

UNIVERSITY OF CAPE COAST

THE EFFECT OF MODERATION OF CONTINUOUS ASSESSMENT SCORES  
ON THE PERFORMANCE SCORES OF CANDIDATES  
AT THE BASIC EDUCATION CERTIFICATE EXAMINATION LEVEL

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CANDIDATE'S DECLARATION

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in the university or elsewhere.

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SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

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## ABSTRACT

The purpose of the study was to determine the effect of moderation of continuous assessment scores on the overall performance scores of candidates at the Basic Education Certificate Examination (BECE).

The descriptive research design was adopted for the study. The target population was the 278,413 candidates who registered for the 2004 BECE in all subjects. Schools were stratified into high, average and low performance categories depending on the performance of their candidates at the 2004 BECE. A maximum of three schools were selected randomly from each of the ten regions in Ghana to represent each category of schools. Six thousand and thirty-four candidates and seven core subjects constituted the sample for the study. The subjects were English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture. The main statistical methods used in the analysis of data were the Pearson's product moment correlation and t-tests. The main finding of the study was that the moderation of continuous assessment scores resulted in the drop in mean performance scores of candidates. The drop in mean performance scores increased from the high to the low performance categories of school for all the subjects investigated.

Some recommendations have been made to improve the quality of continuous assessment scores submitted to the West African Examinations Council by school authorities.

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## DEDICATION

This work is dedicated to Abi, Sekyi, Adubea and Naa Ayorkor.

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## CHAPTER 1

### INTRODUCTION

#### Background of the Study

Yoloye (1988) cited by Wuddah (1993) notes that:

with the coming of independence to African countries in the 1960s, African governments questioned the relevance of educational practices inherited from colonial masters to the needs and aspirations of independent African nations. It was partly to satisfy this questioning that a Conference of African States was organized by UNESCO/ECA in 1961 with a view to establishing an inventory of educational needs and of a programme to meet those needs in the coming years. The report of that conference became the baseline policy document for educational development in independent Africa as countries began actively to seek new directions for change and improvement in their educational systems through a variety of approaches (p.1).

At independence, Anglophone West African countries inherited similar educational structures. The structure of pre-tertiary education in Ghana at the time of independence was 6:4:5:2. This meant 6 years of primary education followed by 4 years of middle school education. After middle school (and later

middle school form 2 or 3) pupils qualified for the 5-year secondary school programme through the Common Entrance Examination. At the end of the five years, students sat for the School Certificate Examination (SCE) and later the General Certificate of Education (GCE) Ordinary Level Examination. Students who obtained good grades at the School Certificate/General Certificate of Education Examination (Ordinary Level), qualified for the two-year Sixth Form programme leading to the General Certificate of Education (GCE) Advanced Level Examination. Students with good grades in the General Certificate of Education (Advanced Level) Examination qualified to enter the university.

The educational systems and their curricula which were largely inherited from the colonial era did not fit graduates easily into the available jobs. Rather, they tended to cater for a minority of the citizenry and thus excluded the majority of the nationals from full and useful participation in the modernization programmes planned by the various governments. Equally important is the fact that the old system tended to play down on the rich cultural heritage of the country in favour of foreign culture. Also, the old system did not provide adequate knowledge and skills in science and technology. Knowledge acquired by graduates was of little relevance to the post-independence socio-cultural setting.

Before the creation of the West African Examinations Council (WAEC) in 1952, post primary institutions in the former British territories of the Gambia, Sierra Leone, Gold Coast (now Ghana) and Nigeria were taking the examinations of the British accrediting bodies. In Ghana, the West African Examinations Council after its creation became responsible for the

certification of candidates at the pre-tertiary level. It conducted the underlisted examinations:

1. Common Entrance Examinations for selection of pupils to secondary schools (1953 to 1986).
2. Middle School Leaving Certificate Examination for the certification of pupils at the end of basic education (1957 to 1992).
3. School Certificate/General Certificate of Education Examinations (Ordinary Level) for certification at the end of secondary school education and for selection of candidates for the Sixth Form programme (1959 to 1999).
4. General Certificate of Education Examination (Advanced Level) for certification at the end of the sixth Form programme and for selection to a University (1959 to 1999).

The Common Entrance and Middle School Leaving Certificate Examinations were one-shot examinations. Assessment at the General Certificate of Education Ordinary and Advanced Levels were also one shot examinations with duration of three hours in most subjects.

The examinations were theory biased and, therefore, failed to assess the ability to apply knowledge and the skills acquired. A pupil's performance over several years of schooling was determined by a one-shot terminal examination written under controlled conditions. This created high levels of stress in pupils as this single examination determined their future career paths. That means a bright pupil who for some reason could not perform well in the three hour examination was deemed to have failed the subject. Consideration was not

given for work done during the period at school even though pupils were assessed by their teachers.

The external examinations had a considerable influence on what went on in the classroom. A teacher's performance was judged by the results of his/her students in the external examination and this motivated them to teach to the examination and encourage rote learning.

According to Akplu (1989), the examination system has gripped the whole educational system and has been misdirecting educational efforts. Students, teachers, parents and schools showed more interest in examinations than in the real business of giving total education for life. From the primary school, children were coached for the Common Entrance Examinations; next they were coached for the SC/GCE (Ordinary level) examinations and then the Advanced level examinations. However, the high expectations of most parents and school leavers that high examination scores/grades were sure means of securing jobs could not be realized. Akplu (1989) noted: "We are training students for examinations with enthusiasm but the examination results are not being translated into food, clothing, housing, water, political and economic development" (p.2). The poor quality of the educational system was, therefore, partly blamed on the type of examination system which was being administered.

Education in Ghana has been characterized by committees and commissions as one government succeeded another. In 1966, the Government of the National Liberation Council (NLC) appointed the Kwapong Committee to review the education system and address the perceived erosion of educational standards. The next committee was the Dzobo Committee, which

the Government of the National Redemption Council appointed. That committee sought to correct the ills of the education system perceived to be an overly elitist and dysfunctional in terms of relevance to agricultural, technical and vocational education, which are directly related to the development process. Aspects of the report of this committee were incorporated in a Government White Paper titled: "The New Structure and Content of Education" which was published in 1974. The Ghana Education Service was charged to implement the reforms.

In 1987, the then government of Ghana, (the Provisional National Defence Council) decided to implement fully the uncompleted educational reforms that was began in 1974 with the nationwide implementation of the Junior Secondary School programme. The document from the Ministry of Education and Culture cited by Akwesi (1993) which outlined the nature of the reforms stated the rationale as follows:

The need for the reforms was based on the recognition that any system of education should aim at serving the needs of the individual, the society in which he lives and the country as a whole (Ministry of Education and Culture, School Reform Programme, 1987, p. 1).

The specific objectives of the reforms were:

- To expand and make access more equitable at all levels of education.
- To change the structure of the education system to 6-3-3-4, reducing the length of pre-tertiary education from 17 to 12 years.
- To improve pedagogic efficiency and effectiveness.

- To make education more relevant by increasing the attention paid to problem-solving, environmental concerns, pre-vocational training, manual dexterity and general skills training.
- To contain and partially recover costs and to enhance sector management and budgeting procedures. (Ministry of Education, 1999).

The reform adopted a 6-3-3-4 structure of education. Primary School remained six years and the three-year Junior Secondary School (JSS) was adopted for universal implementation. Basic education was made compulsory for all children and defined as 6 years Primary and 3 years Junior Secondary School. Senior Secondary School (SSS) was to last for three years and all post-secondary education was classified as tertiary education. The "normal" first degree programme was to last four years.

The 1987 reforms made the Junior Secondary School the common route to Senior Secondary School for all primary school pupils. Entry to Junior Secondary School was automatic for all products of the primary schools and the Common Entrance Examination ceased to be the selection mechanism for admission into Senior Secondary School. The subjects offered at the Junior Secondary Schools are: Mathematics, General Science, Religious and Moral Education, English Language, Agricultural Science, Technical Drawing, Social Studies, French (Optional), Ghanaian Language and Pre-Vocational Studies (Ministry of Education, 1999). JSS 3 pupils write the Basic Education Certificate Examination (BECE). Performance in the BECE determines admission into the Senior Secondary School. The secondary school curricula

were given renewed orientation from academic towards the vocational and technical. Consequently, the Junior Secondary School curriculum is designed to provide opportunities for pupils to acquire basic pre-technical, pre-vocational, and scientific and life skills that will enable them to:

- discover their aptitudes and potentialities and induce in them the desire for self-employment;
- appreciate the use of the hand as well as the mind and make them creative and self-employable;
- understand the environment and make them eager to contribute towards its survival and development.

At the end of the Junior Secondary School, pupils who do not meet the criteria for entrance into Senior Secondary / Technical Schools are encouraged to enter an apprenticeship system or some other out-of-school vocational or trade centres. The curriculum for these centres is geared towards craftsmanship and manual skill development. Pupils with the necessary aptitude and abilities can gain entrance into colleges and polytechnics from these centres.

In September 1987, all Middle Schools were converted into Junior Secondary Schools and pupils in Form 1 at that time became the pioneers of the JSS programme. The Middle School was phased out three years later when the last batch of Middle Form 4 pupils took the Middle School Leaving Certificate Examination in 1990. A re-sit examination was conducted in 1992 for those who were yet to pass the examination.

The Dzobo Committee (1972) recommended that there should be a national certificate of attainment at the end of the Junior Secondary School

programme and that the certificate should be based on the students' performance during the course and at a national examination. According to the Dzobo Committee (1972), its recommendations on selection and certification examinations were made in the light of criticisms levelled against the then existing methods of examination in the country, especially the Common Entrance Examination. Some of the criticisms were:

- Examinations were used as a yardstick by which pupils of a rather tender age were grouped into poor and good candidates for further education.
- Some institutions (especially Private International Schools) coached pupils in the examination subjects. Pupils were, therefore, denied the benefit of a general education which was very essential for further education in the secondary schools.
- Common Entrance Examination was found to be an inadequate method of measuring correctly overall capabilities of pupils.

(p.23)

As part of the 1987 educational reforms, the Ghana government adopted a policy in which the final assessment of candidates at the terminal points of basic and senior secondary education were not to be based only on a single final examination but on a combination of assessment by teachers of participating schools and terminal examination conducted by the West African Examinations Council.

The policy document approved by the Ministry of Education cited by Akwesi (1993) gave specific guidelines for assessment at the basic levels as "in line with the mode of assessment adopted at the Basic Education level continuous



assessment and external examination will be used to assess students' work for final certification" (p.76).

The term continuous assessment was used in the document for recorded assignments, tests and examinations (whether oral, written or practical work) and other methods of measuring pupils learning in the school. The benefits of implementing continuous assessment were perceived as follows:

- i. Pupils will be assessed using different and appropriate assessment methodologies and this will provide a more valid assessment of the learner's performance.
- ii. Assessment will take place in an authentic context. That is the pupils will be assessed in a realistic situation, which is integral to the learning process.
- iii. Assessment will feed immediately into the learning process, thus promoting the formative roles of assessment.
- iv. Judgement of the pupil's performance (summative assessment) will be carried out by the teacher who works intimately with the learner.
- v. Assessment is ongoing and, therefore, pupils are compelled to work consistently and this will contribute to promoting the culture of teaching and learning (Govender, 2003).

It was expected that the introduction of the continuous assessment procedure would help solve the problems associated with the existing methods of examination. According to Akwesi (1993), the Education Reform Act of 1987 stipulated that assessment of pupils' performance should be carried out through regular assignments which should be done weekly, fortnightly or

periodically but by and large, these assignments should yield cumulative and comprehensive data on each individual.

The bulk of the work on continuous assessment, therefore, falls on the teacher. Such work involves the development, administration, marking and recording of teacher-made assessments at regular intervals. The situation demands knowledge, skills and competence in assessment procedures as well as fairness and accuracy on the part of teachers.

Studies conducted on the comparability of scores (Wuddah, 1982; Wuddah, 1983; Wuddah, Arthur & Myers, 1990) to determine how far teachers' assessment agree with external assessment, however, revealed that:

1. Teachers appeared to be more generous and tended to award higher scores to their candidates in the school-based assessments than they achieved in all subjects in the external examination investigated.
2. There was disparity in the mode of assessment from school to school and from subject to subject.
3. Continuous assessment lent itself to abuse.

Amedahe (1989) also found out that most Ghanaian teachers lacked the skills required for assessment because they received no training in testing at school. Teachers, therefore, designed their own instruments which yielded unreliable information and varied from teacher to teacher. The introduction of continuous assessment was, however, not preceded by intensive planning and training appropriate for the educational innovation to ensure high quality of continuous assessment scores from schools.

Arthur (2000) notes that teacher-made scores are low in reliability and justify the assertion with the following observations:

- The continuous assessment scores are usually clustered together with the teacher making a conscious effort to make each pupil get close to the maximum marks.
- Teachers' scoring are erratic and unsystematic due mainly to lack of experience in assessment techniques.

The situation demanded that continuous assessment scores should be moderated before they are used in the award of grades. It, therefore, became necessary for the West African Examinations Council to implement a process of statistical moderation to reduce as far as possible the aforementioned defects of continuous assessment scores in the result of the Basic Education Certificate Examination. Moderated continuous assessment constituted 40% of the final mark whereas the end of the programme examination conducted by the West African Examinations Council constituted the remaining 60% when the BECE was administered for the first time in the year 1990.

The Education Reforms Review Committee of 1994 in its report expressed concern about the lack of proper instruments and guidelines for use in continuous assessment leading to unreliable scores. The Committee, therefore, accepted a recommendation by Wuddah (1994) that a 70:30 weighting of external compared to internal scores was more appropriate for the BECE than the existing 60:40 ratio. The use of the 70:30 ratio took effect from the 1997 examination.

The Education Reforms Review Committee of 1994 also recommended that workshops or training programmes for developing assessment instruments

should be periodically organized for all categories of teachers. Such workshops, the Committee suggested, should emphasize among other things, the construction of tests items to measure specific objectives and interpretation of test results. It was expected that when teachers mastered the techniques for continuous assessment, the moderation procedure adopted and the weighting of component scores for the examination would be reviewed to ensure more valid results.

#### Statement of the Problem

The continuous assessment scores submitted by schools to the West African Examinations Council for inclusion in the performance scores that are used for the final grading of Basic Education Certificate Examination candidates have been found to be unreliable (Wuddah, 1982, 1983, Johnson, 1997; Arthur, 2000). This has necessitated the moderation of such scores by the WAEC using the statistical moderation procedure. The moderation of continuous assessment scores has implications for the performance of candidates. It is not known whether the moderation procedure adopted by WAEC for continuous assessment scores at the Basic Education Certificate Examination Level has any significant effect on the performance scores of candidates. This is the main thrust of the study.

#### Purpose of the Study

The study sought to investigate the effect of moderation of continuous assessment scores on the performance scores of candidates for the BECE in

English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for:

1. the total sample of candidates and
2. each of the sub-samples selected from the following categories of school:
  - a. high performance
  - b. average performance
  - c. low performance

#### Research Questions

1. What is the correlation between raw continuous assessment scores and moderated continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for the total sample of candidates?
2. What is the correlation between raw continuous assessment scores and moderated continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for each of the sub-samples selected from the high, average and low performance categories of school?
3. Is there any significant difference between raw continuous assessment scores and moderated continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies,

Religious and Moral Education, Pre-Technical Skills and Agriculture for the total sample of candidates?

4. Is there any significant difference between raw continuous assessment scores and moderated continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for each of the sub-samples selected from the high, average and low performance categories of school?

5. What is the extent of change in performance scores as a result of moderation of continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for the total sample of candidates?

6. What is the extent of change in performance scores as a result of moderation of continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for each of the sub-samples selected from the high, average and low performance categories of school?

#### Significance of the Study

The findings of the study would be of interest to the West African Examinations Council since it reveals how dependable continuous assessment scores from the various categories of schools are. It would enable policy makers of the Ghana Education Service take a decision on whether there is the

need to moderate continuous assessment scores from all schools using the present statistical procedures or consider the introduction of tolerance limits where moderated continuous assessment scores are used only when they are significantly different from raw continuous assessment scores submitted by schools.

The study would also assist the Ghana Education Service to understand the issues involved when considering a recommendation of the Committee to review the BECE Grading System (2000) for the introduction of the moderation by inspection procedure. The Committee recommended that the statistical moderation procedure adopted by WAEC be discontinued when a system of moderation by inspection procedure is introduced and applied satisfactorily. The Committee was, however, of the view that statistical moderation could be used to generate alerts so that schools whose continuous assessment scores appear to have questionable reliability could be subjected to expert review.

The findings of the study have justified the need to continue with the moderation of continuous assessment scores presented by schools before incorporating them into performance scores of candidates.

#### Delimitation of the Study

The study covered seven subjects that were compulsory for all candidates. These were English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture. Vocational skills and Ghanaian languages were left out of the study because of

the large number of optional papers and time constraints. French was left out because many schools did not offer the subject.

### Limitations

The Computer Services of Division of WAEC does not keep record of raw continuous assessment marks after one year. The study was therefore based on data for the year 2004 only.

### Definition of Terms

#### High Performance Schools

Schools with students obtaining mean aggregate scores of below 10 at the 2004 BECE

#### Average Performance Schools

Schools with students obtaining mean aggregate scores of between 10 and 30 at the 2004 BECE

#### Low Performance Schools

Schools with students obtaining a mean aggregate scores of above 30 at the 2004 BECE.

#### Candidate's Aggregate Score

The sum of the grades of the best six subjects obtained by a candidate at the BECE.

#### Mean School Aggregate Score

The sum of aggregate scores of all candidates presented by the school divided by the number of candidates presented by the school.



Performance Score

The total score of a candidate in a subject that is used for grading the candidate in that subject.

## CHAPTER 2

### REVIEW OF RELATED LITERATURE

#### Introduction

A number of studies were conducted on continuous assessment scores prior to and after the introduction of educational reform programmes in Anglophone West African countries. This chapter reviews some of those studies and other literature related to the present study.

#### Assessment

There are several viewpoints on the definition of assessment. According to a group of researchers, Dietel, Herman and Knuth (1991), assessment may be defined as “any method used to understand the current knowledge that a student possesses” (p. 1). This implies that assessment can be as simple as a teachers subjective judgement based on a single observation of a student’s performance or as complex as a five-hour standardized test. The researchers explain that the idea of current knowledge implies that what a student knows is always changing and that we can make judgement about student achievement through comparison over a period of time. The researchers further explain that assessment may affect grades, advancement, placement, instructional needs and curriculum.

Assessment has also been defined as a process for obtaining information that is used for making decisions about students, curriculum and programmes, and educational policy (American Federation of Teachers, National Council of Measurement in Education and National Education Association (1990) cited in

Nitko (2001)). Nitko, therefore, explains that when we say “we are assessing a student’s competence” (p.4) we mean we are collecting information to help decide on the degree to which the student has achieved the learning target.

The Open University (1997) sees assessment as the general term used for measuring students’ performance on a course against the aims and objectives of that course. It is explained that assessment may be formative or summative. Formative assessment is that assessment which is part of teaching while summative assessment is assessment designed to determine a student’s overall level of performance on a course/programme at the end of the course/programme. In Ghana, both formative and summative assessments are used at the basic and secondary levels of education.

#### The Concept of Continuous Assessment

The search for improved methods of assessing students led to the introduction of the concept of continuous assessment. Educational researchers have come up with several viewpoints on the definition of continuous assessment as in the case of assessment.

Continuous assessment has been described as a type of assessment which takes place in a systematic form throughout a course or programme. It takes into account the learner’s performance over a whole period of study on a course or level of study in a variety of ways and situations in determining his final grade (Tamakloe, Amedahe & Atta, 1996). The term, continuous assessment as applied here, is a misnomer in that it is impossible to assess all students all the time. The term, therefore, refers to the frequency of assessment

of students as occurs in terminal assessment which takes place mainly at the end of course or term or year as the case may be (Rowntree, 1987).

Similarly in Ghana the term "continuous assessment" is used in the document, which outlined the nature of the educational reforms to include everyday recorded assignments, tests, examination (whether oral, written or practical work) and any other method of measuring pupils learning in school (Akvesi, 1993). According to Ojerinde & Falayajo (1984), continuous assessment is an assessment procedure whereby the final grading of a student in any subject takes into account, in a systematic way, the progress of the student throughout the programme. It is a method of evaluating the achievement and development of the learning outcomes of students which seeks to provide information on the ability of the student. Most of these authors agree that continuous assessment is ongoing and involves an assessment of the cognitive, affective and psychomotor domains of learning.

Ogunniyi (1984) defines continuous assessment as "a formative evaluation procedure concerned with finding out, in a systematic manner, the overall gains that a student has made in terms of knowledge, attitudes and skills after a given set of learning experiences" (p. 113). Thus, it facilitates full objectives of education.

According to Ipaye (1982), continuous assessment implies:

1. a variety of opportunities for assessing pupil's performance and progress provided in schools and that these opportunities should not be in the area of academic achievement only but also the affective (attitudes, character building) and psychomotor areas as well;

2. records of such performances should be systematically and faithfully, kept;
3. that the classroom teacher must take a major responsibility for carrying out assessment in a continuous or continual manner.

From the foregoing definitions, one can conclude that a student's final grade after a programme of instruction is an aggregation of all the performances exhibited in the learning tasks, experiences, and activities during the entire period of the programme.

#### Characteristics of Continuous Assessment

The main characteristics of continuous assessment can be summarized as cumulative, comprehensive, systematic, diagnostic, formative and guidance oriented (Etsey, 1992; Tamakloe, Amedahe & Atta, 1996). Continuous assessment is cumulative because the final grade awarded a student at the end of a term, in a year or programme is the aggregation of grades over the entire period collected systematically throughout the period. The grade awarded the student does not centre on one score as in one-shot examinations.

Continuous assessment is said to be comprehensive, first, because a variety of instruments and procedures are used to collect data on the student. The instruments and procedures include teacher-made tests, class exercises, projects, observations, interviews and rating scales. Secondly assessment in continuous assessment covers cognitive and psychomotor domains unlike one shot examinations in which emphasis is placed on the cognitive domain.

Continuous assessment is described as systematic because of the way assessment is scheduled during the term, year or programme. It is carried out

at predetermined intervals (weekly, fortnightly or monthly). The assessment is diagnostic because it aids the identification of the strengths and weaknesses of the student. The diagnostic assessment of students enables teachers to identify students problems early in the course for the initiation of remedial actions.

Continuous assessment is formative since it leads to improvement of teaching and learning as regular information is obtained on the instructional process. In Ghana, the National Committee on School Reforms of the Ministry of Education produced a manual to guide teachers in assessing their pupils systematically, continuously and cumulatively (Wuddah, 1993). Feedback to WAEC, however, indicates that the guidelines are not being adhered to by many teachers and this has contributed to the unreliable continuous assessment scores submitted by schools to WAEC (Johnson, 1997).

#### Merits of Continuous Assessment

The merits of continuous assessment as noted by some researchers are as follows:

1. Continuous assessment provides a more representative sampling of students' performance both across time and across tasks than the traditional examination system. In other words, the work assessed internally can cover more of the syllabus than can a small number of questions in an external examination. If assessment by the classroom teacher operates throughout the course, it can cover the entire syllabus which an external examination cannot do (Akplu 1989; Andoh, 1994; Tamakloe, Amedahe & Atta, 1996).

2. Continuous assessment is fairer to the student than the external examination system because he has more than one chance to exhibit the behaviours being assessed. The stress imposed on students in one shot examination is, therefore, minimized (Akplu, 1989; Andoh, 1994).
3. Continuous assessment motivates students to learn as knowledge of results serves as a reward for successful performance or spurs one on to a greater effort after an unsuccessful performance (Andoh, 1994; Tamakloe, et al, 1996).
4. It is possible to measure all the educational outcomes especially those that can only be measured over a reasonable period of time and not measurable at all under examination conditions (Akplu, 1989; Etsey, 1992; Tamakloe et al, 1996).
5. Continuous assessment provides a constant stream of information about student's progress or about possible reasons for lack of progress. Both students and teachers benefit during the teaching-learning process from systematic feed-back (Akplu, 1989; Andoh, 1994; Etsey, 1992; Tamakloe et al, 1996).
6. Continuous assessment can be used as a means of career guidance for students. The teacher can easily identify a student's aptitude and place him in his field of interest as soon as necessary (Andoh, 1994; Etsey, 1992).
7. Yoloye (1984) also contends that continuous assessment when employed will reduce the high incidence of leakages and other examination malpractices.

8. Educational administrators keep records of the progress of individual students so that prompt responses can be made to queries about individual students. This is best done by the classroom teacher (Andoh, 1994).

#### Problems of Continuous Assessment

Akplu (1989) observed that with the external examinations, there is nearly absolute uniformity with regard to testing conditions, grading standards and procedures. With continuous assessment, the fate of students to some extent is determined directly by the individual classroom teacher and this is bound to generate fear of lack of uniformity and fairness in assessing students. The major problem of continuous assessment is that of comparability of standard from school to school and from district to district. A score of 70% in a rural school may not mean the same as a score of 70% in an urban setting (Tamakloe, et al, 1996). Amedahe (1989) found out that most teachers in Ghana were not well equipped with assessment techniques and procedures and perhaps could not construct valid and reliable tests. Amedahe (1989) also noted that both teachers who received instructions in measurement at teacher training institutions and those who did not, failed to follow basic principles of test construction and this could account for the lack of uniformity in the assessment of pupils.

Another problem of continuous assessment is the increasing workload on the classroom teacher. Continuous assessment is time consuming because teachers have to painstakingly construct their exercises, assignments and tests, score them and have scores recorded on appropriate forms in addition to preparing adequately for their lessons (Tamakloe, et al, 1996). The Curriculum



and Research Division of the Ghana Education Service (CRDD, 2000) reported that teachers, headteachers and circuit supervisors agreed in an investigation into student assessment procedures in Junior Secondary Schools in Ghana, that, using approved instruments (test, exercises, homework and project work) was a tedious job. This finding suggests that the respondents were not likely to use all approved instruments as prescribed for the conduct of continuous assessment in schools which could also account for lack of uniformity in assessment of pupils.

Teacher biases in terms of favouritism can also affect the validity of test scores (Tamakloe, et al, 1996). Akplu (1989) also noted that:

in the present system of external examinations and external examiners, the examinee is anonymous so the examiner has no way of aiding favourites or victimizing enemies. In continuous assessment, the teacher knows the student well and there is the possibility of student-teacher relationship influencing the teacher's assessment. This possibility can put the reliability of continuous assessment marks in doubt (p. 11).

A major problem of continuous assessment in Ghana is the lack of monitoring procedure. The Curriculum Research and Development Division of the Ghana Education Service in 2000 (CRDD, 2000) reported that:

the supervision of continuous assessment by headteachers involved making sure that marks were provided for all pupils by teachers. How the marks were derived by teachers were not properly supervised. In some schools, the

headteachers themselves were classroom teachers and therefore did self-supervision (p. 14).

#### Design of Continuous Assessment at Basic Education Level

Continuous assessment in Ghanaian schools comprises the following;  
4 Class exercises (marked out of 40); 3 Tests/Quizzes (marked out of 20); and  
4 Project/Housework (marked out of 20). Besides, the 11 assignments, there is  
an end of term examination to be conducted and recorded for each pupil.  
Table 1 illustrates the GES Termly Assessment Plan, spelling out what should  
be done to fill class exercises/assignments, class tests, project and homework.

Table 1

**Termly Assessment plan for continuous assessment**

	1					2		3			4		5			6		7		8		9		10		11		12		
Name	Class Assignments Exercises					Sub Total 40		Class Test			Sub Total 40		Project / Home Work			Sub Total 20		Total Class Score 100		30%		End of Term Exam 100		70%		Overall Total 30% + 70%		Position		

From the table the number of marks recorded per pupil in the record book total 19 for a term.

Source: Ghana Education Service

From the table the number of marks recorded per pupil in a record book total 19 for a term.

#### Continuous Assessment Marks for the BECE

Marks forwarded to West African Examinations Council for the purpose of BECE are compiled from Primary 1 to JSS 3 for all 10 JSS subjects. The cumulative records book shows 36 cells plus 2 other cells for the total mark and total mark conversion to the required weight of 30%, making a total of 38 cells. The head teacher therefore has to compile 380 marks for each pupil that is 38 cells x 10 subjects (Quansah, 2000).

The West African Examinations Council also provides the schools with scannable continuous assessment mark sheets with candidate's particulars already printed on them. School heads are required to provide marks for candidates and shade appropriate columns on the form. The continuous assessment scores which are forwarded to the West African Examinations Council are, therefore, simply an aggregation of the means of raw scores derived from class assignments, tests, projects/homework given by each individual teacher from primary class 1 to JSS 3 for each pupil. The period covered for the recording of continuous assessment scores is very long. The means of raw continuous assessment scores for pupils who record drastic improvement or decline in academic work at the JSS is not likely to reflect the pupils' true performance at the JSS. A much more reliable mean continuous assessment scores could be obtained if recording of scores are restricted to the period at the JSS.

### Comparability of Scores

The reputation of an examination board rests upon the certificates issued in its name. The problems associated with continuous assessment, therefore, place additional responsibility on the WAEC to ensure that procedures are in place to ensure the comparability of continuous assessments scores from various schools. The procedure adopted for ensuring comparability of assessments need to be fair and cost effective in view of constrained budgets and large candidature for the examinations.

### Moderation

According to the Victorian Curriculum and Assessment Authority (2005), moderation is a process of ensuring that the same standards of assessment are applied to students from every school studying a particular subject. The New Zealand Qualification Authority (2005) also asserts that the purpose of moderation is to ensure that:

1. assessments are consistent with national standard;
2. assessments are fair and valid;
3. assessors are making consistent judgement about student or candidate performance.

Kindler (1996) says moderation procedures fall broadly into two categories – quality control and quality assurance. Quality control procedures are those concerned with the adjustment of the outcome of assessment to improve fairness for groups or individuals. This takes place after assessment to ensure fairness by adjusting results where there seems to be inconsistency or systematic differences in the way procedures have been followed (Kindler, 1996). Harlen (1994) says there are six different moderation procedures for

quality control. These are the use of (a) reference or scaling (b) inspection of samples by post, (c) inspection by visiting moderators (d) external examinations, (e) teacher requested moderation, (f) group or consensus moderation of internal assessment.

The quality assurance procedures are those concerned with the process of arriving at fair assessment for groups or individuals and usually, although not always, takes place before assessment is completed. These procedures are designed to improve the quality of assessment process and do not result in changes made to students marks (Kindler, 1996). Harlen (1996) lists some of the procedures for quality assurance as (a) defining criteria for assessment, (b) exemplification (c) approval of institutions/centres, (d) visits by verifier or moderators and (e) group moderation. Kindler (1996) explains that in practice most of these procedures are used together.

Amedahe (2000) also describes three moderation procedures. These are (a) moderation by inspection, (b) statistical moderation and (c) moderation by monitoring. Moderation by inspection and statistical moderation procedures are quality control procedures whilst that by monitoring is a quality assurance procedure. When the BECE was introduced in 1990, the WAEC opted for the statistical moderation procedure from the available options for the moderation of continuous assessment scores. The Committee that reviewed the BECE grading system (2000) however recommended that the statistical moderation procedure be discontinued when a system of moderation by inspection procedure is introduced and applied satisfactorily. This study therefore looks at the merits and limitations of the statistical moderation and moderation by inspection procedures.

### Moderation by Inspection

This procedure involves the establishment of mechanism for expert or peer review of school assessment. These may take the form of:

- a. Consensus moderation involving teachers meeting in groups to compare sets of school assessments and to either confirm or adjust the school's initial assessments.
- b. Inspection of schools by externally appointed moderators who either confirm or adjust schools initial assessments.
- c. Inspection of samples by post. Work assessed internally by teachers is checked to find out if they have been marked and graded according to required standards.

The merits of the moderation by inspection procedure are:

1. Work of a particularly high or low standard can be identified and assessed accordingly.
2. It involves teachers in discussing standards of work and thus contributes to the professional development of the teacher.

The moderation by inspection procedures, however, has a number of limitations some of which are:

- i. It is resource intensive in terms of both time and the financial costs associated with employment of moderators, and travel expenses.

- ii. Achieving consistency in standards among moderators or among teachers within moderation panels is difficult and considerable effort is required to maintain acceptable levels of inter-rater reliability (Brown & Ball, 1992). This problem increases as the size of the candidature and the number of schools involved increases.
- iii. Where the review process allows dialogue between the reviewer and the reviewed, the potential exists for undue influence on the reviewer to accept the school's assessments of students (Brown & Ball, 1992).

#### Statistical Moderation

Statistical moderation is a procedure that uses information from an external examination to adjust teacher-based assessment scores (Burton & Linn, 1993). The rationale for statistical moderation as put by the authors is that:

the teacher-assessed components of the examination  
are likely to be more valid in terms of ranking the students,  
while the external exam is more suitable for establishing the  
relative standard of work across schools (p. 18).

The two most common procedures used in statistical moderation are scaling and mapping. In scaling, "the marks from the internal assessment for each assessment are... adjusted to give the same mean and standard deviation as the distribution of marks for the moderating instrument of the candidates in that group" (Smith, 1978, p. 23). In mapping, the results on the moderating



instrument of all candidates from each centre or assessment group are ranked. The candidates are also ranked in the order determined by the internal assessment. The top candidate on the internal assessment is then given a mark equivalent to the top mark obtained in the group on the moderating instrument, the next highest moderating test mark is given to the candidate ranked second by the centre, and so on down the rank order for the internal assessment (Smith, 1978, p. 24). In both approaches, the teacher's rank order is unchanged which implies the acceptance of teacher's rank ordering within schools. Different teachers' marks may, however, change the relative standing of students in a situation where a school has more than one teacher for a subject.

Statistical moderation is based on some criteria. The first criterion is that the internal assessment must be conducted over a period of time and that essentially the same knowledge, skills and abilities are assessed by both internal and external assessments (Cohen & Deale, 1977; Burton & Linn, 1993; Smith, 1978). This criterion calls for the condition that the internal and external scores should be correlated. The Department of Education and Science, Welsh Office's document on appropriateness of moderation methodology for General Certificate of Secondary Education (1995) states "if statistical moderation against an externally assessed component is to be used, it is essential that there is a satisfactory level of correlation between the internally assessed component being moderated and the externally assessed components used to moderate it" (p. 23). Amedahe (2000) has noted that the issue of a satisfactory level of correlation between teacher assessment and external examination scores is a tricky and contentious one. Too little overlap

(correlation) will render the moderating examination unsuitable and too much overlap (multicollinearity) will cast doubt on the advisability of having both components as a part of the same examination process. It is recommended that correlation coefficients below .50 – .60 are possibly too low (Smith, 1978; Cohen & Deale, 1977).

The second criterion is that, the average grade of candidates from a particular school should be at the same level, within statistical limits for both the internal and external assessments, and if they are not, adjustments must be made to the internal assessments to bring the average score within tolerable limits. This criterion assumes that there should be no significant differences in attainment of students on both internal and external components in any particular school (Burton & Linn, 1993).

A third criterion is that the external assessment should be reliable and be capable of being marked with a high degree of consistency. In Ghana, studies using BECE scores show that majority of internal scores from schools have strong positive and significant correlations with the external scores though these varied widely from school to school. Majority of the schools including those with high correlations between internal and external scores, however, exhibited differences in the level of attainment in the two assessments (Wuddah et al, 1993; Andoh, 1994). The evidence shows that though majority of schools meet the first criterion of high correlation between internal and external assessments, they fail to meet the second criterion of no significant difference in the level of attainment in the two assessments.

The WAEC takes the necessary precautions to ensure that the third criterion of external assessment being reliable and marked with a high degree of consistency is met. The precautions include:

- i. training of item writers,
- ii. trial testing of items,
- iii. moderation of items by experts,
- iv. printing, packing and distributing question papers under strict security conditions,
- v. holding of briefing courses for supervisors to ensure compliance with the rules and regulations governing the conduct of the examination,
- vi. inspection of examination centres by WAEC and GES officials to ensure that the examination is conducted in a professional manner,
- vii. holding of coordination meetings for all examiners to ensure standardized marking,
- viii. vetting of scripts by chief examiners and team leaders to ensure that examiners are marking according to agreed standards,
- ix. checking of scripts by trained script checkers to ensure accurate computation and recording of scores and
- x. quality control of final results to ensure that all errors detected are corrected before the release of results.

The merits of the statistical moderation are:

1. It is an inexpensive solution to the comparability problem for certification agencies that have retained the external examinations.
2. It is not subject to significant problems of inter-rater reliability and it is manifestly 'objective'.
3. The scaling of school assessments preserves the order of merit of students as assessed by the school and relative spacing between the students. What changes is the level of spread.

However, the statistical moderation procedure has some disadvantages among which are:

1. The external examination score may not always be a valid moderator variable, particularly in cases where the school assessment has been specifically designed to measure outcomes which are not or cannot be assessed through the external examination (Masters & Hill, 1988). This applies particularly to subjects involving school-based assessment of outcomes requiring very different kinds of abilities from those required in the examination. For example, where the school assessment focuses on practical activities, performances, or extended research, the correlation between the schools assessments may not be particularly a valid indicator of the level of performance of students on the outcomes assessed at the school level.
2. Where external examination scores are used as the moderator variable, statistical moderation encourages schools to focus all their efforts on maximizing scores on the examination to the neglect of school assessment. This is because the distribution of school

assessment scores is adjusted to conform to the distribution of external examination scores, irrespective of the actual level of performance on school-based assessment activities. There is, thus, no incentive for the school to put significant effort into the school assessment, since, regardless of the actual standard of performance, student's assessments will automatically be adjusted to coincide with their performance in the examination.

3. Statistical moderation is problematic when applied to schools with small subject enrolments (Masters & Hill 1988). This is because the magnitude of the adjustments made to the result of the students within the school is unduly influenced by the inclusion or exclusion of one or two individuals with high or low results. Small enrolments (1 – 10 students) in a subject within a school are very common so the small enrolment problem is by no means a trivial matter. The problem can be minimized by requiring schools with small subject enrolments to combine with other schools to form 'pseudo' schools, which jointly submit their assessments for the purposes of statistical moderation. This, however, tends to place additional burdens on small, isolated schools who find it time-consuming and expensive to conduct joint meetings to establish comparability of assessments prior to submitting them for statistical moderation.

Practically, the criteria that should be met for the use of the statistical moderation procedure are difficult to meet fully. Smith (1978), therefore, argue that because no examination can ever fully satisfy the above criteria, it is "probably unwise to place all one's faith in the moderation instrument and to

adjust candidates' internally assessed marks in strict accordance with performance on it as it would be to accept the internally assessed marks without applying any kind of moderating technique" (p. 26). As a solution, he advocates a midway position in which action is taken only if scores on the internal and external examination are sufficiently different. That is, only if the internal assessment scores fall outside established tolerance limits.

Cohen and Deale (1977) identify two ways in which statistical moderation can be used. In the first, it is assumed that the average grade of candidates from a particular school should be the same, within statistical limits, for both the teacher assessment and the external assessment, if they are not, adjustments are made to school grades or marks so that the average does come within tolerance limits. The second way of using statistical moderation is to consider it as a first step in a process that combines statistical moderation and moderation by inspection. If the schools average grades do not fall within the specified tolerance limits, additional information is gathered in order to determine whether grade adjustment is necessary.

#### Tolerance Limits

If the method of involving the use of tolerance limits is chosen, there are a number of factors to be taken into consideration in calculating the tolerance limits (Smith, 1978). These include:

1. the extent to which the external component of the examination satisfies the three criteria for the use of the statistical moderation procedure;
2. the correlation between internal and external components;
3. the spread of marks in the two sets as indicated by the standard

deviations;

4. the number of candidates in each assessment set. Because these factors are likely to vary from school to school, it may not be advisable to use the same tolerance limits for all schools. On the other hand, calculating limits separately for each school would produce "a wild array of adjustments" (Smith, 1978).

Tolerance limits also tend to differentially penalize students from different schools whose grades fall just and further outside the limits. Thus, tolerance limits are also known to suffer from validity problems.

#### Combination of Moderation Procedures

It has been suggested that the use of a combination of moderation procedures may provide the most consistent results (Gipps, 1994; Halen 1994; Linn, 1993). The Board of Studies of the Victoria Certificate of Examination in Australia combines the moderation by inspection and the statistical moderation procedures for the year 12 examination. The Guateng Department of Education in South Africa also combines the two methods for the Senior Certificate Examination.

#### Moderation of Basic Education Certificate Examination (BECE)

##### Continuous Assessment Scores in Ghana

The West African Examinations Council uses only the statistical moderation procedures for the moderation of continuous assessment scores. Both the scaling and mapping methods are used for the Basic Education Certificate Examination (BECE) (Wuddah, 1996).

With the scaling method, continuous assessment scores submitted by schools are adjusted to give the same mean and standard deviation as distribution of marks of candidates from each school using the external examination scores. The steps that the continuous assessment scores go through before being incorporated into individual candidate's final score for grading are as follows:

- Step 1: The external examination scores are scaled to a maximum of 100 marks for each subject and for each school.
- Step 2: The school mean and standard deviations are calculated (for the external scores).
- Step 3: The school mean and standard deviations for continuous assessment marks for each subject are also calculated.
- Step 4: The external examination marks for each subject are used to moderate the continuous assessment marks in that subject school by school using the formula:

$$\text{CASS (Mode)} = \text{TASS (Mean)} + \frac{\text{TASS (SD)}}{\text{CASS (SD)}} \times (\text{CASSR} - \text{CASSM})$$

From the formula, CASS (Mode) is a function of TASS (mean), TASS (SD), GASS (SD), CASSR and CASSM.

Where CASS (Mode) = Moderated continuous assessment



TASS (Mean)	=	Mean of external scores
TASS (SD)	=	Standard deviation of external assessment score
CASS (SD)	=	Standard deviation of continuous assessment score
CASSR	=	Raw score of continuous assessment
CASSM	=	Mean of continuous assessment

The mapping method is used by the WAEC when the subject entry is small but because of the large candidature for the BECE for most schools, situations that necessitate the use of the mapping method rarely arise. In mapping, the results on the moderating instrument (TASS) of all candidates of a school in a given subject are ranked. The candidates are also rank ordered as determined by the internal assessment (CASS). The top candidate on the internal assessment (CASS) is then given a mark equivalent to the top mark obtained in the group on the moderating instrument (TASS), the next highest moderating test (TASS) mark is given to the candidate ranked second by the school, and so on down the rank order for internal assessment (CASS).

#### Correlation between School Assessment Scores and External Examination

##### Scores

The Research Department of the West African Examination Council in Ghana conducted a number of investigations (Wuddah, 1982, 1983; Wuddah, et al 1990) into the relationship between school estimates and external

examination results to enable it advise the Council on the reliability of teacher assessment scores when it became necessary to incorporate teacher assessment scores into the final grade for the award of certificates.

Wuddah (1982) investigated that relationship between school estimates and Advanced Level results in science subjects in an attempt to find out how teachers' assessments in general agree with external Advanced Level examination results in corresponding subjects. The subjects used in the study were Biology, Chemistry, Physics and Mathematics. It was evident from the study that significant positive correlations were found between school assessment and external examinations though they varied from school to school and from subject to subject. Teachers were found to be more generous in their ratings and, therefore, tended to award higher grades resulting in differences in standards between the internal and external assessments. Wuddah (1983) again investigated the relationship between school estimates and Advanced level results but this time in arts subjects. The subjects involved were Economics, Government, Geography, French, History, Religious Studies and Literature. The study confirmed the findings of Wuddah (1982).

Wuddah et al, (1990) repeated the earlier investigations but using Ordinary level subjects for 1988 and 1989 examinations. The subjects for the investigation were Physics, Chemistry, Biology, Agricultural Science, Health Science, Mathematics and Additional Mathematics. The study confirmed earlier findings of a positive correlation between the two methods of assessments in a majority of schools and a majority of subjects sampled. The study also supported the earlier findings (Wuddah, 1982, 1983) that there was disparity between the two assessments in the majority of schools in most

subjects. The grades awarded by teachers in majority of schools were found to be too generous. Discrepancies of up to four grades were found between a school's mean assessment grade and the mean grade achieved by its candidates in the external examination.

The findings of these studies (Wuddah, 1982, 1983, Wuddah et al, 1990) enabled the Council take the decision to moderate all school assessment scores before incorporating them into the external score for the award of certificates on the introduction of the BECE.

In Nigeria, Adeyegbe (1992) tested the hypothesis that there was no significant relationship between continuous assessment and terminal assessment marks used for grading for the award of the Senior Secondary School Certificate. The study was based on a sample of ten schools that were randomly selected from schools that presented candidates for the 1988 Senior Secondary School Certificate Examination (SSSCE) in English Language, Mathematics, Geography, Biology, Chemistry and Physics. The researcher found out that (a) correlation between terminal assessment and continuous assessment were generally positive though low in some cases (b) in all schools the mean of continuous assessment marks was higher than the mean of terminal assessment marks, an indication that schools generally over-rated their candidates. These findings agreed with the findings of earlier studies by Wuddah (1982, 1983) and Wuddah et al, (1990). Adeyegbe (1992) also found out that only few schools had correlations between terminal assessment and final year continuous assessment up to 0.4 when tested at the 0.05 level of significance. This was an indication that there was not much relationship between terminal assessment and continuous assessment for the Senior School

Certificate Examination (SSSCE) in Nigeria. The hypothesis was therefore accepted.

After the introduction of the BECE in Ghana, Wuddah et al, (1993) studied the relationship that existed between scores of internal assessment and the external assessment of candidates for the 1991 BECE. Candidates from 40 schools selected from all the ten regions of Ghana using the stratified random sampling procedure constituted the sample for the study.

The researchers found out that:

1. Majority of the schools in all the subjects demonstrated positive and significant inter-assessment correlations, though this varied widely from school to school and subject to subject.
2. Some schools with high correlations exhibited differences in standards of performance and therefore a disparity between the two modes of assessment from school to school and subject to subject.
3. Teachers appeared to be more generous and tended to award higher scores to their candidates in the school-based assessment than they achieved in the external assessment in all the subjects investigated.

Wuddah et al (1994) repeated the 1993 investigation this time using differential weightings of the scores to determine how far teachers' assessments, in general, agreed with the external assessments. It was hoped that the findings would provide empirical evidence on appropriate weighting of the external and internal scores to be used for the BECE grades until internal assessment scores became more reliable. The sample for the study was

1919 candidates from 35 schools who wrote the 1991 BECE and were taken from each of the subjects listed for the 1993 study. The raw scores of the external and internal assessments were differentially weighted in the following ratios: 80:20, 70:30: and 60:40. The method of analysis compared the differentially weighted internal scores of a group of candidates offering a particular subject in a school with the external scores awarded to the same candidates in that subject.

The findings of the study were as follows:

1. Irrespective of the differential weights applied to the scores in both assessments, majority of the schools in all the subjects investigated demonstrated positive and significant inter-assessment correlations though these varied from school to school and from subject to subject.
2. There was disparity of standards between the two modes of assessment from school to school and from subject to subject irrespective of the differential weights.
3. The application of the 60:40 ratio produced the highest number of schools achieving higher mean scores in the internal as compared to the external assessment. The reverse was true when the 80:20 ratio was applied.
4. In English Language, Mathematics, General Science and Technical Skills, the highest percentage of schools achieved the same standard of performance in the two modes of assessment by the application of the 70:30 ratio.

5. In Social Studies and Agriculture, the highest percentage of schools achieved the same standard of performance in the two modes of assessment by the application of the 60:40 ratio.

The researchers, therefore, recommended that a 70:30 weighting of external compared to internal scores should replace the 60:40 ratio then in use in view of the fact that teachers tended to award higher scores to their candidates than they achieved in the external examinations. This recommendation led to the change in the 60:40 weighting of external to internal scores to the 70:30 ratio of the BECE.

Andoh (1994) also studied the relationship between continuous assessment and external assessment scores for Ghana BECE in English Language, Mathematics and General Science using a sample of 600 candidates' scores in 1993 and found out that:

1. There is a strong positive and significant relationship between school-based continuous assessment scores and the external BECE scores of the WAEC, although the strength of the relationship varied from subject to subject and from school to school; ( $0.34 \leq r \leq 0.92$ ;  $p \leq .05$ )
2. Differences in the mean performances of students between the continuous assessment scores and external BECE scores were significant;
3. although there were not much differences in mean scores of the continuous assessment scores between rural and urban schools, rural schools tended to exhibit very close mean scores in

individual subjects indicating that, rural school teacher saw their students as more homogeneous in the cognitive abilities.

Andor (1994) concluded on the basis of the findings that, continuous assessment scores are good predictors of student performance on the external BECE.

In Sierra Leone, the West African Examinations Council (1996) conducted a study to find out whether any relationship existed between continuous assessment and terminal assessment scores at the 1994 National Primary School Examination (NPSE)

The findings of the study were:

1. correlation coefficients between continuous assessment and terminal assessment were positive in all subjects for the total sampled candidates. ( $0.25 \leq r \leq 0.39$ ;  $p \leq 0.05$ )
2. correlation coefficients between continuous assessment and terminal assessment were also positive in all subjects for the rural and urban sampled candidates taken separately. (rural sample:  $0.18 \leq r \leq 0.35$ ; urban sample  $0.31 \leq r \leq 0.48$ ;  $p \leq 0.05$ ).
3. correlation coefficient between continuous assessment and terminal assessment scores were also positive in all papers for the urban and rural sample schools. (rural sample:  $0.12 \leq r \leq 0.65$ ; urban sample  $0.21 \leq r \leq 0.75$ ;  $p \leq 0.05$ ).

4. correlation coefficients between continuous assessment and terminal assessment scores were significant except for general science and mathematics in the rural sample schools.

The findings agreed with that of Wuddah et al, (1993), that positive significant relationship between continuous and terminal assessments existed at the Ghana Basic Education Certificate Examination.

Analysis carried on the location of school basis generally showed higher correlation coefficients obtained in various subject tests for urban schools than for rural schools. Similarly, higher correlation coefficients were found for urban candidates than for rural candidates. This result was explained by the point that urban schools tend to attract trained and qualified teachers who are better skilled in test construction for the continuous assessment than rural schools.

The West African Examinations Council (2000) again investigated the relationship between continuous assessment and the West African Examinations Council's terminal assessment scores in the 1996 Basic Education Certificate Examination (BECE) in Sierra Leone.

The findings of the study were that;

1. Positive significant relationship between external assessment and continuous assessment was found at the national level for each of the four core subjects investigated. However the values for Mathematics and Social Studies were low ( $r = 0.23$  and  $r = 0.37$  respectively), while that for Language Arts and Integrated Science were higher ( $r = 0.53$  and  $r = 0.44$  respectively).



2. Relationship between external assessment and continuous assessment for all the four core subjects at the rural and urban areas were all low and significant. The values of the correlation coefficients ranged between 0.29 and 0.57. For each subject the correlation coefficient at the rural schools tended to be higher than that for the urban schools.
3. Mathematics showed the lowest level value of correlation coefficient between external assessment and continuous assessment at the national level (0.23) as well as rural (0.31) and urban areas (0.29).

The revelation of positive significant relationship between terminal assessment and continuous assessment in this study also agrees with earlier studies by Wuddah et al (1993) on the Ghana Basic Education Certificate Examination and WAEC (1996) on the National Primary School Examination (NPSE) in Sierra Leone. The finding that correlation coefficient of schools were in general higher in the rural areas than those in the urban areas, however, negates an earlier study on the NPSE (WAEC, 1996). The researchers, however, explained that there could be other intervening variables beyond the scope of the study.

#### Summary of Review

This chapter reviewed some studies on teacher assessment. The studies showed that significant and positive correlations exist between continuous assessment and external assessment in all subjects investigated pointing to a reasonable level of fairness on the part of teachers. The high generosity on the

part of teachers in the award of marks, however, warrants the moderation of their scores to minimize inter-school differences.

This chapter also reviewed the literature on the merits and limitations of the statistical moderation procedure which is used for the moderation of the BECE continuous assessment scores and the moderation by inspection procedure which has been recommended to replace the present procedure by the Committee to Review the BECE Grading System (2000). From the review, one can conclude that neither the moderation by inspection procedure nor the statistical moderation procedure is satisfactory by itself. The approach used by some examining boards is a combination of the two procedures which some researchers have suggested could produce the most consistent results.

## CHAPTER THREE

### METHODOLOGY

This chapter deals with the research design, the population of the study, sampling techniques, and the method of data collection and analysis.

#### Research Design

The descriptive research design was used for this study. According to Gay (1992) descriptive research involves the collection of data to test the hypothesis or answer research questions concerning the current status of subject of the study. In descriptive research, the events or conditions already exist or have occurred and the researcher selects the relevant variables for analysis of their relationships. In conducting the study no attempt was made to manipulate the variables under study. The variables were studied and deductions made on the basis of evidence collected.

#### Population

The population for this study was all the 278,413 candidates who took the 2004 Basic Education Certificate Examination in thirty-three (33) subjects made available, seven (7) of which were compulsory. The compulsory subjects were English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture. There were also twelve (12) vocational skills, eleven (11) Ghanaian language subjects and French. The vocational skills subjects were Basketry, Beadmaking, Catering, Gourd and Calabash Art, Graphics, Leatherworks, Papercraft, Picture Making, Pottery and Ceramics, Sculpture, Sewing and

Textiles. The Ghanaian Language subjects were Dangme, Dagaare, Dagbani, Ewe, Fanti, Ga, Gonja, Kasem, Nzema, Twi (Akuapem) and Twi (Asante).

### Sample

For each of the 10 regions in Ghana the schools were stratified into the high, average and low categories based on their performance at the 2004 BECE. Schools with mean candidate aggregate score of less than 10 were classified as high performing; those with mean aggregate score of more than 30 were classified as poor performing whilst those with mean candidate aggregate of between 10 and 30 were classified as average performing.

Originally, it was planned to select three schools at random from each category from each region. This could not be achieved because five regions could not provide the maximum three schools required for selection from the high performance category of schools. The Brong Ahafo and Northern Regions provided two schools each, the Volta and Upper West Regions provided one school each whilst the Upper East Region could provide no school for selection for the high performance category of schools. Three schools each were, however, selected from the categories of average and low performance schools for all the ten regions. Schools with incomplete raw continuous assessment or moderated continuous assessment for a subject were eliminated from the study for that subject. A total of 6,034 candidates from 81 Junior Secondary Schools in Ghana, therefore, constituted the sample for the study. Table 2 shows the geographical distribution of schools sampled.

Table 2

Geographical Distribution of Sampled Schools

Region	Number of Schools			Total
	High Performance	Average Performance	Low Performance	
Upper West	1	3	3	7
Greater Accra	3	3	3	9
Eastern	3	3	3	9
Central	3	3	3	9
Western	3	3	3	9
Ashanti	3	3	3	9
Brong-Ahafo	2	3	3	8
Volta	1	3	3	7
Northern	2	3	3	6
Upper East	0	3	3	6
Total	21	30	30	81

The subjects that constituted the Junior Secondary School curriculum were also sampled and purposive sampling was used for the selection of the following subjects: English Language, Mathematics, Social Studies, General Science, Religious and Moral Education, Agricultural Science and Pre-Technical Skills.

Data Collection

The Computer Services Division of the West African Examinations Council provided the raw continuous assessment scores and the moderated

continuous assessment scores for the selected candidates in the seven core subjects.

#### Data Analysis

The product moment correlation coefficients were calculated to find out the relationship between raw continuous assessment scores and moderated continuous assessment scores at the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for:

1. the total sample of candidates
2. each of the sub-samples selected from the following categories of school:
  - a. high performance,
  - b. average performance,
  - c. low performance.

The t-tests were used to find out if there were significant differences in mean scores for raw continuous assessment scores and moderated continuous assessment scores at the BECE in English Language, Mathematics, Social Studies, General Science, Religious and Moral Education, Agricultural Science and Pre-Technical Skills for:

1. the total sample of candidates
2. each of the sub-samples selected from the following categories of school:
  - a. high performance,
  - b. average performance,

c. low performance.

A study of the table of differences between mean performance scores computed using raw continuous assessment scores and mean performance scores computed using moderated continuous assessment scores in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills, and Agriculture for

1. the total sample of candidates
2. each of the sub-samples selected from the following categories of school:
  - a. high performance,
  - b. average performance,
  - c. low performance.

## CHAPTER FOUR

### RESULTS AND DISCUSSION OF FINDINGS

#### Introduction

In this chapter, the results of the study are presented and discussed in the order in which the research questions were stated.

#### Answering of Research Questions

##### Research Question 1

What is the correlation coefficient between raw continuous assessment scores and moderated continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for the total sample of candidates?

##### Results

In answering this question, the correlation coefficient between raw continuous assessment scores and moderated continuous assessment scores were calculated for the total sample of candidates for each subject area investigated. The results are presented in Table 3.



Table 3

Correlation coefficients between raw continuous assessment scores and moderated continuous assessment scores for BECE for the total sample of candidates

Subject	N	Correlation
English language	4975	.488*
Social Studies	4857	.486*
Religious & Moral Education	5302	.480*
Mathematics	4815	.470*
Science	5703	.488*
Agriculture	5192	.391*
Pre-Technical Skills	5295	.427*

- Significant at  $p < 0.05$

Table 3 shows that there were positive correlation coefficients between raw continuous assessment scores and moderated continuous assessment scores for the BECE for the total sample for all the subjects investigated. The correlation coefficients for all subjects were significant at the 0.05 level but low ranging from 0.391 for Agriculture to 0.488 for English Language and Science.

The positive correlation coefficients recorded indicate that high raw continuous assessment scores were associated with high moderated continuous assessment scores. However, the low correlation coefficients obtained show that the relationship between raw continuous assessment scores and moderated continuous assessment scores were weak. A candidate who obtained a high

continuous assessment score in a subject was therefore not necessarily likely to obtain a high moderated continuous assessment score.

The findings are similar to that of Adeyegbe (1992) who reported low correlation coefficients between raw continuous assessment scores and external assessment scores for the Senior Secondary School Certificate in Nigeria.

Low quality of raw continuous assessment scores and weaknesses in the external examination could account for the low correlation coefficients recorded between the raw continuous assessment scores and the moderated continuous assessment scores.

Amedahe (1989) found out that both teachers who received instructions in measurement at teacher training colleges and those who did not failed to follow basic principles in test construction and this could account for lack of uniformity in the assessment of pupils. Johnson (1997) also noted that Junior Secondary School teachers did not follow the guidelines in the manual prepared by the Ghana Education Service for assessing pupils continuously and this contributed to the low quality of continuous assessment scores. The external examination which was used to moderate the continuous assessment scores was also not a perfect examination. Factors like cheating, fatigue, ill health, fear of the assessment situation do affect pupils' performance at the examination. Environmental factors such as heat, light, noise, confusing directions, non-adherence to testing times also do affect assessment scores.

The low correlation coefficients recorded between the raw continuous assessment scores and the moderated continuous assessment scores could also

be as a result of the assessment of different skills by teachers and the external examination.

According to Akplu (1989), one of the merits of continuous assessment is that it makes possible the measurement of all educational outcomes especially those that can only be measured over a reasonably long period of time or are not measurable under examination conditions. The continuous assessment by teachers and the external assessment therefore do not necessarily relate to the same levels of skills, knowledge and understanding. The Institute of Education, University of Cape Coast (2006) in a paper presented to its Professional Board explained that in general, statistically moderated continuous assessment scores bear little resemblance to the raw continuous assessment scores except in cases where the skills assessed are similar. The relatively high correlation coefficients recorded for English Language could be a result of assessment of similar skills for the subject.

#### Research Question 2

What is the correlation coefficient between raw continuous assessment scores and moderated continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for each of the sub-samples selected from the high, average and low performance categories of school?

## Results

This research question was answered by computing the correlation coefficients between raw continuous assessment scores and moderated continuous assessment scores for each of the sub-samples selected from the various categories of school and each subject investigated. The results are shown in Table 4.

Table 4

Correlation between raw continuous assessment scores and moderated continuous assessment scores based on the high, average and low performance categorization of schools .

Subject	Category of Schools		
	High	Average	Low
English Language	.267*	.137*	.194*
Social Studies	.507*	.086*	.350*
Religious & Moral Education	.469*	.047*	.216*
Mathematics	.338*	-.008 (ns)	.180*
Science	.391*	.143*	.160*
Agriculture	.156*	.277*	.101*
Pre-Technical Skills	.411*	.184*	.286*

\* Significant at  $p < 0.05$ , (ns) not significant

Table 4 shows that positive correlation coefficients exist between raw continuous assessment scores and moderated continuous assessment scores for all the subject areas investigated for each sub-sample from the various performance categories of school except for Mathematics in the average performance category.

The correlation coefficients obtained were all significant at the 0.05 level except for Mathematics for the sub-sample for the average performance category.

For all the subjects investigated except Agriculture the sub-sample from the high performance category of schools had the highest correlation coefficients between raw continuous assessment scores and moderated continuous assessment scores followed by the sub-samples from the low and the average performance category in that order.

For the average performance category, the correlation coefficients ranged from -0.008 for Mathematics to 0.277 for Agriculture. Thus Agriculture which had the lowest correlation coefficient for the high and low performance categories had the highest correlation coefficient for the average performance category of schools.

High correlation coefficients of 0.507, 0.469 and 0.411 were recorded for Social Studies, Religious and Moral Education and Pre-Technical Skills respectively at the high performance category level. Since the raw continuous assessment scores were moderated using the external assessment scores, the high correlation coefficients could be as a result of the testing of similar skills, knowledge and understanding for the subjects for both continuous assessment and external assessment.

From Appendix C, it can be observed that majority of the schools sampled from the high performance category were located in the urban areas. These schools attract highly qualified teachers most of whom are WAEC examiners. The teachers adopt assessment procedures similar to that of WAEC hence the high correlation coefficients recorded between raw continuous assessment

scores and moderated continuous assessment scores for the sub-sample from the high performance category when compared to that from the other categories.

The low correlation coefficients of 0.156 and -0.008 recorded for Agriculture at the high performance category and Mathematics at the average performance category respectively could be as a result of the testing of different skills for continuous assessment and external assessment. The low correlation coefficients recorded for the average and low performance categories could be as a result of low quality continuous assessment scores and weaknesses in the external assessment for those categories of schools.

### Research Question 3

Is there any significant difference between raw continuous assessment scores and moderated continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for the total sample of candidates?

### Results

This question was answered using the t-test statistic. The results are shown in Table 5.

Table 5

Differences between means of raw continuous assessment scores and moderated continuous assessments scores for the total sample of candidates using t- test

Subject	n	Mean Raw CASS	Mean Mod. CASS	Diff. in Means	t
English Language	4975	73.68	30.19	43.49	247.415*
Social Studies	4857	74.49	33.08	41.41	226.642*
Rel. & Moral Educ.	5302	74.89	38.70	36.19	224.041*
Mathematics	4815	72.53	28.35	44.18	225.255*
Science	5703	74.23	24.44	49.79	307.894*
Agriculture	5192	74.79	31.46	43.32	255.059*
Pre-technical skills	5295	73.98	33.58	40.40	206.720*

• Significant at  $p < 0.05$

An examination of Table 5 shows that for all the subjects investigated for the total sample of candidates, there were significant differences between means of raw continuous assessment scores and moderated continuous assessment scores at the 0.05 level of significance. The mean of raw continuous assessment scores computed for each subject was higher than the corresponding moderated continuous assessment scores as shown in Table 5. The differences in mean scores ranged from 36.19 points for religious and moral education to 49.79 points for science.

The findings are consistent with earlier findings by Adeyegbe (1992) and Andoh (1994) who also found continuous assessment scores to be higher when they compared them with external assessment scores. Wuddah (1982, 1983)

and Wuddah et.al. (1990, 1993) also confirmed the findings and attributed it to the over-rating of candidates by their teachers.

On the other hand, the high continuous assessments scores recorded by pupils compared to their external assessment scores could be attributed to the direct assessment of what the pupils have been taught. This is because in continuous assessment, teachers assess the curriculum as implemented in the classroom.

The practice of using continuous assessment scores of candidates from Primary School class one to Junior Secondary School form three could also be problematic. The period covered is very long and there are several variables that could affect assessment scores as a pupil progresses from primary one through Junior Secondary School three. One of the variables is the pupil's own stage of cognitive development. Pupils who record a decline in academic performance over the period could still record high mean continuous assessment scores but low end of programme external assessment scores hence differences in mean scores.

#### Research Question 4

Is there any significant difference between raw continuous assessment scores and moderated continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for each of the sub-samples selected from the high, average and low performance categories of school?



## Results

In answering this question, t-tests were used to find out if there were significant differences in mean scores for each of the sub-samples selected from the various categories of school for the subjects investigated. The results are presented in Table 6.

Table 6

Differences between the means of raw continuous assessment scores and means of moderated continuous assessment scores based on the high, average and low performance categorization of schools using the t-statistic

Subject	Category	n	Mean Raw CASS	Mean Mod. CASS	Diff. in Means	t
English	High	1020	82.71	44.37	38.34	138.622*
Language	Average	2059	75.79	33.93	41.86	152.021*
	Low	1887	66.45	18.38	48.07	168.402*
Social Studies	High	1077	82.96	48.44	34.52	150.763*
	Average	2130	75.38	36.90	38.48	144.839*
	Low	1650	67.81	18.13	49.68	173.077*
Religious. & Moral Education	High	1159	83.44	50.81	32.63	142.781*
	Average	2298	76.07	42.51	33.56	136.476*
	Low	1845	68.07	26.36	41.71	151.648*
Mathematics	High	1118	81.85	45.96	35.89	135.588*
	Average	1881	73.42	29.10	44.32	136.072*
	Low	1746	65.23	15.57	49.66	162.811*
Science	High	1328	82.48	40.33	42.15	177.969*
	Average	2501	75.35	25.34	50.01	209.907*
	Low	1874	66.89	11.99	54.90	198.053*
Agriculture	High	1212	81.19	48.35	32.84	117.923*
	Average	2352	75.20	33.49	41.71	175.971*
	Low	1628	69.41	15.96	53.45	168.072*
Pre-Technical Skills	High	1212	80.39	48.63	31.76	117.592*
	Average	2533	74.74	36.90	37.84	146.176*
	Low	1550	67.74	16.40	51.34	161.951*

\* Significance at  $p < 0.05$ .

The results from Table 6 show that there were significant differences in the mean raw continuous assessment scores and moderated continuous assessment scores for all subjects investigated for all categories of school at the 0.05 level of significance.

The differences in mean scores increased from the high to the low performance categories of school as shown in Table 6. This means that the means of continuous assessment scores awarded by teachers from the high performance category of schools were similar to the means of their moderated assessment scores than those from the average and low performance categories. The scores from the low performance category of schools recorded the greatest discrepancies in mean scores.

The observation by Arthur (2000) that continuous assessment scores were usually clustered together with teachers making a conscious effort to make each pupil get close to the maximum score offers explanation for the differences in mean scores. The external assessment scores were used to moderate the raw continuous assessment scores so candidates from the high performance category of schools with high external assessment scores obtained high moderated continuous assessment scores. Those from the low performance category with low external assessment scores obtained lower moderated continuous assessment scores. Since all teachers awarded raw scores close to the maximum, the difference in mean scores increased from the high performance category to the low performance category.

### Research Question 5

What is the extent of change in performance scores as a result of moderation of continuous assessment scores for the BECE in English Language, Mathematics, Science, Social Studies, Religious and Moral Education, Pre-Technical Skills and Agriculture for the total sample of candidates?

### Results

To answer this question, the changes in mean performance scores as a result of moderation of continuous assessment scores were computed. The results are shown in Table 7.

Table 7

Differences in mean performance scores as a result of moderation of continuous assessment scores for the total sample of candidates

Subject	n	Mean Raw CASS	Mean Mod. CASS	Mean Raw CASS – Mean Mod CASS	Decrease in mean performance score as a result of moderation
English Language	4975	73.68	30.19	43.49	13.047
Social Studies	4857	74.49	33.08	41.41	12.423
Rel. & Moral Educ.	5302	74.89	38.70	36.19	10.875
Mathematics	4815	72.53	28.35	44.18	13.254
Science	5703	74.23	24.44	49.79	14.937
Agriculture	5192	74.79	31.46	43.33	12.996
Pre-Technical Skills	5295	73.98	33.58	40.40	12.120

From Table 7, it can be observed that for the total sample, the mean of continuous assessment scores awarded by teachers ranged from 72.53 points for Mathematics to 74.89 points for Religious and Moral Education out of a maximum score of 100 points.

The mean performance score of candidates dropped by 10.875 points for Religious and Moral Education and 14.937 points for Science as result of moderation of continuous assessment scores. The performance scores range from a minimum of zero (0) to a maximum of hundred (100) points. The mean performance score for Science thereby recorded the highest decrease with that for Religious and Moral Education recording the least decrease as a result of moderation as indicated in Table 7.

This means the skills, knowledge assessed and standard of assessment for Religious and Moral Education for continuous assessment was similar to that for the external assessment when compared to the other subjects investigated.

#### Research Question 6

What is the extent of change in mean performance scores for the BECE in English Language, Science, Social Studies, Mathematics, Religious and Moral Education, Pre-Technical Skills and Agriculture as a result of moderation of continuous assessment scores based on the high average and low performance categorization of schools?

## Results

The changes in mean performance scores as a result of moderation of continuous assessment scores were computed for the subjects investigated at the various performance categories of school. The results are shown in

Table 8.

Table 8

Differences in mean performance scores as a result of moderation of continuous assessment scores based on the high, average and low performance categorization of schools

Subject	Decrease in performance scores as a result of moderation of CASS		
	High	Average	Low
English Language	11.502	12.558	14.421
Social Studies	10.353	11.544	14.904
Religious and Moral Education	9.789	10.068	12.513
Mathematics	10.767	13.314	14.989
Science	12.645	15.006	16.473
Agriculture	9.852	12.513	16.035
Pre-Technical Skills	9.528	11.352	15.402

Table 8 shows that for all subjects investigated, the sub-sample from the high performance category of schools recorded the lowest decrease in mean performance scores followed by the sub-samples for the average and low performance categories in that order.

Science recorded the highest decrease in mean performance scores for all the categories of school as a result of the moderation of continuous assessment scores. The decrease in mean performance scores were 12.65, 15.01 and 16.47 points for the high, average and low performance categories of school respectively.

Pre-Technical skills recorded the lowest drop in mean performance score of 9.53 points for the high category of schools followed by Religious and Moral Education with 9.79 points.

The effect of moderation of continuous assessment scores on the performance scores of candidates increased from the high to the low performance categories of school for all the subjects investigated.

At the subject level, the effect of moderation of the scores was pronounced on science more than the other subjects investigated while the effect on Pre-Technical Skills and Religious and Moral Education were minimal.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter provides a summary of the study. Conclusions are drawn from the results of the study and recommendations are made.

#### Summary

The study aimed at finding out the effect of moderation of continuous assessment scores in the performance scores of candidates at the BECE in some selected subjects.

A total of 6,034 candidates from 81 Junior Secondary Schools in Ghana constituted the sample for the study. The schools were classified into the high, average and low performance categories, based on their performance in the 2004 BECE and a maximum of three schools were selected from each category for each region.

Product moment correlation coefficients were calculated to find out the relationship between raw continuous assessment scores and moderated continuous assessment scores for the total sampled candidates and for samples from each performance categories of school for the selected subjects. The means of the raw continuous assessment and moderated continuous scores were compared to find out if there were significant differences using the t-values. Finally, a table of differences between mean performance scores computed using raw continuous assessment scores and that computed using moderated continuous assessment scores was studied to detect any possible trend in differences.



The findings show that

- i. there were significant relationships between raw continuous assessment scores submitted by schools and moderated scores by WAEC for the total sample of candidates and sub-samples from each of the school performance categories for all subjects except Mathematics for the average performance category,
- ii. significant differences exist at the 0.05 significant level between raw continuous assessment scores and moderated continuous assessment scores for all subjects investigated for the total sampled candidates and sub-samples from the high, average and low performance categories of school,
- iii. there were drops in the mean performance scores of candidates for all subjects investigated at all levels as a result of moderation of continuous assessment scores. The drops in mean performance scores increase from the high to the low performance categories of school.

The findings of the study provide further justification on the need for the moderation of raw continuous assessment scores received from schools before they are used in the award of grades.

#### Conclusion

Generally, the moderation of continuous assessment scores resulted in the reduction of performance scores of candidates at varying degrees for the total sample and sub-samples from the high, average and low performance categories of schools for the subjects investigated.

## Recommendations

In the light of the conclusion drawn from the study, the following recommendations are made:

- i. Training courses should be held for Basic School teachers to expose them to the techniques of assessment so as to improve on the quality of continuous assessment scores submitted to WAEC.
- ii. WAEC should encourage examiners who are teachers to share their marking experiences with their colleagues who are not. This will help improve the standard of assessment in the schools.
- iii. The Ghana Education Service must develop standardized tests in the various subject areas for use by teachers in continuous assessment.
- iv. The recording of continuous assessment scores for use at the BECE should be restricted to the period at the Junior Secondary School.
- v. The GES should set up moderation committees in schools and district education levels to moderate continuous assessment scores to bring some level of comparability on school assessment scores before submission to WAEC.
- vi. The WAEC should continue to moderate all continuous assessment scores submitted by schools before incorporating them into performance scores of candidates to ensure the comparability of scores from the various categories of school.

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## APPENDIX A

1. Performance Score = 30% Continuous Assessment Score +  
70% External Assessment Score  
(The performance score is used for grading students).
2. Change in performance score as a result of moderation = (30% raw  
cass + 70% Ext. Ass) – (30% mod. Cass + 70% Ext. Ass.) = 30% (raw  
cass – mod. Cass.)

Where:

Raw Cass = Raw Continuous Assessment Scores

Mod. Cass = Moderated Continuous Assessment Scores

Ext. Ass = External Assessment Score

Minimum Performance Score = Zero (0)

Maximum Performance Score = One hundred (100)

APPENDIX B

Records and Aptitude Tests Dept.,

WAEC

Accra,

25<sup>th</sup> January, 2005

The Head of National Office

WAEC, Accra

Thro' the Training Officer

WAEC, Accra

Dear Sir,

REQUEST FOR RELEASE OF DATA

I should be grateful for permission for the Computer Services Divisions to release data on raw and moderated school marks for some randomly selected schools for the 2004 BECE to me for use in the dissertation required for the award of M.A. Degree by the University of Cape Coast.

Thank you.

(Sgd) Felix Akuffo-Badoo

APPENDIX C

SELECTED HIGH ACHIEVEMENT SCHOOLS

REGION	CANDIDATURE	MEAN AGGREGATE	NAME OF JSS
Upper West Region	33	9.33	Wa Numa Int.
Gt. Accra Region	80	8.66	Christ the King
	160	7.30	Morning Stat
	146	9.05	Bishop Bowers
Eastern region	88	8.78	Koforidua Pentecost
	38	8.07	Koforidua Madonna
	37	8.78	Kade Newman
Central Region	39	7.07	Flowers Gay
	30	7.40	Top
	41	9.07	Praso International
Western Region	153	8.91	Chapel Hill
	118	9.38	Tarkwa Gold Fields Prep.
	66	8.15	Tarkwa UST Sch. of Mines
Ashanti Region	60	6.35	Vicande School
	90	8.86	Abusco Royal
	62	6.01	Holy Child
Brong Ahafo Region	108	9.12	St. Mary's Int.
	46	6.60	Holy Spirit
Volta Region	70	9.54	Mater Ecclesiastic
Northern Region	76	9.57	Dahin Sheli
	38	8.21	Abe Halperin

APPENDIX D

**SELECTED AVERAGE ACHIEVEMENT SCHOOLS**

	CANDIDATURE	MEAN AGGREGATE	NAME OF JSS
Upper West Region	56	16.30	Kabanye E/A
	111	23.04	Wa Catholic
	37	17.67	Wa SDA
Gt. Accra Region	115	14.39	Min. of Health
	97	24.25	Teshie 12
	208	15.20	Dcks
Eastern Region	59	24.89	Koforidua Presby 'A'
	116	15.65	Koforidua GHATECO
	61	22.57	Donkokrom Nana Ruadu
Central Region	205	14.21	University Sch. C. Coast
	90	14.27	Hariom Int.
	128	23.93	Unipra (South Campus)
Western Region	79	23.31	Rev. Dr. Osam Pinako
	125	16.84	Services, Takoradi
	70	17.55	St. Anthony of Padua
Ashanti Region	160	17.18	Prempeh College Exp.
	48	21.08	ATTTC Practice
	68	15.92	St. Andrews PAC
Brong Ahafo Region	50	25.64	Boahen Korkor Presby
	40	14.62	Forces. Sunyani
	43	16.65	Ahafoman
Volta Region	123	14.34	Ho Kaborc
	100	18.86	Dora Memorial
	32	22.31	Akatsi Duawodome
Northern Region	87	14.86	Kanville Presby
	35	18.57	St. Charles
	47	22.27	Bamboil L.A
Upper East Region	50	24.46	Saligba L/A
	42	18.11	Methdist Bawku
	51	19.64	Sandema Prep

## APPENDIX E

## SELECTED LOW ACHIEVEMENT SCHOOLS

REGION	CANDIDATURE	MEAN AGGREGATE	NAME OF JSS
Upper West Region	149	33.25	Tendamba
	44	37.56	Eremon Tangzu
	38	32.50	Gwolin
Gt. Accra Region	109	36.47	Nima '2'
	54	33.46	Kaneshie West 'I'
	69	34.39	Abokobi Presby
Eastern Region	67	32.41	Asokore Meth.
	112	37.00	Asesewa Presby
	44	35.00	Dwenase L/A
Central Region	51	33.96	Meth. 'A' & 'C'
	30	34.86	Swedru Ada 'A'
	37	34.83	Kwanyako D/A
Western Region	61	32.90	Juaso Presby
	82	35.90	Obogu L/A
	35	43.00	Punikrom D/C
Ashanti Region	61	32.90	Juaso Presby
	82	35.90	Obogu L/A
	44	41.47	Abodom Meth.
Brong Ahafo	41	32.31	Komfourkrom L/A
	42	32.16	Nana K. Adapre
	32	33.81	Wenchi Frema
Volta Region	70	37.74	Kpetoe R/C
	54	33.50	Ho Kpodzi S.P. 'C'
	68	44.60	Gbi Wegbe E.P.
Northern Region	48	35.95	St. Kizito
	150	35.74	Gushegu L/A
	80	36.02	Karaga L/A
Upper East	70	37.10	Adakura
	64	36.18	Winkogo
	90	36.90	Teshie

APPENDIX F

N VALUES FOR TABLES 3 AND 7

SUBJECT	NUMBER (n)		
	HIGH	AVERAGE	LOW
English Language	1029	2059	1887
Social Studies	1077	2130	1650
Religious & Moral Education	1159	2298	1845
Mathematics	1188	1881	1746
Science	1328	2501	1847
Agriculture	1212	2352	1628
Pre-Technical Skills	1212	2533	1550