UNIVERSITY OF CAPE COAST

KNOWLEDGE AND USE OF FORMATIVE ASSESSMENT AMONG SENIOR HIGH SCHOOL TEACHERS IN THEKUMASI METROPOLIS

WILLIAM NTIAMOAH NTIM

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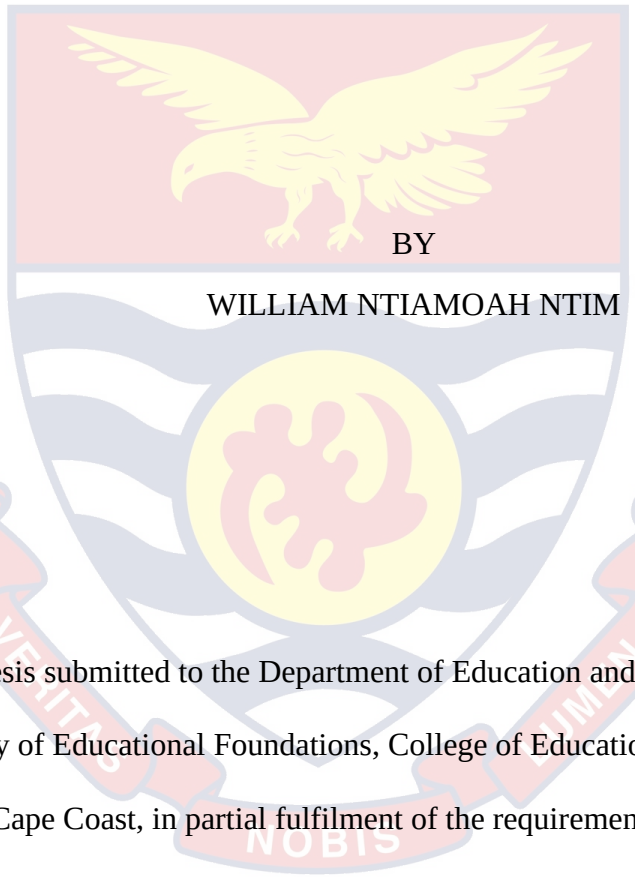

BY

WILLIAM NTIAMOAH NTIM

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 fulfilment of the requirements for the award of Master of Philosophy Degree in Measurement and Evaluation

JUNE 2021

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 examined the knowledge and use of formative assessment among Senior High School teachers in the Kumasi Metropolis. The study used the descriptive survey design with quantitative approach. Multi-stage sampling procedures were used to select a sample of 226 respondents as teachers. Specifically, the study used purposive, stratified and proportionate sampling techniques. Teacher's questionnaire with a reliability of 0. 92 using Cronbach Alpha (r) was used to collect data for the study. My supervisors assessed the validity of the instrument in context of clarity of the items. Means and standard deviations as well as Pearson Product Moment correlation coefficient were used to analyse the data that was gathered. The findings of the study revealed that teachers in Kumasi Metropolis have above average knowledge in formative assessment. The study also reported that the activities that characterise the use of formative assessment are; "Questioning", "Exams," "Class work", "Observation", "Homework" and "Test". The study further revealed that there is a positive weak relationship between knowledge and use for formative assessment. In addition, the findings of the study showed that, "Formative assessment is demanding in nature" and "Formative assessment brings heavy workloads to teachers". It was concluded that, SHS teachers in Kumasi Metropolis have the requisite knowledge in formative assessment. However, some of the activities involving the practice of formative assessment were seen not to be used by the SHS teachers in Kumasi Metropolis. In view of this, it is recommended that Director of Education, Ghana Education Service and Head of schools must ensure teachers use of "Peer assessment", "Presentation", and "Self-assessment" among others in their formative assessment activities.

KEYWORDS

Knowledge of formative assessment

Use of formative assessment

Senior High School

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DEDICATION

To my late father Henry Akwasi Ntiamoah, Mother, Christabel, Nana Adwoa Birago Ntim and all my siblings.

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CHAPTER ONE

INTRODUCTION

Formative assessment is the assessment technique used by teachers in helping students get the understanding of concepts taught in their classroom while teaching is ongoing. Through elicited feedback from students, teachers use formative assessment either to adapt their instructional technique or to continue their teaching (Sadler, 1989).This presupposes that, through the elicited information, teachers are able to understand their students' position on a given content. The adaptation as used in formatives assessment gears toward moving learners forward in their learning but not to grade or determine who is a good or bad student as in the case of summative assessment. Hence, formative assessment takes into consideration the processes involved in students learning but not necessarily students' product(grading) of learning (Stake, 2005).Studies have been conducted regarding teachers' knowledge and practice of formative assessment in the different levels of education, but these studies focused on single subject areas with the neglect of other subjects.

Study conducted in Cape-Coast for instance has shown that, mathematics teachers have low knowledge in formative assessment (Bortey, 2018).This study would serve as a policy guideline to curb the problem.

Background to the Study

Education is seen globally as one of the key components for both human and national development (Wambugi, 2014). This is because, education contributes significantly in the political, economic and social development of every country. Education is regarded as a critical resource, as noted by Wambugi (2014), in that it allows a country to equip young people in particular with information, skills and expertise to enable them to be actively involved in the development of that country. In this sense, the ability of a nation to develop largely depends on the availability of quality education to its citizens. The relevance of education that have been underscored globally has paved the way to the Ghanaian economy to put measures in place in ensuring that, its citizens are educated to acquire the necessary skills, knowledge and expertise to aid in the development of the country. In Ghana here the manifest function of education is for the citizen to acquire the requisite skill of both literacy and numeracy (Baafi-Frimpong, Yaquarh, &Milledzi, 2016).

Looking at the manifest function of education in Ghana, it becomes prudent that, teacher's knowledge in assessment approaches employed in teaching of individual subjects should be given a critical look. This means that, assessment approach to subjects if well implemented would go a long way to help students to better understand any given content taught in all subject at school. Even though, teachers may have the required knowledge in their respective subjects, but the medium of assessment would not be favorable to the extent of helping students appreciate a content taught. According to Allen (2004) assessment requires the compilation and use of empirical evidence on the student to improve programs and enhance learning.

Allen (2004) further declared that, assessment involves a variety of procedures which is used to obtain information about the student, curricula, programs and policies, among others, for decision making.

It is therefore imperative to note that, in order to obtain meaningful or sound information for the purposes of assessment, careful attention should be given to the assessment procedures to be used. Prominent among these assessment procedures are objective and essay tests which can take the form of paper-and-pencil test i.e., quizzes or drills, assignments, projects, observations and interviews. It should be noted that, the assessment procedures selected should be relevant to the characteristics or performance to be assessed and thus, one needs to be much particular and careful regarding the procedure to be used when assessing students (Amedahe & Asamoah-Gyimah, 2016). Muraina and Yunisa (2018) argued that the method of teaching and learning is a two-way traffic where the teacher sends the message while the students understand it through feedback. In essence, this give and take processes could only be effective when the assessment approach or strategy employed is appropriate.

Closely gleaning from the teaching and learning process, it can be deduced that teaching is not an end in itself, but it is learner feedback that would determine how much students were taught. Formative assessment provides the learner with feedback during an instruction or learning process that is designed to ensure the success of the student (Bhagat & Spector 2017). Timely and insightful feedback is important for an effective formative assessment, although the quantity and timing of the feedback is not suitable for a specific learner (Bhagat & Spector, 2017).The purpose of the classroom

assessment is to improve the quality of student learning (Angelo & Cross, 1993). This means that, teachers who teach different subjects should be concerned not only with ‘what’ to teach, but also with ‘how’ to meet the specific needs of the learner in terms of the content taught in the classroom, which at the end would have a great impact on the learner. This therefore requires assessment approach that would encourage students to self-assess, to criticize, to refer, to own and to provide responsive feedback on whatever they learn during the teaching and learning situation.

Scriven (1967) coined the words "formative assessment" and "summative assessment" and emphasized the distinction between them, both in words of the intent of the knowledge they seek and how it is used. As opined by William (2006) Scriven used the words" formative and summative assessment" to discuss the role they play in student education. Bloom, which focused on formative assessment as a teaching aid rather than on assessing work in the grading process, which is a summative assessment, complemented Scriven's work (William, 2006). As further described by Ruiz-Primo (2011), formative assessment is considered to be an informal examination that takes place at the end of the term or year used to guide the teaching process. As explained by Earl (2003), formative assessment provides instructional techniques for instructors to modify teaching strategies to ensure that students are engaged in ways that match their styles of learning. Formative assessment therefore offers an opportunity to participate in metacognition for students. Metacognition is a student's behaviour that is linked to his or her learning (Earl, 2012). Metacognition is correlated with active learning, i.e., the use of strategies in the classroom that include students in exercises where they think

about what they do (Gerard & Lederman, 2012).For scriven (1967), the summative assessment is used to measure student learning, skills development and academic achievement at the end of a given period of instruction, while the formative assessment gathers information to assess the success of the curriculum and informs school systems to make decisions about which curriculum to adopt and how to improve (William, 2006).Black and Wiliam (1998) described the formative assessment as containing two interrelated components: first, activities carried out by the teacher and the student as a means of collecting information on the understanding or development of the student and, secondly, the use of this information to change the activities of the teacher, the student or both teaching and learning activities. In addition, Sadler (1989) "described formative assessment as a systematic technique for continuous data collection and input on learning while training is ongoing. Formative assessment focuses on how to use student response content decisions to shape and enhance the abilities of students by reducing the randomness and inefficiency of trial and error learning" (p 120).

The primary distinction between summative and formative assessment has to do with their intent and effect (Sadler, 1989). Formative assessment relies on the result, and that the information obtained from the formative assessment changes the course delivery in a way that would not have happened if the assessment had not been carried out (William, 2006). Ultimately, Formative assessment enhances students' performance in the classroom. According to Theall and Franklin (2010), the abilities and capacities of the instructor and the achievement of educational goals by the student can be improved by developing practices such as teaching strategies,

teaching techniques, and learning assessment. If assessment is to determines in general what learning gaps remain in students' learning, formative assessment should be introduced to close those gaps. Formative assessment can help to enhance the willingness of students to take control of their learning, but this only happens when students truly understand purpose of the assessment (Trumbull & Lash, 2013).Stake (2005) explained the distinction between summative and formative assessment by creating this analogy that; "if a cook tastes his own food" it is formative and "if a guest tastes the cook's food" it is summative. Looking closely from the analogy of stake, one can see that the formative assessment involves continuous activity by keeping an activity under constant control. This is because the cook ensures constant monitoring throughout the process in the course of cooking in order to ensure balanced meal. Thus, the focus of formative assessment is on the "process" to an activity and not just the "product" as in the case of summative assessment. Formative assessment requires regular assessment of learners' learning to recognise differences in understanding and to adjust instruction (Breakstone, 2011).

Zanevsky (2016) identified four (4) key formative activities that teachers need to incorporate in the classroom; (1) Clarifying learning outcomes or goals (2) Evidencing students understanding minutes by minutes in the classroom (3) Providing positive feedback to students beyond grades (4) Activating learners to be champions of their own learning as well as peers who can fully change learning. Other research studies have shown that learners can become more aware of the gaps between their ultimate target and current information through the understanding of the feedback component of the

formative assessment (Ramaprasad, 1983, Sadler, 1989). Bangert-Drowns, Kulick and Morgan (1991) and Elawar and Corno (1985) noted that the most valuable form of test and homework feedback offered detailed remarks about errors and suggestions for improvement. The prospect of a formative assessment is, as Boston (2002) pointed out, that students will be able to learn how to attain high levels and thus compensate for the cycle in which students attribute poor performance to lack of capacity and thus become discouraged and unwilling to invest in further education. Frederikson and White (1997) concluded that there is a better opportunity for learners who understand the learning objectives and assessment criteria to think about their work than those who do not. McCurdy and Shapiro (1992) stated that performance changes have also been shown by students with learning disabilities who are qualified to use self-assessment approaches related to their understanding of reading and writing practice. There are a number of principles in literature-based formative assessment that are supposed to have a positive overall impact and influence compared to the other form of assessment. These compelling principles include: part of effective planning, centralization of classroom practice, fostering understanding of objectives and criteria, making them sensitive and constructive, encouraging motivation, recognizing all educational achievements, focusing on how students learn, helping learners to improve, building peer and self-assessment skills (Earl,2012).

As opined by Benneth (2011), shared learning expectations, questioning, feedback, self-assessment, and peer assessment are five strategies used to keep learning on track (KLT) using formative assessment. As students share their learning intentions and experience, Bennett exemplifies shared

learning expectations. The relevant discussions and learning tasks in the classroom included questioning. Although the teacher offers guidance, students are engaged in self-assessment, in which each student is the owner of their learning, and peer review, in which students act as "educational tools" to each other (Bennett, 2011).

Studies carried out by (Amoako, 2018; Bahati, Tedre, Fors&Mukama, 2016; Elwood, 2006; Kline, 2013; Magno & Lizada, 2015; Mehmood, Hussain, Khalid &Azam, 2012; OECD, 2011; Wiliam, & Leahy, 2016) have shown that formative assessment has a positive effect on the success of students and also plays a key role in improving classroom teaching and learning. One benefit of the formative assessment is that it helps to form a more educated opinion about the abilities of the student. Teachers strive for consistency in the formative assessment by recognizing the reasons behind the variability in student achievement and by adjusting their teaching to suit individual needs. Formative assessment builds on the "learning to learn" skills of students by stressing the teaching and learning process and by including students as collaborators in that process. It also improves peer-assessment and self-assessment skills for students and helps them to develop a range of effective teaching methods that contribute to heavy workloads and inconsistencies in assessment by classroom teachers.

To help students improve their results, formative assessment should be improved. While research has shown that, in the course of its implementation, the formative assessment presents a lot of problems. Research conducted by Vingsle (2014) disclosed that, in a variety of ways, formative assessment practice was very complicated, challenging and difficult for teachers. Black

and Wiliam (1998) found that further advances have been made in attempts to strengthen formative evaluation. Developing assessments that demonstrate learning objectives are central to good teaching, not just measuring results (Brennan, 2006). Understanding as an educational goal, the emphasis on assessment forces teachers to clarify what evidence of understanding would look like, and these performance descriptions encourage them to provide opportunities for students to develop and practice skills that might otherwise have been missed if "understanding" had been left out. Research also indicates that when learners are asked to engage actively in determining what they understand and how they understand and what they need to know, comprehension is strengthened (National Research Council, 2000).

Classroom practices that encourage this type of metacognition include peer and self-assessment, consideration of one's own success and determination of what further development is required, and exercises to allow students to understand new concepts through speaking or writing, enabling teachers to gather student understanding information to direct their next steps (Bereiter, & Steinbach, 1984; Palincsar & Brown, 1984; Scardamalia, White & Frederiksen, 1998). Structuring these kinds of opportunities is formative assessment practice.

In spite of the overarching significance of formative assessment as shown in literature, the clear-cut of teachers' knowledge in the use of formative assessment becomes difficult to ascertain. This is because in literature, at times teachers are seen to have insufficient knowledge, ie low knowledge in formative assessment and high or above knowledge in formative assessment. For instance, Vingle (2014) reported that, teachers have

insufficient knowledge in formative assessment. Moreover, Alkharusi, Aldhafri, Alnabhani and Alkalbani (2012) reported that, teachers have low knowledge in the practice of formative assessment. Furthermore, Alufohai and Akinlosotu (2016) also revealed in their study that, teachers have insufficient knowledge in the practice of formative assessment. However, Chun (2011) reported that, teachers have professional knowledge, thus, teachers have high knowledge in formative assessment. It is in this respect that the study has become necessary to examine the knowledge level of teachers as well as the activities that characterise use of formative assessment of public Senior High Schools in the Kumasi Metropolis of the Ashanti region of Ghana.

Statement of the Problem

Despite the positive impact of formative assessment as indicated in the background, strong traditions of summative assessment have long dominated in education (Houston& Thompson, 2017). It has been stressed that, in most Senior High Schools there is non- existence of formative assessment in the classrooms (Earl, 2003).Reports have shown that teachers lack the mindset towards the practice of formative assessment or even others do not practice it at all (APERA Conference, 2006; Gashaw, 2014; Mcmillan, Cohen, Abrams, Cauley, Pannozzo & Hearn, 2010; Hingins Grant, Thompson &Montarzino, 2010).

Several studies have reported that formative assessment approach has a positive effect or plays a key role in enhancing classroom teaching and learning (Bahati, Tedre, Fors & Mukama, 2016; Elwood, 2006; Kline, 2013; Mango & Lizada 2015; Mehmood, Hussain, Khalid &Azam, 2012; OECD, 2011).A number of studies, however, show that there is lack of sufficient

knowledge and skills required to practice formative assessment (Brookhart, 2011; Heritage, Kim, Vendlinski & Herman, 2009).So, the question that comes to mind as a researcher is; what hinders the practice of formative assessment by teachers? Is it by their (teachers) insufficient knowledge level as stated by Vingsle (2014)?

As a researcher, I am of the view that, the hindrance of teachers practice of formative assessment could be attributable to the fact that, large class size in SHSs of which Kumasi is of no exception is a factor. This is because, formative assessment is believed to be a classroom assessment technique which involves pooling along students in all facet of teaching. This therefore means that, formative assessment is geared towards meeting the unique needs of every student in the classroom, but due to limited instructional period accompanied with large class size will not permit teacher to employ formative assessment in their teaching. Hence, teacher will rather result to the other form of assessment which will aid them completing the syllabus.

Studies have been conducted in Ghana regarding teacher's knowledge and activities that characterise use of formative assessment. But it appears none of these studies have been conducted in the Kumasi Metropolis where there are lot of SHSs which equally demand studies of these nature. For instance, a study conducted by Bortey, (2018) in Cape Coast Metropolis revealed that, SHS mathematics teachers have low knowledge in formative assessment. Moreover, Bekoe, Eshun and Bordoh (2013) explored formative assessment activities that social studies tutors in the colleges of education frequently use in their classroom. Their study found that peer assessment and self-assessment are the most frequently used formative assessment activities.

Looking closely from the studies conducted in Ghana here, it appears the researchers focused on teachers and tutors from single subject discipline with the neglect of other teachers and tutors.

So as a researcher, I am of the view that, why the researchers are not exploring all subject teachers' knowledge and their activities that characterised the use of formative assessment. This I believe would help to ascertain the global view of all subject teachers regarding formative assessment. Moreover, regarding the study area, the researcher was motivated when by chance revealed by large number of students from different schools during inter school quiz competition that, their teachers do not involve them in their teaching. So as a measurement and evaluation student, it appears teachers in Kumasi Metropolis do not understand what formative assessment is all about. This is because involving students plays a key role in teachers use of formative assessment.

It is in this regard that this study has become necessary to examine knowledge and activities that characterise use of formative assessment among all subject teachers in Senior High School in the Kumasi Metropolis.

Purpose of the study

The main purpose of the study was to examine knowledge and use of formative assessment among SHS teachers in the Kumasi Metropolis. The specific objectives of the study were to:

1. examine the knowledge level on formative assessment among senior SHS teachers in Kumasi Metropolis.

2. investigate the most frequently used activities that characterise the use of formative assessment among SHS teachers in the Kumasi Metropolis.
3. determine the relationship between knowledge and use of formative assessment among SHS teachers in Kumasi Metropolis.
4. identify the problems associated with the use of formative assessment among SHS teachers in Kumasi Metropolis.

Research Questions

The following research questions guided the study:

1. What is the knowledge level of SHS teachers in Kumasi Metropolis on formative assessment?
2. What are the most frequently used activities that characterise the use of formative assessment among SHS teachers in Kumasi Metropolis?
3. What is the relationship between knowledge and use of formative assessment among SHS teachers in Kumasi Metropolis?
4. What are the problems associated with the use of formative assessment among SHS teachers in Kumasi Metropolis?

Significance of the study

The results from this research would present evidence of knowledge and use of formative assessment practices among teachers in Kumasi Metropolis. The generated results would provide the opportunity to offer constructive suggestions to the Ministry of Education, teachers and stakeholders on compelling importance attached to the use of formative assessment regarding student's performance.

The results from the study could help in the planning and conducting of in-service training programs for the teachers of SHS who handle various subjects by District Teachers and Support Team (DTST) as it would serve as a source of information on the assessment package or technique to employ during teaching and learning situations in the classrooms.

Results of the study would also encourage teachers to maintain, modify, or discard certain assessment practices which do not improve teaching and learning. Sometimes various agencies donate items to schools to enhance the teaching and learning. The results, therefore, would also help donor agencies to have keen insight to what formative assessment entails and how it operates so that, they channel appropriate logistical support to improve the execution among SHS teacher in Ghana.

Finally, results from this research would add to existing literature to help other researchers who would want to explore other aspects on formative assessment practices in Ghana and beyond.

Delimitation of the Study

There are various SHS institutions in Ghana. Most of these are government owned whereas others are private institutions. This study only concentrated on SHS teachers in the government institutions within the Kumasi Metropolis. Other stakeholders like students and Parents and Teachers Association(PTA)were not considered. Location of institutions in terms of District, and peri-urban was also not considered. Only teachers in SHS who were engaged on permanent basis within the Metropolis were included in the study, it therefore did not involve part time, casual teachers or national service

persons. Teachers' knowledge and use of formative assessment practices were considered.

Limitation of the Study

A major limitation of the study is the use of questionnaire which does not allow for follow up on respondents' responses. This might result in giving out shallow responses by respondents because of lack of probing.

In addition, the quantitative methodology used requires large sample size, but this study used a few selected respondents from the SHS in the Kumasi Metropolis.

Definition of Terms

The following terms have been conceptually defined for the purpose of this study:

Formative assessment: an assessment approach used by teachers to ensures both the teacher and the learner to be actively involved in the teaching and learning process.

Knowledge of formative assessment: having an idea about formative assessment as a classroom teacher.

Use of formative assessment: activities that teachers implement or practice during formative assessment in their daily classroom teaching.

Organization of the Study

The study was structured into five chapters. Chapter one was the introduction that covered the background to the research, the problem statement, the study's purpose, as well as research questions. The significance of the study, delimitation and limitations of the study and definition of terms were also presented. The second chapter presented a review of existing

literature on the knowledge and use of formative assessment by public SHS teachers in different subject areas. In the third chapter, the methodology employed in the study was presented.A description of the research design, area of study, population, sample and sampling procedure, and data collection tools were provided in the chapter. The chapter also identified the validity and reliability of the instrument, ethical considerations, data collection and data analysis. The results and discussion of the study were presented in chapter four, whereas the summary, conclusions and recommendations of the results were presented in the fifth chapter. The chapter also made recommendations for further studies.

CHAPTER TWO

LITERATURE REVIEW

Overview

The study sought to investigate the knowledge and use of formative assessment among SHS teachers in the "Kumasi Metropolis of the Ashanti Region of Ghana. The chapter therefore reviewed relevant literature on the topic indicated. The literature review" encompassed the knowledge, use, relationship and problems associated with formative assessment. Specifically, the review covered the theoretical, conceptual as well as empirical studies on knowledge, use, relationship and problems of formative assessment.

Theoretical Framework

The Three-Strands Approaches to Learning

The three strands approach to learning describe assessment as a learning-oriented activity, but do not necessarily offer final or absolute judgment over a variety of activities to a student's success (Carless, 2007). It highlights three basic formative assessment metrics within the framework of the three strands, which the researcher deemed necessary to situate as a theory to the study. These three strand indicators are: learning task based on learning outcome; involvement of students in assessment and, finally, how feedback is appropriately used to get responses from students (Carless, 2007).

Careless's principle is considered well adapted to being positioned when implementing formative assessment in the classroom. This is because the principles used by the theory are the very highlights in much of the

concept of formative assessment regarding the application of the assessment. For example, in a definition given by Black and Wiliam (1998) on formative assessment, it clearly sets out the roles of the three components as used in the strands and that help in mediating learning lapses of students: first, activities undertaken by both teachers and students as a means of obtaining information on the understanding or progress of students (involvement of students in assessment) and, second, the students' involvement in assessment. In addition, formative assessment is believed to be an assessment approach involving a systematic process through the use of feedback to gather information while ongoing instruction is ongoing (Saddler, 1989).

Careless (2007) first spoke in this theory about the need to set out learning results as a role in assessment, and how it allows collectively give guidance to the substance of the subject matter. The first tenet of the theory states that the actions (learning outcomes) intended to be exhibited should be explicitly stressed before formative assessment can be carried out in the classroom. Essentially, learning result is expected to act as a road map to which teaching and learning can be guided. Furthermore, students and teachers can also use the learning outcome to streamline discussion, in order to judge how much content is assimilated by applying a particular subject matter.

Student involvement in assessment is seen as the second strand of careless learning-oriented learning task approach where students are to be pooled across all facets of instruction in order to better understand learning goals, criteria and standards. This theory principle captures the need for the students to be actively involved in the assessment process. Through formative assessment the instructor is seen not only as an active participant in the

assessment process. This strand claims that before students fully appreciate the standard (learning goal) set for a given content, the teacher must engage them in all aspects of the teaching process. Bennett (2011) puts that students will become active participants through questioning, self-assessment, and peer assessment. Students feel at ease to disclose their learning expectations, intentions and experiences through active participation (Bennett, 2011).

Questioning should be put in such a way that, discussions in the classroom are directed towards the substance of the specific subject. Self-assessment allows the student to be the owner of his or her learning through the calculation of a criterion, and in peer assessment, the students represent each other as instructional assessors (Bennett, 2011). If teachers implement these practices successfully during interaction in the classroom, students are assumed to be able to grow their learning autonomy, and thus, learning becomes a lifelong practice.

The final strand explains the need for adequate feedback during formative assessment. In the theory, feedback helps students to consider their role within an instruction context, using it in their learning as a "feedforward" (Carless, 2007). This third principle of the theory attempts to explain the need for adequate feedback in formative assessment. Butler (1987) demonstrates that, by presenting students with task-oriented assessment, adequate feedback as used in classroom-based formative assessment contributes to greater student learning and higher task results. Feedback by elicited information on the assignments and discussion of students as a way of assessing where students are working toward a goal often assists in the achievement of students (Duschl & Gitomer, 1997). Bennett (2011) explains the feedback that comes from the

instructor (teacher) to keep learning on track as one of his five assessment techniques. It must be pointed that, feedback from either both the student or teacher does not enhance learning by itself, but it is after students have diligently embraced it and acted upon it (Brookfield, 2015). In essence, the holistic role that feedback plays in teaching is achieved after a conclusive decision is either taken by the teacher or the student. By providing adequate feedback, teachers can diagnose where students have difficulties and adapt the teaching technique to scaffold those lapses (Nikolov, 2017). It is further stressed that, acting on feedback helps learners step forward as it acts as a method of feedforward in a form a students' guide in their next learning.

Considering the theory's three highlights (learning objectives, participation of students and feedback), the researcher is of great conviction that the theory works validly for the study, as the application of formative assessment really requires use of these three main identities. Consequently, the interplay of these three measures makes the theory truly supports the analysis of the study.

The Theory of Formative Assessment

Scriven introduced the Formative Assessment Theory (FAT) in the year 1967. Depending on the development of the theory, it was found that the theory emphasizes that, formative assessment use affects student learning as teachers incorporate them in their guidance to teach (Black &Wiliam, 1998). Scriven explained explicitly that the formative test replaced the old assessments that had been used in the past. New principles that encourage the advancement of educational readiness building, shortcomings to be targeted and likes were placed in place to remove any lapses that may have been left by

the older criteria. This indicates that the formative assessment was performed to fine-tune the shortcomings of the older criterion. The goal of these new ideas was to bring dynamism in virtually every human being. Therefore, the formative assessment theory is to provide precision in measuring phases of ability and overcome hitches that cannot help the person and the educational institution to enhance learning for the students.

The concept of using formative assessment theory is based on the idea that teachers are often required to assess and evaluate students in order to gain experience in their classroom learning (Bailey & Jakicic, 2012). Technical expertise acquired through collegial dialogue and reflective learning experiences is primarily based on the diagnosis and assessment of student learning by teachers (Black & Wiliam, 2009). This will have a beneficial effect on student achievement when formative assessment is used with commitment and will typically contrast with the purpose and position of summative assessment in relation to the delivery of instruction (Bortey, 2018). This means that until a teacher actually implements formative assessment, it is up to the teacher to be fine-tuned with the formative assessment techniques that help to elicit the appropriate answers in relation to a given material. Being able to grasp the entry actions of learners before a material is a function of the amount of information held by teachers regarding formative assessment. Formative assessment emerges as a method of assessment to help define and address the learner's unique needs by effective questioning. The appropriate questioning helps to identify the disposition of the learners in the content of a given topic. While Black and William (1998) claimed that summative

assessment (SA) as being used in the context of the theory of formative assessment will instantly help students learn more.

Therefore, in essence, the feedback obtained through the use of summative assessment is accepted as formative if the results are not to give value judgment about the learners. This means that, in the sense of formative assessment, the task of summative assessment through feedback is to help mediate difficulties that students face in their learning. Clark (2010) argues that cognition and social aspects are seen as linked entities to the learning system that "combines cognition and social interaction into a practical theoretical structure by putting individual cognitive development within a context of collective classroom activity" (p. 347).

The symbiotic relationship between teacher and student in formative assessment, positions the two in a supportive position by helping each other make changes while teaching and learning is ongoing by reducing errors (Black & William, 2009). It has also been argued that the systematic process involved in formative assessment requires quality mutual interaction between teacher and student, and more importantly between peers and not software program "(Clark, 2010, p. 343. In the classroom, instructional practices are formative when evidence obtained through elicited interaction is used to inform future student, peer, or teacher decisions (Black & William, 2009).Using formative assessment, students can devise their own learning plans as they are exposed to how elicited information is adapted to improve future learning (saddle, 1989, p. 140).

Saddler (1989) states that, clearly spelt learning goals are believed to be a medium through which students can see how their performance improves

and how fast they progressed (p. 142). Saddler (1989) suggested that "the shift from teacher-provided feedback to learner self-monitoring is not something that comes about automatically" (p. 143) in relation to set learning targets. However, saddler (1989) explained that "it is incumbent on the assessor to provide explicit provision for the students themselves to acquire evaluative skills for an instructional system to yield expected results" (p. 143). Therefore, teachers and assessors need to develop themselves by means of professional training in order to successfully incorporate performance assessment methods (Bailey & Jakicic, 2012; Black & William, 2009; Clark, 2010; Saddler, 1989).

Although the theory went through several metamorphoses, but there is a consensus among all scholars on formative assessment that, by using feedback to adjust teaching. The reciprocal relationship between teacher and student shows what the formative assessment is all about. Since there is a clear description of the symbiotic relationship between human beings (teachers, students, peers) and the use of feedback, my research is validly supported by the theory of formative assessments.

Conceptual Review

The Concept of Assessment

Assessment is perceived differently among individuals of different backgrounds. These variations in belief resulting from the varied orientation given by different scholars on assessment. Nitko (2001) cited in the American Federation of Teachers, the National Council on Measurement in Education and the National Association of Education, sees assessment as a method of obtaining information that is used to decide on the curriculum and program and national policy of students. From this, assessment can be viewed as a

means of collecting relevant students' information to make educational decisions about the well-being of students with regard to curriculum and program and national education policies. Palomba and Banta (1999) define assessment as "the systematic collection, review and utilization of information on educational programs undertaken to improve learning and development" (p.4).

They are more specific about using assessment results to enhance learning and development. This means that the information obtained from the assessment will not be a single event operation, but instead a sequence of activities conducted to ensure that any person at the receiving end can evolve entirely. These entities could be students that teachers could use to help improve their academic performance.

On the other hand, Green and Lewis (1986) regarded the assessment as an estimate of the relative importance, significance or value of the work or output observed by an observer. According to them, assessment is not just collecting the information but evaluating how valuable or the degree to which the collected information helps to achieve its intended objective. Usually, teachers do this through careful observation of the progress of their students at school and intermittent conducting of various tests and other assignments. Assessment serves as the medium through which teachers communicate with students through various teaching techniques to gather relevant information for decision-making on various aspects of students.

Tamakloe, Amedahe and Atta (2005) maintained that "assessment occurs when one person obtains and interprets information about other person in terms of his or her knowledge and understanding or abilities or attitudes

through some sort of interaction with another" (p. 176). Airasian (1991) also sees assessment as a process by which information about a student is gathered, interpreted and synthesised to assist in the decision-making process. McMillan (2001) notes that there are a number of "essential" assessment concepts that propel teachers to be current in order to make valid student decision, different ways of obtaining the information should be used to remove any biases. The collected information may be from a mirage of sources to make the student's decision.

Linn and Grolund (1995) disagreed McMillan's (2001) claim that assessment should be used to collect student learning information. Nitko (1996) defines assessment as "a process for gathering learner information" (p. 4). From the different definitions of the different scholars, the main issue about assessment definition is the collection of educationally relevant information about students in order to make an informed decision or choice that would foster the student's overall development. Assessment is the method of examining a sample of a student's actions and drawing inferences regarding the students' knowledge and skills (Ormrod, 2008).

Usually, when one looks at the behaviour of the students, only a snapshot of classroom activity is used. Assessment is for the mutual benefit of the teacher and the student, as well as other stakeholders. This explains that assessment (formative) helps the teacher adapt his teaching technique and also helps the students understand what is being taught by the teacher through adequate questioning, testing, etc. Through the work samples children engage in their homes, stakeholders like parents could also benefit from assessment. Assessment is a form of communication to the student, as a form of feedback

to their learning (McAlpine, 2002). Feedback from teachers gives an indicator of success for the students. These assessments describe the degree to which the students have mastered the material of a given topic. It is the feedback that helps the curriculum designer to either terminate, adopt or adapt an existing curriculum.

Again, assessment is beneficial in protecting the security of society. For example, the Organization for Economic Co-operation and Development (OECD) (2012) explained that the method for evaluating final year engineering students' competencies is to test their ability to use basic engineering and scientific concepts, engineering processes, and generic skills to solve societal problems. This ability is measured to ensure progress in society's quality of life, social needs and commercial success (OECD, 2011). Biggs (2003) note that the assessment process is complex, and that its function and nature is highly contested and valuable. The assessment practice is widely debated within society by academics, industry, governments, students and various stakeholders, all of whom have their own agenda, assumptions and views on the subject.

Gipps and Murphy (1994) suggested that assessment design should come into play after our purpose was decided. The different views on the significance of assessment confirm the earlier statement that assessment means different things for different individuals. Gleaning from the various definitions I can also say that, assessment plays an integral role of bringing forth traits possessed by an individual.

Purpose of Assessment

It is imperative that, before a teacher assesses students, the underlining reasons for which the assessment is conducted must be explicitly stated. In order to do this, the teacher must be able to ascertain the use to which the assessment result will be put. Thus, this will help the teacher design a suitable assessment method that will help elicit the information needed. Dunn, Morgan, O'Reilly, and Parry (2004) explain that assessment is used to accomplish various purposes. They observed that while it may seem obvious that, the purpose of assessment is to measure student learning, it is overly simplistic thinking. It remains the dominant perspective, nonetheless. To develop a suitable assessment method that helps to obtain the information needed, it was stressed that, the kind of information required by the assessor should be made known since assessment is been used to accomplish a number of purposes (Dunn, Morgan, O'Reilly& Parry 2004).

According to Dunn et al (2004), opined that, the role and purpose of assessment is far broader than merely measuring student learning and maintaining pre-set achievement standards. They suggested further that, successful assessment is what identify the problems of students, quantify the achievement of students (with specific emphasis on improvement) over time, motivate students, determine skills mastery, evaluate teaching efficiency and provide students with feedback.

Salvia and Ysseldyke (1978) outlined at least five specific reasons for assessing students over a level of performances. These are for individual progress screening, placement, program planning, assessment of the program

and assessment. Some assessment results may serve one purpose while others in nature are multi-purpose.

Screening: Achievement tests are routinely administered to help identify students who may require particular attention. For example, when selecting students for a further course or for employment, students may be tested and, based on the results, those who may not meet the admission criterion may be given the necessary help based on their area of difficulty in the test. For example, assessment in this context is used to predict which students will be able to take advantage of further study or how the individuals might perform in employment.

Placement: Assessment outcomes are used in a school to position students of specific academic abilities into classes. For example, students who are not placed in honours are placed at other levels of education (Nitko, 2001).

Programme planning: Assessment information is used to decide placement for assignment or group work in groups, or to assign students to a remedial program. Individuals are grouped according to similar skills and no student is turned away. It helps to decide how to teach both individuals as well as a group as their level of education would be known.

Programme assessment: Assessment results are used for assessing the effectiveness of a particular curriculum as well as individual progress. Assessment is used through grades to monitor students over a level of performances. Grades obtained in an appraisal are an indication of the students ' academic progress. Below are some further assessment purposes identified:

Diagnosis: Diagnostic assessment deals with the identification of both suitable content and learning activities features in which students have learning

difficulties. When the learning difficulties are identified, these students are then given remedial help.

Selection: The results of the assessment are used to identify individuals for different educational programs, according to the requirements set. For that educational activity, individuals who do not meet such defined requirements are not considered. Write an entrance exam, for example, to select students to offer a course at the university.

Nitko's (2001) other reasons for assessment uses are: providing feedback to students and teachers, motivating students, advice and guidance decisions, and credit.

Feedback to students. The results of the assessment help students become aware of their incorrect and correct answers to questions. Student errors can be corrected during lessons, and either the teacher or the student himself can make these corrections.

Feedback to teacher. If the results of the assessment show that students have not grasped a concept, then it is appropriate for the teacher to re-teach that concept.

Motivating students. Assessment helps the students understand. When students are motivated to learn more when they reach a certain level of the learning goal, those who are unable to perform in a particular assessment are also motivated to learn in order to achieve a learning goal.

Assessment Techniques

According to Angelo and Cross (2012) assessment techniques are the various teaching strategies used to inform teaching and improve learning. There are numerous techniques used to assess the progress or performance of

the students. Some means of assessing students are through classroom reactions, assignment, observation, interviews, presentations and portfolios, peer assessment, self-assessment. Tests and examination are among these methods that most classroom teachers commonly use to evaluate their students (Tamakloe, Amedahe & Atta, 2005). Not only paper and pencil experiments are limited to those techniques. Because of its practicality, Paper and Pencil Test / Examination is often the first option for formal assessment (Ormrod 2008). Such assessment techniques (test / examination) allow students to write individually so as to show concept mastery. A teacher gives students seatwork as well as homework to help students to pursue learning goals. Below are the assessment techniques teachers employ in their daily classroom interaction;

Formal Assessment

Formal assessment is when the students who perform the task are aware of what they are doing is for assessment purposes, exemplary examinations and theses. This includes using the test to collect results, which are then made available to the institution. Typically, the data obtained are subject to statistical analysis and distinctions made with other students (Quinn, 2000). Example in SHS is off-campus teaching practice on potential future teachers in the classroom conducted by the various university institutions. Sometimes it puts stress on the student, which causes him / her to perform poorly; others may also cram and perform well without a deep understanding. The criteria for formal assessment have less room for bias (McAlpine, 2002).

Informal Assessment

There is no comparison of the performance of students with this type of assessment. Typically, it is personal and subjective to the concerned

teacher. Data for such assessment are day-to-day observation of the actions of the students, casual interaction and communication with the student, review of notes from the students among others. Informal assessments focus on individual and teacher observation reading behaviors rather than scores and comparisons (Wason-Ellam, 1994).

Final/Terminal Assessment

It happens at the completion of a course, such as the conventional assessment of the 'finals' in which three years of study are measured over a span of several days. Episodic appraisal deals with student assessment at different times, such as the end of the year. Such method of assessment is important when studying how each new area of research relates to the understanding of others and so it is far more fitting to evaluate the studying as a whole than as separate sections. A key problem with this method of assessment is that the performance of the student may not be a true reflection of his abilities as the test is taken once. Again, this type of assessment generates data based on a very small and potentially unrepresentative sample of the behavior of a student.

Continuous Assessment

It is the assessment at regular intervals during the course of study, example, and the modular assessment in which judgment is made at the end of a study. It samples all of a student's output in a course and on a regular basis; there is no 'once-and-for-all' basis for a student's 'passage.' Feedback from the assessment can be used to improve teaching and learning, and the final results are based on the performances over time.

Convergent Assessment

Convergent assessments are those tasks that have one correct answer, example is the correct goals of the answer. Another feature of this assessment is that, it is easier to mark without the evaluator being biased, and can cover a broader curriculum spectrum. It can also be marked through a computer.

Divergent Assessment

This form of assessment is based on, for example, opinion and analysis of the test taker, such as, essay type test. They are easy to create but can take up time to label. It also calls for greater marking skills. It makes it possible for the students to express themselves.

Quantitative Assessment

Quantitative assessments consisted of an assessment of the student in order to compile numerically represented results. For example, performance on a test can be ranked in such a way that the number reflects the degree to which an individual has performed. Because quantitative data is expressed in numbers, when comparing one data point to another, it can be analyzed directly or statistically to allow the tutor to make certain assumptions. Quantitative assessment can also make it possible (given such circumstances) for one to record numerically meaningful performance changes. Therefore, quantitative data is valued for the ease with which it is possible to make calculations and comparisons and for the easy-to - understand performance representations they produce. (Dunn, Morgan, O'Reilly & Parry, 2004).

Qualitative Assessment

This concerns the assessment of attributes that a person possesses without the numbers necessary for a judgment on the position of value.

Qualitative data is the student's view of what constitutes a good student relationship (Quinn, 2000). A common misconception is that qualitative assessment is not as accurate, true or objective as those that are quantitative. There are well-designed and statistically accurate ways to view and evaluate qualitative data and various learning tools for the use of qualitative approaches (Silverman, 2001; Maxwell, 1996). It is therefore better used if the assessment is structured around the same set of standards previously shared with the student. Qualitative data shall be sorted, categorized and interpreted in advance of the final judgment. Methods for making qualitative data reliable are time-consuming.

Teacher-centred Assessment

According to Dunn et al. (2004), students in teacher-centered assessment are most often seen as passive participant in teaching and learning process. The instructor then defines clear requirements to be met by the students: the requirements can be incremental in nature or part of a sequence; the instructor verifies whether each requirement has been met by the student.

Student-centred Assessment

In this assessment, students are involved and provide an evaluation of their own performance or progress. Students are given the opportunity to give written or oral, formal or informal, journals, or reflective narratives to a task assigned to them. Teaching and assessment are interwoven, and assessment is used to promote and diagnose learning (Dunn, et al 2004).

Norm-referenced Assessment

Norm-reference assessment (NR) is a method of assessment that uses standardized testing in which results compare the performance of a person

with the performance of a large group of students.NR is sometimes referred to as "relative standing" scores. NR contrasts individual scores with a prescriptive sample, which is a group of students with defined demographic characteristics (age, gender, ethnicity, or school grade). Comparisons are made using the normative sample with two statistical properties: the mean and the standard deviation. NR generates raw scores which are translated into standard scores using the mean and standard deviation formulas. To determine how a student performed compared to peers, the standard score is used.

Standard scores are mostly reported as percentiles because parents and teachers are reasonably easy to understand, but there are many other forms of standard scores (e.g., z-scores or T-scores) that can be reported. Commercially available cognitive and performance tests are often referenced to standard. (Wiredu, 2013)

Criterion-referenced Assessment

Salvia and Ysseldyke (1978) describe criterion-referenced assessment as assessing the development of particular skills by an individual in terms of absolute level of mastery. That explains whether or not a person can perform a specific task. The student, for example, is or cannot identify the primary colours.

Achievement Assessment

Achievement refers to how well a student previously performed (Quinn, 2000). This type of test is intended to measure goal achievement in school-based curricula. It is attempting to gage skills and knowledge developed due to specific instruction.

Aptitude Assessment

Aptitude is how well a student will perform in the future. According to Elliot, Kratochwill, Cook and Travers (2000), an aptitude test is a test that predicts a student's performance in a certain task by sampling the cumulative effect on the individual on many experiences. They are used to predict what students can learn. They are used to measure performance based on learning abilities.

Paper and Pencil Test

This is often the first choice used for formal assessment because of its practicality (Ormrod, 2008). The assessment requires students to write independently or to demonstrate understanding of concepts. A teacher gives seatwork as well as homework to students for them to respond in writing. These help the students to practice the learning target.

Performance Assessment

Performance-based assessment is a collection of techniques to apply skills and work habits by conducting activities that are important to the students and engaging them. This method of assessment offers teachers information about how to critically evaluate a student's success (Airasian, 1991).

Summative Assessment

At the end of a course or program this form of assessment is done to judge the overall performance of the students. This provides evidence of the student achievement throughout the course at strategic times, often at the end of a learning period. Three main sources-findings, experiences and student achievement-gather evidence of student achievement over time. Its aim is to

advance the student from one stage to the next; it is more useful for external purposes relating to further studies or jobs. An example of this is the end of the year exam used to promote students to the next level.

Boud (2000) suggested that summative assessment dominated higher education thinking and practice and took too much of teachers' time, energy and resources to prepare effective learners. Light, Cox and Calkins (2009) pointed out that they still prevail throughout higher education, irrespective of the shortcomings in traditional endpoints, summative assessments of course. Summative assessment is believed to help improve students' self-efficacy and motive intrinsically (Linn, 1982 & Shepard, 1991)

Formative Assessment

To be successful in promoting student learning, teachers must actively test for their student's understanding. Formative assessment is the type of assessment that occurs in the course of the teaching to assist the learning process by improving future performance(Heritage, 2010).As Klenowski, and Wyatt-Smith,(2010)quote, formative assessment is "the process of searching and interpreting evidence to be used by learners and their teachers to determine where the learners are in their learning, where they need to go and how to get there best" (p. 10).An example of this type of assessment is student essays with comments from the teacher. One advantage of formative assessment is that, it helps form a more detailed opinion on the capabilities of a student.

Clark (2012) claimed that by concentrating on the teaching and learning process and including students as collaborators in that process, the formative assessment develops students' "learning to learn" skills. It is also

stressed that formative assessment also improves students' peer assessment and self-assessment skills and allows them to develop a range of successful learning strategies (Spiller, 2012).It is important to improve the formative assessment in order to help students improve their performance. Black and Wiliam (1998) found that attempts to improve the formative assessment have resulted in further improvements. As Brennan (2006) points out, the development of the assessment is that learning objectives are central to good teaching, not just to measuring results. Understanding the educational objective, stressing the assessment that forces teachers to spell out what proof of understanding would look like, and that success motivates them to provide opportunities for students to develop and practice certain skills that might otherwise have been overlooked if "understanding" had been left out. (Katz, 2012).

Education research also shows that when learners are asked to take an active role in deciding what they understand, how they understand and what they need to know, learning is improved (National Research Council, 2000).Classroom strategies that promote this type of metacognition include peer and self-assessment, recognition of one's own success and determination of what further development is required, and exercises aimed at enabling students to grasp new concepts through speaking or writing, enabling teachers to gather information on student comprehension to direct their next steps (Palincsar & Brown, 1984). Structuring such opportunities is the practice of formative assessment.

The formative use of summative assessment was defined by Black et al. (2003) as one of the four methods considered to be successful by teachers in their assessment. Teachers planned many formative activities to make

improvements in their classroom and collaborating, so that the assessment was used to help students learn. Teachers have studied three main ways to use classroom assessment to improve student understanding in terms of the formative use of summative tests, beyond just measuring accomplishment. In order to identify areas of vague understanding, the first of these included making students prepare for exams by reviewing students work and examining previous test questions. This attention on their areas of vulnerability allowed students to concentrate on their rethinking. The second innovation was to ask students to build test questions and marking schemes. This has also helped them to grasp the assessment process and concentrate on more growth initiatives, according to Black et al. (2003).The third change was for teachers to allow objective use of test results and for students to be included in each other's exams, in some cases following the introduction of the marking scheme. This is somewhat similar to Ashwell (2000) reported method, which she called 'test review. “In this, after showing where errors occurred, the teacher returned the test papers to the students, leaving the students to identify and correct those lapses. The final mark of the students reflected both their response to the test analysis and their initial answers. Carter described this as shifting the learning burden to the students, who were encouraged to work together to find and correct their mistakes. These are the approaches that teachers can use in the context of the classroom tests that they have full control over. Black et al. (2003) indicated that the process would change from 'improving comprehension' to 'teaching to testing' while requiring external assessment. More broadly, the stresses imposed by the existing external testing and assessment criteria are not entirely compatible with appropriate

educational standards (Black et al., 2003, p. 56)". To integrate formative importance into summary practices, the teachers used their ingenuity.

If the assessment from the outset is to serve both ends, a more fundamental change is needed. Such an improvement in the implementation of the assessment is probable, and would offer an incentive for the test to serve formative purposes. The evaluation was designed to help develop understanding and skills in the majority of the studies examined by Harlen and Deakin (2003) on the use of ICT for the evaluation of innovation and critical thinking. The mechanism for formative behavior was input from the teacher to the students (Bennett, 2011).In certain situations, it just mirrored the movements or connections they made between concepts or variables as they tried to solve a problem for the students. According to Osmundson, Chung, Herl and Klein (1999), feedback was to provide a 'score' for the concept by dragging the student's willingness towards the goal. The score compares the degree of mastery of a particular content relative to the target set. For example, Chung, Herl,Klein, O'Neil and Schacter(1997) argued that students and teachers provided feedback to reach a solution during the computer program by recording all mouse clicks. It is necessary to be able to report not only on the students ' final performance, but also on the processes that the students need to strengthen students' progress in order to provide a formative justification for assessment (Chung et al., 1997).

Fullan, Hill, and Crevola (2006) further clarify the need to include and place the formative assessment in the context of the design of programs for professional training. They include the following elements;

1. A set of powerful and aligned assessment tools that combine each lesson's learning goals and give teachers access to accurate and comprehensive information on each student's progress on a daily basis.
2. A method of enabling data to be captured in such a way as to provide information that is powerful enough to inform future decision-making.
3. A means by which assessment is used to plan and execute customized instruction in a specific way for each student.
4. An interactive tool to track and control learning, check what works, and consistently enhance the efficacy of classroom instruction in order to respond more specifically to each student's learning needs in the classroom.

Principles of Formative Assessment

Principles are seen as the fundamental laws or theories that underlie a given construct. They serve as the basis upon which a piece is constructed. Greenstein (2019) outlines three basic principles for the formative assessment;

Formative Assessment is Student Focused: Formative assessment is intentionally directed toward the student. It does not emphasize how knowledge is delivered by teachers, but how it is interpreted by learners, how well they understand it, and how they can apply it (Lamborn, Newmann, & Wehlage, 1992). Teachers collect information about their students' growth and learning needs through formative assessment and use this knowledge to make instructional improvements (Andersson & Palm, 2017). It is further stressed that, students use self-assessments specifically and honestly to improve their own learning (Chonko, Tanner, & Davis, 2002). In order to build confident

and motivated learners, educational flexibility and student-focused feedback work together.

Formative Assessment is Instructionally Informative: Teachers assess student comprehension and progress towards mastery during the course of instruction according to expectations set in order to determine the efficacy of their instructional design (Gibbs & Simpson, 2005). Teachers and students assess and comment independently and collectively on the results of the assessment. They change their teaching to further learning for the students as teachers collect knowledge from formative assessment (Cauley& McMillan, 2010).

Formative assessment is based on learning outcomes: Teaching and learning gears towards meeting standards set. Therefore, students are expected to familiarise themselves to the standard set. Teachers, as a matter of duty are to streamline discussion through the use of formative assessment activities, so that, those teaching criteria could be met (MacDonald, 2007). Teachers prepare actions to get the learning goals closer to the students. Work is measured mainly in terms of quality in relation to the student's expectations, rather than attitude or commitment.

The Institute of Academic Development (2016) has established a variety of concepts that underlie the use or practice of formative assessment in classroom, and teachers are recommended to ask themselves a question for each. Those criteria illustrate what formative testing in classroom environments is possessed of as regards its execution.

Help clarify what good performance is: Formative assessment explains the extent students have the opportunity to actively engage with goals, criteria and

standards before, during and after an assessment task? This principle describes the parameters on which the learners' achievement is measured and must be clearly spelt out before a teacher deploys formative assessment. Setting standards should serve as a guide through which teaching and learning is streamlined.

Deliver effective feedback information that helps learners self-correct. Formative assessment takes charge to the question**:** What kind of feedback do you give as teachers - how does it help students self-assess and self-correct themselves? This principle explains the ability of teachers to provide constructive feedback in order to enable learners to determine the extent to which they understand a given content. Feedback is expected to help both learners and teachers to make necessary correction in the course of instructional delivery (Evans, Hartshorn, McCollum & Wolfersberger, 2010).

Provide opportunities to act on feedback: Another question that is paramount to teachers use of formative has to do with; To what degree is the students in the classroom receiving feedback and acting on it, and if so, how? Such concepts clarify the feedback that allows learners to understand their previous experience and their current attitude by presenting the gabs with immediacy. This means feedback does not encourage learning in its own way, but after it has been acted upon. As noted by Quinton and Smallbone (2010), acting on feedback will serve the learner as a guideline as a feedforward towards their next step of learning.

Fosters interaction and dialogue around learning. What opportunities do you have in your course for feedback dialogue (peer and/or tutor-student) around assessment tasks? This principle clearly explains that, development in

the learner is achieved through symbiotic interaction between teacher and the learner active engagement with each other in dialogue (Marshall, Jane& Drummond, 2006). It is expected that this would allow all parties to understand each other regarding solving specific classroom problems.

Self-assessment facilitates development in the learner: To what degree does teaching provide opportunities for self-assessment or peer assessment? It is assumed that, acting upon feedback, should serve as the classroom teacher's insightful guide. As put by Nicol and Macfarlane-Dick (2006) information obtained through feedback will aid in adapting teaching by coming out with an appropriate instructional activity in the form of self-assessment, so that, students become assessor of their own progress based on set criteria.

Teachers' activities involving Use of formative assessment

Appropriate assessment methods will be selected once the teacher knows the learner as well as the learning preferences when implementing formative assessment in classroom. These formative techniques include the following activities

Discussions: Involving students in classroom discussions provide a range of insights into how they perceived feedback, what they feel about it and how they used it (Rollinson, 2005).

Interviews: Face-to face interview allow teachers to elicit student thinking about a particular subject matter (Rollinson, 2005).

Observation: Through observation, evidence of students' cognitive process can be ascertained (Summers & Volet, 2010)

Self-Assessment: This is formative assessment activity where learners are their own assessors base on a criterion set with the guidance of a classroom

subject teacher (Nicol & Macfarlane-Dick, 2006). Thus, students become self-aware of their own learning difficulties and try to come out with appropriate strategies to mitigate them with the help of a teacher.

Peer assessment: This is also a formative assessment activity where learners become assessors of each other (Topping, 2010). Thus, in peer assessment, other students determine the success of the other base on a given criteria. Hence, students become each other's instructional resource.

Portfolio Check: When students and teachers annotate the entries and track development over time and practice, portfolios or a compilation of student work may also be used formatively (Duschl & Gitomer, 1997).

Presentation: Presentation is the goal-oriented practice of manipulating and exchanging information to affect the expectations that an audience has created. Through presentation, people attempt to form expectations of an audience (Schlenker, 2012).

Test/Quiz: The aim of the test is to measure a specific knowledge, ability, trait possessed by an attribute or an individual. A test can be conducted orally, on paper or in a specified area requiring a test taker to demonstrate or perform a series of competencies (Rubin & Chisnell, 2008). Tests are purpose-driven. So, testing can be used formally and informally. The concept of formative assessment refers to the informal assessment of learning, where scores obtained from the test are not used to make value or final judgment, but rather to inform the learner's level of understanding of ongoing activity in the classroom. A formal test could, of course, be a final exam administered by a teacher in a classroom or unit intended for grading at the end.

Empirical Review

Knowledge of Formative Assessment

A study conducted by Chun (2011) in Man Hong Kong investigated the challenges of formative assessment at school. "A case study design was adopted for the study. Interview as well as documentary analysis were the two main research techniques used to gather data. Personal and face-to-face interviews were given to fifteen (15) teachers at the school with Twenty (20) pupils comprising 4th and 5th grade were also interviewed. It was reported from the study that, teachers have professional knowledge and skills in formative assessment. It was further reported that, "formative assessment results in a heavy workload on teachers" and influences the basic assessment competency on the school-base." Adding to these findings, "formative assessment brings inconsistencies in the modes of assessment adopted at various class levels and subjects".

The use of qualitative research design although was not out of place, but then, it would have been equally good for the Chun (2011) to use quantitative approach since this approach requires the use of relatively large number of samples for a study.

Alkharusi, Aldhafri, Alnabhani, Alkalbani (2012) explored teachers' knowledge regarding formative assessment. One hundred and sixty-five in-service teachers from the various subjects' areas in grade 5 to 10 were selected randomly from Muscat Educational Governorate in the Sultanate of Oman as participants for the study. The methodology employed was a descriptive survey with a quantitative approach. Results revealed "teachers had a low level of knowledge in formative assessment".

Considering the nature of the study, it has focused equally on all the subject areas from different levels as the current study, but geographical variation may not allow the research findings. As a researcher, therefore, it is appropriate to explore the different teachers at SHS from different subject areas to determine their level of knowledge in educational (formative) assessment in order to either validate or disconfirm their findings.

Kankam, Bordoh, Eshun, Bassaw and Korang (2014) conducted a study on the formative assessment of the skills of social studies teachers in selected SHSs in Ghana's Central Region. The design used by the study was a case study. Twenty (20) teachers from fifty-seven (57) government SHS were randomly selected from the schools. The key instruments used for data collection were semi-structured interviews. The results of the study revealed that,“ teachers have low knowledge in formative assessment”. It was further indicated that the use of formative assessment in the classroom of Social Studies was limited by “policy systems”, “time”, “resources”, and “methods of assessment employed by the different schools”. It recommended that Ghana’s teaching universities expand their scope on assessment teaching to include formative assessment.

However, with the issue of generalizing findings, the design as used in Kankam et al. (2014) is out of place, descriptive survey with quantitative approach is considered fit due to its use of the relatively large sample size. In addition, the study focused only on teacher of social studies, but the current study focused on all SHS teachers from various subject areas.

Vingsle (2014) identified activities that characterise knowledge and skills that a mathematics teacher uses during full-class lessons in their

formative assessment practice. The study adopted a case study research design on grade 5th mathematics lessons. The data was analyzed by identifying the teacher knowledge and skills used in the course of the classroom activities. The study revealed that,“ formative assessment practice is a very complex”, “demanding” and “difficult task for the teacher”. Moreover, teachers’ sufficient knowledge on classroom formative assessment practice was lacking (Vingsle, 2014).

However, with the issue of generalizing findings, the design as used in Vingsle (2014) study is out of place, descriptive survey with quantitative approach is deemed fit due to its use of relatively large sample size. In addition, the study focused only on social studies teachers, but the current study focused on all SHS teachers from various subject areas.

Alufohai and Akinlosotu (2016), in Edo Central Senatorial District, Nigeria, investigated the knowledge that secondary school teachers have towards formative assessment practices. Out of the population of 1084 teachers across the district, 543 teachers were drawn. Descriptive statistics, mean and standard deviations were used to analyze the study problems. Findings showed that most teachers perceived FA practices as a systematic and comprehensive assessment system but had “insufficient knowledge in formative assessment”.

Considering the nature of Alufohai and Akinlosotu (2016) study, it focused equally on all SHS teachers from different subject areas as the current study, but contextual variation may not allow the research findings to hold. It is in this vein that, there is the need to explore the different teachers of SHS in Kumasi Metropolis from different subject areas to ascertain their level of

knowledge in formative assessment so as to either validate or disconfirm Alufohai and Akinlosotu (2016) findings.

"Amoako, Asamoah, and Bortey (2019) investigated knowledge level of formative assessment among SHS mathematics teachers. The design employed for the study was descriptive cross-sectional survey. Census survey was conducted on 148 mathematics teachers in the thirteen public SHS in the Cape Coast Metropolis and that was the study's target population. It was disclosed that SHS mathematics teachers in the Metropolis of Cape Coast had low knowledge in formative assessment practices. It was recommended, Directorate of Education, Ghana Education Service organise frequent workshop and in-service training programs for SHS mathematics teachers on formative assessment practices."

Contextually,Amoako et al. (2019) findings may not be validated by SHS teachers in the Kumasi Metropolis. Amoako et al (2019) moreover, focused on mathematics teachers alone, but not exploring teachers from different subject areas within the Cape Coast Metropolis. This current study sought to fill the gap in literature by exploring all SHS subject teachers in the Kumasi Metropolis.

Activities Characterise Use of Formative Assessment

Bekoe, Eshun and Bordoh (2013) examined the "formative assessment techniques used by tutors to evaluate teacher-trainees learning in social studies. The study employed a cases study research design for the study. Three colleges of education in the Central Region of Ghana were used to conduct the study. Together, collected data were used to form a single case. Tutors as well as the three colleges were chosen purposively and conveniently for the study.

Nine (9) Social Studies tutors from the colleges of education were administered with interview guide and classroom observation checklists. The findings indicated that self-assessment and peer-assessment" are the major formative assessment techniques in Ghana's College of Education institutions.

However, with the issue of generalizing findings, the design as used in Bekoe, Eshun and Bordoh (2013) study is out of place, descriptive survey with quantitative approach is considered fit due to its use of the relatively large sample size. Hence, this current study intends to fill the methodological voids in literature. In addition, the study focused only on tutors of social studies, but the current study is undergoing study of all SHS teachers from various subject areas in the Kumasi Metropolis. Moreover, the level of education as used inBekoe, Eshun and Bordoh (2013) study is different from the level of education in the current study.

Asare (2015) studied the formative assessment activities of kindergarten teachers. The analysis employed was sequential mixed methods. Questionnaires were used to collect data from 192 teachers in public and private kindergarten schools and which formed the quantitative aspect of the study from six regions. Through the use of interviews, data were gathered from 192 sampled teachers and which also constituted qualitative aspect of the study. It was found from the study that, the formative assessment technique that charaterise the use of formative assessment is use the paper- and pencil test method of assessment. It was further indicated that, teachers also appeared to use a particular mode of assessment with the aim of meeting parents and educational leaders' expectations without meeting the prescription for the curriculum assessment. For this reason, it was recommended by stakeholders,

including parents, educational leaders and teachers that, workshops and in-service training should be organised to help use developmentally appropriate formative assessment practices in a much more interactive manner to improve learning for pupils.

With reference to the design employed by the researcher, its importance relative to the current study cannot be put at the same pedestal. This is because, the mixed method design has the tendency of mobbing-up the deficiencies of the other, and however, considering the educational level (kindergarten) to which the study was conducted, the current study deviates from such educational level (SHS).

"Relationship between Knowledge and Use of Formative Assessment

Amoako, Asamoah, and Bortey (2019) investigated knowledge and use of formative assessment among SHS mathematics teachers. The design employed for the study was descriptive cross-sectional survey. Census survey was conducted on 148 mathematics teachers in thirteen public SHS in the Cape Coast Metropolis and that was the study's population. The results showed a high positive relationship between the knowledge and practice of formative assessment of SHS mathematics teachers." The method employed byAmoako, Asamoah, and Bortey (2019) is ideal for generalisation from the analysis as it makes use of relatively large sample size. The researchers, however, concentrated only on a single subject area, but this study focuses on all teachers from various subject areas.

Problems associated use of Formative Assessment

A study conducted by Chun (2011) in Man Hong Kong investigated the challenges of formative assessment at school. A case study had been

employed for the research. Interview as well as documented analysis had been used as two major study procedures to gather data. Personal and face-to face interviews were given to fifteen (15) teachers and Twenty (20) pupils comprising 4th and 5th grade. It has been found that the "formative assessment results in a heavy workload on teachers". Again, "formative assessment brings inconsistencies in the modes of assessment adopted at different classes and subjects".

The design adopted by Chun (2011) cannot be used for generalising findings since it does not require sampling from a population. This is because with the issue of generalising findings, descriptive survey with quantitative approach is deemed appropriate. This present research is therefore conducted to seal the methodological hole in previous works by adopting descriptive survey with quantitative approach.

Vingsle (2014) identifies the activities which describe the knowledge and skill that mathematics teachers adopt during full-class lessons in their formative assessment practice. The study adopted a case study research design in year 5 during the mathematics lessons. The study reported that "formative assessment practice is a very complex, demanding, and difficult teacher task".

The design adopted by Chun (2011) cannot be used for generalising findings since it does not require sampling from a population. This is because with the issue of generalising findings, descriptive survey with quantitative approach is deemed appropriate. This current study is therefore conducted to fill the methodological gap in literature by adopting descriptive survey with quantitative approach.

Noori, Shafie, Mashwani, and Tareen (2017) discussed the difficulties faced by lecturers while carrying out formative assessments in their classes. The study adopted the method of qualitative case study design with participants of three English lectures. Interviews were used as the main method for data collection. The study findings showed that all three lecturers held positive perceptions about formative assessment. Nonetheless, the application of formative assessment is influenced by certain problems such as, large classes and time constraints.

However, it would have been equally better if Noori et al. (2017) had used quantitative approach as this method paves way to use relatively a large number of respondents to investigate the phenomenon. Moreover, Noori et al. (2017) research focused solely on the English teachers, but not including other subject teachers from various subject areas.

Chapter Summary

In respect of empirical studies reviewed, it has been shown that, numerous studies relative to formative assessment have been conducted within our Ghanaian context as well as the western world. Contextually, the studies that have been conducted focused on tutors of Colleges of Education. Moreover, studies that covered SHS teacher were mostly on teachers from individual subject areas with no study focusing on teachers from all subjects' areas. Furthermore, none of the studies conducted locally was found to be from the Kumasi Metropolis.

Looking at the imbalances in terms of geographical, methodology and content, served as a research gap in literature on the topic. Hence, there is the

need to examine the knowledge, use and problems associated with formative assessment among Senior High School teachers in the Kumasi Metropolis.

CHAPTER THREE

RESEARCH METHODS

Introduction

"The section on methodology describes the study's research design and the study area. The section also presents the study's population, sample and sampling procedure, data collection instruments, data collection and data analysis. There is also discussion of the ethical issues considered in the study.

Research Design

Bless and Higson-Smith (2000) clarified that providing a study design in order to achieve the study goals, is necessary for all research studies. Pursuant to this, the study used descriptive survey with quantitative approach research design. Descriptive survey research design because, objectively, it enables accurate description of activities, objects, processes, and individuals. Descriptive survey aims to observe, describe and document aspects of a situation that occur naturally (Amedahe, 2002). Descriptive survey research has a propensity to obtain data about individuals or groups of individuals who hold certain defined characteristics, attitudes, behaviours and beliefs through interviewing, requesting answers and evaluating the responses provided regarding the current position of the study subject.

Queirós, Faria, and Almeida (2017), maintain that descriptive research involves identifying the attributes of a specific phenomenon based on an observational basis, or exploring the correlation between two or more phenomena." The study used the descriptive survey research method with a

quantitative approach in achieving the study's ultimate goals in this respect. Quantitative approach includes the practice of applying objective analysis of numerical data in order to illustrate the relationships between variables that exist (Creswell, 2014). Researchers use quantitative approach to measure the extent and frequencies of construct in a quantitative approach to discover the meaning and understanding of constructs (Creswell & Plano-Clark, 2011). The central concept of the quantitative method as a hallmark of analytical science includes the use of numerical analysis in formulating and finding answers to research questions.

A quantitative analysis approach retains the premise of an empiricist model, which enables data to be used objectively to measure fact (Creswell, 2012). Therefore, quantitative research answers the relational questions of variables within the research. The aim is to create, confirm or validate relationships and develop generalizations which contribute to the theory (Leedy & Ormrod, 2005). Accordingly, the emphasis is to highlight both a posteriori and a priori knowledge on formative assessment through quantitative approach, which is the study's main theoretical basis.

Rationale for the Design

In conducting research in one form or the other, arguments have been advanced regarding philosophical assumptions that underlie qualitative and quantitative paradigms as the two contradictory forces. Particular emphasis should not be placed solely on the merit and demerit debate of the two opposing paradigms (Tashakkori & Teddlie, 2010).

On this score, Green (2007) emphasizes saying there are no superlative technique in social research, and that the technique adopted should be

appropriate to the issues or problem being investigated. Again, Creswell (2014) argued that the approach to social research is not based solely on the basic philosophical underpinnings, but on important factors such as the research goals and the practicality of the study.

With regard to the study's ultimate goal of exploring knowledge and the use of formative assessment among Kumasi Metropolis teachers in the Ashanti region of Ghana, the use of quantitative approach is quintessential. This is because, to make generalizations, there is a need to gather data from all SHS teachers in the Metropolis. Furthermore, in various subject areas, there is a need to provide descriptive and inferential information about knowledge and the use of formative assessment among teachers. This therefore calls for the collection of standardized information from all respondents using the same tools and questions.

The study will use the descriptive survey with a quantitative approach to meet those expectations. Accordingly, the design involves collecting data from all respondents through the administration of a questionnaire on knowledge and the use of formative assessment and response analysis (Leedy & Ormrod, 2010). This study is descriptive because, as Cohen, Manion and Morrison (2007) have indicated, it will seek to describe and explore a phenomenon in real-life situations and generate new knowledge about the subject.

The design is acceptable because the study aimed to collect one-point data from a number of respondents without any form of manipulation to explain SHS teachers' knowledge and use of formative assessment among teachers (Amedahe & Asamoah-Gyimah, 2015).It should be noted that

descriptive surveys aim to collect "data at a specific point in time in order to describe the nature of existing circumstances or to identify standards against which existing conditions can be compared (Creswell, 2012). Descriptive, inferential and explanatory information that can be used to determine associations and relationships between subjects and themes of the survey can also be included in surveys (Cohen, et al., 2007).In assessing the situation as a pre-requisite for conclusions and generalizations, Punch (2005) indicated that descriptive survey is fundamental to all types of research."

Fraenkel and Wallen (2006) believed that the objective of the descriptive survey research design was to observe, describe and document aspects of a natural phenomenon. As Polit and Beck (2008) have pointed out, concise surveys collect information to reflect what is happening at only one point in time. Considering the nature of the research problem, the researcher selected conditions for the analysis of their relationships that already existed. In addition, regarding the quantitative approach, Dudwick, Kuehnast, Jones and Woolcock (2006) asserted that quantitative approach helps others to make informed decisions and validations about the authenticity of the findings without necessarily repeating the analysis. On the other hand, as suggested by Neuman (2000), quantitative approach does not include an in-depth explanation of the experiences of participants with respect to a study which tends to be a major demerit of quantitative approach adoption.

It should be noted that descriptive survey research design with quantitative approach also has its pitfalls, including its inability to ask probing questions as well as its inability to seek clarification, especially when structured or close-ended questionnaires are used as instruments for data

collection. Given the weaknesses, the descriptive survey design would be selected for the research as judging from the main focus of the analysis where data would be obtained from the schools at just one point in time.

Study Area

"One of the thirty (30) administrative districts in the Ashanti Region is the Kumasi Metropolis. The Kumasi Metropolis was created under Local Government Law 1988, NDPC Law 207, by Legislative Instrument 1614 of 1995, which replaced the Local Government Act 462, 1993 (Ghana Statistical Service, 2014). It is situated between Latitude 6.350N and 6.400S and Longitude 1.300W and 1.350E, 250 to 300 meters above sea level. In particular, the Metropolis shares northern boundaries with Kwabre East and Afigya Kwabre Districts, Atwima Kwanwoma and Atwima Nwabiagya Districts to the west, Asokore Mampong and Ejisu-Juaben Municipality to the east, and Bosomtwe District to the south (Ghana Statistical Service, 2014)."

The Kumasi Metropolis is approximately 270 KM north of the national capital, Accra with a surface area of approximately 214.3 square kilometers which is approximately 0.9 percent of the land area of the region accommodating approximately 36.2 percent of the population of the region (Ghana Statistical Service, 2014). This makes the Metropolis the country's second largest populated city, next to Accra with more than 2.5 million people (Ghana Statistical Service, 2014).

As at 2014, the Metropolis was divided into ten "(10) sub-Metropolitan councils, namely Asokwa, Suame, Bantama, Kwadaso, Manhyia, Oforikrom, Subin, Asawase, Tafo, and Nhyiaso (Ghana Statistical Service, 2014). The KM's political structure includes the Metropolitan Chief Executive, who is the

head and appointed by the President of Ghana and then confirmed by members of the assembly and who represents the central government, 136 members of the Assembly with the power to vote, 10 parliamentarians and heads of the Assembly departments (Ghana Statistical Service, 2014). According to Act 462, the key role of the Metropolis is to exercise deliberative, legislative and administrative roles within the Metropolis and primarily responsible for the overall growth of the Metropolis, as well as to ensure, among others, the preparation of development plans and budget (Ghana Statistical Service 2014). The dominant group in the Kumasi Metropolis is the Asantes who serve (80.7%) followed by Mole Dagvon (8.7%) and Ewe (3.6%). According to the Ghana Statistical Service (2014), The Kumasi Metropolis has various amenities and facilities available to residents, such as health care delivery, teaching and learning, water supply, power transmission, information and communications technology, transportation services, tourism and security services." In particular, Kumasi Metropolis has 136 health facilities with the largest being the Komfo Anokye Teaching Hospital (KATH), offering healthcare services to its residents.

The Metropolis can boast numerous basic, secondary and tertiary schools on Education. Some of the tertiary colleges in include; Wesley University College of Education, St. Louis College of Education and Kumasi Nursing and Midwifery Training College. There are 19 Public SHS accredited, and about 35 private SHS and institutions such as the Kwame Nkrumah University of Science and Technology and the University of Education are in the Kumasi Metropolis among others. It plays a pivotal role in the large and competitive business and manufacturing sectors with respect to the

distribution of products in Ghana, due to the Kumasi Metropolis's strategic location (Ghana Statistical Service, 2014).

Looking at the Kumasi Metropolis 's educational, health, economic and social backgrounds, it became very worrying when, by chance, the researcher during off-campus teaching practices got to know from a large number of students from the respective public SHS during the Metropolis' inter-school zonal debate that, most of their teachers did not actively involve them in their teaching. This disclosed information from the students made the researcher understand that the importance of involving students in teaching is not keenly understood by teachers in the Metropolis. As a student of measurement and evaluation, these teachers do not seem to have a fair understanding of formative assessment, which as a key element, involving students actively plays an instrumental role. It is for this reason that a study of this nature is relevant to examine the knowledge of teachers and the most frequently used activities that characterise use of formative assessment in the Kumasi Metropolis. The geographical map of the Kumasi Metropolitan Assembly showing all the sub-districts are shown in figure1.

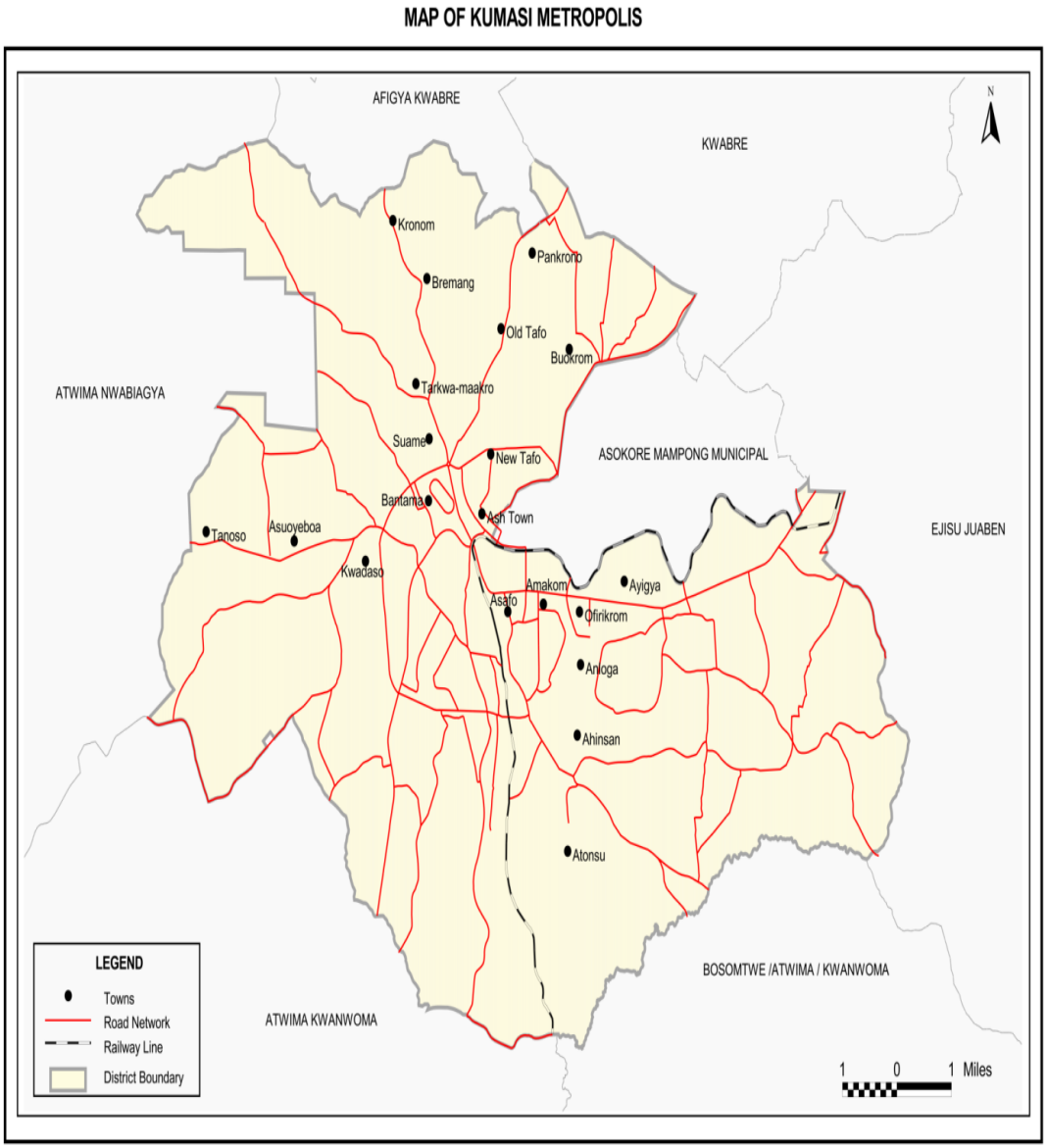


Figure 1: Geographical map of KM showing all the sub- Districts

Population

Gorard (2001) explained that a population refers to a group of subjects from which a sample is selected in order to produce study results. The study target population includes all SHS teachers in the public schools in the Kumasi Metropolis. There are nineteen (19) public SHS accredited in the Kumasi Metropolis as at 2019, out of which five (5) are single sex girls' SHS, four (4) are single sex boys' SHS and ten (10) are mixed SHS with a total population of 2,403 subject teachers SHS(Ghana Statistical Service, 2014).

Sampling Procedure

Sampling procedure is the process use to sample participants for a study (Martínez-Mesa, González-Chica, Duquia, Bonamigo&Bastos, 2016). A sample refers to a population subgroup being studied to generalise with respect to the target population (Creswell, 2014). The need for sampling in a study as stated by Fowler (2009), is to pick a portion of the population which is most representative of the population. It should be pointed out that, a multi-stage sampling procedure was used in the study. The multi-staged sampling procedures as been used to select the participants are described below:

Stage 1

In selecting the study area, a purposive sampling, non-probability sampling, was used. Purposively, Kumasi Metropolis was selected because, it is the largest city in the Ashanti region and has 19 out of the122 public SHS within the region. Moreover, it is a city with all the categories of SHS. Thus, a city which has 4 single sex boys, 5 single sex girls and 10 mixed public SHS.

Stage 2

In selecting the schools for the study, the proportional stratified random sampling procedure was employed. This means that, all the public SHSs were put into strata. Specifically, all boys' schools, girls' schools and mixed schools were put into different stratum. Each stratum represented a homogeneous group of teachers, that is, a group with similar characteristics (Ary, Jacobs, Razavieh & Sorensen, 2006). The researcher then selected SHSs from each stratum using the lottery method of simple random sampling procedure.

For example, in the first stratum consisting of a single sex boys' school, the names of all the SHS' single sex boys were written on paper and put in a bowl, and thoroughly stirred before picking one of the SHS. The name of the picked school has been reported on a separate sheet. In selecting a single sex girls' school as well as a mixed school the same approach was employed. It should be noted that, as in the case of the two selected schools in the mixed category, the picking was done with replacement, and without looking to ensure objectivity.

Table 1- *Stratification and the number of schools selected from each stratum for the study*

Stratification of the nineteen public SHS	Number of schools in each stratum	Number of schools selected from each stratum
Single sex boys	4	1
Single sex girls	5	1
Mixed	10	2
Total	19	4

Source: Field survey (2019)

In effect, four schools were selected from the strata. Thus, one single sex boys' school, one single sex girls' school and two mixed schools ensured fairness in gender representation to this study. In this respect, the four schools were appropriate for generalisation of the study results. The teachers at each level should be used because each of these teachers is supposed to have some knowledge about formative assessment. As at 2019, the total population of teachers in the four selected schools under study from different subject areas

was 532 (*Researcher's field experience*, 2019). As indicated by Kothari (2004), a sample for a study is selected from the accessible population.

The distribution of population among the four SHS teachers is shown in Table 2.

Table 2-*Distribution of the accessible population among the four selected schools*

Schools	Population of subject teachers
Serwaah Nyarko SHS	97
Osei kyeretwie SHS	156
Kumasi High SHS	152
Adventist SHS	127
Total	532

Source: Field survey (2019)

Stage 3

After determining the accessible population of 532, a "sample of 226 was selected for the study using Krejcie and Morgan (1970).According to Krejcie and Morgan (1970), there is no a population figure of 532 which is the study's actual accessible population, and so, the researcher selected a population of 550 which closer to 532 and used its sample of 226 for the study. In this regard, based on the recommendation by Krejcie and Morgan (1970), a sample of 226" was selected for an accessible population of 532 for the study.

Stage 4

Based on the sample of 226, the distribution of the respondents (teachers) for the schools was obtained through the use of proportionate

sampling. In Adventist SHS, for example, a proportionate sampling was used to determine the number of respondents (teachers) required from the school as shown below:

$$\frac{number\ of\ teachers\ in\ Adventist}{total\ number\ of\ teachers\ of\ \ the\ accessible\ population} \times 226 \quad = \frac{127}{532} \times 226 = 54$$

The rest of the samples for each of the schools were calculated and the resulting sample sizes are shown in Table 3.Table 3 illustrates the distribution of the sampling of teachers as estimated using the proportionate sampling among the schools.

Table 3-*Distribution of samples among the Schools*

School	Population Teachers	Sample
Adventist SHS	127	54
Serwaa Nyarko Girls SHS	97	41
Kumasi High SHS	152	65
Osei Kyeretwie SHS	156	66
Total	532	226

Source: Field survey (2019)

In essence, both probability and non-probability sampling (purposive, stratified and proportionate sampling) procedures and the use of Krejcie and Morgan (1970) sample size determination table was used to select 226 SHS teachers in each school of the accessible population for the study.

Data Collection Instrument

A questionnaire was "used for the study (see Appendix A). As opined by Paralov (2006) questionnaire is an effective means of measuring the behaviour, attitudes, preferences, opinions and intentions of relatively large

numbers of subjects conveniently than other methods." Questionnaire was used since the focus of the study was on teachers' attitudes, preferences, opinions and intentions they had regarding their knowledge as well activities characterised use of formative assessment. Knowles (as cited in Adane, 2013) indicated that, relatively, administration of questionnaire is easy, friendly to complete, fast to score, and less time is used by respondents. Looking at these merits of a questionnaire, there are also setbacks in its usage. Its demerit includes not encouraging probing which fosters respondents to give shallow responses (Payne & Payne, 2004). Moreover, on the bases of respondents given 100 percent truthfulness to their responses, issues of privacy and social desirability bias prevent respondents. This often results to skipping of sensitive questions which in effect, affects the results of the study. Although, respondents were assured of their anonymity and confidentiality pertaining to any information provided in their participation in the study. It must be pointed out that, the questionnaire items used for the study was adapted.

A survey questionnaire with a reliability of 0.647 was adapted from Bortey (2018) who explored the formative assessment practices among mathematics teachers in the Cape-Coast Metropolis. The questionnaire was composed of five Sections labelled A, B, C, D and E.

Section A was made up of 3 items highlighting the demographic Characteristics of the respondents as gender, professional qualification and year of teaching experience.

Section B focused on SHS mathematics teachers' knowledge in formative assessment practices. Which consisted of 30 items numbered from 4

to 33. The items were scored dichotomously (Nominal) with a scale: YES and NO.

Section C aimed at eliciting information on SHS mathematics teachers' perception of formative assessment with the items number from 34 to 41. "The items were scored on a four-point likert scale: Strongly Disagree, Disagree, Agree and Strongly Agree.

Section D aimed at formative assessment practices of SHS mathematics teachers in the classroom. It also comprised items from 42 to 53 and was score on a four-point likert scale; Scarcely, Sometimes, Often and Most often."

Section E which formed the last section elicited information on problem associated with teachers' implementation of formative assessment. In this section, 7 items (a to g) with an open-ended question formed the response to be provided.

In sum, the adapted questionnaire was composed of 54 items. Comprising, three (3) items in Section A and 51 items labelled in the Sections B, C, D and E.

In adapting Bortey's (2018) questionnaire, some items were reworded since the focus of her study was different from my study. For instance, with regard to my study, the respondents surveyed were not limited to only mathematics teacher, but all SHS subject teachers.

Moreover, the scales of some items were changed. For instance, on the issue of measuring SHS teachers' knowledge on formative assessment, it was score dichotomously whereas my study measured the SHS teachers' formative knowledge on a four-point likert scale. As a researcher, I am of the believe

that, items scored dichotomously (YES OR NO) give room for some respondents dodge their opinion on a construct measured by choosing "NO". However, the four-point likert scale inherently forces respondents not to dodge but rather, provide their opinion or stance regarding the construct being measured.

Another area where the adaptation occurred was on how information elicited regarding problems SHS teachers encounter in implementing formative assessment. Thus, Bortey (2018) used an open-ended question but my study used a close-ended item scored on a four-point likert scale of strongly disagree, disagree, agree and strongly disagree. In sum, my study's questionnaire was composed of 50 items.

After reading closely on formative assessment, the adapted questionnaire was fine-tuned to collect data for the study in accordance with my supervisor's suggestions and recommendations. Particularly the questionnaire was for SHS teachers purported to elicit responses on the knowledge and use of formative assessment. The questionnaire was made up of four (4) sections, (A to D). Section 'A' elicited responses regarding the demographic data of teachers whereas section 'B' composed of thirty-three (33) items which sought responses on the knowledge level of formative assessment among teachers. Section 'C' on the other hand, contained twelve (12) items which elicited responses on the activities that characterised use of formative assessment. Section 'D' on the contrary, contained five (5) items which elicited responses on the problems associated with teachers use of formative assessment. It must be pointed that, items in all sections of the questionnaire were measured on a four-point Likert scale; Strongly Disagree

(SD), Disagree (D), Agree (A) and Strongly Agree (SA) with one (1) representing the least agreement to the issues while four (4) indicating the strongest agreement to the items. With regards to the negatively worded items, reverse coding was done before they were scored. This therefore means that, with the reverse coding, Strongly Agree (SA) becomes least agreement to the issue while Strongly Disagree become the strongest agreement to the issue.

Validity and Reliability of the Instruments

My supervisors, who are experts and well-grounded in the field of measurement and assessment in line with the study's objectives, the research questions and the study's interest variables, have assessed the content validity of the survey questionnaires on knowledge and use of formative assessment among SHS teachers. “To assess the quality of each item in the context of clarity, ambiguity and generality, the instruments were given to the supervisors for the necessary corrections and enviable suggestions to be made.

The pilot test was conducted on 23SHS teachers after 10 percent of accessible population of 226 had been calculated. The pilot-testing was conducted in the University Practice SHS in the Central Region of Ghana in December 2019. Before the pilot-testing, a letter was taken from the Head, Department of Education and Psychology, University of Cape Coast. Copies of the letters were sent to the authorities of the school to seek for permission to conduct the pilot-testing. The teachers were randomly selected to participate in the pilot-testing of the instruments. The reliability of pilot test was 0.92 using Cronbach Alpha (r).

After the main data collection, a post reliability test was conducted on the instruments and reliability” coefficients of 0.801 of the participants

(teachers) was ascertained (see Appendix D). As indicated by Pallant (2010), a reliability coefficient (alpha) of 0.60 or higher is considered moderately appropriate. This indicates that the reliability coefficients of 0.80 for the teachers' questionnaire show that the items on each of the questionnaire were appropriate in measuring the construct under consideration.

Ethical Considerations

Researchers need to prepare themselves and consider ethical concerns regarding the design of the study to pave way for inculcating sound ethical practices into the study (Neuman, 2006). Regarding ethical issues, the right to privacy, voluntary participation, and no harm to participants, anonymity and confidentiality were held in high esteem. Before the commencement of the data collection on the field, ethical clearance was obtained from the Institutional Review Board (IRB) in the College of Education Studies, University of Cape Coast, for the approval of my study (see Appendix C). The ethical clearance was given after my proposal and data collection instrument have been vetted.

It should be emphasised that teachers have rights to privacy and as a result, these rights must be respected at every point in time. In this sense, the rights of privacy of respondents in the study were respected. To ensure strict adherence to this ethical protocol, respondents were studied after their permission or consent has been granted. In addition, one of the key components regarding ethical issues in the arena of research has to do with respondents' voluntary participation. Responding to questionnaires in the study of this nature would demand a lot of time and energy which would not lead to the disruption of the regular activities of respondents. It is for this

motive that the researcher explained the objectives and significance of the study to the respondents and therefore, allowed respondents to exercise their voluntary right in their participation of the study.

Another ethical issue in educational research has to do with the fact that, the exercise should not cause an injury to the participants under study irrespective of whether they volunteer to participate in the study. The concept of harm as used in this regard can be physical, psychological or emotional. In pursuance of this, questions were constructed in such a way that, it gave the respondents several alternatives and freedom in selecting the answers that are most appropriate to them.

Furthermore, as part of the ethical issues in research, the ultimate goal is to protect and safeguard the well-being, interest and the identity of the respondents. In pursuance of this, the researcher adopted anonymity and confidentiality techniques in ensuring the protection of respondents. The respondents were therefore given an assurance that the information they provide will be highly confidential.

In addition, it should be said that in research, unethical behaviour which include plagiarism is not welcomed. This normally originates when a researcher falsifies, distorts data or plagiarises other peoples' works. In this study, the researcher followed strictly the prescribed standard of scientific behaviour to avoid plagiarism. The researcher therefore gathered information from the right respondents and subject on the information gathered in proper analyses before writing the research report. Notably, ideas, works and writings were duly acknowledged by way of providing appropriate references in the in-

text referencing and main referencing as adopted by the University of Cape Coast.

Data Collection Procedures

Prior to the administration of the questionnaire, the headmasters/ headmistresses of the various SHS for the study were written to for permission to conduct the study in their schools. With an introductory letter (see Appendix B) from the Head, Department of Education and Psychology of the University of Cape Coast, the researcher visited the four selected public SHS in the Metropolis. Upon arrival at the SHS for the study, the authorities of the various schools were informed about the study. Having sought the permission of the management of the SHS, the teachers that participated in the study were contacted. The purpose of the study was explained to the participants (teachers) and the questionnaires were given out to participants to complete.

I administered the questionnaire items personally to the 226 respondents. The questionnaire items were administered and collected within a period of one month from January to February with a minimum of four days devoted to each school. I moved from school to school to administer and collect the data until all the four schools were exhausted. In all, approximately40 minutes were given to the respondents to respond to the items on the instruments. The return rate was 213 which stood at 94% of the questionnaire administered by the researcher.

Data Processing and Analysis

The data analysis phase consisted of editing, coding and statistical computation. The data gathered were analysed with the aid of Statistical Packages for Social Sciences (SPSS, version 21) after the data had been

collated and edited in order to address questions that might have been answered partially or not answered at all. In addition, the questionnaires were arranged and numbered serially to ensure easy identification and errors. Descriptive statistics, mean and standard deviations as well as inferential statistics, Pearson Product Moment correlation coefficient were used to analyse all the research questions with the view that, collected data were approximately normally distributed. It must be pointed out that, percentages and frequencies were used to analyse the background information of the respondents.

Specifically, data on research question one which sought to examine knowledge level of SHS teachers in the Kumasi Metropolis on formative assessment was analysed using mean and standard deviation.

For research question two, which sought to investigate the most frequently used activities that characterise the use of formative assessment among SHS teachers in Kumasi Metropolis on formative assessment, the mean and standard deviations were used to analyse the data collected.

Research question three which examined the relationship between knowledge level and activities that characterise use of formative assessment among SHS teachers in the Kumasi Metropolis, the Pearson Product Moment correlation coefficient was also used to analyse the data elicited.

For the last research question which sought to identify the problems associated with the use of formative assessment among SHS teachers in the Kumasi Metropolis, the mean and standard deviations were used to analyse the data.

Chapter Summary

"This study focused on knowledge and use of formative assessment among SHS teachers in the Kumasi Metropolis. The chapter discussed the methods and procedures that were used to accomplish the objectives of the study. A review of the research design, population and sample, data collection instruments, data collection and analysis procedures as well as validity and reliability of the instruments have been described. As indicated above, the descriptive research design with quantitative approach was most appropriate for the study".

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

"This chapter presents the results from the analyses of the data collected from the field. The purpose of the study was to investigate knowledge and use of formative assessment among SHS teachers in the Kumasi Metropolis. For the purpose of the study, the descriptive survey with quantitative approach was considered appropriate. Questionnaires for SHS subject teachers were used to collect data for the study. Descriptive statistics, means and standard deviations, and inferential statistics, Pearson Product Moment correlation coefficient, were used to analyse the data collected in exploring SHS teachers' knowledge and use of formative assessment in the Kumasi Metropolis".

The sample size for the study was 226. The response rate stood at 94% because 213 out of the 226 teachers returned the questionnaire items. Hence, a sample size of 213 was used for the analysis.

Results

Demographic characteristics of SHS teachers

This section surveyed teachers' responses on their demographic characteristics by gender. A summary of the responses on the demographic characteristics is presented in Table 4.

Section A: Demographic Information of the respondents

Table 4-*Gender distribution of respondents*

Gender	Frequency	Percentage (%)
Male	126	59.2
Female	87	40.8
Total	213	100.0

Source: Field survey (2020)

"From Table 4, the majority of the respondents were males representing 59.2% (126), while 40.8% (87) were females. This indicates that, there were more males than females' respondents in the study.

Research Question 1: What is the knowledge level of SHS teachers on formative assessment in the Kumasi Metropolis?

The goal of this question was to explore the knowledge level on formative assessment among SHS teachers in the Kumasi Metropolis. 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. In the analysis, a mean value of 2.5(1+2+3+4/4=2.5) was established as the standard mean set. A mean value greater than 2.5 means that majority of the respondents agreed to the statement, while a mean value less than "2.5" means that majority of the respondents disagreed to the statement. In other to judge teachers' level of knowledge in formative assessment mean of means was computed using SPSS. A summary of the results is presented in Table 5".

Table 5-*Teachers knowledge on formative assessment*

Items	M	SD
Formative assessment takes place during the process of teaching and learning encounter.	3.23	.76
Formative assessment provides ongoing feedback to improve teaching and learning.	3.29	.74
Clarification of specific learning intention in teaching is required in formative assessment.	3.11	.71
Sharing of learning objective with students in teaching is not part of formative assessment.	2.38	1.01
Formative assessment allows teachers to discover the way students think about what is being taught in the classroom	3.13	.83
Engaging of students in asking relevant questions during lesson is not part of formative assessment.	1.87	.99
Criteria for success need to be specified in practicing formative assessment in the classroom.	2.90	.66
Formative assessment is an integral part of teaching and learning in my subject.	3.16	.85
Feedback can be delayed when practicing formative assessment in my classroom.	2.39	.98
Formative assessment improves learning and achievement in classroom.	3.23	.88
The use of professional knowledge in teaching is very relevant in formative assessment.	3.27	.77
Formative assessment is used by teachers to modify their teaching methods.	3.22	.73
Formative assessment has negative impact on student learning.	1.99	.99
Formative assessment is for grading of subjects scores.	2.35	.90
Formative assessment is not necessary tied to a	2.63	.92

specific subject learning pathway.

Table 5 continues

Formative assessment is not mostly interactive in teaching my subject.	2.25	1.03
The teacher must consciously plan for formative assessment in course of teaching.	3.11	.76
Formative assessment involves actively both the teacher and students in teaching and learning.	3.19	.79
Formative assessment involves the various ways in which teachers find out the progress of learners.	3.18	.75
Formative assessment is embedded in my classroom lessons.	2.95	.79
Formative assessment brings about my subject's instructional correctives.	3.05	.77
Formative assessment has strong positive impact on students learning in my subject.	3.20	.79
Feedback can be immediate when practicing formative assessment in the classroom.	3.03	.78
Formative assessment requires students to take responsibility of their own learning.	2.85	.84
Formative assessment helps students to focus on their learning goals.	3.09	.75
Formative assessment leads to collaboration among students and teachers in classroom.	3.14	.80
Formative assessment uses continuous and diverse forms of assessment in learning.	3.07	.71
Formative assessment has long-lasting impact on students learning.	3.14	.74
Formative assessment has little or no point value	2.07	.97
Formative assessment is high stake in nature.	2.69	.89
Entering behaviour of learners can be ascertained by formative assessment.	2.83	.81
Formative assessment helps to identify learners' strength and weakness to a content taught in my classroom.	3.29	.75
Formative assessment enriches teaching by employing varieties of activities.	3.26	.73
Mean Total	95.54	
Mean of Means	2.895*	

Source: Field survey (2020)M= MeanSD= Standard Deviation
Number of items = 33

From Table 5, it can be seen that, twenty-six of the thirty-three items measuring Kumasi Metropolis SHS teachers' knowledge level recorded means and standard deviations ranging from "M=3.29, SD= .75" to "M=2.63, SD=.92" which are above the Standard Mean of "2.5", indicating that majority of respondents have agreed to almost all the statement on formative assessment. From the data in Table 5, the following items recorded the highest means. Items two and thirty-two with the statements, "Formative assessment provides ongoing feedback to improve teaching and learning" and "Formative assessment helps to identify learners' strength and weakness to a content taught in my classroom" recorded the highest mean score of "M=3.29, SD= .74" and "M=3.29, SD= .75"respectively. Also, item eleven with the statement "The use of professional knowledge in teaching is relevant in formative assessment" scored the mean of "M=3.27, SD=.77". Considering the two items having the highest means, it clearly indicates that, truly,Kumasi Metropolis teachers have knowledge in formative assessment since those items, to the large extent, explain what formative actually means. However, the items "Engaging of students in asking relevant question is not part of formative assessment" and "Formative assessment has negative impact on students learning" obtained the lowest mean scores of "M=1.87, SD= .99" and "M=1.99, SD=. 99" respectively.

Referring to the mean of means value of 2.89, it can be observed that, SHS teachers of Kumasi Metropolis have above average knowledge level in formative assessment. This because, the mean of means value (2.89) is greater than the standard mean of "2.5".

Research Question 2: What are the mostly frequently usedactivities that characterise use of formative assessment among SHS teachers in Kumasi Metropolis?

The goal of this research question was to explore the most frequently used activities that characterise use of formative assessment among SHS teachers in Kumasi Metropolis. Activities that were included were the "Class work", "Examination", "Homework", "Peer-assessment", "Self-assessment", "Interview", "Test", "Discussion", "Observation", "Questioning", "Presentation" and "Project work". Teachers were asked to choose among these activities regarding the use of formative assessment in their profession. I believed that, the teachers had a good understanding about formative assessment, and therefore should select according to the activities they use in their respective classrooms.

Means and standard deviations were used to analyse data on the responses of respondents. Mean values above 2.5 (1+2+3+4/4 = 2.5) shows that majority of the respondents agreed with the activities while a mean value below 2.5 shows that majority of the respondents disagreed with the activities. A summary of the responses is presented in Table 6.

Table 6-*Teacher activities that characterize use on formative assessment*

Items	M	SD
Class work	3.10	.83
Home work	2.68	.89
Observation	2.90	.88
Questioning	3.21	.82
Discussion	2.49	.91
Short test	2.68	.90
Presentation	2.23	.94
Peer- assessment	2.11	.93
Self-assessment	2.37	.98
Project work	2.30	.97
Interview	2.14	.92
Exams	3.12	.92

Source: Field survey (2020) M= Mean SD= Standard Deviation

From Table 6, it is evident that, the items which recorded the means above 2.5 are the most frequently used activities that characterise use of formative assessment by the respondents. These activities include "Questioning", "Exams," "Class work", "observation", "homework" and "short test", with mean scores and standard deviations of "M= 3.21, SD= .82", "M=3.12, SD=.92", "M=3.10, SD=.83,""M=2.90, SD= .88", "M=2.68, SD=.89" and "M=2.68, SD=. 90" respectively. However, "Peer assessment", "Presentation" "self-assessment" among others obtained the lowest mean scores of "M=2.11, SD=. 93", "M=2.23, SD=.94" and "M=2.37, SD= .98" respectively.

The results imply that, the most frequently used activities that characterise use of formative assessment among SHS teachers in the Kumasi Metropolis are "Class work", "Questioning", "Exams", "Homework", "Observation", and "Short test". However, the least used activities for formative assessment among SHS teachers in the Kumasi Metropolis were "Peer assessment", "Presentation" and "Self-assessment" among others.

Research Question 3: What is the relationship between knowledge and use of formative assessment among SHS teachers in the Kumasi Metropolis?

Research Question 3 sought to establish the relationship between teachers' knowledge and use of formative assessment in Kumasi Metropolis. Data on this research question was analysed by conducting a Pearson Product Moment Correlational Coefficient analysis between knowledge level and use of formative assessment in Kumasi Metropolis. The data in Table 7 presents the results from the Pearson Product Moment correlational analysis. This was because the two variables were continuous and were measured on the interval scale. Before the analysis, composite scores of the two variables were calculated since the original measure of the two variables was on nominal scale.

Table 7-*Correlation between knowledge and use of formative assessment*

		Knowledge of formative assessment	Use of formative assessment
Pearson correlation (r)	Knowledge of formative assessment	1.000	
	Use of formative assessment	.274**	1.000

Source: Field Survey (2020) p= 0.000 p< .05** N= 213

From Table 7, it can be seen that, there is a positive and significant relationship between teachers' knowledge in formative assessment and use of formative assessment (r= .274, p< .05, p= 0.000). The correlation coefficient depicts a weak, but positive relationship between teachers' knowledge and use of formative assessment. The weak correlation coefficient is as a result that, degree of the relationship between knowledge and use of formative assessment was r<0.40. This positive relationship implies that, as teachers' knowledge in formative assessment increases, there is a corresponding increase in their formative assessment, however such increase is weak. On the other hand, as teachers' knowledge in formative assessment decreases, there is a corresponding decrease in the use of formative assessment.

Research Question 4: What are the problems associated with the use of formative assessment among SHS teachers in Kumasi Metropolis?

The aim of this research question was to explore the problems associated with the use of formative assessment among SHS teachers in the Kumasi Metropolis. In answering this research question, teachers were asked some problems related to the use of formative assessment. These problems are formative assessment being demanding, formative assessment bring heavy workloads on teachers, formative being a difficult assessment task, complexity of formative assessment and inconsistencies in assessment.

Means and standard deviations were used to analyse the responses of respondents. It should be noted that, mean values above "2.5" (1+2+3+4/4 = 2.5) shows that majority of the respondents agreed with the statement while a mean value below "2.5" shows that majority of the respondents disagreed with the statement. A summary of the responses is presented in Table 8.

Table 8-*Problem associated with the use of formative assessment*

Items	M	SD
Formative assessment is demanding.	2.66	.91
Formative assessment is a difficult assessment task.	2.25	.88
Formative assessment is complex activity	2.15	.90
Formative assessment brings a heavy workload on teachers	2.56	.99
Formative assessment brings inconsistencies in assessment	1.91	.91

Source: Field Survey (2020) M=Mean SD= Standard Deviation

From Table 8, it is evident that, "Formative assessment is demanding" and "Formative assessment brings a heavy workload on teachers" with a mean score of "M=2.66, SD= .91" and "M=2.56, SD=.99" respectively were the problems teachers identified in Kumasi Metropolis. However, the items "Formative assessment brings inconsistencies in assessment", "Formative assessment is complex activity" and "Formative assessment is a difficult assessment task" with the mean scores of "M=1.91, SD=.91", "M=2.15, SD= .90" and "M=2.25, SD= .88"obtained the lowest mean scores respectively. It can be inferred from the Table8 that, the major problems associated with the use of formative assessment in Kumasi Metropolis is attributable to fact that, "formative assessment is demanding" and "Formative assessment brings a heavy workload on teachers"

Discussion of Findings

This section discusses the major findings based on the results obtained for the study. The discussions were done in relation to relevant literature reviewed. It can be observed that, teachers' knowledge on formative

assessment, activities that characterise the use of formative assessment, relationship between knowledge level and use of formative assessment and problem associated with the use formative assessment have been explored in the Kumasi Metropolis. It also highlighted where research findings were consistent with finding of the study as well as where they differed.

Knowledge level on Formative Assessment

The study aimed at examining SHS teachers' knowledge level on formative assessment in Kumasi Metropolis. From the analysis of data on this research question, "it was revealed that, SHS teachers in Kumasi Metropolis have above average knowledge level in formative assessment. This above average knowledge level of SHS teachers on formative assessment may be attributed to a number of factors. These factors may include number of frequent in-service training to the teachers on formative assessment. However, the empirical studies reviewed reported that, teachers have low knowledge in formative assessment. For instance, a study conducted by Chun (2011) on challenges of school-base formative assessment in Man Tak, Hong Kong reported that teachers lacked professional knowledge and skills in formative assessment.

Moreover, According to Alufohai and Akinlosotu (2016) study on knowledge and attitude of secondary school teachers towards formative assessment practices in Edo Central Senatorial District, Nigeria, found that, teachers have inadequate knowledge in formative assessment. Furthermore, a study conducted by Amoako, Asamoah and Bortey (2019) on SHSteachers' knowledge of formative assessment also revealed that majority of SHS mathematics teachers in the Cape Coast Metropolis had low knowledge in

formative assessment practices". Considering the empirical studies reviewed, none appears to be consistent with the finding of the current study. This inconsistency may be as a result of mirage of factors such as; context, subject area, study area variations and educational levels of respondents and where the study took place.

For instance, Amoako et al (2019) focused only on SHS mathematics teachers whereas, the current study focused on all SHS teachers from different subject areas. This variations in respondents (teachers) might have accounted for such disparity in the result. This is because, teachers from different subject areas may have diverse views on formative assessment, and hence, they may have above average knowledge in formative than teachers who have convergent view. In addition to the difference in the findings, contextual variation may also account for that, thus, every environment is recognised based on what it does. It is possible that, the low knowledge in formative assessment among teachers as it has been reviewed in literature may be as a result that, teachers had not upgrade themselves with the use of formative assessment.

Activities that Characterise Use of Formative Assessment

The study aimed at investigating the activities that characterise the use of formative assessment among SHS teachers in Kumasi Metropolis. From the analysis of data on this research question, it was found that, the most frequently used activities that characterised the use of formative assessment are "Class work", "Questioning", "Exams", "Test", "Homework" and "Observation". From Benneth (2011) "questioning" encompassed pertinent classroom discussions that helps to keep learning on track. Thus, adequate

classroom questioning provides avenue for teachers to pool students along in their teaching, and also plays important role in maximizing students understanding. "Exams" on the other hand is reported to be one of the most classroom techniques teachers use to assess their students (Tamakloe, Amedahe & Atta, 2005). Moreover, Asare (2015) "Short test" as one of the formative assessment activities has been validated by this current study.

However, "Peer assessment", "Presentation" and "Self-assessment" among others were found to be the least used formative assessment practices among the SHS teachers in the Kumasi Metropolis. The position of Bekoe et al (2014) was that, "Peer assessment" and "Self-assessment" were the major formative assessment tutors use to assess teacher-trainees' learning in Social Studies has not been justified regarding the respondents who were surveyed in this study, and hence differed from the findings of this current study.

Relationship between Knowledge and Use of Formative Assessment

"In relation to the relationship between SHS teachers' knowledge and use of formative assessment in Kumasi Metropolis, the analysis of data on this research question found that, there is a positive weak and significant relationship between SHS teachers' knowledge and SHS teachers' use of formative assessment. Positive relationship between teachers' knowledge and teachers' use of formative assessment as obtained for the study means that, if there is an increase in SHS teachers' knowledge on formative assessment, there is a corresponding increase in SHS teachers' use of formative assessment. On the other hand, if there is a decrease in SHS teachers' knowledge on formative assessment, there is a corresponding decrease in SHS

teachers' use of formative assessment. Thus, knowledge and use of formative assessment among Kumasi Metropolis teachers are in the same direction.

Amoako, Asamoah and Bortey (2019) investigated Knowledge of Formative Assessment Practices among SHS Mathematics Teachers. It was reported that, relationship between SHS mathematics teachers' knowledge and the practice of formative assessment was positively strong (Amoako et al, 2019). Considering the study of Amoako et al., it can be seen that, the positive relationship that exist between mathematics teachers' knowledge and practice of formative assessment is consistent with the findings of this study". However, the magnitude or the degree of the relationship between Amoako et al. study and the current study is not in agreement to each other. The weak correlation between SHS teachers' knowledge and SHS teacher use of formative assessment may be as a result of the fact that, the respondents to this study were from different subject areas. This variation of the respondents may also be as a result of the heterogeneous relationship among people, and hence, there is a weak positive correlation.

Problems associated with use of Formative Assessment

Generally, the study investigated five associated formative assessment use problems that have been highlighted in literature. From the analysis of data on this research question, it was found that, among the five highlighted problems associated with the use of formative assessment, it was revealed that, "Formative assessment being demanding" and "Formative assessment brings a heavy workload on teachers" are the major problems in the Kumasi Metropolis. This finding revealed by the current study is in agreement with the study conducted by Vingsle (2014) who identified the activities that

characterise the knowledge and skills that a teacher of mathematics uses in her formative assessment use during whole-class lessons and found that, "formative assessment is demanding in nature". Moreover, Chun (2011) finding of formative assessment results in "bringing heavy workload on teachers" is also in congruence with the finding of this study.

It can be inferred from the finding of this study that; the heavy workload challenge imposed on subject teachers practice of formative assessment puts a lot of demands on them. The demanding nature of formative assessment might have constrained Kumasi Metropolis SHS teachers use of some formative assessment activities such as the peer assessment and self-assessment among others due to limited instructional periods. As opined by Noori et al. (2017)that, instructional time serves as a constraint to the implementation of formative assessment. Moreover, since formative assessment gears towards meeting the need of every student, small class size is paramount to its implementation. However, large class size in Kumasi Metropolis puts great demands on teachers' use of formative assessment (Noori et al, 2017). Hence, formative assessment could not be faithfully be utilised due to large class size and limited instructional periods allotted to the SHS subject teachers in Kumasi Metropolis.

However, the finding of this current study is not consistent with below study. First and foremost, Chun (2011) investigated challenges of school-case formative assessment in Man Tak, Hong Kong. It was reported that, formative assessment is a difficult assessment task. The finding of Chun is not in congruence with the finding of this study, and hence, the position of Chun has not been justified with the respondents being surveyed for this study.

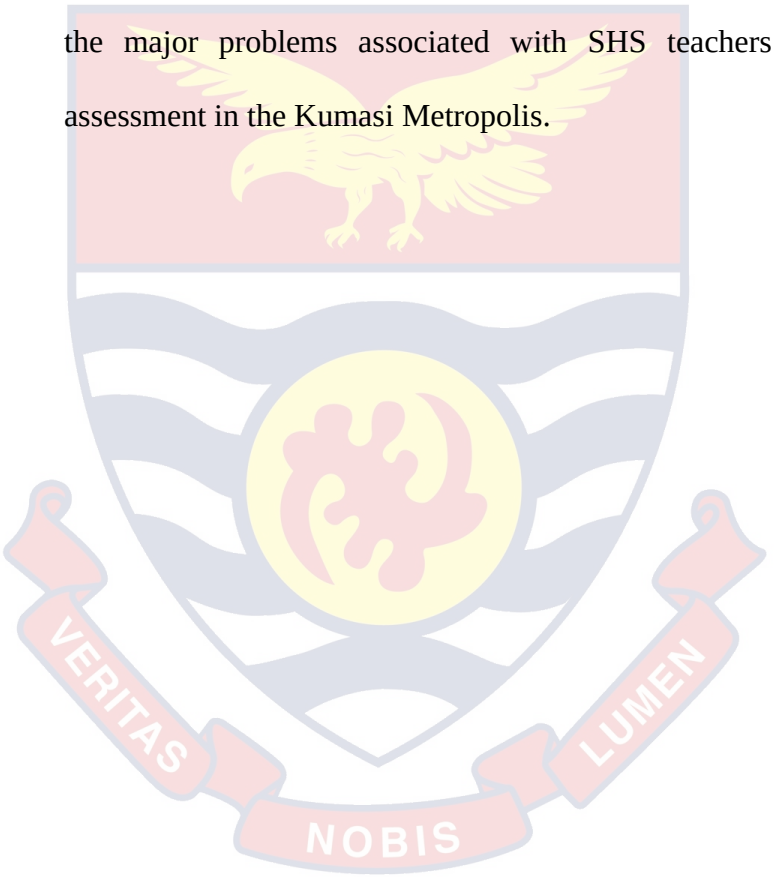
Furthermore, it was not found in this study that formative assessment is complex activity. This finding is also not in support of the study conducted by Vingsle (2014) who identified the activities that "characterise the knowledge and skills that a teacher of mathematics uses in her formative assessment practice during whole-class lessons. The study also revealed that, formative assessment use is a very complex and difficult task for the teacher in several ways (Vingsle, 2014). As far as the respondents to this study are concerned" Vingsle stance has not been justified.

Summary

This chapter looked at the findings and discussions of results obtained from the data on the four research questions. Specifically, data on the four research questions were analysed with means and standard deviations and Pearson Product Moment correlation coefficient statistical tools. The findings are presented as follows:

1. SHS teacher in Kumasi Metropolis were reported to have above average knowledge on formative assessment.
2. On the activities that characterised the use of formative assessment, it was reported that; "Class work", "Questioning", "Exams", "Short Test", "Observation" and "Homework" are the major formative activities that are frequently used in Kumasi Metropolis. Among these major activities, "Questioning" is the most dominating formative activity followed by "Exams". "Peer assessment", "Presentation" and "Self-assessment" among others were the least practiced formative assessment activity in SHS in the Kumasi Metropolis.

3. With respect to the relationship between SHS teachers' knowledge and use of formative assessment in Kumasi Metropolis, it was found that, there is a weak positive relationship between knowledge and use of formative assessment in Kumasi Metropolis.
4. Concerning the problems associated with the use of formative assessment, it emerged that, "Formative assessment being demanding" and "Formative assessment brings a heavy workload on teachers" are the major problems associated with SHS teachers use formative assessment in the Kumasi Metropolis.



CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

"The chapter presents a summary of the key findings, the conclusions, recommendations and suggestions in the study.

Overview of the study

The study sought to investigate knowledge and use of formative assessment among SHS teachers in Kumasi Metropolis in the Ashanti region of Ghana. In pursuance of the purpose, the following research questions guided the study:

1. What is the knowledge level of SHS teachers on formative assessment in Kumasi Metropolis?
2. What are the most frequently used activities that characterise use of formative assessment among SHS teachers in Kumasi Metropolis?
3. What is the relationship between SHS teachers' knowledge and use of formative in Kumasi Metropolis?
4. What are the problems associated with the use of formative assessment among SHS teachers in Kumasi Metropolis?

A descriptive survey design involving quantitative approach was adopted for the study. Four (4) SHSs were selected from the Nineteen (19) public accredited SHS within Kumasi Metropolis in the Ashanti Region of Ghana. A multi stage sampling procedures were used to select a sample of 226 teachers for the study".

In stage 1, purposive sampling technique was used to select the study area for the study.

In stage 2, stratified random sampling using lottery method was used to put the school into their respective stratum and selected the accessible population of 532 from the strata. Thus, teachers from single sex girl, single sex boy and mixed school.

In stage 3, Krejcie and Morgan (1970) sample size determination table was then used to select a sample 226 respondents (teachers) for the study.

In stage 4, Proportionate sampling as the last technique was employed to allocate the 226 participants of the study into their respective stratum.

The main instrument that was used in data collection to capture teachers' knowledge, use as well as problems associated with the use of formative assessment based on literature was a questionnaire.

In sum, fifty (50) items questionnaire was adapted for the instrument, comprising 33 items for teachers' knowledge, 12 items for activities that characterise use and 5 items for problems. Statistical procedures used in data analysis were mainly means and standard deviations and Pearson Product Moment correlation coefficient.

"Summary of Key Findings

The key findings are presented in conformity with the objectives of the study as follows:

1. The key finding that emerged was that, the knowledge level of SHS teachers on formative assessment in Kumasi Metropolis have above average knowledge on formative assessment". It became evident that, out of the thirty- three items measuring teachers' knowledge, twenty-

six items recorded means above the average mean. Moreover, an overall mean computed was above the standard mean of the items measuring the teachers' knowledge level.

2. Also, it emerged that, among the twelve activities that characterise SHS classroom teachers' use of formative assessment, "Questioning", "Exams", "Short Test", "Class work", "Observation" and "Homework" were the major classroom activities that characterise use of formative assessment in Kumasi Metropolis. However, "Peer assessment", "Presentation" and "Self-assessment" among others were least used by SHS teachers in Kumasi Metropolis regarding formative assessment.
3. Again, it was found that, SHS teachers' knowledge on formative assessment had a positively weak correlation with use of formative assessment in Kumasi Metropolis.
4. Finally, it was revealed that, that major challenges that SHS teachers in Kumasi Metropolis face with the use of formative assessment are the fact that, "Formative assessment is demanding" and "Formative brings heavy workload on teachers".

Conclusions

Based on the findings from the study, it concluded that, SHS teachers in Kumasi Metropolis have the requisite knowledge in formative assessment. However, some of the activities involving practice of formative assessment were seen not to be used by the SHS teachers in Kumasi Metropolis. These unused activities defy the fact that, assessment should be comprehensive. This is because for an assessment to be comprehensive, all domains and for that matter, all formative assessment activities should be employed by the SHS

teachers in Kumasi Metropolis. Moreover, formative assessment was seen to involve a lot during its implementation, and as such, impose challenges to SHS teachers in Kumasi Metropolis. Furthermore, it was observed that, teachers' knowledge in formative assessment directly relates to their classroom formative activities. That is, the more teachers acquire knowledge in formative assessment, the ease they become with use of formative assessment activities.

Recommendations

On the basis of the findings and conclusions drawn from the study, the following recommendations were made for consideration by Ghana Educational Service, the Heads of the SHS as well as teachers in the Kumasi Metropolis for policy and practice.

1. The study recommends that Heads of the SHS in Kumasi Metropolis should organise regular in-service training, seminars and workshop for the teachers in order to sustain teachers' high knowledge level in formative assessment.
2. The study also recommends that, stakeholders such as Ministry of Education, Ghana Education Service and Heads of SHS should encourage teachers to continuously incorporate all formative assessment activities in their daily classroom interaction.
3. Moreover, the study also recommends that, Director of Education, Ghana Education Service and Head of schools must ensure teachers use of "Peer assessment", "Presentation", "Self-assessment" among others in their formative assessment activities. This activity must be

included in their school-based in-service training so that teachers could advance their knowledge.

4. Furthermore, Head teachers in the Kumasi Metropolis should encourage subject Associations and District Teacher and Support Team (DTST) to include formative assessment skills in their workshops they organise.
5. Lastly, donor agencies should support SHS in the Kumasi Metropolis by providing appropriate logistics to improve the execution of formative assessment practices.

"Suggestion for Future Research

The following suggestions are made for further research:

1. In order to have a nationwide generalisation of SHS subject teachers' knowledge in formative assessment, it is suggested that, similar studies should be done in different regions within country.
2. It is also suggested that, studies should be conducted" to find out how SHS groupings influences teachers practice in formative assessment.
3. Since knowledge in formative assessment and practice is not limited to only SHS teachers, studies can also by conducted in JHS within Kumasi Metropolis to ascertain teachers' knowledge at that level of education.

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APPENDICES

APPENDIX A

UNIVERSITY OF CAPE COAST

DEPARTMENT OF EDUCATION AND PSYCHOLOGY

QUESTIONNAIRE FOR SHS TEACHERS

The purpose of the questionnaire is to examine Senior High School teachers' knowledge and extent of use of formative assessment in the Kumasi Metropolis. You are therefore kindly requested to respond to all statements or items based on the instruction given. Your response to the statements in this questionnaire in the most truthful and objective way are highly appreciated. Information provided will be used solely for research purposes and its confidentiality is highly assured.

Thank you very much for your golden opportunity and co-operation.

SECTION A DEMOGRAPHIC INFORMATION

1. Gender

   Male [ ] Female [ ]

SECTION B
TEACHERS' KNOWLEDGE ON FORMATIVE ASSESSMENT

"1= Strongly disagree", "2= Disagree", "3=Agree", "4= Strongly agree"

S/N		1	2	3	4
1	Formative assessment takes place during the process of teaching and learning encounter.				
2	Formative assessment provides ongoing feedback to improve teaching and learning.				
3	Clarification of specific learning intention in teaching is required in formative assessment.				
4	Sharing of learning objective with students in teaching is **not** part of formative assessment.				
5	Formative assessment allows teachers to discover the way students think about what is being taught in the classroom				

6	Engaging of students in asking relevant questions during lesson is **not** part of formative assessment.				
7	Criteria for success need to be specified in practicing formative assessment in the classroom.				
8	Formative assessment is an integral part of teaching and learning in my subject.				
9	Feedback can be delayed when practicing formative assessment in my classroom.				
10	Formative assessment improves learning and achievement in classroom.				
11	The use of professional knowledge in teaching is very relevant in formative assessment.				
12	Formative assessment is used by teachers to modify their teaching methods.				
13	Formative assessment has negative impact on student learning.				
14	Formative assessment is for grading of subjects scores.				
15	Formative assessment is not necessary tied to a specific subject learning pathway.				
16	Formative assessment is not mostly interactive in teaching my subject.				
17	The teacher must consciously plan for formative assessment in course of teaching.				
18	Formative assessment involves actively both the teacher and students in teaching and learning.				
19	Formative assessment involves the various ways in which teachers find out the progress of learners.				
20	Formative assessment is embedded in my classroom lessons.				
21	Formative assessment brings about my subject's instructional correctives.				
22	Formative assessment has strong positive impact on students learning in my subject.				
23	Feedback can be immediate when practicing formative assessment in the classroom.				

24	Formative assessment requires students to take responsibility of their own learning.				
25	Formative assessment helps students to focus on their learning goals.				
26	Formative assessment leads to collaboration among students and teachers in classroom.				
27	Formative assessment uses continuous and diverse forms of assessment in learning.				
28	Formative assessment has long-lasting impact on students learning.				
29	Formative assessment has little or no point value.				
30	Formative assessment is high stake in nature.				
31	Entering behaviour of learners can be ascertained by formative assessment.				
32	Formative assessment helps to identify learners' strength and weakness to a content taught in my classroom.				
33	Formative assessment enriches teaching by employing varieties of activities.				

SECTION C
TEACHERS' ACTIVITIES INVOLVING USE OF FORMATIVE ASSESSMENT

"1= Strongly disagree", "2= Disagree", "3=Agree", "4= Strongly agree"

S/N		1	2	3	4
1	Class work				
2	Home work				
3	Observation				
4	Oral questions/ Questioning				
5	Group discussion				
6	Short test/ Quizzes				
7	Presentation				
8	Peer assessment				
9	Self-assessment				
10	Project work				
11	Interview				
12	Exams				

SECTION D
PROBLEMS ASSOCIATED WITH USE OF FORMATIVE ASSESSMENT

"1= Strongly disagree", "2= Disagree", "3=Agree", "4= Strongly agree"

S/N	Formative assessment is;	1	2	3	4
1	demanding.				
2	a difficult assessment task.				
3	very complex activity.				
4	Formative assessment brings heavy workload on teachers.				
5	Formative assessment brings inconsistences in the assessment.				

APPENDIX B

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:

23rd October, 2019

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

THESIS WORK
LETTER OF INTRODUCTION
MR. WILLIAM NTIAMOAH NTIM

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

Mr. Ntim is researching on the topic:

"KNOWLEDGE AND USE OF FORMATIVE ASSESSMENT AMONG SHS TEACHERS IN KUMASI METROPOLIS."

He has opted to collect or gather data at your institution/establishment for his thesis work. We would be most grateful if you could provide him the opportunity and assistance for the study. Any information provided would be treated strictly as confidential.

We sincerely appreciate your co-operation and assistance in this direction.

Thank you.

Yours faithfully,

Gloria Sagoe (Ms.)
Chief Administrative Assistant
For: **HEAD**

APPENDIX C

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/v4/19-02 Date: December 2, 2019

Your Ref: .....

Dear Sir/Madam,

ETHICAL REQUIREMENTS CLEARANCE FOR RESEARCH STUDY

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

The bearer, William Ntiamoah Ntim Reg. No. EF/MEP/18/0001 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:

Knowledge and use of formative assessment among Senior High School teachers in the Kumasi Metropolis.

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)

APPENDIX D

POST RELIABILITY ANALYSIS

Reliability Statistics

Cronbach's Alpha	Number of Items
.801	50