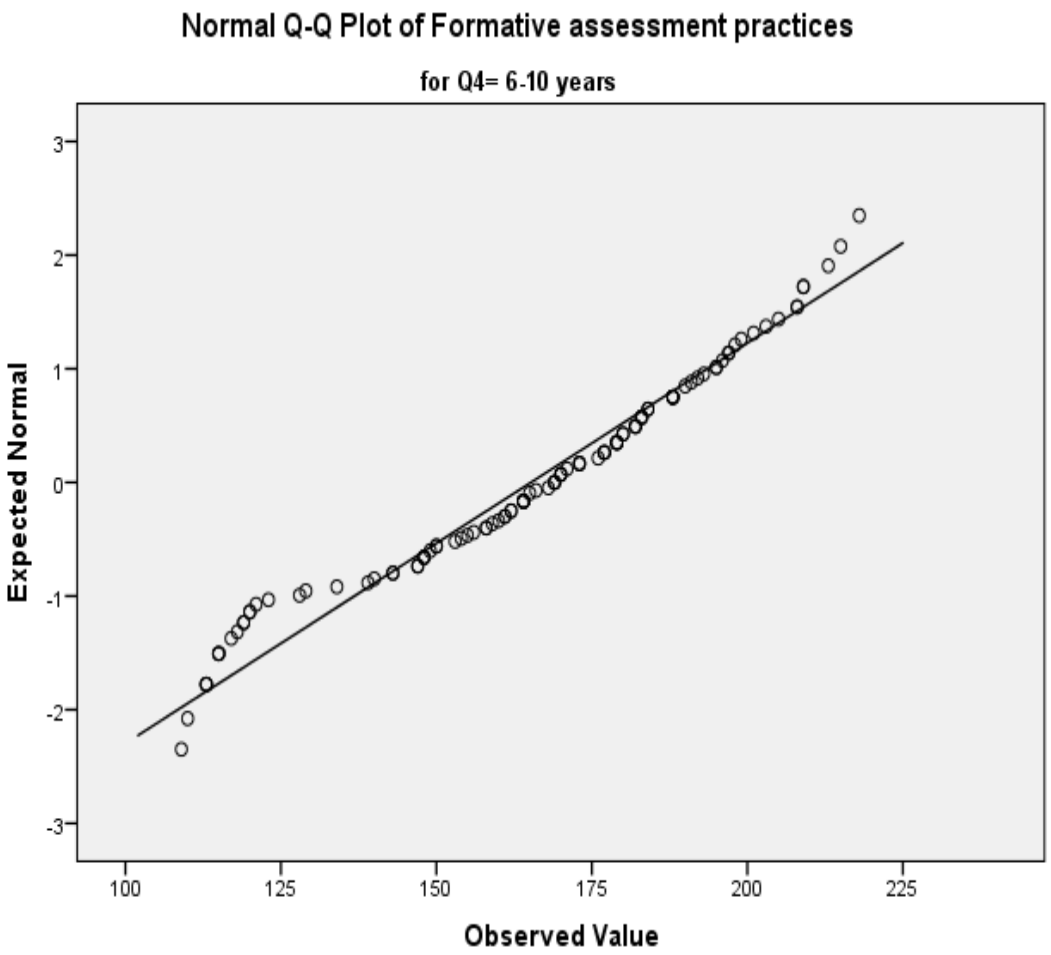
Tests of Normality

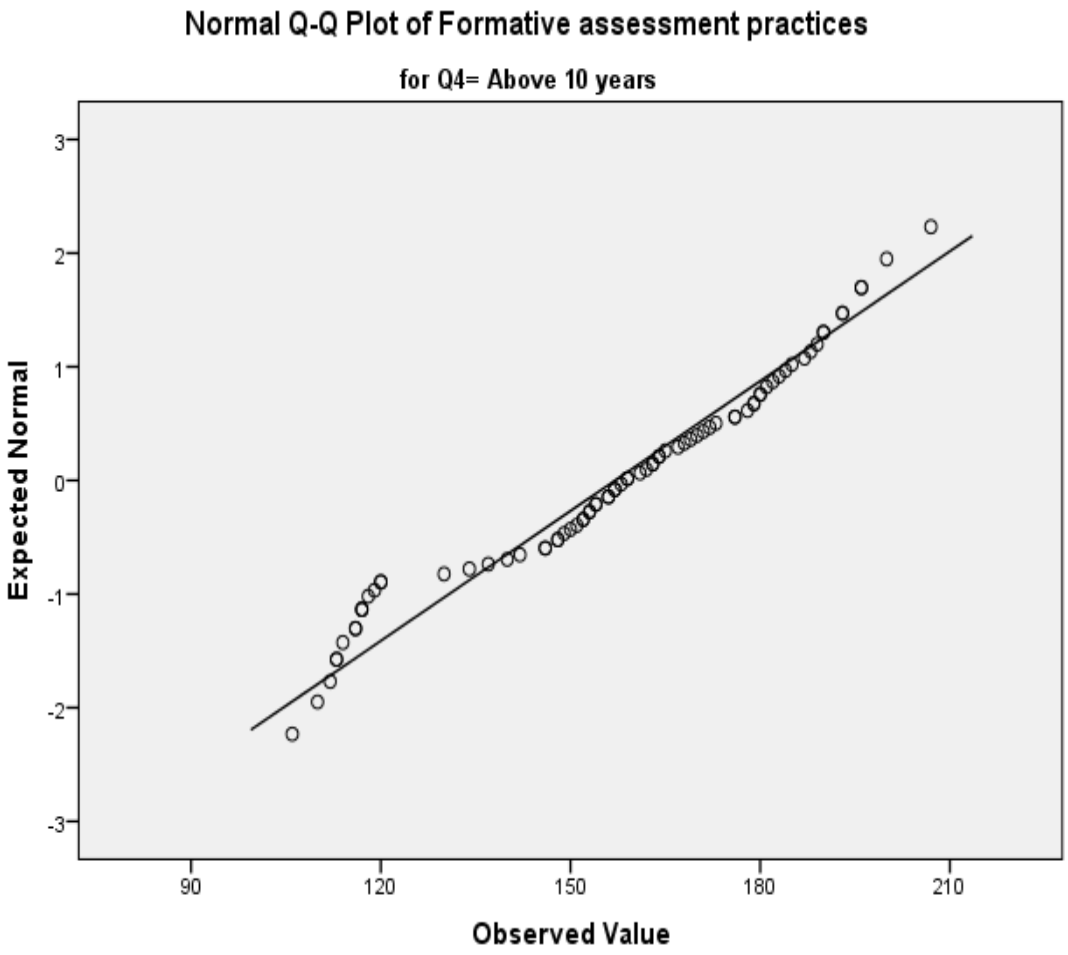
	Years of teaching experience at the SHS Level	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Formative assessment practices	1-5 years	.069	127	.200*	.975	127	.019
	6-10 years	.084	105	.066	.959	105	.003
	Above 10 years	.116	77	.012	.952	77	.006

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction







Test of Homogeneity of Variances

Formative assessment practices

Levene Statistic	df1	df2	Sig.
.656	2	306	.520

APPENDIX G

RELIABILITY

Reliability Statistics

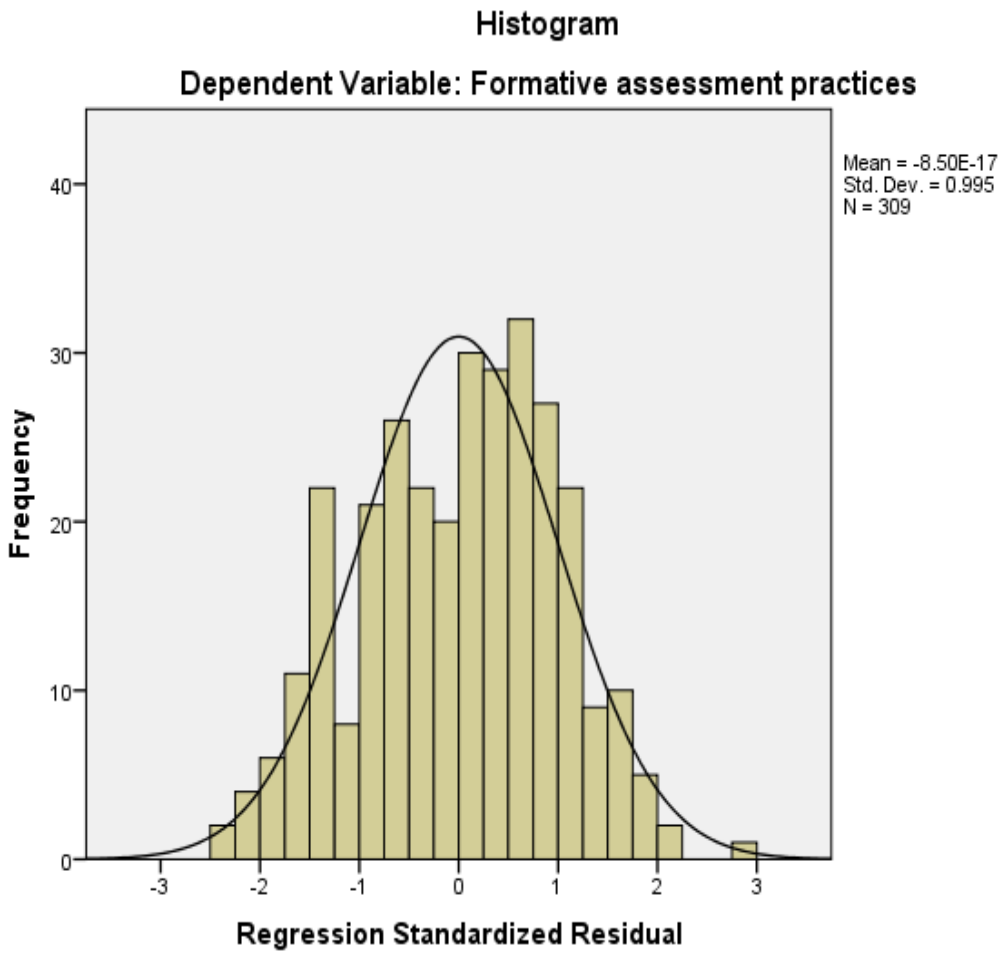
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.820	.946	150

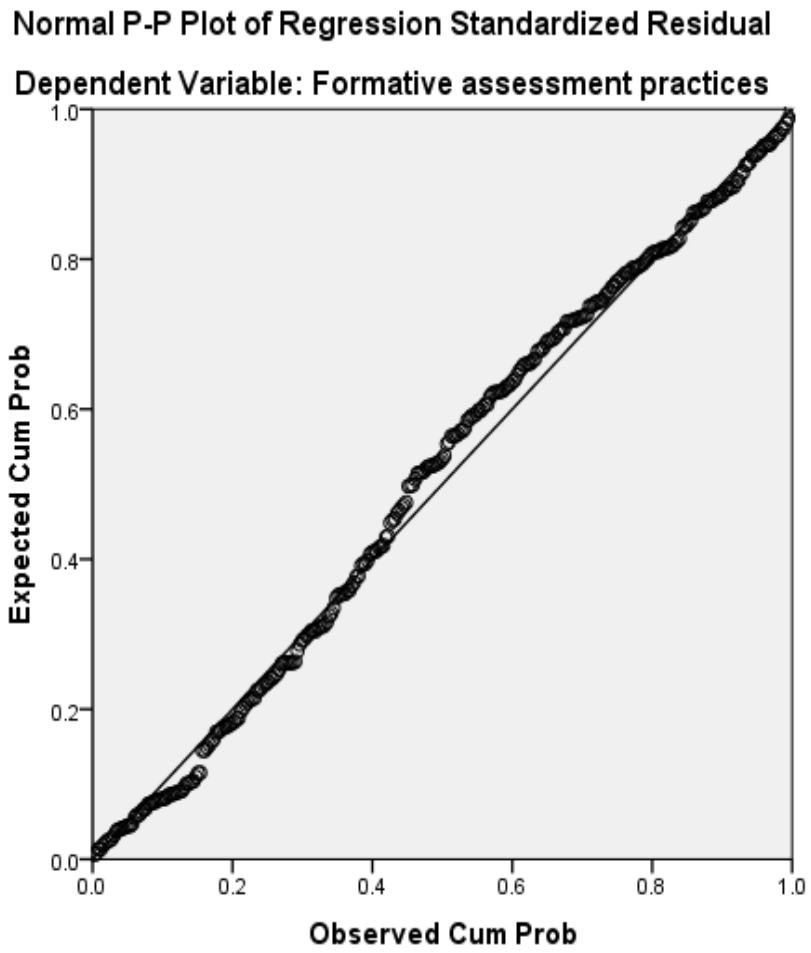
APPENDIX H

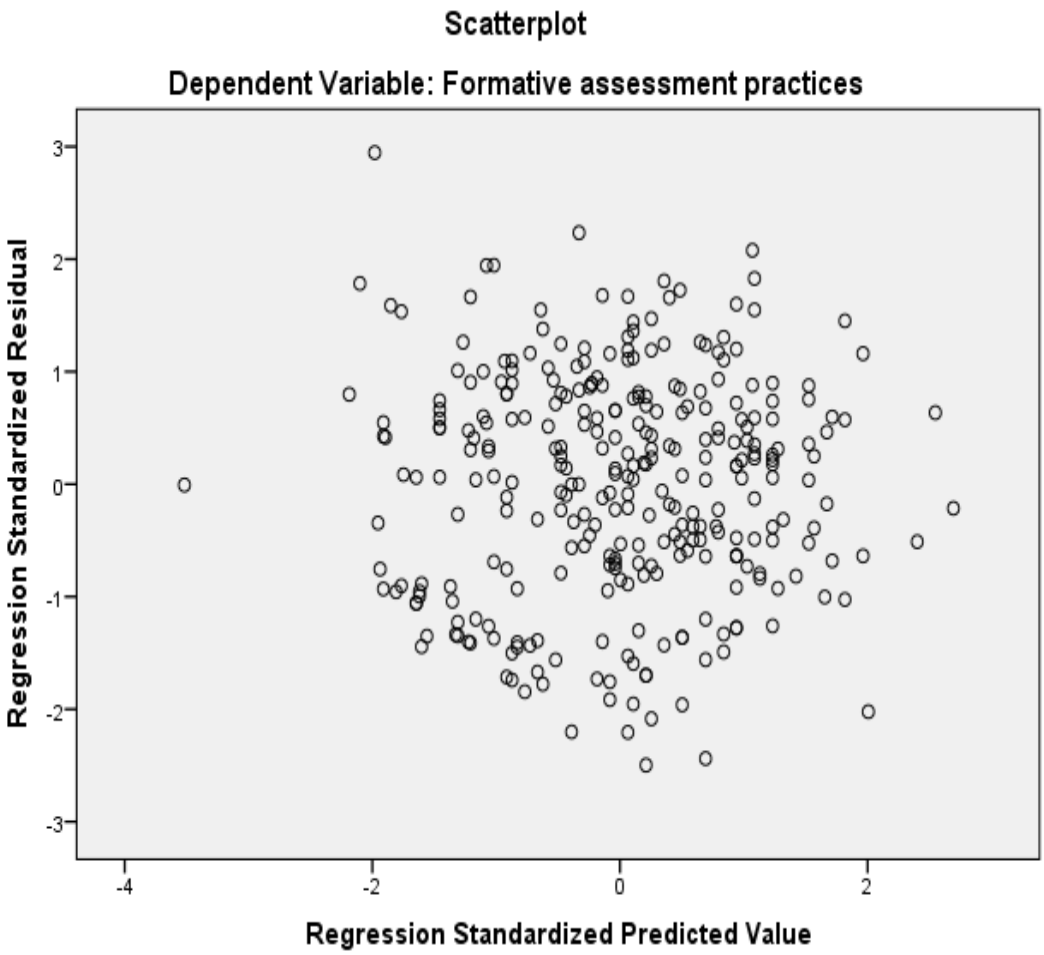
ASSUMPTIONS

Correlations

		Formative assessment practices	Gender	Years of teaching experience at the SHS Level	Teachers' knowledge in formative assessment practices
Pearson Correlation	Formative assessment practices	1.000	.160	-.247	.471
	Gender	.160	1.000	.081	.141
	Years of teaching experience at the SHS Level	-.247	.081	1.000	-.060
	Teachers' knowledge in formative assessment practices	.471	.141	-.060	1.000
Sig. (1-tailed)	Formative assessment practices	.	.002	.000	.000
	Gender	.002	.	.077	.006
	Years of teaching experience at the SHS Level	.000	.077	.	.147
	Teachers' knowledge in formative assessment practices	.000	.006	.147	.
N	Formative assessment practices	309	309	309	309
	Gender	309	309	309	309
	Years of teaching experience at the SHS Level	309	309	309	309
	Teachers' knowlwdge in formative assessment practices	309	309	309	309







APPENDIX I

CODING SCHEME

Main themes	Sub themes	Categories of codes	Examples of patterns of response
SHS teachers' knowledge of formative assessment		Formative assessment knowledge	Formative assessment is about a teacher conducting a number or series of tests at regular intervals or continuously or let's say frequently with the main purpose of evaluating student performance in the classroom **Respondent 1** It (formative assessment) means judging the quality of a student's achievement after the instructional process **Respondent 2**
SHS teachers' formative assessment practices	Sharing learning intentions and success criteria with students	Not sharing learning intentions	I don't normally share learning intentions with the students. The intentions are only known to me, so when I enter the classroom, I only start teaching and at the end of it all, I have my own ways of finding out whether I have achieved my learning intentions or not. But, I don't disclose the learning intentions to the students before the learning begins **Respondent 6** I normally don't share it with the students, so I don't share my lesson intentions with my students **Respondent 1**
	Questioning	To assess students' understanding of a lesson	I use questioning a lot to find out whether the students follow the lesson. ... Based on the responses and answers given by the students, I can judge whether the class is following the lesson or not **Respondent 1**
		Ask questions 'on the fly'	I frame my questions while I am teaching based on the lesson, so I don't plan my questions in advance before my lessons and when I ask

			the questions, I expect immediate responses from the students to enable me continue the lesson without wasting time **Respondent 1**
	Formative feedback	Scores/marks/praises	… I am able to communicate feedback about student learning to students through the scoring of my students work. I score their work when I give them a test or any assignment for them to at least know what they have done. Apart from scoring their work, I also use praises such as well done, that is right, very good, to communicate feedback about student learning to students **Respondent 4**
		For grading	… 30% of the formative assessment data is added to the end- of-term exam mark for grading the student **Respondent 1**
		No dialogic feedback	I don't conference with individual students to provide feedback because of the large class sizes **Respondent 1**
	Self-Assessment	No self-assessment practice	In my classroom I do not practice self- assessment **Respondent 5**
	Peer assessment	Asking students to score/mark each other's written work	To an extent I do, usually when I conduct class tests or class exercises in each class I ask them to exchange their books and mark because of the large class size **Respondent 3**
	Integrating assessment data into instruction	For grading	I use the marks in grading my students. Most at times I use it in grading my students **Respondent 4** I use the data always to grade my students **Respondent 1** You know the main purpose is to use it to grade my students at the end of the term or the academic year **Respondent 3**
Formative assessment techniques used		Formative assessment techniques	Very often I use midterm test in gathering evidence about student learning, I also use class test or class exercises at the end of the instructional process **Respondent 3**

by SHS teachers			I most at times use the mid-term test; I also use the end-of-term test and sometimes end-of-topic test. Apart from the tests, I use oral questioning to assess students learning **Respondent 4** I mostly use the mid-term tests **Respondent 5**
Challenges teachers face in implementing formative assessment in the classroom			
	Inadequate Knowledge	Inadequate knowledge/understanding	I don't actually have adequate knowledge or understanding of how this formative assessment practice should be carried out in the classroom because it is when a teacher understands it and have adequate knowledge of it that you can appreciate and practice it **Respondent 1** I don't have adequate knowledge in practicing it (formative assessment). It is confusing, so now that I don't understand it well, how do I practice it? **Respondent 3**
	Large class size	Large enrolment	Large class size also makes it (formative assessment) difficult to practice **Respondent 1** The large class sizes even makes it (formative assessment) very difficult to practice **Respondent 3**
	Inadequate supply of assessment materials	Inadequate supply of assessment materials	I face a number of challenges, number one is inadequate resources, I mean here, stationery, probably I want to conduct class test that will be typed and printed, I may want to conduct midterm test, I want to conduct a take home test and I want everything to be typed and printed. Some time, you will be told there's no paper, there is no ink **Respondent 5** … another serious concern is inadequate supply of assessment materials Respondent 3
	Examination-oriented culture	Impact of summative assessment	If you concentrate on practicing formative assessment and your students fail at the WASSCE, you will be queried by school authorities,

			so I teach for my students to pass WASSCE **Respondent 1**
	Time constraints	Time constraints	The time is not always enough for formative assessment practices to be followed in the classroom **Respondent 4** Again, there is no time to practice it **Respondent 1** If i have to practice formative assessment i would not have enough time to cover the syllabus .. **Respondent 3**
	Time consuming	Time consuming	… it (formative assessment) is time consuming **Respondent 1** If you have to follow all the formative assessment practices, it will take a lot of time in the classroom **Respondent 4**
	Interfere with teaching	Interfere with teaching	… and therefore it(formative assessment) interferes with teaching **Respondent 1**
	More materials to cover in the syllabus	Extensive nature of the syllabus	The major challenge is the extensive nature of the syllabus, the syllabus is largely extensive, teachers are usually in a haste to finish their syllabus to the extent that they don't have time for 'all these things' (formative assessment practices) …. The syllabus is too vast, which puts a lot of pressure on the teachers to the extent that you intend to cover more grounds whether the students understand or not **Respondent 6** **…** the content of the syllabus that I have to even cover is much, the content is too much **Respondent 3**
	Difficulty in marking/scoring	Difficulty in marking/scoring	I have so many students in each of the classes I teach so even if I give one class exercise marking becomes a headache **Respondent 3**
	Poor working condition	Lack of motivation	The working condition of the teacher too is very bad. For instance, it is not motivating, teaching learning resources are lacking, teaching so many subjects or even many periods **Respondent 3**

APPENDIX J

DISCRIPTIVE STATISTICS OF THE PREVALENT FORMATIVE ASSESSMENT PRACTICE OF SHS TEACHERS

Statements	Freq.	Mean	Std. Dev
Sharing learning intentions and success criteria			
I share learning intentions and success criteria with my students	309	2.42	.98
I clearly communicate learning intentions and objectives to my students at the start of every lesson	309	2.41	1.0
I refer to the learning intentions and success criteria throughout my lesson delivery	309	1.97	.93
I involve students in the development and use of rubrics	309	2.02	.93
I share rubrics with students prior to assessment	309	2.28	.97
I provide examples of quality work that shows the standards required during assessment	309	2.22	.98
I assess using rubrics aligned explicitly with learning intentions	309	2.41	.87
I give opportunities for students to study the criteria by which their work will be evaluated	309	2.06	.92
My students use success criteria to judge one another's work Formative assessment reduces memorisation of concepts	309	2.37	.91
Overall mean		**2.24**	
Questioning			
Questioning is my main assessment tool during my instructional delivery	309	3.26	.75
I plan, design questions and questioning practice for my lessons	309	2.33	1.0

I allow long waiting time during questioning to engage every student in answering	309	2.08	.99
I use follow-up questions to ensure students understanding of concepts	309	3.21	.82
I ask questions to determine how well students have understood a material (concept) taught	309	3.37	.76
I ask questions to engineer a general classroom discussion	309	2.34	.93
I encourage every student to ask questions	309	3.40	.73
I call upon individual students at random to answer questions	309	3.24	.87
I ask questions of students I think would be more likely to respond well	309	2.50	.90
I allow reflection on questions and students' answers	309	2.46	.98
I ask questions of the class as a whole	309	2.95	.84
I use closed questions to assess my students' learning	309	2.76	.80
I use open questions to assess my students' learning	309	2.48	.94
I use mixed questions type in my classroom	309	2.42	1.0
Overall mean		**2.53**	
Formative Feedback			
I provide feedback in the form of grades or marks on students' work	309	3.30	.93
I provide general written comments on students' response papers	309	2.81	.89
I give oral feedback to the entire students of a class	309	2.63	1.0
I provide oral feedback to students in groups	309	1.86	.87
I provide written feedback that identifies students' strengths and weaknesses	309	2.31	.92

I provide judgmental feedback on students' work	309	2.76	.87
I conference with individual students to give them feedback/ I provide teacher-student dialogue to give feedback	309	1.45	.78
I use praises to express my approval for satisfactory performance	309	3.25	.85
I provide detailed correct answers after each assessment task	309	3.28	.80
My feedback suggests to students how to improve their learning	309	2.75	.94
I give written descriptive feedback that focuses on the process and product of learning	309	2.41	.97
I link feedback to learning intentions and success criteria/assessment rubric	309	2.37	.92
Overall mean		**2.60**	
Self-assessment			
I give opportunities to my students to assess their own work	309	1.91	.89
I get students to suggest ways in which they can improve upon their own work	309	2.27	.87
My lesson plans provide time for student reflection on their individual work	309	2.02	1.0
I do allow students to assign marks to themselves	309	2.27	1.0
I educate my students on self– assessment skills	309	1.91	.88
I share rubrics with my students to enable them assess their own work	309	2.25	.90
Overall mean		**2.11**	
Peer assessment			
I provide opportunities for my students to assess one another's work	309	2.22	.88

I advise students to assess others' work against learning objectives	309	1.99	.85
I encourage collaboration among students in their learning process	309	3.01	.83
I get one student to help another	309	2.47	.95
I do allow students to assign marks to their peers' work	309	3.10	.86
I educate my students on peer assessment skills	309	1.95	.90
I engage my students in group discussion and oral presentations	309	2.55	.97
I allow peer-to-peer questions and dialogue/discussion	309	2.39	.93
I allow students to comment on their peers' answers	309	2.08	1.0
Overall mean		**2.42**	
Formative use of summative test			
I ask my students to use past examination questions to identify areas that they have weaknesses	309	2.61	1.0
I involve students in generating and answering their own questions	309	2.08	.93
I ask my students to re-work past examination questions	309	2.28	.91
Overall mean		**2.32**	
The purpose of using formative assessment data (integrating formatting assessment data into instructional decisions)			
To plan what to teach next (to guide my next steps in instruction)	309	2.20	.94
To modify my instructional strategies when a student does not perform well in a test or assessment	309	2.24	.92

I modify my instructional strategies on the spot while teaching when a student or group of students do not seem to understand	309	2.23	.97
To enable me grade my students	309	2.98	.78
To identify errors in students' learning	309	2.52	.80
To conduct remedial lessons for the class	309	2.04	.94
To make instructional decisions	309	2.34	1.0
I use formative assessment results to prepare my lesson plans and learning goals	309	1.94	.92
To record and monitor students' learning	309	2.70	.98
To plan curriculum and assessment	309	2.01	.93
To judge the effectiveness of teaching and learning	309	2.66	.92
To modify ongoing teaching of students	309	2.29	.93
I make little use of formative assessment data in my teaching	309	2.50	.95
To identify students' prior knowledge of subject matter	309	2.58	.93
To diagnose students' weaknesses	309	2.54	.90
Overall mean		**2.38**	

Source: Field survey (2018)

APPENDIX K

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD

INFORMED CONSENT FORM

Title of Study: Formative assessment practices of senior high school teachers in the Upper West Region of Ghana.

General Information of the study

The purpose of this research is to explore the formative assessment practices of senior high school teachers in Ghana. Specifically, the research seeks to examine the level of senior high schools teachers' knowledge in formative assessment practices; explore the prevalent formative assessment practice of senior high school teachers; explore the formative assessment techniques used by senior high school teachers; identify the challenges senior high schools teachers face in implementing formative assessment practices in their classrooms; identify differences in formative assessment practices between female and male teachers; identify the difference in teachers' formative assessment practices in relation to their years of teaching experience; and identify the contribution of senior high school teachers' formative assessment knowledge, years of teaching experience and gender to formative assessment practices.

Your agreement to participate in this research will involve responding to some carefully developed questionnaire, responding to an interview session or permitting the researcher to observe your lesson delivery in the natural classroom setting. In particular, participation time for the questionnaire will take between 13 and 18 minutes which can only be considered complete if you

are able to provide answers to all the questions posed; the interview session will last between 14 and 44 minutes and the lesson observation session will last for 2 hours per session (twice per participant).

Likely Risk and Discomforts

Since some questions in both the questionnaire and semi-structured interview guide will be posed regarding your immediate classroom assessment practices, there will be the likelihood that these questions might pose some discomforts. Also, another likely discomfort may occur as the interview sessions will be audio-taped to facilitate easy transcription and maintenance of originality. Again, observing your lesson as you deliver in the classroom may cause yet another discomfort. In addition, the minutes that have been stipulated for responding to the questions in both the questionnaire and semi-structured interview guide can prevent you from having time to carry out your activities.

Possible Benefits

The fundamental expectation of this research is to explore the formative assessment practices of senior high school teachers in Ghana. The results of the study will inform teacher education reform, in-service professional development programmes, capacity building efforts geared at transforming classroom assessment practices, and deepen educators' assessment understanding and improve upon educational practices in Ghana.

Confidentiality

It must be stressed that, in the conduct of the research, no identifiable information of respondents shall be included in any part of the reports of the research. Respondents are assured that the information they give are strictly

for research purposes. So, the questionnaire, semi-structured interview guide and lesson observation guide will exclude any identification details such as name and address of the respondent. Other forms of identifiers will be replaced with pseudonyms immediately after the interview and lesson observation data are recorded. The researcher will make tremendous efforts to safeguard the privacy and identity of respondents in the best of my ability and thus, any means used as a way to trace the identity of respondents will be used for follow-ups purposes.

Voluntary Participation

Respondents should note that participation is done on voluntary basis and under no circumstances will any respondent be compelled to participate in this research. Participation is therefore done in respondent's own will.

Right to leave the Research

Respondents have the right to withdraw or leave the research at any point in time regarding the administration of the instruments without any fear or panic for any consequence. In this regard, respondents who might show any form of physical or emotional reactions in responding to the instruments can also terminate their participation.

Voluntary Agreement

Having read thoroughly the above document which describes the benefits, risks and procedures in this research and all other relevant questions having asked and explained to me to the best of my knowledge, I agree to participate in this research.

Name: ……

Signature: …… Date: ……..

APPENDIX L

A SAMPLE OF A CODED TRANSCRIPT

Respondent 1

Interviewer: Please madam, thank you for giving me information for this research work

Respondent: You are welcome.

Interviewer: Please madam, tell me the subject you teach and how many years you have been teaching at the senior high school level.

Respondent: Well I teach social studies and I have been doing that for the past two years

Interviewer: Thank you very much madam

Interviewer: Madam, what does formative assessment mean to you?

Respondent: To me, formative assessment is about a teacher conducting a number or series of tests at regular intervals or continuously or let's s ay frequently with the main purpose of evaluating student performance in the classroom **{Formative assessment knowledge}**. The regular or series of tests include class tests, end-of-unit or topic test, weekly test, midterm test **{Formative assessment techniques}** among others. But my brother, let me be frank with you, because of large number of students in the classroom that I teach **{large enrolment},** I conduct only midterm test so that I can mark. Let me also add that apart from measuring student performance, 30% of the total score of these tests form the continuous assessment components for the term and will be added to the end of term exams score to enable the teacher grade his or her students **{for grading}**.

Interviewer: Thank you very much madam.

Interviewer: Madam, so have you ever received any training in formative assessment?

Respondent: Thank you my brother. I received some training at the university in formative assessment but I think I still need further education from it because it's like the training I received was inadequate. However, I have never, I say never received any training such as work shop, seminar on formative assessment since I started work as a teacher.

Interviewer: thank you very much madam. Madam, do you think colleague teachers understand the practice of formative assessment in the classroom?

Respondent: Well, I will say yes and No. In the sense that some teachers may understand but do not practice it, because most of us use only midterm test to grade our students.

Interviewer: Thank you very much madam.

Interviewer: Madam, so in practicing formative assessment in your classroom what do you do?

Respondent: Well, as I indicated earlier, in practicing formative assessment, I conduct a number of tests such as, midterm, class test, end of unit test or even class exercises to find out whether students are following lessons thought **{Formative assessment techniques}**. Okay sometimes I ask them to do presentations **{Formative assessment techniques}** as well.

Interviewer: Thank you very much madam.

Interviewer: So in your classroom, do you share learning intentions and success criteria with your students?

Respondent: Hmmm, I don't even prepare lesson notes, not to talk of having lesson intentions, I only prepare scheme of work which is an outline of the topics and sub-topics to be treated during the term, which I present to my HOD and assistant academic for vetting. But, I normally don't share it with the students, so I don't share my lesson intentions with my students **{Not sharing learning intentions}**. When I enter the class, I greet my students and start teaching, I don't refer to these intentions when teaching because, there is no time to waste **{time constraint}**, I need time to cover my syllabus so that students can pass their WASSCE exams **{impact of summative assessment}**. My brother, on the part of rubrics or what do you call it, I don't give my students rubrics when I assess them, the reason is simple, I mostly give them tests which I think they don't need any rubrics. Also, giving them rubrics is like indirectly giving them the answers to the questions.

Interviewer: Thank you very much madam for this information.

Interviewer: So, for what purpose do you use questioning in your classroom?

Respondent: Well, I use questioning a lot to find out whether the students follow the lesson **{To assess students' understanding of a lesson}** because I don't prepare lesson notes, I frame my questions while I am teaching based on the lesson, so I don't plan my questions in advance before my lessons **{Ask questions 'on the fly'}** and when I ask the questions, I expect immediate responses from the students to enable

me continue the lesson without wasting time **{No 'wait time'}**. Based on the responses and answers given by the students, I can judge whether the class is following the lesson or not.

Interviewer: Thank you very much madam.

Interviewer: How do you communicate feedback about your student learning to the students?

Respondent: Hmmm, when I give my students any assessment such as class test, midterm, exercises or homework, I mark and give out the books or scripts to them. When a particular student performs well, I remark good, very good as an expression of satisfaction and also to encourage them. I also praise a student who have performed well in a test or answered questions correctly and oral questions to be precise in class **{Scores/marks/praises}.** At the end of a test and after I have finished marking, I give the correct answers to the students to enable them do their corrections **{Scores/marks/praises}**. Again, as I earlier indicated, 30% of the formative assessment test is added to the end of term exam mark for grading the student {**For grading}.**

Interviewer: Thank you very much madam.

Interviewer: Madam, in providing feedback to students, do you hold conferences with students in the class to provide feedback to them?

Respondent: No sir, I don't conference with individual students to provide feedback because of the large class sizes **{No dialogic feedback}.**

Interviewer: Madam, do you practice self-assessment in your classroom?

Respondent: No please. I don't practice self-assessment in my classroom **{No self-assessment practice}.** How can you ask a student to assess him or

herself? No student wants to fail, every student wants a good grade, so the marks obtained from self-assessment will not be reliable as some will erase the wrong answers they wrote and write the right answers and mark them correct. So I don't practice it.

Interviewer: wonderful madam, so do you practice peer assessment in the classroom?

Respondent: Yes, sometimes I do allow my students to mark or score their colleagues written test or exercises when I have no time to mark them. They exchange the books and mark **{Asking students to score/mark each other's written work}** so that I can record the marks later, this reduces my work load. But, I do not allow them to make comment on their colleagues work because; they may end up making derogatory comments.

Interviewer: Thank you madam. So you said sometimes you allow the students to exchange their books and score each other, so madam do you teach these students or your students peer assessment skills?

Respondent: No, I don't teach peer assessment skills to my students. Because, I myself don't understand them, secondly I even want more time to cover my syllabus to enable my students pass their WASSCE exams **{impact of summative assessment}** which is the ultimate aim of administration and parents.

Interviewer: Wonderful madam. Madam, for what purpose do you use this formative assessment data in the classroom?

Respondent: I use the data to determine whether the student understand the lesson or understood the lessons learnt or if possible to modify my

methodology employed. However, most importantly I use the data always to grade my students **{For grading}.** As I indicated earlier 30% of the formative data will be added to 70% of the end of term to enable me grade the students **{For grading}**. My brother, the reality is that, parents or guardians and even administrators judge the performances of students at the end of sem by considering total score positions in class and the grades obtained.

Interviewer: Wonderful madam. Madam so what is your experience in planning lesson based on this formative assessment data? now that you said sometimes you use it to modify your methodology.

Respondent: My brother, I must admit the fact that this is a difficult task for me. I don't even prepare lesson notes so I have difficulty adjusting my teaching methods based on formative assessment data. Also, there is no enough time to re-teach already thought lessons. The worst of it is that, weak students you might target for the remedial lessons may not turn out for the lesson because, they don't want to be labeled as weak by their colleagues.

Interviewer: What formative assessment techniques do you then employ in gathering evidence about your student learning?

Respondent: I use tests, end-of-topic test, class exercises, homework, mid-term test **{Formative assessment techniques}** among others. But let me be honest with you my brother, because of large class size, sometimes I use only midterm test to assess my students **{Formative assessment techniques}** to make marking easier. Yes mid-term test, has always been my main assessment tool.

Interviewer: Thank you very much madam.

Interviewer: What challenges do you face in implementing formative assessment practices in the classroom?

Respondent: Hmmm, challenges you mean, I do not have to tell lies here. I don't actually have adequate knowledge or understanding of how this formative assessment practice should be carried out in the classroom because it is when a teacher understands it and have adequate knowledge of it that you can appreciate and practice it **inadequate knowledge}**. Again, large class size also makes it difficult to practice **{large enrolment}**, you can imagine if you have 61 students in the class and you teach about 7 of such classes, how do you mark scripts **{Difficulty in marking/scoring}** or control that class or attend to individual student needs, some will not even attend classes. Again, there is no time to practice it **{Time constraints}**, it is time consuming **{Time consuming}** and therefore interfere with teaching **{Interfere with teaching}**, meanwhile, I want time to complete my syllabus to enable my students pass WASSCE, because, if you concentrate on practicing formative assessment and your students fail at the WASSCE, you will be queried by school authorities **{impact of summative assessment},** so I teach for my students to pass WASSCE. Another serious challenge we have in this school is lack of stationery **{Inadequate supply of assessment materials}**, you will want to conduct class test or midterm test, but school administrators may tell you there is no paper, so you are required to write the questions on the white board making the work frustrating.

Interviewer: Thank you very much madam.

Interviewer: Madam, so suggest any way or ways we can improve upon formative assessment practices in the classroom?

Respondent: Well, if you could reflect back, I made mention of large class size, so I would suggest that GES should frequently organize an in-service training on formative assessment for teachers, if possible the class sizes should also be reduced by putting in more infrastructure and employing more teachers.

Interviewer: Thank you very much madam for giving me information for this research work.

APPENDIX M

A SAMPLE OF A TRANSCRIBED INTERVIEW

Respondent 4

Interviewer: Thank you very much for availing yourself to give me information about tis research work.

Interviewer: Can you tell me the subject you teach at the senior high school?

Respondent: I teach geography, I have been teaching geography at the senior high school level for five years no

Interviewer: In your profession as a teacher, what does formative assessment mean to you?

Respondent: Formative assessment is the regular assessment of students accompanied with feedback in order to improve student performance. It is actually a series of tests administered to evaluate students learning.

Interviewer: Can you add any other thing to what you have said?

Respondent: Well, sometimes we use questions to assess students during learning and when we understand that students have learned, it goes a long way to improve student performance in class room.

Interviewer: Sir, during your training, did you have any course work in formative assessment?

Respondent: During my pre-service training, I did a bit of formative assessment training but that was not adequate. Apart from that, I haven't received any training whether in-service training or workshop in formative assessment.

Interviewer: Wonderful. Sir, does it mean that during your in-service period, you have never received any workshop or training in formative assessment?

Respondent: I haven't received any training in formative assessment.

Interviewer: Do you think teachers understand the practice of formative assessment in the class room?

Respondent: Well, I think a lot of teachers do not understand the practice of formative assessment in the classroom, because of their inability to access in-service training or attend workshops in formative assessment. In my case, apart from the training that I received during my pre-service, I haven't received anything again. I believe a lot of teachers

teaching have not also access in-service training in formative assessment.

Interviewer: In practicing formative assessment in your classroom, what do you do?

Respondent: Emmm, I conduct mid-term test to assess my students, apart from midterm, I also conduct end of term and other tests especially end of topic test. Then, I also use oral questioning, I think oral questioning is what I use most, because that gives me a very quick understanding or am able to assess my students very fast in the classroom.

Interviewer: Can we say you use tests in the process of formative assessing your students?

Respondent: Yes. I actually use tests, especially the midterm test.

Interviewer: Sir, in your class room, do you share learning intentions and success criteria to your students?

Respondent: Well, this I don't usually do. This most at times escapes me, when I go to class and introduce the topic, then I start teaching.

Interviewer: Does it mean that you don't refer to your learning intentions throughout your delivery?

Respondent: No, I don't often refer to my learning intentions.

Interviewer: In the process of assessing your students, you need to have some rubric (in the form of guidelines) for your students to use that one to guide them in the process of doing the assessment, do you share those guide lines to your students?

Respondent: No. Just like the learning intentions, I don't do that one too, because most at times, when I introduce the topic, I teach. In most cases it does not occur to me to do that and so I usually skip it.

Interviewer: For what purpose do you use questioning in your classroom, because earlier on you made mention that questioning has been your main assessment tool?

Respondent: Yes this is my main assessment tool in the classroom; I use oral questioning to be able to assess the understanding of students in the classroom. This actually saves time because, I wouldn't need to organize a test before I can understand whether students have followed the lesson that I have thought. With oral questioning, am able to understand that the students are following what am teaching them in the classroom.

Interviewer: Before your lesson delivery, do you always plan and design the questions and questioning strategies before you enter the classroom?

Respondent: No. I don't plan and design questions before entering the classroom. In the course of my teaching, am able to get questions to ask students. I don't usually plan the questions that I ask.

Interviewer: Sir, in the process of asking your questions, do you give the students enough time to answer questions?

Respondent: When you say enough time, that I may not understand, but when I ask a question in class and no student puts up the hand then it takes time before am able to get someone to answer the question. But, when I ask a question and somebody immediately puts up the hand, then I quickly call the person to answer the question.

Interviewer: Sir, how do you communicate feedback about student learning to the students?

Respondent: I am able to communicate feedback about student learning to students through the scoring of my students work. I score their work when I give them a test or any assignment for them to at least know what they have done. Apart from scoring their work, I also use praises such as well done, that is right, very good, to communicate feedback about student learning to students.

Interviewer: Are you able to hold conferences with individual students to discuss their problems, thus each and every student?

Respondent: No. Am able to attend to a few students, but mostly those who come to me outside teaching period, I attend to very few of them not all of them. Am unable to get time to attend to all students.

Interviewer: Sir, may I know some of the reason why you are unable to get time to attend to them individually?

Respondent: It is basically because of time constraints. If you look at the number of hours allocated to geography in particular, it's not enough, if I have to attend to every student it will take a lot of time. Because of that, I am unable to attend to most of the students. Apart from that, you will consider the numbers in the classroom, the numbers are large. So if I will have to attend to all the students or every student, it will take a lot of time, so am unable to attend to all the students.

Interviewer: Do you practice self-assessment in your classroom?

No. I don't do that.

Interviewer: Is there any reason why you don't practice self-assessment in your classroom?

Respondent: Yes. It's also because of the time constraint, if you allow students to assess their own work, it will take time. I also believe that at the end of the day if a student write something and you allow the student to assess that same thing that he or she has written, its not going to make a lot of impact. It's better if a student assesses another students work or if a teacher assesses a students work it makes a lot of impact, than a student assessing what he has written himself. I believe that will not make a lot of impact, so because of that, I don't practice it.

Interviewer: Does it mean you don't allow students assign marks to their work?

Respondent: No. I don't allow students assign marks to their selves.

Interviewer: Do you practice peer assessment in your classroom?

Respondent: Yes. I practice it but not often, I only allow students to make comments on their colleagues work or sometimes I allow them to assign marks to their colleagues work, but in most cases I don't use the marks for their continuous assessments, because I believe that is not always the true reflection of the student performance.

Interviewer: Please explain why the peer assessments do not reflect the true performance of the student?

Respondent: I believe that, students may favor their friends, so because of that I don't add it to their continuous assessment. The students sometimes favor their friends in awarding marks, if you are not very careful, you will end up giving marks to students that they actually haven't worked for.

Interviewer: It implies that you sometime allow them to assign some marks to their colleague's work?

Respondent: Yes. I do that.

Interviewer: In the process of practicing peer assessment, do you allow peer to peer questioning or dialogue in the classroom?

Respondent: I don't do that. Because, this will also take a lot of time, I don't do it to save time.

Interviewer: After using questioning to get the understanding of students, what do you use it for or for what purpose do you use formative assessment data in the classroom?

Respondent: I use formative assessment data to understand my student performance. Am able to understand whether all the students have understood the lesson I have thought, so that I may not need to go back to organize remedial lessons to make sure students understand. When I understand that students have understood all that I have thought, then I move forward. It is very important to me.

Interviewer: Do you use marks in the student continuous assessment in grading students mostly?

Respondent: Yes. I use the marks in grading my students. Most at-times I use it in grading my students.

Interviewer: What is your experience in organizing remedial lessons for your students?

Respondent: Remedial lessons most at-times are not very effective, because, I have realized that after taking the students through a particular lesson, when you organize remedial lessons for those who don't understand to understand, they are either not serious or they show seriousness but at the end of the lesson, you don't see a lot of improvement. So I think it's not very effective in my case.

Interviewer: What formative assessment techniques do you employ in gathering evidence about your student learning?

Respondent: I most at times use the mid-term test; I also use the end of term test and sometimes end of topic test. Apart from the test, I use oral questioning to assess students learning.

Interviewer: In practicing formative assessment, what challenges do you face in your classroom?

Respondent: In the classroom, the time constraint will still come in. The time is not always enough for formative assessment practices to be followed in the classroom. This is actually aggravated by the large numbers in the classroom. If you have to follow all the formative assessment practices, it will take a lot of time in the classroom, these are the challenges that we face in the classroom and also because a lot of us have not got a lot of training in formative assessment practices, we don't actually know the techniques or the practices in the classroom. These are challenges that we face in the classroom.

Interviewer: In the process of explanation, you indicated that you have a lot to cover, can that be considered to be a challenge?

Respondent: Yes. It is also a challenge, in my area thus geography, it is quite broad and every teacher who teaches geography will always be rushing to make sure you cover everything before the students sit for the WASSCE exams, so this is also a challenge.

Interviewer: As an experienced professional in teaching, can you suggest any way or ways that we can improve upon formative assessment practice in the classroom?

Respondent: Yes. One of the ways in which we can improve upon formative assessment practice in the classroom is to organize in service training or workshops in formative assessment practices will help teachers understand these practices and use them in the classroom.

Interviewer: Is there any other information that you can make available to me?

Respondent: I can say that this area is very good and I would have wish that stake holders in education get to know some of these things and try to make teachers get the necessary formative assessment practices through in-service training so that it will go a long way in helping the student improve upon his or her performance in the classroom.

Interviewer: Thank you very much for your time.

APPENDIX N

POPULATION DISTRIBUTION OF THE RESPONDENTS/TEACHERS FOR THE STUDY (SENIOR HIGH SCHOOL TEACHERS IN THE UPPER WEST REGION, GHANA)

District	School	Teachers		
		M	F	T
Sissala West. Gwollu	Hilla Limann Senior High	25	3	28
Wa East. Funsi	Loggu Community Day Senior High School	8	0	8
	Funsi Senior High School	27	1	28
Wa West Wichau	Lassie Tuolu Senior High School	29	2	31
Lambussie-Karni. Lambussie	Lambussie Community Day Senior High School	10	0	10
	Holly Family Senior High School	10	2	12
	Pinna Senior High School	25	5	30
Lawra, Lawra	Birifoh Senior High School	21	2	23
	Rising Star Academy Senior High Tech. Sch.	6	0	6
	Eremon Sec. Tech. School	36	5	41
	Lawra Senior High School	47	6	53
Sissaa East. Tumu	Kanton Senior High School	55	8	63
	Holy Child Senior High Technical School	7	0	7
	Tumu Senior High Technical School	54	7	61
Daffiama/Bussie/Issa	Daffiama Senior High School	22	3	25
Jirapa	Jirapa Senior High School	36	10	46
	Dominion Senior High School	6	0	6
	Hain Senior High School	6	2	8
	St. Francis Girls' Senior High School	29	10	39
	Ullo Senior High School	37	3	40
Nadowli-Kaleo	Sombo Senior High School	7	0	7
	Kaleo Senior High Technical School	47	9	56
	Queen Of Peace Senior High School Nadowli	39	6	45
	St. Augustine Senior High Technical	12	1	13
	Takpo Senior High School	16	0	16
Wa Municipal	Northern Star Senior High School	14	1	15
	St. Francis Xavier Junior Seminary	15	1	16
	T.I Ahmadiyya Senior High School	50	11	61
	Tupaso Senior High School	15	5	20
	Wa Senior High School	64	25	89
	Wa Senior High Technical School	57	17	74
	Islamic Senior High School	46	14	60
	Islamic Girls' Senior High School	14	6	20
Nandom	Ko Senior High School	35	6	41
	Nandom Senior High School	38	3	41
Total		965	174	1139

Source: GES District Office

KEY TO APPENDIX N: M=MALE TEACHERS
F=FEMALE TEACHERS
T=M+F

APPENDIX O

SAMPLE DISTRIBUTION OF RESPONDENTS FOR THE STUDY

District	School	Teacher Population			Sample
		M	F	T	
Sissala West. Gwollu	Hilla Limann Senior High	25	3	28	12
Wa East. Funsi	Loggu Community Day Senior High	8	0	8	1
	Funsi Senior High School	27	1	28	13
Wa West. Wichau	Lassie Tuolu Senior High School	29	2	31	18
Lambussie-Karni. Lambussie	Lambussie Community Day Senior High School	10	0	10	6
	Holy Family Senior High School	10	2	12	3
	Pinna Senior High School	25	5	30	7
Lawra, Lawra	Birifoh Senior High School	21	2	23	3
	Rising Star Academy Senior High Tech. Sch.	6	0	6	4
	Eremon Sec. Tech. School	36	5	41	12
	Lawra Senior High School	47	6	53	17
Sissaa East. Tumu	Kanton Senior High School	55	8	63	16
	Holy Child Senior High Technical School	7	0	7	3
	Tumu Senior High Technical School	54	7	61	13
Daffiam/Bussie/Issa	Daffiama Senior High School	22	3	25	12
Jirapa	Jirapa Senior High School	36	10	46	17
	Dominion Senior High School	6	0	6	1
	Hain	6	2	8	2
	St. Francis Girls' Senior High School	29	10	39	12
	Ullo Senior High School	37	3	40	14
Nadowli-Kaleo	Sombo Senior High School	7	0	7	0
	Kaleo Senior High Technical School	47	9	56	5
	Queen Of Peace Senior High School Nadowli	39	6	45	22
	St. Augustine Senior High Technical	12	1	13	2
	Takpo Senior High School	16	0	16	10
Wa Municipal	Northern Star Senior High School	14	1	15	4
	St. Francis Xavier Junior Seminary	15	1	16	6
	T.I Ahmadiyya Senior High School	50	11	61	15
	Tupaso High School	15	5	20	5
	Wa Senior High School	64	25	89	16
	Wa Senior High Technical School	57	17	74	12
	Islamic Senior High School	46	14	60	14
	Islamic Girls' Senior High School	14	6	20	5
Nandom	Ko Senior High School	35	6	41	9
	Nandom Senior High School	38	3	41	4
Total		965	174	1139	315

KEY TO APPENDIX O: M=MALE TEACHERS
F=FEMALE TEACHERS
T=M+F