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The Assessment Practices of SHS Mathematics Teachers in two Districts in the Central Region of Ghana

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ABSTRACT

The purpose of this study is to find out whether Senior High school teachers integrate assessment in the teaching and learning of Mathematics. Acquisition of Scientific and Mathematical knowledge is based on effective use of assessing students' learning outcome. Therefore, there simply cannot be any meaningful learning of mathematics without using assessment. In this study Assessment Practices means what teachers use assessment to do in the teaching learning of Mathematics. A sample of 160 teachers in two districts in the Central Region were used. This comprised of 92 Beginning and 68 Experienced teachers. Questionnaire was the main research instruments used in this study. The questionnaire was administered to 160 mathematics teachers in the two districts in the Central Region of Ghana. The design used in this study is a cross-sectional survey. Data collected from the respondents were analysed using frequencies, percentages means and standard deviations. It was found out that majority (136 out of 160) of the Senior High School mathematics teachers do not frequently integrate assessment in the teaching and learning of mathematics. They rather see assessment as an added on activity which mainly comes at the end of the teaching learning process. Based on the findings, it was recommended that Senior High School mathematics teachers be equipped to carry out assessment practices that will enhance students learning in mathematics.

Introduction

According to Leinhardt (1983), the extent to which different teachers accurately assess students' achievement or performance is related in part to their educational, professional, and personal backgrounds. This variation may be associated with differences in teaching experience or with differences in content area or pedagogical professional development of the teacher. In other words, different features of the classroom environment can also have influence on the teacher' judgments of students' achievement. For example, Mathematics teachers might assess students in a diverse way in the classroom with simplification problems. In addition, teachers in the classroom with a substantial proportion of students with special learning needs such as limited calculation or learning disabilities may find it particularly challenging to judge the achievement of some or all of their students accurately or may tend to assign differential weight to different factors in their judgments (Darling- Hammond, 1995). According to Etsey (2003), when thinking about the role of assessment in teachers' judgments, it is important to distinguish between externally mandated made tests and various kinds of classroom assessment practices which is under the direct control of the teacher. External assessments are usually standardized, on demand tests that rely on multiple-choice or short constructed response questions.In this case, 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 way, typically in a norm- or criterion referenced metric. Judgments of students' performance that is based solely on performance on standardized tests would likely be similar across teachers who assessed them. According to Dietel, Herman and Knuth (1991), assessment may be defined as any approach used to better understand the current knowledge that a student has attained in learning or training. Unfortunately, this goal is far from being attained, because Fletcher (2011) found that students fail to make connections between classroom mathematics and its real-life applications. According to Tamakloe, Amedahe & Attah, (1996), Continuous Assessment can be described as cumulative, comprehensive, systematic, diagnostic, and formative and guidance oriented depending on the purpose or its usage. From literature, it is not clear what teachers use assessment to do in the teaching and learning of Mathematics at the high school level. Knowing what teachers use assessment to do would help one to be informed about their assessment practices since the study of mathematics must be driven by effective use of assessment.

Research Question

This research question guided the study:

1. What are the assessment practices of Senior High School mathematics teachers?

Methodology

A cross-sectional survey is the design used in this study since it was interested in describing a particular phenomena under a study(Cohen, Mansion & Morrison, 2006).

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The cross-sectional survey is appropriate for this study because it deals with collecting a data from a sample that has been drawn from predetermined population.

Population

The target population was made up of all Senior High School mathematics teachers in Abura/Asebu - Kwamankese and Cape Coast metropolitan districts all in the Central Region of Ghana. The accessible population was made up of 160 Senior High School mathematics teachers in Abura/Asebu-Kwamankese and Cape Coast metropolitan districts in the Central Region of Ghana.

Table 1. Participating Schools in Cape Coast Metropolis.

Name of schools	No. of Mathematics Teachers
AD	11
CT	05
ET	08
GN	10
HC	11
MF	14
OT	05
UP	10
WG	15
SA	10
Total	100

Source: Fieldwork, 2015, N = 100

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

Name of the school	Number of Mathematics teachers
ABU	12
ABA	12
AG	11
AS	13
ST	12
Total	60

Source: Fieldwork, 2015, N = 60

Sampling Procedure

All 160 Senior High School Mathematics teachers in the accessible population were sampled to participate in the study because of the small size of the population (Cohen, Mansion & Morrison, 2006) from Abura/Asebu - Kwamankese districts and Cape Coast Metropolis. The researcher used simple random sampling technique in selecting the two districts. Therefore 160 mathematics teachers participated in the study.

Data Collection Instrument

Questionnaire was the research instrument used for this study. The questionnaire was named, "The Assessment Practices of Senior High School Mathematics Teachers". This instrument was developed by the researcher.

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 was used to effect the necessary changes to improve upon the instrument.

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 Mfantsiman districts respectively.

EDSH and MFG Senior High Schools were randomly selected using a table of random numbers for the pilot – testing. They had all the characteristics being looked for and were outside the two districts that participated in the study. EDSH and MFG were selected from Komenda and Mfantsiman districts respectively. The questionnaire was personally administered to total of 30 mathematics teachers with 12 mathematics teachers and 18 mathematics teachers from the two districts respectively. Response rate of 80% and 88% were achieved respectively. The result was analysed to determine the content validity of the instrument. The internal consistency of the instrument was determined using the Cronbach co-efficient alpha. The coefficient alpha obtained for the pilot-testing were 0.87 and 0.90 respectively, indication of a high correlation among all of the items that make up the scale (Pallant, 2005, p.6).

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 to160 Senior High School mathematics teachers with 100 mathematics teachers from the Cape Coast metropolis and 60 mathematics teachers from Abura / Aseibu - Kwamankese districts respectively (Table 2 and 3). The respondents were allowed to participate in the study with the assistance of the heads of Department of the schools.

Data Processing and Analysis

The data collected in this study was checked, edited, coded and analysed with descriptive statistics based on the research question and the literature reviewed for this study.The research question was analysed using descriptive statistics specifically frequency counts, percentages, mean and standard deviations to obtain a comprehensive picture of the assessment practices of Senior High School mathematics teachers.

Results and Discussions

The Assessment Practices of Senior High School Mathematics Teachers

Table 3 shows the Overall Mean and Standard Deviation Obtained from the Assessment Practices of the Senior High School Mathematics Teachers.

Table 3. The Overall Mean and Standard Deviation Obtained from the Assessment Practices of the Senior High School Mathematics Teachers.

Activity	N	Minimum	Maximum	Mean	Std. Deviation
Assessment Practices.	160	1.14	3.80	2.6	0.4

Source: Fieldwork, 2015, N = 160, M = 2.6, SD = 0.4

The mean and standard deviation recorded on the assessment practices of Senior High School Mathematics teachers were (2.6 out of 5) and 0.4 respectively. The mean and standard deviation scores show that generally, Senior High School Mathematics teachers rarely use classroom assessment in the teaching and learning of Mathematics. In other words, the results indicate that Senior High School Mathematics teachers do not frequently practice classroom assessment in teaching and learning of Mathematics

Teachers use assessment to guide students to set their goals and monitor their own learning progress

The mean and standard deviation scores recorded on teachers use of classroom assessment to guide students to set their goals and monitor their own learning progress were M = 1.9 and SD = 0.9.

Table 4. Indicates the means and standard deviations obtained from the current assessment practices of the Senior High School Mathematics teachers.

Table 4. The Means and Standard Deviations Obtained from the Assessment Practices of the Senior High School Mathematics Teachers.

Assessment Practices (Teachers use assessment to)	Mean	SD
Guide students to set their goals and monitor their own learning progress	1.9	0.9
Assist students to identify means of getting personal feedback	2.7	0.4
Learn alternative approaches to assess learning outcomes of students	2.9	0.3
Measure the extent of students learning at the end of a lesson or subject	2.4	0.5
Improve instruction for the next teaching term or school year	2.5	0.5
Make final decision about the level of learning that students achieve at the end of a lesson or subject	2.1	0.8
Allow students to discover their learning difficulties in class	2.3	0.6
Provide feedback to students in order to improve their learning process	2.2	0.7
Make suggestions to students about how they can develop better learning strategies	2.6	0.5

Source: Fieldwork, 2015, N = 160

This mean score obtained showed that majority of the teachers (respondents) do not use classroom assessment to guide students to set their goals and monitor their own learning progress. This outcome also indicated that teachers who responded to the questionnaire have not discovered the need to use classroom assessment to guide students to set their goals and monitor their own learning progress. The distribution of responses on teachers use of classroom assessment to guide students to set their goals and monitor their own learning progress shows that: 13 (8.1%) rarely use classroom assessment to guide students to set their own goals and monitor their own learning progress, 127 (79.4%) very rarely use classroom assessment to guide students to set their own goals and monitor their own learning progress, 19 (11.9%) occasionally use classroom assessment to guide students to set their own goals and monitor their own learning progress, and only a teacher 1(0.6%) frequently use classroom assessment to guide students to set their own goals and monitor their own learning progress (See table 4).

Teachers use assessment to assist students to identify means of getting personal feedback

The mean and standard deviation scores recorded on teachers use of classroom assessment to assist students to identify means of getting personal feedback when teaching Mathematics were M = 2.7 and SD = 0.4. This mean score indicated that most teachers or respondents as of the time of this study showed that they rarely assist students to identify means of getting personal feedback. The distribution of responses revealed that the following percentages of teachers:14 (8.8%) very rarely use classroom assessment to assist students to identify means of getting personal feedback, 119 (74.4%) rarely use classroom assessment to assist students to identify means of getting personal feedback, 26 (16.3%) occasionally use classroom assessment to assist students to identify means of getting personal feedback and only a teacher 1 (0.6%) frequently use classroom assessment to assist students to identify means of getting personal feedback (See table 4).

Teachers use assessment to learn alternative approaches to assess learning outcomes of students

The mean and standard deviation scores recorded on whether Senior High School teachers use classroom assessment to learn alternative approaches to assess learning outcomes of students were M = 2.9 and SD = 0.3. The mean scores obtained showed that most teachers or respondents as at the time of this research rarely use classroom assessment to learn alternative approaches to assess the learning outcomes of students. The distribution of responses revealed that: 19 (11.9%) teachers very rarely use classroom assessment to learn alternative approaches to assess the learning outcomes of students, 119 (74.4%) teachers rarely use classroom assessment to learn alternative approaches to assess the learning outcomes of students, 19 (11.9%) teachers occasionally use classroom assessment to learn alternative approaches to assess learning outcomes of students, 3(1.9%) teachers frequently use classroom assessment to learn alternative approaches to assess learning outcomes of students (See table 4).

Teachers use assessment to measure the extent of students learning at the end of a lesson or subject

The mean and standard deviation recorded on whether Senior High School teachers use classroom assessment to measure the extent of students' learning at the end of a lesson or subject were M = 2.4 and SD = 0.5. The mean score recorded on this item indicated that majority of the teachers occasionally use classroom assessment to measure the extent of students' learning at the end of a lesson or subjects. The distribution of responses indicated that: 15(9.4%) teachers very rarely use classroom assessment to measure the extent of students' learning at the end of a lesson or subject, 125(78.1%) teachers occasionally use classroom assessment to measure the extent of learning of students' at the end of a lesson or subject, 19 (11.9%) teachers rarely use classroom assessment to measure the extent of learning of students at the end of a lesson or subject and only 1 (0.6%) teachers rarely use classroom assessment to measure the extent of learning of students at the end of a lesson or subject (See table 4).

Teachers use assessment to improve instruction for the next teaching term or school year

The mean and standard deviation recorded on whether Senior High School teachers use classroom assessment to improve instruction for the next teaching term or school year were M = 2.5, and SD = 0.5. The mean and standard deviation scores recorded indicated that most of the teachers occasionally use classroom assessment to improve instruction for the next teaching term or school year. The distribution of responses on this item showed that 10 (6.3%) very rarely use classroom assessment to improve instruction for the next teaching term or school year, 113 (70.6%) occasionally use classroom assessment to improve instruction for the next teaching term or school year, 35 (21.9%) rarely use classroom assessment to improve instruction for the next teaching term or school year, 2 (1.3%) frequently use classroom assessment to improve instruction for the next teaching term or school year (See table 4).

Teachers use assessment to make final decision about the level of learning that students achieve at the end of a lesson or subject

The mean and standard deviation recorded on whether Senior High School teachers use classroom assessment to make final decision about the level of learning that student achieve at the end of a lesson or subject M = 2.1 and SD =

0.8. The results showed that a number of teachers believed that assessment must be used occasionally to make final decision about the level of learning that students achieve at the end of a lesson or subject. The distribution of responses recorded on this item showed that: 11 (6.9%) teachers always use classroom assessment to make final decision about the level of learning that students achieve at the end of a lesson or subject, 118 (53.8%) teachers occasionally use classroom assessment to make final decision about the level of learning that students achieve at the end of a lesson or subject, 31 (19.4%) rarely use classroom assessment to make final decision about the level of learning that students achieve at the end of a lesson, or subject (See table 4).

Teachers use assessment to allow students to discover their learning difficulties in class

The mean and standard deviation recorded on whether Senior High School teachers use classroom assessment to allow students to discover their learning difficulties in class were = 2.3 and SD = 0.6. The mean and standard deviation obtained on this item showed that majority of the teachers occasionally use classroom assessment to allow students to discover their learning difficulties in class. The distribution of responses on this item showed that 8 (5%) teachers always use classroom assessment to allow students to discover their learning difficulties in class, 113 (70.6%) teachers occasionally use classroom assessment to allow students to discover their own learning difficulties in class, 39 (24.4%) teachers rarely use classroom assessment to allow students to discover their learning difficulties in class (See table 4).

Teachers use assessment to provide feedback to students in order to improve their learning process

The mean and standard deviation recorded on whether Senior High School teachers use classroom assessment to provide feedback to students in order to improve their learning process M = 2.2 and SD = 0.7. The mean and standard deviation indicated that a number of respondents agreed to the statement that classroom assessment must be used to provide feedback to students in order to improve their learning process. The distribution of responses on this item showed that: 25 (15.6%) teachers very rarely use classroom assessment to provide feedback to students in order to improve their learning process, 111 (69.4%) occasionally use classroom assessment to provide feedback to students in order to improve their learning process, 22 (13.8%) teachers rarely use classroom assessment to provide feedback to students in order to improve their learning process (See table 4).

Teachers use assessment to make suggestions to students about how they can develop better learning strategies

The mean and standard deviation recorded on Senior High School teachers use of classroom assessment to make final decision about the level of learning that students achieve at the end of a lesson or subject were M = 2.6 and SD = 0.5. The results showed that a number of teachers believed that assessment must be used occasionally to make final decision about the level of learning that students achieve at the end of a lesson or subject. The distribution of responses recorded on Senior High School teachers use of classroom assessment to make final decision about the level of learning that students achieve at the end of a lesson or subject showed that: 11 (6.9%) teachers very rarely use classroom assessment to make final decision about the level of learning that students

achieve at the end of a lesson or subject, 118 (53.8%) teachers occasionally use classroom assessment to make final decision about the level of learning that students achieve at the end of a lesson or subject, 31 (19.4%) rarely use classroom assessment to make final decision about the level of learning that students achieve at the end of a lesson, or subject (See table 4).

Conclusions

Generally, teachers in this study do not frequently integrate assessment in the teaching and learning of Mathematics. It was found out that majority (136 out of 160) of the Senior High School Mathematics teachers do not frequently use classroom assessment to inform their teaching. The few teachers who occasionally assessed their students, do it at the end of the lesson. In other words, assessment comes at the end of their teaching. Majority (136 out of 160) of the Senior High School Mathematics teachers do not have accurate basis to show the achievement of their students in the classroom. Majority (111 0ut 160) of the Senior High School Mathematics teachers occasionally use classroom assessment mainly for giving feedback to their students. This may not help students to conceptualized Mathematical concepts and therefore must not be the main tool for assessing students. Based on the findings from this study, further study can be conducted to investigate the effects of teachers' assessment practices on students' achievement in Mathematics at the high school level.

Recommendations

From the findings of this study, the following recommendations were made for the improvement in the assessment practices of Senior High School Mathematics teachers regarding classroom assessment in Ghana:

The study revealed that majority of the Senior High School Mathematics teachers do not frequently practice classroom assessment in the teaching and learning of Mathematics. It is therefore recommended that Senior High School mathematics teachers should frequently practice classroom assessment in the teaching and learning of Mathematics. This will help students to conceptualized Mathematical concepts being taught by their teachers at the Senior High School level.

Structuring the ability of teachers to improve their assessment skills should be a priority of all stakeholders and institutions responsible for training teachers if learning Mathematics has to be meaningful to students at the High School levels. Ghana must therefore put in a great effort in improving educational values in which good classroom assessment practices are critical issues in enhancing students' learning. Stakeholders and institutions should therefore put much emphasis on training teachers thoroughly in modern assessment techniques during the time they are doing courses in the teaching and learning of Mathematics.

In-service training should be frequently organized for teachers to update and sharpen their skills in assessing students. The training of teachers should integrate modern assessment courses that will help teachers to use assessment to inform their teaching and learning of Mathematics at the Senior High School level since this will go a long way to improve students'' performance in Mathematics.

References

Cohen, L., Manion L., & Morrison, K. (2006). *Research method in education*. London. Routledge Falmer.

Darling-Hammond,L., Access, J., & Falk B.(1995) .*Authentic assessment in action* .New York*:* Teachers College press.

Dietel, R. J., Herman, J. L., & Knuth R. A. (1991). *What does research say about assessment?* . NCREL : Oak Brook.

Etsey, Y. K. A. (2003). Pre-service teachers knowledge of continuous assessment techniques in Ghana. *Journal of educational Development and practice, 1*(1), 1-20.

Fletcher, J. A. (2011). Applying mathematics in real life problems: A case study of two senior high schools in Ghana. *Journal of Science and Mathematics Education, 5*(1), 55-80.

Leinhardt, G. (1983). Decision-Oriented Educational Research. Linking instruction and assessment in the mathematics classroom. *Arithmetic Teachers, 39(*6*)*, 11-16.

Pallant, J. F. (2005). SPSS survival manual: *A step by step guide to data analysis using SPSS version 12* (2nd ed.). New York, NY: Open University Press.

Tamakloe, E. K., Amedahe, F. K., & Attah, E.T. (1996). *Principles and methods of teaching.* Accra. Black Mask Ltd.