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## **Continuous Assessment-Basic Education Certificate Mathematics Examination Scores Relationship as Indicator of Millennium Development Goals (MDGS) Attainment in Boki, Cross River State**

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### **Abstract**

*The purpose of the study was to verify the relationship between the internal-external Mathematics achievement ratings of Basic education students in Boki Local Government Area of Cross River State, Nigeria. It was hypothesized that there is no significant positive correlation between the students' scores in Continuous Assessment (CA) and the Basic Certificate Mathematics examination. Four hundred (400) students, 240 from the 2008/2009 and 160 from the 2009/2010 sessions were respectively selected from records in the State Ministry of Education by the proportional simple random sampling, based on their population. Correlational analysis of the data revealed a significant, strong positive relationship between internal and external assessments.*

*It was concluded that confidence could be placed on the Basic education teachers' ratings. External and internal assessments therefore may actually constitute indicator of level of attainment of MDGs. Implications for MDGs were stated and recommendation made.*

Educational Assessment as a quality control mechanism and litmus paper for performance filtration is believed to have the capacity to serve as a tool for measuring the degree of measurable objectives attainment, by the Tylerian ideology. By extension, assessment presents itself as a ready viable option for determining the degree of attainment of the Millennium Development Goals (MDGs), especially the second goal, namely, "achieve primary education". In the Nigerian context today, primary education is now called the Basic Education Level, comprising the lower, middle and upper basic cadres.

Puzzled by the exponential growth rate of poverty among nations, world leaders met in year 2000 and strategized on how to tackle the monster and to achieve by 2015. This led to the Millennium Development Goals which provide concrete, numerical benchmarks through a multi-dimensional approach to poverty reduction. The eight MDGs broken down into 21 quantifiable targets had 60 indicators. By 2010, there was an undeniable progress on some MDGs in several nations. Poverty reduced globally, there was significant improvement in enrolment and gender parity in schools. Unfortunately, though poverty reduced globally, the poor increased numerically especially in most African nations, including Nigeria.

While goal number 2 of the MDGs is "achieve universal primary education", target 2a is to ensure that all boys and girls complete a full course of primary schooling. The indicators are:

- Net enrolment ratio in primary education
- Proportion of pupils starting grade one who reach last grade of primary school; and
- Literacy rate of 15 – 24 year olds, women and men.

Completion of Basic education and certification are based on assessment. But the attainment of the MDGs is being hindered by some challenges.

Despite rising aid from the developed nations toward achievement of the MDGs in recent years, more than half of this regrettably is towards debt relief owed by poor nations. The rest virtually goes for disaster relief and military aid which does not further national development. According to the United Nation's Department of Economic and Social Affairs (2006), the 50 least developed nations only receive about one-third (33.3 percent) of all aid that comes from the developed countries, raising the issue of aid not moving from the rich to the poor based on development needs, but rather from the rich to their closest allies.

Some development experts also question the MDG idea of transferring billions of dollars from the wealthy nations to the often bureaucratic and corrupt nations in the developing world. This view creates cynicism among the general public in the wealthy nations, and stifles support for the needy nations.

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Furthermore, another challenge comes from the non-achievement of full commitment to the 0.7 percent of Gross National Income of the United Nations. For the past 35 years, members of the UN have repeatedly made a commitment of 0.7 percent of the rich nations' Gross National Product (GNP) to official development assistance. However, some powerful members including the United States have made for less financial commitment proportionally.

As rightly observed by the Federal Republic of Nigeria (2004), assessment is an integral part of the instructional process. That is, teaching is incomplete unless it is carried out simultaneously with assessment. Educational assessment is therefore as old as the formal school system itself in Nigeria. It started with the traditional assessment, which conceived of assessment as the process of testing and examining learners at the end of teaching. This summative, examination-focused, traditional assessment had a further weakness of being cognitive-centered. Criticisms of this shoddy assessment prompted the organization of the 1989 curriculum conference which ushered-in the 6 3 3 4 system. Assessment in the 6 3 3 4 system was called continuous assessment (CA), defined as an approach whereby the final grading of the learner in the cognitive, affective and psychomotor domains of behaviour systematically takes account of all the student's performance during a given period of schooling (Joshua & Bassey, 2010). Soon, contrary to expectations that the continuous assessment will give the teacher greater involvement in the total assessment of his learners, provide a more valid and reliable assessment of students' abilities, increase teacher flexibility and innovation in teaching, provide a basis for more effective guidance of the learners, minimize examination malpractice and emphasize formative instead of summative evaluation (Jatto, 1996), it was rather found to be fraught with large-scale abuses by both teachers, learners and even some parents.

Over time, several assessment innovations were introduced. The globalization of educational policies, practices and issues in contemporary educational thought under the Universal Basic and Secondary Education (UBASE) now makes assessment reforms a critical imperative.

Typical assessment innovations include the changing of School Based Assessment (SBA) from assessment of learning (AOL) to Assessment for Learning (AFL). Whereas the former merely carries out assessment to ascertain the level of learning as an end in itself, the former undertakes assessment to verify degree of learning and uses these results for diagnostic purposes so as to address observed challenges and therefore attain improved learning outcomes (NTI, 2006). Another innovation in assessment is the Minimum Contemporary Testing (MCT), a strategy in testing which sets a certain minimum level of competency learners are expected to attain to be judged successful in learning a content or skill (Joshua & Bassey, 2010). Setting minimum levels of attainment required for graduation as done in some Western countries could prove very profitable if employed in Nigeria. The third innovation is the assessment philosophy known as Integrated Domain Benchmarking Assessment (IDBA) which contends that setting assessment criteria for promotion and judging

educational success that cover all of the cognitive, affective and psychomotor domains of behaviour is a sure panacea for wholesome personality development of the individual, and for healing the commonly observed affective learning failure in Nigerian education (Bassey & Idaka, 2008).

The critical philosophy of educational assessment is based on the classical test theory (CTT) propounded by Charles Spearman in 1904 which decomposes an observed score (X) into the true score (T) and an error (E), symbolically expressed as  $X = T + E$ . This idea presupposes that every observed assessment score has some error. To obtain the true individual's ability therefore, efforts must be made to minimize or eliminate the measurement error which could come from the measurement instrument, the testee, the tester or the environment.

Literature reveal a strong positive correlation between CA and end of term examination in Mathematics (Attah & Binda, 2001) and the need for improvement in the CA practice based on studies in four Western States of Nigeria – Oyo, Osun, Ogun and Ondo (Oladunni, 2001).

Writing on the caption “performance based assessment and educational equity”, Darling-Hammond (1994) argued that alternative assessment methods, such as performance-based assessment are not inherently equitable, and that educators must pay careful attention to the ways the assessments are used. Some school reform strategies in the United States for example, use assessment reform as a lever for external control of schools. These strategies arguably are unlikely to be successful and the assessment are unlikely to be equitable because they stem from a distrust of teachers and fail to involve teachers in the reform processes. Rather, he averred that assessment should be used to give teachers practical information on student learning and to provide opportunities for school communities to engage in a recursive process of self-reflection, self-critique, self-correction and self-renewal. He concluded that equitable use of performance assessments depends not only on the design of the assessments themselves, but also on how well the assessment practices are interwoven with the goals of authentic school reform and effective teaching. The question is how does assessment serve as an indicator of attainment of the Millennium Development Goal (MDGs)?

The problem of invalidity in classroom assessment and teacher assessment incompetence in Nigeria is quite worrisome (Bassey & Idaka, 2008; Asim, Kalu, Idaka & Bassey, 2007). One observes inflation of assessment scores, punitive assessments, and “sorted” assessments. Consequently, people obtain grades they neither deserve nor can defend. Such scores lack replicability, repeatability, creditability, validity and inter-rater reliability. Is there any positive correlation between internally generated continuous assessment scores and the senior Basic school certificate Mathematics examination scores in Boki?

The purpose of this paper is to verify the relationship between the Mathematics scores of students in continuous assessment and the final senior Basic school certificate examination.

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### **Research Question**

What is the relationship between continuous assessment scores and the senior Basic school certificate Mathematics examination scores in Boki Local Government Area?

### **Null Hypotheses**

There is no significant positive correlation between the continuous assessment scores and the Basic school certificate Mathematics examination scores in Boki Local Government Area.

### **Method**

The correlational design was used for this study since the researchers were interested in finding out the relationship between students' scores in continuous assessment and their scores in the final senior Basic education certificate Mathematics examination. The study was located in Boki, one of the eighteen (18) Local Government Areas of Cross River State. Boki was carved out of Ikom Local Government Area in 1992, with headquarters at Boje. The local government area is bounded in the North by Ogoja and Obanliku, in the South by Ikom, in the East by the Republic of Cameroon and in the West by Yala. The people speak Boki language.

Educationally, Boki Local Government is a very active area, having the highest number of secondary schools in Cross River State. There are forty-six (46) secondary schools, comprising 29 public and 17 private from statistics available at the Secondary Education Board, Calabar (2007).

The population of the study is the 4,469 students from Upper Basic 1-3 (JSS) comprising 1669 male and 2800 female students available as candidates from which the sample was selected. Secondary data of continuous assessment scores and the Upper Basic or Junior Secondary School (JSS) Certificate Examination scores in Mathematics were sampled from records available in the Cross River State Ministry of Education, Examination Division.

From a sampling frame and list of all the 46 secondary schools in Boki Local Government Area, slips of papers were prepared, with the name of one secondary school on each. These slips of papers were folded, put in a chalk box and shuffled. Then one piece of paper was picked at a time with replacement until ten schools were selected. This is the simple random sampling process by 'hat and draw method' employed to select the ten sampled schools. The selected schools were in Bateriko, Bumaji, Orimekpang, Okundi, Abo, Bashua, Bansan, Biajua, Biakwan (SPC) and Biakwan (King James). Two hundred (200) students (20 per school) were selected by the simple random sampling from each of 2008/2009 and 2009/2010 sessions. That is, in all, 400 students constitute the sample size. Thus, data was obtained from available records in the Ministry of Education, Examination Division, Calabar. The Pearson Product Moment Correlation Analysis was carried out using the Statistical Package for Social Sciences (SPSS).

## Results

### The Null Hypotheses

There is no significant positive correlation between the continuous assessment scores and the Basic School Certificate (JSS III) Mathematics examination scores in Boki Local Government Area. The results of the data analysis are presented in Table I below:

**Table I**

### **Pearson Product Moment Correlation Analysis of Significance between CA Scores and Basic School Certificate Mathematics Examination Score**

Variable	N	Sum	Sum of Squares	Sum of Cross Product	df	r cal	t cal	Proh
Continuous Assessment (X)	400	6,998	8,205					
				627947	398	.863*	34.09	.000
Basic School Certificate Examination (Y)	400	19,628	11,332					

\*  $p < .01$  Critical r-values = .098, .128 at .05 and .01 levels respectively and 398 d.f.

From the Table I above, there is a significantly strong positive relationship between students scores in continuous assessment and scores in the Basic School Certificate Mathematics examination. This is because the calculated r-value of .863 is greater than the critical values of .098 and .128 at points .05 and .01 level of significance with 398 degrees of freedom. ( $t\text{-cal} = 34.09$ ,  $t\text{-crit} = 1.645$ ). Consequently, the null hypothesis of no significant positive relationship is rejected.

## Discussion

Data analysis revealed the existence of a significant, strong positive relationship between students' scores in continuous assessment and scores in the Basic School Certificate Mathematics examination in Boki Local Government Area of Cross River State. This means that students who had high scores in the continuous assessment also had high scores in the school certificate final examination, and those who had low scores in the continuous assessment also had low scores in the final examination. Concurrent ratings in internal and external assessments could be highly indicative of qualitative assessments, combining the attributes of validity and reliability. This is based on the maxim that witnesses from two persons confirm a case. However, even this is probabilistic.

The finding of score consistency is in consonance with findings in literature, like the case of Attah and Binda (2001), which reported high positive correlation between continuous assessment and end of term examination. It contradicts Bassey and Idaka (2008) and Asim, Kalu, Idaka and Bassey's (2009) claims of Basic education teachers' incompetence in conducting continuous assessments. This is however not

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surprising. Continuous assessment is a multi-variate phenomenon, having different specific components like statement of objectives, observation, item writing, preparation of table of specification, assembly of test, test try-out, administration and scoring of test. It is probable that Basic Teachers' difficulties found by the researchers may not be in the entire assessment rubric, but in some of the listed components which does not affect the entire assessment results. The existence of teacher difficulties in handling continuous assessment is widely reported (Oladunni, 2001) who conducted his study in four States in Western Nigeria. The high CA – external examination correlation established in the present study could also be attributed to the recent State government school-quality pursuit intervention programmes demonstrated through the renovation of physical structures, writing of indigenous high quality subsidized textbooks for use in schools, the aggressive school supervision strategy adopted, and the yearly teacher capacity-building efforts.

**Implications for the MDGs**

The fact that the relationship between continuous assessment scores and Basic Certificate examination scores is significantly strong and positive is an indication of high confidence level on the internal assessment. It speaks of the assessment competence of the Basic education teachers who are the assessors in this case. Huge budgetary allocations as well as expenditures on education, coupled with government spending on capacity building of teachers as a routine annual event has not been wasted after all.

Next, the proportion of pass declared by the external assessors in the final Basic education certificate Mathematics examination is true and valid based on performance consistency with internal assessments. Consequently, the MDG of “achieve universal primary education” or the targets of completing a full course of primary schooling are indeed measureable with some level of accuracy, using the external ratings. That is, indeed the CA – Basic Certificate Examination high correlation coefficient is an indicator of teacher education quality in terms of their assessment effectiveness, and therefore indicator of MDGs attainment level.

A high positive correlation also indicates acceptable level of teacher integrity as internal assessors. Absence of teacher integrity could have led to negative or low correlation. The results of the certificate examination therefore is the actual level of instructional success, the degree of attainment of the millennium educational goal and extent of accomplishment of the MDGs goal of completing minimum acceptable education globally.

However, the above inferences and implications are based on the assumption that the external assessment have the expected validity. Certificate examinations are expectedly set by a team of experts in subject matter content and Educational measurement, subjected to test construction principles and scored by trained personnel, in addition to the rater integrity criterion. The commonly reported examination fraud in all its ramifications has been one major challenge to validity in research.

## **Conclusion**

One could repose confidence in the continuous assessment Mathematics ratings of our Basic Educators in Boki Local Government Area of Cross River State. This is because of the high positive CA – Basic Education Certificate Examination scores correlation.

## **Recommendations**

1. The current practice of retraining teachers by the State Government, Federal Government and NGO partnership should be sustained and consolidated. This factor is suspected as being responsible for the degree of Basic Teacher development that is apparently changing earlier findings about teacher incompetence in classroom assessment.
2. There is need also to maintain the on-going intensive school supervision in Cross River State. This will avert further regression of teacher attitude toward continuous assessment. This is in view of the high demand of this responsibility on the teacher.
3. Teacher motivation strategies should be employed to make the teacher happy. A happy teacher readily discharges his responsibilities than a dissatisfied teacher. The labourer deserves his wages. The use of verbal and material incentives could work effectively if employed.

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