

Senior high school mathematics teachers' use of School-Based Assessment guidelines and test Scores in the Cape Coast Metropolis of Ghana

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Abstract

This paper reports on a study conducted to explore senior high school mathematics teachers' use of School-Based Assessment (SBA) guidelines and test scores in the Cape Coast Metropolis in Ghana. A total of 110 educators comprising 100 male and 10 female mathematics teachers participated in the study. A questionnaire and an interview schedule were used to collect data for the study and descriptive statistics was used to analyse the data. Findings revealed that mathematics teachers in senior high schools in the Cape Coast Metropolis do not follow the School-Based Assessment guidelines on principles of testing in the construction of teacher-made or classroom tests. Very few respondents reported that students' test scores were used to identify strengths and weaknesses and for remedial teaching. The majority of the respondents still practise the old continuous assessment in which students' assessment scores were used mainly for promotion/selection, awarding of prizes/ranking, record keeping, providing feedback to parents, generating score for the West African Examinations Council (WAEC), and preparing students for examination. This is because they do not understand the SBA guidelines. Based on the above findings, it was recommended that the Ghana Education Service should facilitate regular in-service training in testing practices for senior high school mathematics teachers in the Metropolis.

Keywords: Mathematics, Assessment, Application, Senior High School, School-Based Assessment.

Introduction

Assessment is a process of gathering evidence of what a student can do. It provides feedback on a student's learning to direct further development. It is also meant to help students with their learning as well as help teachers improve their teaching (Moore, 1998). As Etsey (2012) observes, good assessment can make teaching more transparent and reliable. Assessment also looks into the special behaviour displayed by learners and measures learners' mastery of the subject matter. It is the process of seeking and

interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there. Assessment can also be used to present feedback to parents on their children's achievement in education.

Anamuah-Mensah and Bartels (1998) have argued that classroom assessment and grading practices can be used as a means to improving teaching and learning. According to them, the best way to enhance learning for a diverse range of students is through appropriate, reliable and valid classroom assessments and grading practices. It is critical, therefore, that teachers possess not only the comprehensive knowledge of subject matter but also the ability to assess the learning of the subject matter, and mathematics teacher are no exception.

There simply cannot be any meaningful development in virtually any area of life without knowledge of science, technology and mathematics. Achievement in science, technology, engineering and mathematics (STEM) is increasingly recognized as one of the most reliable indicators for measuring socio-economic and geo-political development among nations (Justina, 1991). It is for this reason that the education systems of countries that are concerned about their development put a great deal of emphasis on the study of mathematics. In Ghana, mathematics is a compulsory subject at all pre-university levels of the educational system.

Due to its importance, the government of Ghana is committed to ensuring the provision of high quality mathematics education programme. Various attempts have been made in the past to improve students' achievement in mathematics in schools. These include the Science, Technology and Mathematics Education (STME), Japan International Cooperative Agency (JICA) initiatives and the Female and Education in Mathematics and Science in Africa (FEMSA) programme. These attempts are also seen in the New Educational Reforms Committee's Report (Anamuah-Mensah, 2002), the implementation of which started in September, 2007.

Included in the assumptions underlying the tenets of the senior high school (SHS) mathematics curriculum in Ghana is the expectation that mathematics teachers will embrace the new School-Based Assessment (SBA) system administered in schools and marked by the students' own teachers. The SBA was introduced into the curriculum in the last curriculum review in 2007 to replace what used to be called Continuous Assessment (CA) with the view to making assessment more comprehensive. The SBA was designed to provide schools with an internal assessment system that would help schools achieve the expected standards in mathematics. The SBA

and the end-of-term test marks are combined in equal proportions of 50:50 in the schools. However, WAEC uses only 30% of marks obtained from the schools.

The new curriculum in mathematics at the senior high school (SHS) level places emphasis on skill acquisition, creativity and the art of enquiry and problem solving. It aims at developing in the student the ability and willingness to perform investigations using various mathematical ideas and operations. As part of the reforms, the curriculum places a lot of SBA guidelines as a means of encouraging improvement in teaching, learning and assessment (MOESS, 2007). The introduction of the SBA led to several changes in CA. These changes were necessary for some pertinent reasons, among which was to bring about a reduction in the workload of teachers. Every term, the teacher was expected to be active in designing and producing a variety of assessment instruments, scoring the class tests, assignments, projects, taking observations, providing up-to-date records on each pupil and simultaneously be involved in remedial and individual teaching. Where classes were large, the workload became unbearable. The teachers then resorted to unfair means of providing the requisite data for each student (Etsey, 2012).

The new SBA system is designed to provide schools with an internal assessment system that will help schools to standardize the practice of internal school-based assessment in all schools in the country; provide reduced assessment tasks for each of the senior high school subjects; provide teachers with guidelines for constructing assessment items/questions and other assessment tasks; introduce standards of achievement in each subject and in each class of the school system; provide guidelines on marking and grading of test items/questions and other assessment tasks; introduce a system of moderation that will ensure accuracy and reliability of teachers' marks; and provide teachers with advice on how to conduct remedial instruction on difficult areas of the syllabus to improve students' performance. Curriculum documents in this context suggest that teachers should carry out SBA properly to help schools achieve the expected standards of mathematics CRDD (2007, p. xi).

The SBA consists of 12 assessments a year instead of the 33 assessments in the previous CA system, that is, a reduction of 64% of the work load compared to the previous CA system. To improve assessment and grading and also introduce uniformity in schools, guidelines for marking the assessment tasks and grading procedure were suggested. In writing a report on an experiment or any form of investigation, the students has to introduce the main issue in the investigation, project or report. The introduction carries a weight of 20%, the main text/actual work- 40%, conclusions and

evaluation of results/issues- 20%, acknowledgement and other references- 20%. The grade boundaries are as follows: Grade A: 80-100%, Grade B: 70-79%, Grade C: 60-69%, Grade D: 45-49% etc (CRDD, 2007).

School based assessment in the Ghanaian SHS curriculum

As indicated above, the SBA was introduced into the Ghanaian school curriculum in the last curriculum review in 2007 to replace what used to be called continuous assessment with the aim of making assessment more comprehensive i.e. to cover more applications profile dimensions (Mereku, Nabie, Appiah & Awanta, 2011). The major changes to assessment which came with the reforms are summarised in Table 1.

Table 1: Major Changes to Assessment in the 2007 Reforms

	Nature of changes	CA	SBA
Overall changes	i. Use of class exercises and home work	Largely for CA	For formative evaluation only
	ii. % contribution of Class Exercises/ Homework/project work to overall school assessment	30%	-
	iii. % contribution of SBA Tasks to overall school assessment (i.e. class tests & project)	-	50%
	iv. % contribution of end of term exams to overall school assessment	70%	50%
	v. % contribution of (I or II and III) to final WASSCE score	30%	30%
	vi. Number of assessments per term	11	4
	vii. Number of assessments per year	33	12

Changes in project	a) Number of project tasks given per term	4	1
	b) Term distribution of project tasks by individual or group	All individual tasks each term	Individual tasks in terms 1 and 3; Group task in term 2
	c) When is project task given and completed?	Any time, i.e. teachers discretion	Beginning of the term and submitted at the end of the term
	d) Written report required?	Optional, largely oral presentation	Yes, with references
	e) Scoring projects	5	20

(Source: Mereku, Nabie, Appiah & Awanta, 2011)

In the SBA, project work has been restructured and its focus is now to encourage students to apply knowledge and skills acquired in the school term to carry out authentic assessment tasks and write analytic reports or use mathematics to solve real life problems. In the new syllabus, hitherto the class exercises and homework scores were recorded as part of continuous assessment but in the SBA these are supposed to be done as part of the everyday formative assessment and not to contribute to the SBA scores (see Table 1). This means that after teaching for the first 3 or 4 weeks in a term, the teacher should set and administer a class test covering the topics (or content) treated and record this as SBA Task 1. Then after the next 3 or 4 weeks in the term, the teacher sets and administers SBA Task 2, etc. Also, unlike the continuous assessment where teachers use homework tasks that can be completed overnight or over the weekend as project, in SBA projects are supposed to take at least six weeks to complete.

Task 4, Task 8 and Task 12 are supposed to be project to be undertaken throughout the term and submitted at the end of the term; a student is expected to select one project topic for each term; and projects for the second term will be undertaken by teams of students as group projects. A project involves tasks or a series of tasks for students to carry out using one or more of the following processes: gathering data, observing, looking for references, identifying, measuring, analyzing, determining patterns and or relationships, graphing and communicating. An investigational task may also be set in the context of algebra, geometry and or measurements. A project

usually requires students to take a substantial amount of time (e.g., a few days, weeks, or even months) to finish. As part of project-based learning, the teacher is expected to give the students the opportunity to periodically present progress reports to the class for colleagues' feedback and suggestions. For SBA scoring, it is recommended that each class test (or task) should be scaled to the score of 10 and project task scaled to the score of 20 (CRDD, 2007). Table 1 shows the distribution of scores to be awarded to the tasks (i.e. 3 class tests and a project) and examinations each term.

All over the world, more and more emphasis is being placed on student performance and teacher accountability. As a result, assessment is becoming increasingly important to all educators. For example, David (2008) stated that in Australia, traditionally a wide range of measures had been used to identify academically successful schools. The mix of these measures has varied from state to state. But recently, added to this mix, and perhaps becoming the most influential factor, have been the examination results of senior students. These have become far more available to the prospective parents and governing bodies. They are used to gauge the ranking of the school, and to find out whether parents can expect their children to gain entry into the more prestigious tertiary programmes available. These scores are used to rank staff. Consequently, the 'quality' of staff becomes yet another factor in identifying an academically successful school.

About a decade ago, state organizations such as the Ghana Education Service (GES), the media and school boards in Ghana were using test scores in order to evaluate schools. The Ghana Education Services published the Senior Secondary School Certificate Examination (SSSCE) Result League, in which 470 secondary schools in Ghana were ranked from first position to last based on the total number of students each school presented in the examination and the number of candidates that passed 6-7 subjects. Other information including the number of passes in 5, 4, 3, 2 subjects and 1 subject for each school, along with fails, absences, results withheld, and results cancelled was also displayed in the SSS Results League. The ranking became the subject of intense public discussions among Ghanaians inside and outside of Ghana. While some people jubilated over the performance of their former schools, others bowed down their heads in despair. Some people even stated categorically that their former schools were better than others simply because they came near the top position in the ranking. Consequently, some people even suggested that the SSSCE results should be used as an objective criterion for the allocation of resources of money, personnel, and other facilities to secondary schools (Fredua-Kwarteng,

2004). This phenomenon is still lingering in the Ghana Education Service, perhaps because of the international league tables of junior high schools students' performance in science and mathematics (TIMSS, 2007).

In spite of government efforts to encourage the use of formative assessment to enhance the teaching of mathematics, the subject has not undergone much change in terms of how it is assessed. This is reflected consistently in low achievement levels in mathematics among students at the high school levels. The high failure rate and low scores of students over the years in the West African Secondary School Certificate Examinations (WASSCE) attest to this (Ottevanger, van den Akker & de Feiter, 2007). This is true because of the way teaching and learning of mathematics is carried out in schools, interest level in mathematics among students, attitude of teachers toward assessment practices etc. According to Fletcher (2001), teachers tend to use summative assessment during the instructional phase with the misconceived intention of formatively evaluating the learner. Goldstein (as cited by Fletcher, 2001) opines that the attempt to use summative assessment in place of formative assessment encourages pupils to hide their weaknesses and exaggerate their strengths.

Fletcher (2001) further argues that assessment should be rooted in the daily classroom practice of the teacher and as such the curriculum should lead the examination, and not the other way round. Students get credit for everything they do and so there is less temptation from the teacher to omit areas of experience on the grounds that they cannot be examined by a paper and pencil test. Assessment should have a way of measuring what is educationally important. The issue is how we can produce reliable information about pupils' achievement in ways which recognize their true achievement and do not harmfully narrow the criteria on which they and their schools are judged, so that students' examination results are not linked to teacher performance in a simplistic manner. The central purpose of assessment in education is to contribute to raising educational standards by assisting the improvement of teaching and learning. This can only be achieved if assessment encourages open and honest admission of failure as well as successes. Any attempt to use students' examination results as a key indicator of his/her performance could result in the teacher subverting any assessment scheme which tends to promote individual learning at the teacher's expense.

According to Stiggins (1991), "teachers spend much of their instructional time (a third to a half) in assessment-related activities. While this would suggest the need for teachers to be knowledgeable with assessment practices, that is not the case" (p. 1). In Ghana, both trained and untrained teachers in the classroom, from the basic level to the university

level, construct, administer and score classroom achievement tests irrespective of whether they have had training in assessment practices or not. Decisions mostly taken on students have far-reaching consequences that affect students. Policy makers have ignored the training and equipping of teachers with the skill in test construction, test administration and test scoring but not all teachers in the secondary schools in Ghana have undergone professional training in testing techniques Amedahe (2000). Yet, there is scanty literature on how mathematics teachers particularly those with little or no skills in assessment practices construct, administer, score and use classroom or teacher-made tests as a means of assessing students' performance in mathematics (Amedahe, 2000,1989).

The purpose of this study was to investigate senior high school mathematics teachers' use of SBA guidelines and test scores in the Cape Coast Metropolis in order to ascertain the degree to which they are able to apply principles of test construction as enshrined in SBA guidelines, and the uses to which they put test scores.

The study was guided by the following research questions:

- i. Which assessment formats do senior high school mathematics teachers' employ in assessing students' learning and achievement in mathematics?
- ii. To what extent are senior high school mathematics teachers implementing the school-based assessment (SBA) guidelines outlined in the 2007 revised mathematics syllabus?
- iii. How do senior high school mathematics teachers use assessment scores?

Method

The descriptive survey design was used. The study administered a questionnaire and interviewed some of the participants (i.e. sequential mixed methods design) in order to clarify some outstanding claims made by the participants while completing the questionnaire. All the mathematics teachers in the 15 senior high schools in Cape Coast Metropolis participated in the study with the exception of one school that could not render the desired assistance and three of the schools that did not have the desired features necessary for the study. A total of 110 mathematics teachers consisting of 100 males and 10 females from 10 schools (out of the 15) schools in Cape Coast Metropolis participated in the study. The low representation of female teachers in this study is a reflection of the under-representation of females in science and mathematics at all levels, from basic school to the university level in Ghana (Baah-Korang, 2002). For instance, in

2006, female teachers constituted only 15% of the mathematics teachers in the country (Ottevanger et al., 2007). Mathematics teachers were used in the study because the mathematics curriculum in particular emphasises that SBA is a very effective system for teaching and learning if carried out properly.

Instruments

A questionnaire and an interview schedule were used to collect data for this study. The questionnaire was made up of 12 items. Seven of these were closed while the remaining five were open-ended. Section "A" which contained one item requested information on the gender of the respondents. Section "B" of the questionnaire dealt with factors involving construction of achievement tests based on the basic principles in assessment. This section "assessed" knowledge of respondents in assessment practices and how often they had attended in-service training events

Section "C" was concerned with some general issues connected with the management of assessment practices in senior high schools. Amongst them were: how often teachers planned the schedule for assessing students in the schools and the number and types of assessment administered to students the previous term. In writing the items in this section, the four tasks required by CRDD (2007) to be administered in a term in SBA were considered. As part of the SBA, the respondents were requested to indicate the number of times they had used other assessment methods implied by SBA within a term. These other assessments are home work/assignment, class exercises, observation, interview, question and answer (CRDD, 2007).

The questionnaire was pilot tested and the results were analysed to confirm the content validity of the instrument which had earlier been ascertained by experts in assessment in the Department of Science and Mathematics Education. The internal consistency of the instrument was determined using the Cronbach co-efficient alpha. The co-efficient alpha obtained for the pilot-testing was 0.776, an indication of a high correlation among all of the items that make up the scale (Pallant, 2005, p.6).

Data Collection Procedure

The questionnaire was administered to 130 mathematics teachers in the 10 schools that participated in the study with the assistance of the HOD in the schools.

In each of the schools, the purpose of the study was explained to the Head of Department and the mathematics teachers, and they were pleaded with to respond to all the items as candid as desired, while assuring them that no attempt would be made to associate their names or institutions with the

responses. Questionnaires were then distributed to the teachers. There was time for questions, before the participants responded to the questionnaire. The administration of the questionnaire to the teachers was done in September and October, 2012.

Twelve teachers and their HODs were interviewed and data obtained provided in-depth elaborations for the data collected through the questionnaire. This is based on the claim by Fontana and Frey (2008) that interviewing is one of the most common and powerful ways in which one tries to understand people.

Out of the one hundred and thirty teachers given the questionnaire to complete in the 10 schools that participated in the study, 20 of them did not oblige because of their tight schedules. One hundred and ten respondents returned their completed questionnaires, resulting in 84% return rate.

Results

Table 2 summarizes the gender distribution of mathematics teachers who responded to the questionnaires.

Table 2: Gender Distribution of the Respondents

	Frequency	Percent
Male	100	90.9
Female	10	9.1
Total	110	100.0

It is observed from Table 2 that the majority of the respondents, 100 out of the total 110 were males. This suggests that women are in the minority in the teaching of mathematics in the Cape Coast Metropolis.

Furthermore, to be able to assess students very well, a teacher must have taken a course in assessment whether at the pre-service or in-service level (Chapman & Snyder, 2000; Stillman, 2001; Etsey, 2003). Table 3 shows the number of respondents who had taken an assessment course at different levels.

Table 3: The Level at which Respondents Undertook the Assessment Course

	Frequency	Percent
Pre-service	17	15.5
In-service	27	24.5
Both	46	41.8
None	20	18.2
Total	110	100.0

It could be inferred from Table 3 that most of the respondents (90 out of the total 110) had taken an assessment course while the remaining 20 respondents had not taken any assessment course before. Out of the total 90 respondents who had taken an assessment course, the majority of them (about 42%) had their assessment at both the pre-service and in-service levels.

There are many test formats at the disposal of a competent teacher to be used to assess students (Etsey, 2012; Fletcher, 2009). Table 4 shows a summary of the test formats used by the respondents.

Table 4: Frequency Distribution on Use of Test Format (s)

Test Format	Very often	Fairly often	Often	Not often	Never	Total (%)
Essay	50 (45%)	13 (12%)	19 (17%)	26 (24%)	02 (2%)	110 (100%)
Multiple choice	35 (32%)	20 (18%)	32 (29%)	22 (20%)	01 (1%)	110 (100%)
Matching	01(1 %)	08 (7%)	11(10 %)	46 (42%)	44 (40%)	110(100%)
Evaluating mathematical statement	16 (8%)	22 (20%)	22 (20%)	28 (25%)	22 (20%)	110 (100%)
Analysing own error	28 (25%)	28 (25%)	24 (22%)	21(19 %)	09 (8%)	110 (100%)
Peer assessment	15 (14%)	23(21 %)	25 (23%)	39 (35%)	08 (7%)	110 (100%)
Self-assessment	38 (35%)	29 (26%)	14 (13%)	17 (15%)	02 (2%)	110(100%)

Table 4 indicates that the most common format used by the teachers appeared to be Essay (45%), Self-assessment (35%) and Multiple choice (32%) respectively, while Matching (1%) was rarely used. It could be said that in addition to the use of essay and multiple choice in testing students in the schools, teachers claimed they used formats which are current in assessment such as evaluation of mathematical statements, matching, analysing own error, peer assessment and self-assessment. Regarding current formats in assessment, it was found out from the responses that self-assessment (35%) and analysing own error (25%) formats were said to be very often used by the teachers, while matching different representations of mathematical statement (1%) was the least used by the teachers. This finding is not surprising because research (e.g. Higgins et al, cited in Fletcher, 2009) has shown that matching often leads to learners arriving at conflicting answers but such conflicts when resolved through reflective discussion lead to more permanent learning than conventional, incremental teaching methods which seek to avoid learners making 'mistakes'.

Regarding the activities which a teacher should carry out when constructing test items, Table 5 shows the frequency distribution of respondents' practice of those activities.

Table 5: Frequency Distribution of Activities Regarding Test Construction

Activity	Always	Very often	Often	Not often	Never
I write individual assessment items at least two weeks before the date of testing.	14	28	26	37	05
I prepare a marking scheme before students take the assessment	40	30	23	16	01
I review assessment item by letting another teacher in the subject area read over them	28	20	27	24	11
I write direction/instructions for the test	71	21	12	05	11
I copy questions from past questions set by WAEC	03	18	25	63	01
I develop assessment items only when it is time to assess students	03	13	27	49	18
I use test specification table	06	15	39	36	14

when writing test items

I copy assessment questions from textbooks	01	12	34	59	04
I match instructional objectives with assessment items	36	28	32	12	02
I arrange assessment items in order of increasing difficulties	25	38	20	24	03
I write items based on the information that students know	29	47	20	11	03
I arrange objective test answer in a pattern to make scoring easy	05	11	2	18	64
I consider the purpose of the assessment before developing assessment items	39	52	15	04	-
I allow students to select a specific number of items from a given set of items in the essay test	22	41	24	17	06
I prepare more items than needed before I review and select some for the examination	22	27	31	23	07
I evaluate the test as a whole before I submit it for typing	15	22	27	05	02
I give test to students without prior notice	01	09	26	48	26
I give tough test item to students during quizzes to prepare them for examinations	06	22	28	48	06

Table 5 reveals that only 42 (out of 110 respondents) indicated that they write individual assessment items at least two weeks before the testing date and a good number of the respondents (70 out of 110) indicated that they prepare a marking scheme before students take the assessment. Likewise, 48 out of 110 respondents review assessment items by letting

another teacher in the subject area read over them and 92 respondents write direction/instructions for the test. As many as 11 respondents do not write direction/instructions for test. Interviewing these respondents revealed that although experts in assessment condemn the act of copying questions from past questions and textbooks (Etsey, 2012) only one (1) and four (4) respondents respectively have never been guilty of the “offence”.

Over 60 respondents claimed that they match instructional objectives with assessment items while 63 arrange assessment items in order of increasing difficulties. It is interesting to note that only a handful of the respondents never waited till when it is time to assess students before developing assessment items. Yet very few of the respondents (21 out of 110) use test specification table when writing test items. This is an interesting finding because Fletcher (2011) seems to suggest that most mathematics teachers continue to use traditional forms of assessment in schools and these do not necessarily match curriculum objectives. Teachers can avoid this situation if they use test specification tables.

Furthermore, the data from Table 5 shows that 34 of the respondents do not write assessment items based on what the students know the majority of the respondents (84 out of 110) arrange objective test answer in a pattern to make scoring easy, 84 give test to students without prior notice and nearly all the respondents (104 out of 110) give tough test item to students during quizzes to prepare them for examinations: all these are against experts' recommendation in assessment. In addition, Table 5 shows that the majority of the respondents seemed to consider the purpose of the assessment before developing assessment items, about half (63) of the respondents allow students to select a specific number of items from a given set of items in the essay test but few respondents (49) prepare more items than needed before reviewing and selecting some for the examination. The findings from Table 5 generally support the observation made by Fletcher (2001) that teachers are not making use of assessment practices even if they have had training in assessment, considering that as many as 90 respondents had had training in assessment.

As part of the SBA, teachers are supposed to assess their students as often as possible; nevertheless, the standard schedule for assessing the students should be monthly (CRDD, 2007). Figure 1 show often respondents claimed they planned the schedule for assessing the students.

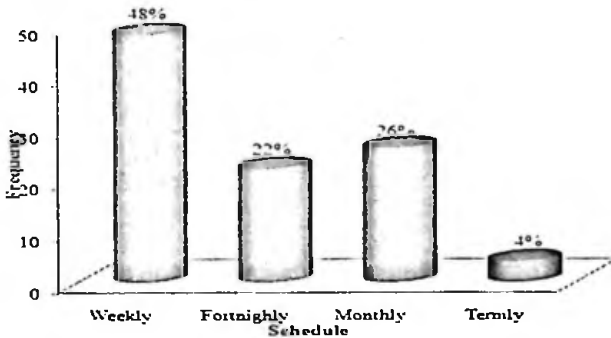


Figure 1: How often respondents claimed they planned the schedule for assessing the students

Figure 1, shows that only a handful (29 out of 110) of the respondents assesses monthly. Thus, from their responses, 26% claimed they followed SBA regarding the schedule for assessing the students while the claims of the majority (74%) are not in line with the SBA guidelines. Those respondents claimed they assessed weekly, fortnightly or termly. Assessing students termly is highly against the standards (Mereku, Nabie, Appiah & Awanta, 2011).

Figure 2 shows summary of the number and method of School-Based Assessment indicated by the teachers.

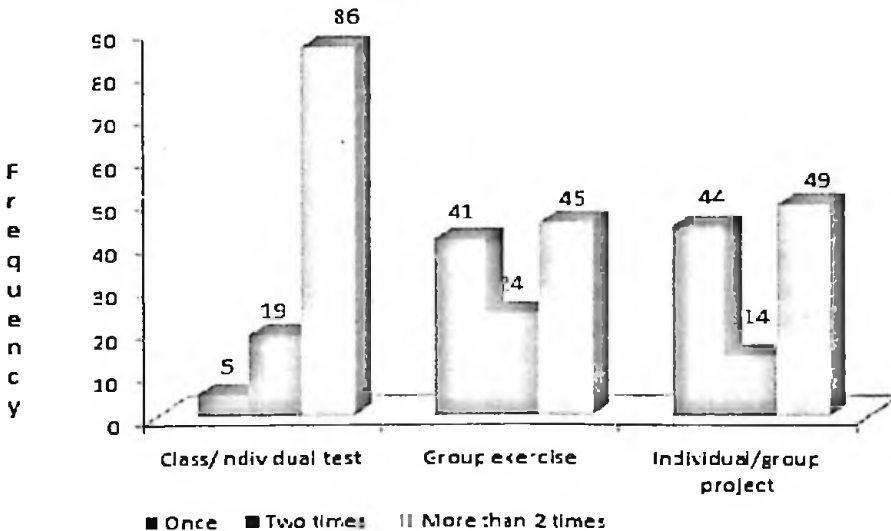


Figure 2: Number and method of School-Based Assessment indicated by the teachers.

It can be observed from Figure 2 that the majority of the respondents (86 out of 110) claimed they administered class/individual test once last term, 5 respondents claimed they administered class/individual test more than two times last term, while only 19 teachers claimed they practiced the SBA system by administering the test twice last term.

Regarding group projects, 45 of the respondents claimed they administered this 'once' as expected, although, 41 and 24 respondents respectively declared that they administered Group Projects 'more than two times' and 'two times'. Additionally, 49 respondents indicated that they administered individual project 'once' as required. Nonetheless, 44 and 41 teachers, respectively indicated they administered same 'more than two times' and 'two times' last term.

In addition, teachers are expected to use class exercises, homework, interview, observation, and question and answer as processes for continually assessing students' class performance and as a means for encouraging improvements in learning performance (CRDD, 2007). Table 6 summarises teachers' responses to this effect.

Table 6: Number of times the Other Assessment Methods were used

Method	More than 4 times	4 times	3times	2times	Once
Homework/Assignment	88	6	7	7	2
Class exercises	00	86	14	08	02
Observation	57	11	12	14	16
Interview	33	05	09	22	41
Question and Answer	75	11	07	07	10

Table 6 shows that 88 out of the total respondents declared that they administered home work/assignment to the students correctly (more than 4 times), the majority of the teachers (86) administered class exercises 4 times in a term. In addition, 57 respondents indicated that they used observation to assess their students within the term, 41 and 33 respondents claimed they carried out interview within the term as a way of assessing their students, 'once' and 'more than 4 times', respectively.

Finally, 75 teachers claimed that they used Question and Answer method to assess their students more than 4 times within the term. This is one of the traditional teaching methods in mathematics and sometimes called

'transmission' method because of the way procedures for solving mathematical problems are explained to learners 'one step at a time'. This according to Fletcher (2009) involves teachers questioning learners in order to lead them in a particular direction or to check if they are following the taught procedure(s). This method may appear superficially effective when short-term recall is required, but they are less effective for long-term learning because they encourage rote memorisation of disconnected rules which are often misapplied and quickly forgotten (Mereku, 2004; Clements & Battista, 1992).

Teachers put students' score to different use. Table 7 represents the respondents' ideas of the use of students' SBA Scores.

Table 7: The Use of School-Based Assessment Scores by Teachers

Use of students' test scores	Frequency	(%)
Identifying strengths and weaknesses/Remedial teaching	40	36.3
Promotion/Selection	39	35.4
Awarding of prizes/Ranking	35	31.8
Evaluating and improving teaching methods	20	18.2
Feedback to parents	16	14.5
Generating score for WAEC	13	11.8
Guidance and Counselling	13	28.2
Record keeping	09	08.1
Prepare students for examination	07	06.4
Others	37	33.6

It is observed from Table 7 that the sum of the frequencies exceeds the sample size because respondents gave multiple factors. According to the Table, 36.3% of the respondents stated that they used SBA for identifying strengths and weaknesses to determine students learning and understanding of the topic and help where necessary. Also, 39 (35.4%) of the teachers indicated that they used the SBA scores of the students for promotion/selection, 35 (31.8%) indicated they used the SBA results for awarding of prizes/ranking, 20 (18.2%) reported that they used the SBA scores for evaluating and improving teaching methods, 16 respondents (14.5%) indicated that SBA provided them with scores as feedback to parents and 13 (11.8%) specified that they used the scores for Guidance and Counselling. In addition, 8% and 6% of the respondents, respectively indicated that they used the scores for record keeping and for preparing students for examination. This suggests that the teachers put more emphasis

on summative assessment than on formative assessment. This may lead to a situation where students invest time and effort in short-term surface learning just to enable them pass tests and examinations (Fletcher, 2001).

Interview

An interview guide was the second research instrument used in the study. The interview guide was made up of relevant items from the questionnaire. After analysing the responses from the questionnaire, the interview was conducted to confirm the earlier claims by the respondents of their activities regarding test construction of classroom or teacher-made tests and the use to which they put students' scores. Most importantly, the interview was conducted to investigate the results that are shown in Figure 1, where 48%, 22% and 4% respondents, respectively claimed they assessed students weekly, fortnightly and termly. Assessing students termly is highly against the standards (Mereku, Nabie, Appiah & Awanta, 2011).

Using the codes on the questionnaire, the respondents were traced to their various schools. There were twelve teachers involved, out of which six belonged to the same school. The respondents as well as their HODs were interviewed. Although they refused to have the interview taped, they were nonetheless reasonably honest on the issues discussed. The respondents who were interviewed said so many things which were not directly related to assessment but which were nevertheless affecting the way they assessed their students. Their responses to the questions pertaining to assessment were reasonably adequate to explain some of the results revealed by the questionnaire data. Relevant excerpts from the interviews are presented here. What motivated teachers to remain in the classroom for long period and yet why they were not doing what they were supposed to do with regard to SBA was sought. Some of the responses suggested that some experienced teachers were still in the classroom, not because they wanted to be there but in their view they had to be there in order to sustain their families. One of them said:

...we cannot leave, even if we want to, the good thing is that, at least we are able to feed ourselves. That is all. Many of my colleagues have left the teaching field for something else, if you don't have anybody to finance you, you cannot go into business. Teachers are really suffering, those students one taught some years ago are now riding big cars, and here I am using 'footwagan' (meaning on his feet)!

This suggests that some of the teachers who had taught for over 10 years were not really learning from the work they had done in the past or even if they were learning from them, they were repeating the same mistakes they had made in the past.

Asked how they conduct their assessment, one of the respondents said:

“You mean C.A? You do it at your own convenience. What is important is that at the end of the term, you have 30% scores ready to be added to the 70% scores from the end of term examination. The time is not just there to even construct the items, I write the items one after the other while in the classroom teaching”

Another respondent stated:

“You cannot afford to waste time giving tests every now and then, where is the time to mark them? I need to teach well and cover the syllabus before they write WASSCE; anyway, whenever I remember there is a need for a test, I quickly give one”.

Nearly all the interviewees were of the view that time factor is one of the challenges facing assessment of learning in schools. This suggests that teachers see assessment as a separate activity from teaching and as such are not committed to it.

Conclusion

Despite the positive policy statements regarding the need for SBA in Ghanaian senior high schools, and in the mathematics curriculum in particular, SBA guidelines are yet to be adopted by the mathematics teachers in classroom practice, in the Cape Coast Metropolis. Considering the claims made by the respondents on the various items on the activities regarding test construction (see Table 5), it can be concluded that mathematics teachers in the senior high schools sampled partially followed the principles in constructing teacher-made tests in the schools and the majority of the mathematics teachers used essay, multiple-choice and self-assessment in testing students in the schools while matching was rarely used (see Table 4). Furthermore, students' test scores are yet to be seen by the majority of the mathematics teachers as meant for identifying the strengths and weaknesses of the students and for remedial teaching.

The responses of the mathematics teachers in this study show that they had limited skills and competence in the knowledge of construction of classroom or teacher-made tests, even though most of them (90 out of 110) had been exposed to a course in testing either at the pre-service stage of their training or in-service or both. Some teachers did not have any formal training in the practice of continuous assessment, much less the practice of SBA which is very recent in schools. Teachers generally learn the basic principles of test construction on the field and not during the course of training as teachers. Teachers' lack of knowledge of the appropriate procedures in test construction and use of students' test scores has weakened the validity of assessment of students' performance in mathematics.

The interview revealed that some mathematics teachers often prepare test items at the last minute, only a handful of the respondents did not wait till when it was time to assess students before developing assessment items. Most teachers acknowledged the need for in-service training in test construction, stating that their lack of skills in test construction and scoring often dampen their desire to give valid tests to the students. Given this situation, the main conclusion is that the majority of teachers in the Cape Coast Metropolis may not be measuring students' performance in mathematics accurately.

Based on the findings of the study, it is recommended that the Ghana Education Service ought to give serious attention to the continuing professional development of teachers and the provision of the necessary support services to sustain the SBA.

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