

Influence of Accountability Pressure on Science, Mathematics and English Language Teachers' Classroom Practices in Senior High Schools in Ghana

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Abstract

In this study I investigated the sources and influence of accountability pressure on science, mathematics and English language teachers, and suggested ways teachers could better adapt their teaching without yielding to teaching to the test practices with its resultant narrowing of the curriculum. The research was conducted within the midlands of Ghana (Ashanti Region) with a cosmopolitan feature. High schools in the Region attract students from all parts of the nation and nearby regions in West Africa. A large sample of teachers (N = 251), made up of 208 males and 43 females were involved in the study. The distributions of teachers in the three core subjects were 87, 88 and 76 for science, English language and mathematics respectively. In this study, the researcher analysed the sources and effects of accountability threats to the various aspects of science, English language and mathematics teachers' practices in the classroom with means, standard deviations and ANOVA. In the findings, there was pressure on teachers in the three subject categories to increase the performance of students in WAEC examinations. These pressures often came from school administrators, students and parents. It is recommended that school administrators should focus attention on holistic supervision of teachers to develop a well-informed and educated citizenry instead of leading teachers to achieving students' gains in performance in external examinations. Also, teachers have to be self-efficacious in their day-to-day practices in the classroom and develop proactive attitudes to learning in students rather than drilling and prepping them on test preparation practices.

Key words: Accountability pressure, high-stakes tests, teaching to the test, curriculum objectives, WAEC examination.

Introduction

National tests have assumed prominent role in current efforts to improve teaching and learning in schools and colleges. Policymakers, educators, and the general public are looking once again to student assessment as a gauge for what students know and have learnt over a time period, and as a spur and catalyst for education reform (Jennings, 2012). This is due to its reputed ability to leverage instructional improvement and to hold school systems accountable for their results (Feng, Figlo & Sass, 2010). Recent mandates for improved student outcomes have shifted focus away from assessments that test students' "minimal" skills to accountability form - one that emphasizes high standards in skill areas that are considered necessary for success in the face of changing conditions and today's technologically advanced society (Zimmerman, 2009; Moon, Brighton, Jarvis, & Hall, 2007; Amrein & Berliner, 2003). These are predicated on the fact that the public school systems are in dire need of comprehensive reform to increase student and school performance, as they are currently failing to effectively prepare the nation's youth for the workplace and preventing individuals from competing on an international stage (Moon et al., 2007) and research on how children learn, the effects of minimum competency testing of instruction, and on the public's demand to hold schools accountable for student achievement (Darling-Hammond, 2003).

Educational reforms in recent times, especially since 2007, are often linked to national frameworks that broadly specify nationally agreed curriculum objectives and set out broad areas of study and key ideas and concepts in subject content and knowledge expectations for all students (Bolton, 2012). In addition, and especially in Ghana, the curriculum framework serves as guidance for various subject syllabi development, textbook development and selection, teacher professional development, and evaluation of schools' performance (Anane, 2010).

In response, many countries, including Ghana, have, made student assessment the centerpiece of their school reform and improvement efforts and externally conducted examinations, the main tools of extrapolating various value-added models. As put succinctly by Moon, Callahan and Tomlinson (2003):

In our continuing quest for better schools and high achieving students, testing has taken center stage.

Society has begun to consider good test scores a major goal of schooling. Thus, there is great pressure, particularly in schools with large populations of low-achieving students, to demonstrate academic progress and success through improved test scores (p. 1).

Today, nationwide examinations such as the West African Senior School Certificate Examination (WASSCE) and the Basic Education Certificate Examination (BECE) are becoming more and more high-stakes, as results from such examinations are used for determining the quality of a senior high school, and for school selection and placement in tertiary institutions and remedial classes respectively. In most cases, reference is made of students' achievement relative to specified content in core subjects such as English language, mathematics and science. Increasingly, national assessments are being overtly or covertly linked to policies that hold school systems, teachers and administrators and the students themselves accountable for students' performance. Students' scores on national tests are, for example, reported in newspapers and other media as a matter of public accounting. In some cases, stakeholders such as opinion leaders (e.g., chiefs) are suggesting that students' performance be used as a basis for determining rewards and sanctions for schools and their staff. The results are also used in making decisions about which senior high school (SHS) is better usually through league systems (Ghana Education Service, 2004).

These positions follow the lines of accountability and high-stakes testing enthusiasts who believe that the quality of education can be hugely improved by introducing a system of rewards and sanctions that are triggered by students' standardized test performance (Hanushek & Raymond, 2005). According to Nichols, Glass and Berliner (2006), the theory of action undergirding this approach is that, teachers and other educators and their students will work harder and more effectively to enhance student learning when faced with large incentives and threatening punishments (p. 2).

But skeptics worry that the unintended effects of high-stakes testing not only threaten the validity of test scores, but also lead to *perverse* (Ryan, 2004) and *corrupt* educational practice (Jones, Jones, & Hargrove, 2003; Nichols & Berliner, 2005). In view of these, they

have begun to wonder if the effort to raise standards for all students through high-stakes testing and accountability initiatives has too steep a price, including a narrowing of the curriculum and a de-emphasis on curricular depth, lack of efforts in achieving broad national goals, an abandonment of constructivist-type activities that give meaning to learning, and a curtailment of extracurricular activities and distortive use of test scores data (Jennings, 2012). These, therefore call for the need to scrutinize current regime of testing and its concomitant effects on teachers' teaching practices and students' learning. Considering the fact that every frantic effort is being made by researchers, policy makers and educators to find ways of improving teaching and learning in schools. However, very little known about the impact of accountability pressures on teachers, especially in Sub-Saharan Africa.

For several decades, experts have warned that high-stakes testing could lead to inappropriate forms of test preparation, undesirable teaching practices such as cheating in examinations. It could lead to loss of self-esteem, narrowed content teaching from syllabuses. In fact, another consequence of high-stakes testing is test score inflation, which according to Koretz (2005, p.1), is define as "a gain in scores that substantially overstates the improvement in learning it implies". Thus, the tendency of overstating students' true ability is high under high-stakes testing conditions. Critics of test-based accountability often argue that it will simply increase test-preparation activities, thus improving test-specific skills at the expense of more general skills and producing achievement gains that do not generalise to alternative outcome measures (Jacob, 2005). Of course, the individuals implementing the changes in instructional policies and practices are teachers, and school accountability, therefore, has the potential to influence their views and practices in the school. This tendency is likely to put teachers under a great deal of pressure to raise students grades, as a failure on the part of the students may seem to portray a teacher as having failed. Teachers are likely to view themselves as less effective and probably leave the teaching profession or leave the school where the pressure is enormous (Harris & Sass, 2011).

Again, when teachers are given the opportunity to score a part of such examinations, they are likely going to be overgenerous with the way they award marks to students on coursework. Teachers may change

their teaching methods to concentrate on test contents and test preparations which can lead to 'test score inflation' over time. Even though test preparation has some good aspects to it as students need to know how to approach issues and problems in their daily lives (including the need to take examinations). Nevertheless, the increased use of national and international tests as a basis for school improvement and accountability for students' achievement has placed new demands on teachers to improve students' scores. These demands have upped the ante for teachers and made teachers change their instructional strategies to using most part of the instructional hours to review past test items that come on WAEC's examinations (Anane, 2010; Moon et al., 2003; Koretz, 2005). This condition has been aptly captured in the findings in a research conducted in USA by Wright (2002) that:

Everything that has to do with the test has been given such a high priority, that there is no priority any more but that ... The bottom line question comes down to, "Well, what's going to help them do better on the test?" In addition, if it is not going to help them do better on the test, well, we do not have time for that right now (p.10).

Even though, up until now, no dependable evidence has shown that "high-stakes tests work to increase achievement" (Nichols, Glass & Berliner, 2006, p. 6). This notwithstanding, nations seem to be enthused about its implementation as it seeks to give governments what Sunderman and Kim call "an unprecedented federal and monolithic mandate" (cited in Nichols, Glass, & Berliner, 2006, p. 3). They further assert that high-stakes tests guide all schools to a solitary goal (i.e., 100 percent of students reaching "proficiency") through a single system of implementation (i.e., standards-based assessment and accountability). However, some educators worry that the pressure of doing well on a test seriously compromises instructional practice (Abrams, Pedulla, & Madaus, 2003) and keeps teachers from caring for students' needs that are separate from how well they score on tests (e.g., Walker-Gleaves, 2009). In short, high-stakes tests cannot meet all the demands made on them (Linn, 2000). In spite of these increasing uncertainties about high-stakes tests, the current landscape of education prominently features

high-stakes testing. But is it working? Does it increase students' learning? How do teachers respond to high-stakes testing?

Walstad (1984) looked at what kinds of practices were responsible for increases in test scores. Controlling for other factors such as socioeconomic status (SES), Walstad looked at three variables: pretesting students, curriculum changes based on the national education standards, and district-sponsored workshops to increase the skills of teachers in implementing the standards. Pretesting, a practice where students were able to practice the test format, was the only significant variable that contributed to an increase in test scores. Curriculum and instructional changes had no significant impact. This suggests that increases in the test scores were not due to actual learning, but rather to familiarity with the tests and prepping of students. Statistical evidence suggest that student test scores alone are not sufficiently reliable and valid indicators of teacher effectiveness to be used in high-stakes personnel decisions (Economic Policy Institute, 2010).

Also, Fish (1988) in a study found that apparent pressure on teachers to improve their students' test scores was influenced by a number of factors including the degree and nature of administrator involvement, teachers' professional self-concepts, and teachers' years of teaching experience. Thus, administrator concern over test scores was positively related to accountability pressure reported by teachers. Both positive teacher self-concept and more years of teaching experience were negatively related to such pressure. One possible explanation for experienced teachers feeling less accountability pressure comes from a study by Smith, Edelsky, Draper, Rottenberg, and Cherland (1989). Smith and her colleagues found that veteran teachers more often believed that low test scores were due to factors beyond their control, such as low student ability and discrepancies between the test and curriculum, than did novice teachers (Hattie, 2003).

What then needs to be done to prevent this? Should schools implement assessment systems that are not only aligned and integrated with examination curricula, instructional practices, and professional development strategies, but also contribute to the goal of increasing student achievement based on rigorous content standards? Should teachers be involved in authentic assessments and the development of academic goals which are horned on values and beliefs of students and the society as a whole, as well as the exigencies of the nation? This is

complex, demanding work that can take several years, yet, it is worth doing! Similarly, managing, synthesizing, interpreting, and using student assessment data obtained from a multifaceted assessment system can be a daunting task for educators, particularly when (a) the assessment system lacks well-structured standards and coherence; (b) school staff do not have the necessary training or experience in student assessment; and (c) the time, attention, and energies of teachers and administrators are stretched to personal limits looking at the amount of work they have, from the syllabuses and other competing national events such as sports and public holidays.

These issues are critical and inundating in achieving quality. However, it appears not much is known about the sources of accountability pressure and the extent of influence on teachers' classroom practices, especially at the senior high school level in Sub-Saharan Africa. This study, therefore, aims at finding out the sources of pressure and how they affect classroom practices for different teachers with different specializations (English language, mathematics and science) in senior high schools in Ghana.

Method

Design and Sample Selection

This study used a descriptive survey design. Twenty Senior High Schools were selected from the 82 Senior High Schools in the Ashanti Region using the simple random technique. A list of names of the schools in the Region was collected from the Ashanti Regional Education Office. The names of the schools were coded so that the sampling process would be devoid of bias. The codes were then written on pieces of paper and were put in an urn from which 20 schools were sampled. From each school, mathematics, science and English language teachers were purposively selected for the study. In all, 94 mathematics, 111 English language and 109 science teachers were selected for the study. Three objectives were examined. First, to explore the amount of pressure stakeholders put on teachers to improve students' performance. Second, to determine the extent to which mathematics, science and English language teachers differ on the way pressure is exerted on them. Three, to examine how the attention paid to test score improvement has affected mathematics, science and English language classroom practices.

Measures

The 57-item questionnaire used in this study was in two sections, A and B. Section A of the questionnaire, which was a demographic survey part administered to obtain information on biographic variables (i.e. gender, educational qualifications and the subjects respondents teach) from respondents. This section was to provide background information to illuminate the kind of respondents whose views were being sought in this study. The second part of the questionnaire, which was Section B, was made up of eight major questions of varied scale types. This section sought information on the sources of pressure on teachers and the amount of attention teachers gave to characteristics of teaching to the test to inquiring about the form at which teachers gave WAEC format of assessment. Out of the 314 participants selected, 251, representing 80% responded to the questionnaire.

Research Questions

1. What are the background characteristics of mathematics, science and English language teachers?
2. How much pressure do stakeholders put on teachers to improve students' performance?
3. How do mathematics, science and English language teachers differ in the way pressure is exerted on them?
4. How has the attention paid to test score improvements affected mathematics, science and English language teachers' classroom practices?

Results

Background Characteristics of Respondents

The background information of the respondents was in relation to their sex, subjects taught and academic qualifications. The background information is very pertinent to put the study in context. The majority (82.9%) of the respondents were males. The remaining 17.1% were females as represented in Table 1.

Table 1
Gender of Respondents

Sex	Frequency	Percent (%)
Male	208	82.9
Female	43	17.1
Total	251	100

The male domination seems to attest to the fact that as teachers progress in the academic ladder, more females seem to drop out than their male counterparts. Again, more males tend to study science related courses in higher education than females.

Table 2 indicates the distribution of respondents by the subjects of specialism and practice in schools where the study took place.

Table 2
Subjects Taught by Respondents

Subject	Frequency	Percent (%)
English Language	88	35.0
Mathematics	76	30.3
Science	87	34.7
Total	251	100

Table 2 shows that the respondents were evenly distributed among the three subjects under study. Thirty-five percent of the respondents were teachers who taught English language, 34.7% science and 30.3% mathematics. The near equal representation of teachers in these three subjects is not surprising as these are core courses offered by every student and therefore it is likely that teacher recruitment in terms of numbers would be similar.

The academic and/or professional qualifications of respondents are shown in Figure 1.

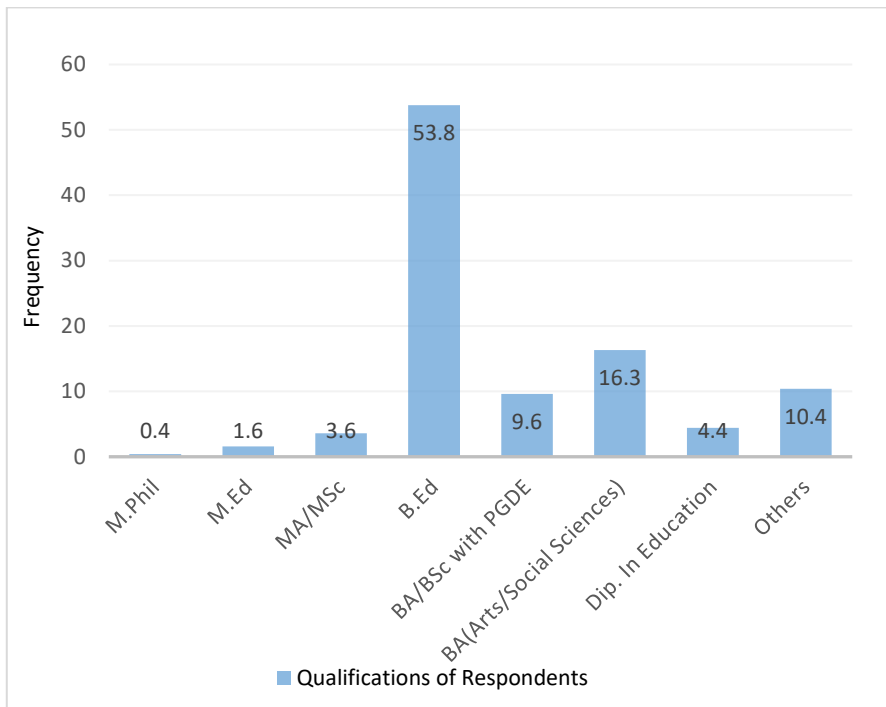


Figure 1. Academic Qualifications of Respondents

As shown in Figure 1, 53.8% had a Bachelor of Education (B.Ed.) degree, 16.3% bachelor of Arts or Social Science degree and 4.4% had Diploma in Education (Dip. Ed.). Two percent of the respondents had a master's degree in education (M.Ed./M.Phil.), and about 10% of the respondents held other certificates such as HND and Diploma in agricultural science. This indicates that, majority of the teachers in the three subject areas had at least a bachelor's degree, and were therefore qualified to teach at the senior high school level.

The amount of pressure stakeholders put on teachers to improve students' performance

Research question 2 sought to find out the extent to which school administrators, district education officers, students and colleague teachers put pressure on teachers to improve test scores in relation to the West African Examination Council's examinations. This

was assessed on a 3-point scale, ranging from almost no pressure = 1 to great pressure = 3. The analysis of the responses is shown in Table 3. The mean and standard deviation of the scores from the responses were used to analyze responses to determine the extent to which stakeholders pressurize teachers in the education system to improve test scores.

Table 3
Sources and amount of Pressure to Improve Students' Test Scores

Sources	*Mean	Std. Deviation
School Administrators	2.54	.638
Other teachers	1.90	.608
District Education Officers	1.57	.598
Parents	2.17	.731
School Management Committee	1.79	.708
Students	2.19	.734

* Means (indicating levels of pressure): 0.0 - 1.4 = almost no pressure, 1.5 - 2.4 = moderate pressure, and 2.5 - 3.0 = great pressure

Source: Field data

As indicated in Table 3, teachers reported that they felt a great deal of pressure from their school administrators ($M = 2.54$, $SD = 0.64$). Teachers also reported feeling a moderate amount of such pressure from their students and parents to improve students' test scores from WAEC examinations.

How mathematics, science and English language teachers differ on the way pressure is exerted on them

The one-way analysis of variance (ANOVA) was used to determine the extent to which mathematics, science and English language teachers differ in the way pressure is exerted on them. A post-hoc (Tukey) test was conducted to find out where specifically, differences exist if any. The results indicated that teachers felt the greatest pressure from almost the same sources. The only exception was found in the pressure from district education officers. The results showed a statistically significant difference in the effect of accountability pressures from officers from the education office ($F(2, 248) = 3.91$, $MSE = 1.366$, $p = .021$, $\alpha = 0.05$). A post hoc Tukey test conducted showed a negative significant mean difference between

English language and science teachers ($MD = -.22$, $SE = 0.89$, $p = 0.35$, $\alpha = .05$). Thus, English language and science teachers receive different levels of pressure from officers from the district education office.

How the attention paid to test score improvement affected mathematics, science and English language classroom practices

The fourth research question was intended to find out whether teaching procedures have been affected by the way attention is given to test score improvement. It sought to find out the extent to which teachers employ certain evaluation practices when planning instruction for their students and this was done using a three-point Likert-type scale ranging from 1 (*not at all affected*) to 3 (*to a large extent affected*). The results of analysis of the responses is shown in Table 4.

Table 4

Influence of Test use on Curriculum Content, Teachers' Instructional Planning and Classroom Activities

Statement	Mean	SD
I make sure the content and skills covered in the SSSCE are reviewed with my class within the week or two prior to the administration of any test	2.32	.56
I look at the new and the old SSSCEs to make sure that my subject matter includes all or most of the test's content	2.58	.58
I make sure the objectives of SSSCE are covered in my instruction	2.69	.48
I adjust my instructional plans based on the SSSCE performance of the school in the current year	2.33	.60
I adjust my instructional plans based on my student's prior SSSCE results in the subject area	2.38	.62
I adjust the sequence of my curriculum based on what is included in the SSSCE	2.42	.57
I use objective-type-test format to assess my students	2.14	.56

In general, the teachers in the sample reported that testing and test results, to some extent influence their instructional planning.

Specifically, they reported that in devising their plans for instruction they look at prior tests to make sure that their curricula (subject matter) includes all or most of the test content, and plan to assure that they cover test objectives. Further, they reported that, to some extent, they adjust their instructional plans based on the test (SSSCE) performance of the school in the current year and more so the most recent test performance of their students in the subject area ($M = 2.33$, $SD = .599$). Teachers in the study also reported that in considering what to teach, to some extent, they adjust the sequence of their curriculum based on what is included in the test ($M = 2.42$, $SD = .57$). In addition, teachers in the study indicated they made sure contents and skills covered in the SSSCE were reviewed with their class within a week or two prior to the administration of any test ($M = 2.32$, $SD = .56$). Moreover, teachers reported that to some extent, they use objective-type test format to assess their students ($M = 2.14$, $SD = .56$). This probably suggests that teachers are not developing higher thinking skills in students.

Follow-up test was conducted to find out whether teachers in the three subject areas differ on the use of test scores and its eventual consequences class room practices. The results of the one-way analysis of variance (ANOVA) for respondents showed no statistical difference between how the use of test results influence teachers' instructional planning and the choice of curriculum content among subject teachers. However, on teachers' use of objective-type-test format in assessing students, teachers differed significantly ($F(2, 250) = 4.165$, $MSE = 1.269$, $p = .017$, $\alpha = .05$). The multiple comparisons, post hoc Tukey test conducted shows that English language and science teachers reported use of objective-type test more often than mathematics teachers. This differences between English language and science on one hand, and mathematics on the other may be due to content structure differences.

Discussion

The purpose of this study was to examine the sources and influence of accountability pressure on science, mathematics and English language teachers in senior high schools in the Ashanti Region, Ghana. The researcher began by looking at the biographic data of the participants with the view that background characteristics of teachers play vital role in their choice of instructional strategies and modes of

assessing students' learning. The results revealed a male dominance in teacher distribution in the three core subjects studied. This finding is consistent with Ghana Statistical Service's data from 2010 population and housing census which pegged the representation of female teachers in senior high schools in Ghana at 21% and that of male teachers at 79%. Notwithstanding, the sharp difference in the male-female distribution could be attributed to the subjects under focus. Often times, males tend to dominate in the teaching of science related subjects (Bryner, 2007; Sabbatini, 1997).

The researcher further looked at the sources and amount of accountability pressure put on teachers to bring about students' test score gains relative to WAEC examinations, and how this has affected teachers' classroom practices. The results show that teachers to some extent are influenced by tests and test results (e.g., SSSCE) in their evaluation practices when planning instruction for students. Results from the study suggest that, teachers felt a great deal of pressure from their school administrators. This finding parallels the conclusions drawn by Fish in his study reviewed by Herman and Golan (2002) that, pressure on teachers to improve students' test scores often occurs as a result of pressure from school administrators (e.g., head teachers and heads of departments) to impress upon teachers to improve test score gains. The conclusion is also in line with what Herman and Golan (2002) found in their study of teachers in USA, that, teachers feel strong pressure, especially from district administrators and the media, to improve their students' test scores. These findings confirm Dietel et al.'s (1991) assertion that, when stakes become high, greater pressure is placed on teachers to devote more and more time to prepare students to do well on the tests, and that of Volante (2005) that teachers are faced with increasing pressure from school administrators, other teachers, and the public in order to increase test scores.

Consequently, these pressures on teachers would lead to narrowly focused tests that emphasize recall and a similar narrowing of curriculum, and an emphasis of memorization of facts with little opportunity to practice high-order-thinking skills. Teachers are in effect encouraged to focus on specific test content more than curriculum standard and engaging in inappropriate test preparation. For example, results from the present study indicate that on the average, teachers spent a significant amount of class time – more than 20% on discussing

past questions to increase test scores in order to avoid the pressure placed on them by school administrators to increase students' test score gains in WAEC examinations.

In the present study, the researcher used one-way ANOVA to test for the differences in the sources of pressure on teachers to improve students' test scores. The results indicate that teachers felt the greatest pressure from almost the same sources. However, English language and science teachers differed on the amount of pressure received from district education offices. The differences in the amount of pressure from education officers on English language and science teachers may be due to the level of preparedness of the teachers teaching these courses. Overall, teachers reported feeling moderate pressure from school administrators to improve their students' test scores.

Concerning the extent to which the attention paid to test improvement through test use has affected the content of curriculum taught to students, the results indicated that testing substantially influenced teachers' classroom planning and instruction. Teachers made sure that their instructional programmes covered test objectives and many looked at prior tests to assure a good match. On whether test is defining the curriculum that is taught to students, results for question four revealed that adjustments were made in curricular scope and sequence based on test (WAEC) content and students' prior performance. Teachers, to some extent made use of objective-type test items as a means of conforming to the tenets of WAEC examination formats to the detriment of using other alternate assessments which could help in developing students' critical thinking skills (Facione, 1990). The overall impression was that testing and test results affected respondents to some extent. This is in line with the literature on high-stakes testing. For example, Salmon-Cox (1981) in a study reported that teachers involved in the study said achievement tests were useful in sequencing and planning instruction. Teachers involved in this study reported that in devising their plans for instruction they, to a large extent, look at prior tests to make sure that their curricula includes all or most of the test content and plan to assure that they cover test objectives. This tentatively suggests that tests are gradually defining what is to be taught to students and instruction is examination focused. This finding is consistent with a report by Madaus (1988) which agreed with Corbett and Wilson's (1988) finding that in high stakes testing

situations, schools redefine course objectives and re-sequence course content in an attempt to improve test scores.

Further, teachers in the present study reported that to some extent, they adjusted their instructional plans based on the test performance of the class they had the previous year and on the most recent test performance of their current class. They also adjusted the sequence of their curriculum based on what is included in the test (SSSCE) in order to improve tests scores. This means that there is the likelihood that important aspects in the school curriculum that do not appear on tests (WAEC) are ignored. The ANOVA test results show that there is no significant difference between mathematics, English language and science teachers on how testing influences their planning teach lessons at schools. This suggests that the respondents are affected equally considering the fact that they all reported high on the effect of pressure on their teaching activities.

Conclusion

Current studies in the area of high-stakes testing show that accountability pressure has significant influence on teachers and their classroom practices (e.g., Moon et al., 2007). Consistent with such studies, the findings of the data analyses suggest that teachers are experiencing accountability pressure to increase test score gains of students which has led to an emphasis on WAEC examinations, and their uses, which are gradually shaping what science, mathematics and English language teachers would want to teach to students under their care. The findings highlights how teachers in the study are shaping the national curriculum through their classroom practices. Specifically, teachers in the study are focusing on what comes in external examinations when it comes to curriculum implementation at the senior high level. Thus, they tend to ignore topics however essential they may seem, since they do not appear on WAEC examination. This invariably leads to narrowing of the prescribed curriculum thereby leaving knowledge gaps in students by the time they leave senior high school. These notwithstanding, the fact that tests serve as a very good source of evaluating what students have learnt, it is dangerous when tests become objects of study instead of being a measure of student learning and of course, tests should serve as a means to an end not an end in its self.

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