

The Perceived Use of Assessment by Beginning and Experienced SHS Mathematics Teachers in Two Districts in the Central Region of Ghana

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ABSTRACT

The role of assessment in the teaching and learning of Mathematics cannot be under estimated. Therefore, efficacious teaching and learning of Mathematics must be driven by effective use of assessment. This study therefore sought to investigate the Use of assessment (practices) of Beginning and Experienced SHS Mathematics teachers in two selected districts in the central region of Ghana. In this study Assessment Practices means what SHS teachers use assessment to do in the teaching and learning of Mathematics under the auspices of a school. A sample of 160 SHS Mathematics teachers were used in this study. These were made up of 92 Beginning and 68 Experienced SHS Mathematics teachers. The instrument used in this study was a questionnaire. The questionnaire was administered to the 92 Beginning and 68 Experienced SHS Mathematics teachers in the two districts in the Central Region of Ghana. The design used in this study was cross-sectional survey. Data collected from the respondents were analysed using frequencies, percentages, means and standard deviations. Independent sample t-test was used in test whether there exists a significant difference in the assessment practices of the Beginning and Experienced SHS Mathematics teachers. It was found out that majority (87 out of 92) of the Beginning Senior High School Mathematics teachers do not either frequently or always integrate assessment in the teaching and learning of Mathematics. It was also found out that majority (60 out of 68) of the Experienced Senior High School Mathematics teachers also do not either frequently or always integrate assessment in the teaching and learning of Mathematics. They rather see classroom assessment as an additional activity which mainly comes at the end of the teaching learning process. The study also revealed a significant difference in the assessment practices of Beginning SHS Mathematics teachers and that the Experienced SHS Mathematics teachers in the two districts. Based on the findings, it was recommended among other things that In-service training should be organised for both the Experienced SHS Mathematics teachers and the Beginning SHS Mathematics teachers to help them bridge the gap that exist between their practices.

Keywords: Classroom Assessment Practices; Beginning SHS Mathematics Teachers; Experienced SHS Mathematics Teachers.

Introduction

It is the most cry of teachers, students, parents and school administrators that Senior High School students are assessed before, during or after a teaching section to enhance students understanding of Mathematical concepts and improve teacher's mode of teaching. The point is that assessment must form part in the creation of an effective learning process. However, a learning environment that is dominated by assessment procedures can detract the learning environment but we have found that if the students are able to see the value of the learning process, and that assessment is part of the learning and not an end in itself, then they can buy into the process and actually use it to gain better understanding of what ever concept that they are learning while benefiting from the learning environment which they help to create through their self-monitoring and peer-assessment activities(William, 2010). This idea has been demonstrated by William in identifying the processes of peer tutoring, co-operative learning, reciprocal teaching through predicting answers, questioning, clarifying, summarizing and collaborative reasoning ((Black & William, 2009). All of these processes when used in a classroom will empower the learners as they are placed at the center of the learning process; echoing Smith's question: What do you do in the classroom? If assessment activities are part of the doing of Mathematics, then they become a central part of the learning process which will elicit understanding of concepts.

Literature points to the fact that when thinking about the role of assessment in teachers' judgments, it is important to distinguish between externally mandated tests and various kinds of classroom assessment practices which are mainly under the direct control of the teacher (Shepard, 2006; Etsey, 2003; Stiggins & Chappuis, 2005). They added that external assessments are usually standardized, on demand tests that rely mostly on some kind of multiple-choice or short constructed response questions types. All students are assessed on the same few subjects and topics sampled for inclusion in each assessment, and all scores are reported and summarized in the same manner, typically in a norm or criterion referenced metric. Judgments of students' performance that is based solely or mainly on performance on standardized tests would likely be similar across teachers. In contrast, classroom assessment encompasses a wide range of approaches for the on-going evaluation of students' achievement and progress, including structured tests and quizzes; worksheets; home assignments; and informal assessing of student participation, effort, and behaviour. Judgments of students' achievement that are based only or mostly on classroom assessment could differ considerably across teachers. For instance, one may value information from class test less important than information from assignment whereas another assessor may assign the opposite weights to the same sources of information.

Teacher conceptions about assessment and the nature of learning in general can fundamentally influence their decisions about students' achievement. For example, subscribing to a view that every student should be held to the same academic standards and expectations is likely to influence the way in which a teacher judges the level of achievement of his/her students. Furthermore, teachers' perceptions about the relative value of standardized tests compared with classroom assessments will naturally influence

their assessment practices of students. A teacher who solely depends mostly on standardized tests could reach widely different judgments about students' achievement as compared to the one who places greater value on teacher made quizzes, effort, and participation in the classroom (Martínez, Stecher & Borko, 2009, William, 2011).

According to Fletcher (2001); Inekwe and Umar (2011), the mode of teachers' assessment prescribes the nature of the educational experiences and the quality of the relationship that exist between teachers' teaching and students' learning. They added that assessment is not something separate but a tool by which education may be evaluated; it acts upon the educational system so as to shape it in accordance with what the assessment demands. You cannot have, at one and the same time, educational system for personal growth and a totally impersonal system of assessment (Bennett, 2011). Assessment should therefore be a connection between teachers and what they have taught their students, not something which threatens and antagonizes students' efforts. To make assessment human oriented, then, we have to make schooling a more cooperative initiative between teachers and students, and opportunity to develop the whole range of human competencies, leading up to informative profiles. This should be the pattern of things for the immediate future; it is the way to discard the routine, and often unjust grading techniques of traditional education which does not benefit teachers and learners in anyway (NCTM, 1995, 2014).

According to (William 2016), the various and different evaluation objectives include but are not limited to a) student feedback; (b) diagnostic information; (c) record keeping summary data; (d) reporting evidence; and (e) curriculum review. Garrison & Ehringhaus (2011) states that teachers use evaluations to serve at least three distinct types of purposes in their classrooms: (a) to inform assessment, grading, diagnostics and referrals, sorting and grouping decisions; (b) to facilitate teaching and learning through communicating expectations and engaging students in self-evaluation and peer-evaluation; and (c) to retain management or regulation of behaviour in the classroom. We are of the opinion that what teachers use assessment to do must not only be limited to this categorization, but must go deeper to control the whole process of teaching and learning.

It must be noted that countries that are much concerned about their development put great deal of emphasis on the study of mathematics across all grade levels (Curriculum Research and Development Division, 2011). The rationale for the senior high school mathematics syllabus is therefore focused on attaining one crucial goal: to enable all Ghanaian young people to acquire mathematical skills, insights, attitudes and values they need to have to be successful in their chosen careers and daily lives. This rationale needs assessment system that will nurture the realization of the paramount goal of the mathematics curriculum at the Senior high school level.

Chief Examiners' reports in 2009, 2011, 2012, 2013 and 2014 indicate that Senior High School students performed abysmally in core mathematics over these years and the situation is not different from what happens at the basic level in Ghana. Many studies have been done to understand why students perform poorly in mathematics (Fletcher, 2001; Inekwe & Umar, 2011, Etsey 2003). The results show that some teacher factors such as content knowledge, pedagogical knowledge, pedagogical content knowledge, professional practices of which assessment is a key component that influence how teachers teach their students.

The results of the Trends in International Mathematics and Science Research (TIMSS) conducted in 2003 by the United States International Association for the Assessment of Educational Achievement (IEA) show that Ghanaian grade 8 children performed poorly in the mathematics achievement examination (TIMSS, 2003), where Ghanaian eighth graders were rated 43rd out of 44th graders. Trends in International Mathematics and Science Research (TIMSS, 2007) in an international study conducted in 2007. This condition is similar to what goes on at SHS levels in Ghana. It is more serious at the senior high school level where passing mathematics is a requirement for gaining admission into tertiary institutions. Failure to pass mathematics has resulted in many senior high school graduates being unable to continue at the tertiary level.

Ghana realizes the need to support mathematics education in high schools but without paying much attention to how students are assessed in the classroom. All teacher support programs and determinations may not adequately prepare teachers to meet the challenges they face in the classroom. There are many facets of education that need to be understood and addressed if teachers are to support students to learn meaningfully by integrating assessment in their teaching. For Ghana education to attain the standard it needs to achieve then it requires teachers who can ably conduct classroom assessment to inform their teaching and learning process.

According to Gbormittah and Bonney (2018), teachers who have gone through formal assessment training either as part of a programme package or as a course are expected to demonstrate high level of competencies with regards to classroom assessment. All teacher training institutions are making some attempt to equip prospective teachers the needed skills, knowledge and experience that they would need to do effective assessment. Workshops are organized for those who are even on the field of teaching to keep them abreast with modern based way of conducting ideal assessment of teaching and learning. Despite the significance of assessments in education today, few teachers put the skills, knowledge and experience from these training into effective use. Most of these teachers don't see the need to have teaching and learning processes that is assessment driven. Some teachers perceived assessment as added on activity that is mainly separated from the teaching learning process. Mathematics teachers who participated in this study prefer to set separate days sometimes few days or more days after teaching the concept or topic or sometimes they may not even assess their students at all on some of the concepts being taught and learned by them. This must not be case at all. These unfortunate practices have made students to develop the notion that their efforts have little or no influence on their results (Guskey, 2000a,2000b; William 2016). They added that students who participated in their study have little or no confidence in their assessment results. Consequently, students won't benefit from the assessment results. The teachers themselves won't be left out from what we called the gimmicking situation in academics. The teachers won't benefit as well as their students since the teachers' classroom assessment is not purposely oriented. So, who is the teacher deceiving? himself/ herself or the system? It is like we want to please the system in disguise of doing the right thing. Students are always disadvantaged and the consequence is the consistent poor performance of our students in mathematics. In fact, desired learning goals and assessment must go hand in hand. In other words, desired learning goals and assessment are mutually influential in teaching and learning mathematics. We tried to review literature on assessment models that could summarize the focus of our study. The Model for Assessment in Relation to Pedagogy was found useful and adopted for this study (Black & William, 2018).

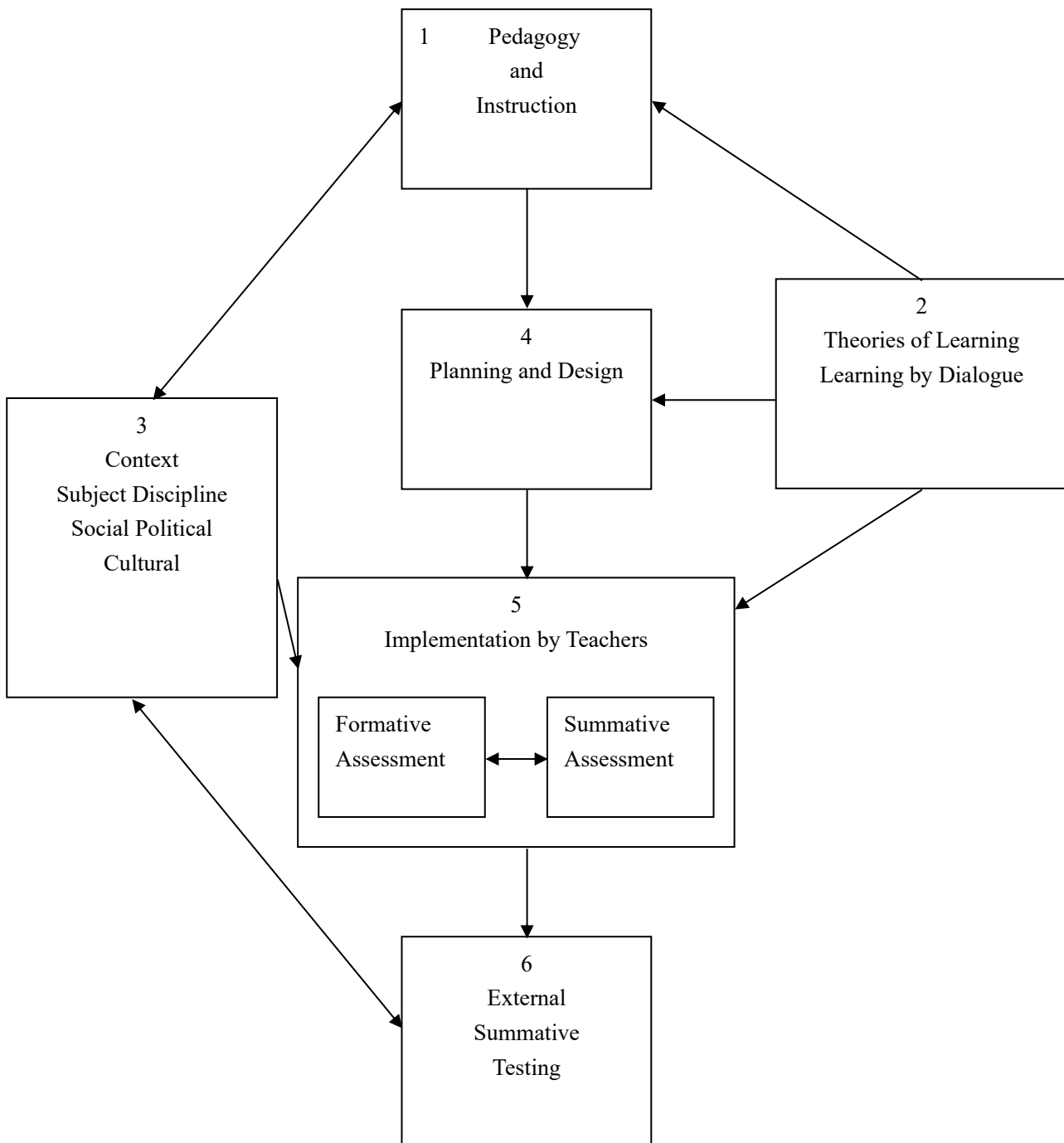


Figure 1: Model for Assessment in Relation to Pedagogy (Black & William, 2018)

Whatever the relative merits of the wide and narrow definitions of pedagogy, a narrow definition of pedagogy would completely, or at the very least, exclude assessment, even if it included some elements of assessment, would exclude others, making it difficult to deal with assessment in an integrated manner. We therefore describe pedagogy generally for the purposes of this paper, and specifically as 'the act and discourse of teaching' (Black & William, 2018). Alexander (2004 p. 8) thus explicitly including curriculum and assessment, Specifically, we adopt Alexander's (2008) definition:

pedagogy is the act of teaching together with its attendant discourse of educational theories, values, evidence and justifications. It is what one needs to know, and the skills one needs to command, in order

to make and justify the many different kinds of decision of which teaching is constituted. Curriculum is just one of its domains, albeit a central one. (p. 47 original emphasis)

Not many studies have looked at the assessment practices of Beginning and Experienced Senior High School Mathematics teachers in particular. It is also unclear whether the poor performance of students in mathematics is as a result of the assessment practices of the Beginning and Experienced Senior High School Mathematics teachers. It is also unclear, whether the kind of students’ assessment both the Beginning and Experienced SHS mathematics teachers do really mirrors the actual performance of our students. It is as a result of these issues that the study sought to investigate the assessment practices of Beginning and Experienced Senior High School Mathematics teachers. The following research questions and hypothesis guided the study:

1. What are the assessment practices of Beginning Senior High School Mathematics teachers?
2. What are the assessment practices of Experienced Senior High School Mathematics teachers?

H₀₁: There is no significant difference in the assessment practices of Beginning and Experienced Senior High School Mathematics teachers.

Methodology

A cross-sectional survey was the design used in this study since it was interested in describing a particular phenomenon under a study (Cohen, Mansion & Morrison, 2011). The cross-sectional survey is considered appropriate for this study since it deals with collecting a data from a sample that has been drawn from a population which was predetermine.

Population

The target population was made up of all Beginning and Experienced Senior High School mathematics teachers in Abura/Asebu - Kwamankese district and Cape Coast metropolis in the Central Region of Ghana. The accessible population comprised of 100(60 Beginning and 40 Experienced) and 60(32 Beginning and 28 Experienced) Senior High School mathematics teachers in Cape Coast metropolis and Abura/Asebu-Kwamankese districts respectively all in the Central Region of Ghana.

Table 1: Participating Schools in Cape Coast Metropolis

Name of schools	No. of Beginning SHS Mathematics Teachers	No. of Experienced SHS Mathematics Teachers
HCHS	8	3
SAHS	8	2
ADHS	7	5
GNHS	7	3
MFHS	7	7
USHS	6	4
WGHS	6	9

CTHS	4	1
ETHS	4	4
OTHS	3	2
Total	60	40

Source: Fieldwork, 2015, N = 100

Table 2 - Participating Schools in Abura / Asebu -Kwamankese District

Name of the school	No. of Beginning SHS Mathematics Teachers	No. of Experienced SHS Mathematics Teachers
AGHS	8	4
ASHS	8	6
STHS	6	5
ABAHS	6	7
ABUHS	4	6
Total	32	28

Source: Fieldwork, 2015, N = 60

Sampling Procedure

All the 92 Beginning and 68 Experienced SHS Mathematics teachers in the accessible population during the time of this study were sampled to take part in the study because of the small size of the population (Cohen, Mansion & Morrison, 2011) from Abura/Asebu - Kwamankese district and Cape Coast Metropolis. The researchers used simple random sampling technique in selecting the two districts. Therefore 160 (92 Beginning and 68 Experienced) SHS Mathematics teachers participated in this study from the two districts in the Central Region of Ghana.

Data Collection Instruments

The research instrument used for this study was questionnaire. The questionnaire was named, "The Assessment Practices of Beginning SHS and Experienced SHS Mathematics Teachers". This instrument was developed by the researcher. The questionnaire consists of two sections:

- Five Demographic variables: gender, degree type, teaching experience, areas of mathematics being taught and academic qualification (see Appendix A).
- Consists of thirty-five (35) closed ended statements made up of various assessment practices each on a five-point Likert scale in which teachers were required to indicate the degree of frequency levels that best matches their typical assessment practices (See Appendix A)

Reliability and Validity of the Instrument

The instrument was subjected to validity and reliability test. They were given to both supervisors who thoroughly vetted them and ascertained that they met both face and content validity. The suggestions as given by the supervisors with regard to the improper constructions of some items in the questionnaire were used to effect the necessary changes to improve upon the content validity.

Pilot testing of the Instrument

Although the target population is made up of all the teachers in the Abura/Asebu-Kwamankese and Cape Coast metropolitan districts, pilot testing was carried out in two schools with each school from Komenda and Mfantseman districts respectively. EDSH and MFG Senior High Schools were randomly selected using computer pseudo random number generator for the pilot-testing. They had all the characteristics being looked for and were outside the two districts which participated in the study. The questionnaire was personally administered to total of 30 Mathematics (Beginning and Experienced) SHS Mathematics teachers with 14 mathematics teachers and 16 mathematics teachers from the two districts respectively. Response rate of 81% and 89% were achieved respectively. The result was analyzed to determine the content validity of the instrument. The internal consistency of the instrument was determined using the Cronbach co-efficient alpha. The Cronbach co-efficient alpha obtained for the pilot-testing were 0.86 and 0.91 respectively, indicating a high correlation among all of the items that make up the scale (Pallant, 2005, p6).

Data Collection Procedures

The initial data collection process included obtaining permission from the department of Mathematics and I.C.T. Education, University of Cape Coast.

The questionnaire was administered to 92 Beginning SHS Mathematics teachers (60 from Cape Coast metropolis and 32 from Abura/Asebu-Kwamankese district) and 68 Experienced SHS Mathematics teachers (40 from Cape Coast metropolis and 28 from Abura/Asebu-Kwamankese district) [See table 1 and 2]. The respondents were allowed to participate in the study with the assistance of the heads of Department of the schools under the supervision of the researcher.

Data Processing and Analysis

The data collected in this study was checked, edited, coded and analyzed with descriptive statistics based on the research questions and the literature reviewed for this study. The research questions were analyzed using descriptive statistics specifically frequency counts, percentages, mean and standard deviations to obtain descriptive statistics for the assessment practices of Beginning and Experienced Senior High School mathematics teachers. Independent sample t-test was further computed to determine whether there exists a significant difference between the assessment practices of the Beginning SHS Mathematics teachers and that of Experienced SHS Mathematics teachers. The following subscales were used for the data analysis: 1- very rarely (0-10% of the time), 2- rarely (11- 25% of the time), 3- occasionally (26- 50% of the time), 4- very frequently (51- 75% of the time) and 5- always (more than 75% of the time).

Results and Discussions

The Assessment Practices of Beginning Senior High School Mathematics Teachers

The first research question sought to investigate the assessment practices of Beginning Senior High School Mathematics teachers. This is to enable the researcher to explore the assessment practices of Beginning Senior High School Mathematics teachers. Table 3 shows the overall mean and standard deviation of the assessment practices of Beginning Senior High School Mathematics teachers.

Table 3- The Overall Mean and Standard Deviation of Assessment Practices of Beginning Senior High School Mathematics Teachers

Activity	N	Mean	SD
Assessment Practices.	92	2.2	0.3

Source: Field work, 2015, N = 92, M = 2.2, SD = 0.3

The overall mean and standard deviation recorded on the Beginning Senior High School Mathematics teachers' assessment practices were 2.2 and 0.3 respectively. The mean and standard deviation scores show that the assessment practices of Beginning Senior High School Mathematics teachers were more of rare practices than anticipated. It also means that majority of the Senior High School Mathematics teachers do not frequently integrate classroom assessment in the teaching and learning of Mathematics left alone integrating it always in their teaching and learning process.

Furthermore, a summary of item-by-item analysis was explicitly calculated for the assessment practices of the Beginning Senior High School mathematics teachers. The responses of the Beginning SHS Mathematics teachers were then categorized under five themes; Very Rare use of assessment, Rare use of assessment, Occasional use of assessment, Frequent use of assessment, and Always use of assessment in teaching and learning as shown in Table 4 below.

Table 4-shows the thematic analysis of the survey data from the Beginning SHS mathematics teachers.

Assessment practices	No of teachers N=92 N(%)	No of assessment practices N=35 N(%)
Very Rare use of assessment	6(6.5)	2(5.7)
Rare use of assessment	63(68.5)	24(69.0)
Occasional use of assessment	18(19.6)	7(20.0)
Frequent use of assessment	5(5.4)	2(5.7)
Always use of assessment	0(0.0)	0(0.0)
Total	92(100)	35(100)

The analysis of results in Table 4 shows that majority 63 (68.5%) of the Beginning Senior High School Mathematics teachers rarely use assessment to inform their teaching and students' learning. It means that majority of the SHS mathematics teachers scarcely use assessment to inform their teaching and students'

learning. The analysis of the results in Table 4 also indicates that 24 out of 35 of the assessment practices these majority 63(68.5%) of SHS Mathematics teachers were rarely applied in the teaching and learning of mathematics.

Beginning Senior High School Mathematics teachers rarely used classroom assessment to:

- a) Create conducive environment helpful for students to complete an assigned task.
- b) Provide students the opportunity to demonstrate what they have learnt in the Mathematics class.
- c) Guide students to set their goals and monitor their own learning where the teacher is only seen as an effective facilitator in the teaching learning process.
- d) To assist students in getting personal feedback.
- e) Demonstrate to students on how to do self-assessment.
- f) Set criteria for students to assess their own performance in class.
- g) Provide examples of good self-assessment practices for students to examine their own learning progress.
- h) Allow students to perform tasked based activities more than paper and pencil tests.
- i) Learn alternative approaches for assessing the learning outcome of students.
- j) Measure the extent of learning at the end of a lesson.
- k) Evaluate the level of competence of students.
- l) Determine the level of accomplishment of a desired learning outcome.
- m) Assess the quality of students learning in class.
- n) Allow students to discover their learning difficulties in class.
- o) Help students to improve their learning process in class.
- p) Assist students to determine their learning strengths in class.
- q) Suggest to students about how they can develop better learning strategies.
- r) Provide specific information to students about their strengths and weakness in class.
- s) Enhance the quality of classroom instruction.
- t) Explore effective classroom teaching methods.
- u) Diagnose areas for improvement of instructional activities.
- v) Identify better learning opportunities for students in class.
- w) Collect continuous learning data from students and
- x) Rank students based on their performance in class.

It was also found out that 2 out of 35 assessment practices of the

Table 4 indicate that minority 6.5% (6 out of the 92) Beginning Senior High School Mathematics teachers very rarely use assessment in the teaching and learning of Mathematics. In other words, 5.7% of the assessment practices of the Beginning Senior High School Mathematics teachers were very rarely applied in their teaching.

Beginning Senior High School Mathematics teachers very rarely used classroom assessment to:

- a. Perform classroom observation to determine how students learning can be improved.
- b. Determine how students can learn on their own in class.

The analysis of results in Table 4 also show that Beginning Senior High School Mathematics teachers occasionally practice assessment in 7 out of 35 of their assessment practices in the teaching and learning of Mathematics. This means that, a fifth of their assessment practices were occasionally used in the teaching and learning of mathematics.

Beginning Senior High School Mathematics teachers occasionally used classroom assessment to:

- a. Help students to develop clear criteria of good learning practices.
- b. Improve instruction for the next teaching term.
- c. Make final decision about the level of students learning at the end of a lesson.
- d. Provide feedback to students.
- e. Create effective teaching approach and strategies for teaching students.
- f. Provide information to parents about their children performance and
- g. Have an accurate basis to show the achievement of students in a class.

The analysis of results in Table 4 revealed that 2 out of the 35 assessment practices of the Beginning Senior High School Mathematics teachers were very frequently used in the teaching and learning of Mathematics. This means that 5(5.4%) of the Beginning Senior High School Mathematics teachers very frequently practice classroom assessment in the teaching and learning of Mathematics. They frequently use classroom assessment to:

- a) Examine how students perform relative to others and
- b) Supply information to other teachers, schools, employers regarding students’ performance in class.

Analysis of results in Table 4 shows that none of the Beginning SHS mathematics Always use assessment to inform their teaching and students’ learning.

The Assessment Practices of Experienced Senior High School Mathematics Teachers

The second research question sought to investigate the assessment practices of Experienced Senior High School mathematics teachers.

Table 5 shows the overall mean and standard deviation of the assessment practices of Experienced Senior High School mathematics teachers.

Table 5: The Overall Mean and Standard Deviation of the Assessment

Practices of Experienced Senior High School Mathematics Teachers

Activity	N	Mean	SD
Assessment Practices	68	2.4	0.2

Source: Field work, 2015, N = 68, M = 2.4, SD = 0.2

The analysis of results in Table 5 indicate that the mean and standard deviation scores recorded on the Experienced Senior High School Mathematics teacher’s assessment practices were 2.4 out of 5 and 0.2 respectively. Generally, the mean and standard deviation showed that the Experienced Senior High School

Mathematics teachers' rarely use assessment in the teaching and learning of Mathematics. These are set of teachers who are expected to put up good classroom assessment practices in the teaching and learning of Mathematics with regards to the number years of experience as mathematics teachers. These teachers have had all the exposure either from training or the field and are expected to effectively integrate assessment in the teaching and learning of Mathematics.

Furthermore, a summary of item-by-item analysis was computed for the assessment practices of the Experienced Senior High School Mathematics teachers and the responses of their practices were also explicitly categorized under five themes; Very Rare use of assessment, Rare use of assessment, Occasional use of assessment, Frequent use of assessment, and Always use of assessment in teaching and learning of mathematics as shown in Table 6.

Table 6 -shows the thematic analysis of the survey data from the Experienced SHS mathematics teachers.

Assessment practices	No of teachers N=68 N(%)	No of Assessment practices N=35 N(%)
Very Rare use of assessment	4(5.9)	2(5.7)
Rare use of assessment	33(48.5)	17(48.6)
Occasional use of assessment	23(33.8)	12(34.3)
Frequent use of assessment	8(11.7)	4(11.4)
Always use of assessment	0(0.0)	0(0.0)
Total	68(100.0)	35(100)

The analysis of results in Table 6 *indicates* that a little less than half 33 (48.5%) of the Experienced Senior High School Mathematics teachers rarely use assessment in teaching and learning of mathematics. In other words, significant majority 17 (48.6%) of their assessment practices were rarely used in the teaching and learning of Mathematics.

The Experienced Senior High School Mathematics teachers rarely used classroom assessment to:

- a) Provide students the chance to show /demonstrate what they have learnt in class.
- b) Guide student to set their goals and monitor their own learning progress.
- c) Demonstrate to students how to assess their own performance.
- d) Set the criteria for students to assess their own performance.
- e) Provide example of good self-assessment practices for students to examine their own learning process.
- f) Allow students to perform task-based activities more than paper and pencil tests.
- g) Measure the extent of learning at the end of a lesson.
- h) Evaluate the level of competence of students of instructional programme.
- i) Improve instruction for the next teaching term or school term.
- j) Determine the level of accomplishment of a desired learning outcome.
- k) Assess the quality of students' learning in class at the end of instruction.

- l) Make final decision about the level of learning that students achieved.
- m) Allow students to discover their learning difficulties in class.
- n) Provide specific information to students about their strengths and weakness in class.
- o) Enhance the quality of classroom instruction.
- p) Explore effective classroom teaching methods and strategies and
- q) Identify better learning opportunities for students in class.

The analysis of results in Table 6 show that 4(11.4%) of the assessment practices of the Experience Senior High School Mathematics teachers were very frequently applied in the teaching and learning of mathematics. This means that only 8 out of 68 Experience Senior High School Mathematics teachers' assessment practices very frequently use assessment in the teaching and learning of mathematic. The analysis of results in Table 6 also shows that none of the Experienced SHS Mathematics teachers Always use assessment in the teaching and learning.

Experienced Senior High School Mathematics teachers very frequently used classroom assessment to:

- a) Provide information to parents about students' performance of their children.
- b) Have an accurate basis to show the achievement of students.
- c) Examine how students perform relative to their others in class and
- d) Supply information to other teachers, schools, employers regarding students' performance in class.

The analysis of results in Table 6 show that 23 (33.8%) of the Experienced Senior High School Mathematics teachers occasionally use assessment in the teaching and learning of Mathematics. In other words, 12(34.3%) of the assessment practices of Experienced Senior High School Mathematics teachers were occasionally applied in the teaching and learning of mathematics.

Experienced Senior High School Mathematics teachers used classroom assessment occasionally to:

- a) Create an environment which is helpful for students to complete an assigned task.
- b) Help students to develop clear criteria of good learning practice.
- c) Assist students to identify means of getting personal feedback.
- d) Determine how students can learn on their own in class.
- e) Learning alternative approaches to assess learning outcomes of students.
- f) Provide feedback to students in order to improve their learning process and class performance.
- g) Make suggestions to students about how they develop better learning strategies.
- h) Diagnose areas for improvement of instructional activities.
- i) Collect continuous learning data from students to improve instruction.
- j) Create effective teaching approach and strategies for my class and
- k) Rank students based on their performance to inform other officials.

The analysis of results in Table 6 show that 2 out of the 35 practices of the Experienced Senior High School Mathematics teachers were very rarely used in the teaching and learning of mathematics.

Experienced Senior High School Mathematics teachers used classroom assessment very rarely to:

- a) Assist students to determine their learning strengths for my class and
- b) Perform classroom observation to determine how students learning can be improved.

Senior High School Mathematics Teachers’ level of Experience and their Assessment Practices

Teachers’ ratings on the items were aggregated to form the variable ‘The Assessment Practices of Beginning and Experienced Senior High School Mathematics Teachers’. This computed variable was further investigated to determine whether or not there is a significance difference between the Assessment Practices of Beginning and Experienced Senior High School Mathematics Teachers’ by the number of years that they have been teaching Mathematics in the Senior High School. Independent sample t-test was used in testing the null hypothesis: There is no significant difference in the assessment practices of Beginning and Experienced Senior High School Mathematics teachers.

Table 7: Comparative analysis of Assessment Practices of ‘Beginning’ and ‘Experienced’ Mathematics Teachers

Assessment practices	N	M	SD	T-value	P-value
Beginning Teachers.	92	2.2	0.34	0.423	0.033
Experienced Teachers	68	2.4	0.23		

Source: Fieldwork, 2015

Table 7 shows the test for equality of means among the Beginning SHS Mathematics teachers (those who have taught for less than 5 years) and Experienced SHS Mathematics (those who have taught for 5 years and above) groups. Since the equality of variance assumption is validated the researcher used the first 2-tailed significant value of a test for equality of means at p-value of 0.033 which is less than significant level of 0.050. The researcher therefore has enough evidence to reject the null hypothesis. In other, words, we reject H_0 at the 5% significance level and conclude that there is a significant difference among Senior High School Mathematics teachers who have taught for ‘less than 5 years’ and those who have taught for ‘5 years and above’.

Lastly, there is the need to determine the value of Eta square, which is the proportion of variances of the dependent variable explained by the independent variable. The value of the Eta Square (0.048) shows the proportion of the variance in the assessment practices of the SHS Mathematics teachers explained by their teaching experience. The Eta square is moderate, $t(158) = 0.423$, $p = 0.033$ (two-tailed), $d = 0.050$, indicating that though there is a difference in the assessment practices of those who have taught for less than 5 years and that of 5 years and above but the difference is not significant.

Summary of key findings

The mean and standard deviation of the assessment practices of Beginning Senior High School Mathematics teachers are 2.2 and 0.3 respectively which indicate rare use of assessment in the teaching and learning of mathematics. In other words, majority (87 out of 92) of Beginning Senior High School Mathematics teachers do not either frequently or always integrate assessment in the teaching and learning of Mathematics. The mean and standard deviation of the assessment practices of Experienced Senior High School Mathematics teachers are 2.4 and 0.2 respectively which generally show rare use of assessment in the teaching and learning of mathematics. In other words, majority (60 out of 68) of the Experienced SHS Mathematics teachers do not either frequently or always use classroom assessment in the teaching and learning of mathematics. The best assessment practices of Beginning SHS mathematics teachers were applied to examine how students perform relative to others, and supply information to other teachers, schools, employers regarding students' performance in class whereas that of the Experienced SHS mathematics teachers frequently use assessment to provide information to parents about students' performance of their children, have an accurate basis to show the achievement of students, examine how students perform relative to others in class and supply information to other teachers, schools, employers regarding students' performance in class. Finally, there was a significant difference between the assessment practices of the Beginning SHS Mathematics teachers and that of Experienced SHS Mathematics teachers but the difference was not much.

Conclusion

Both the Beginning and Experienced Senior High School Mathematics teachers rarely use assessment to inform their teaching and students' learning. In other words, majority of Beginning and Experienced Senior High School Mathematics teachers do not either frequently or always integrate assessment in the teaching and learning of Mathematics. Experienced SHS Mathematics teachers mainly use classroom assessment to provide information to parents about students' performance of their children, have an accurate basis to show the achievement of students, examine how students perform relative to others in class and Supply information to other teachers, schools, employers regarding students' performance in class. Finally, even though there was a significant difference between the assessment practices of the Beginning SHS and that of Experienced SHS Mathematics teachers but the difference was not much. Based on the findings, it was recommended that intensive In-service training should be organised for both the Experienced SHS Mathematics teachers and the Beginning SHS Mathematics teachers to help them bridge the gap that exist between their practices.

Implication for Teaching and Learning

Beginning and Experienced SHS mathematics teachers must use assessment to inform their teaching and learning in context to help their students to make meaning of their own learning. Teachers must use the assessment to facilitate students' learning. Effort must be made by head of schools, head of departments to bridge the gap between the assessment practices of the beginning and experienced SHS mathematics teachers so that their practices will reflect the teaching standards of a good teacher. Assessment must be

used to improve students' learning and the teaching practices of the teachers. SHS Mathematics teachers' assessment practices must be purpose driven to improve teaching and learning. SHS Mathematics teachers must therefore avoid using classroom-based assessment mainly as a way of ranking students and schools rather they must use assessment practices that will mirror the true image of their students' learning abilities in a wholistic manner. Students must see classroom-based assessment as a means of improving learning and value its potentiality of correcting the way they learned. Students must desire to get feedback from whatever they were asked to work on. This feedback could come from the teacher or any experienced peer or the learner himself/herself who could do authentic assessment of the situation which can improve learning.

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