Predictive Power of School Based Assessment Scores On Students' Achievement In Junior Secondary Certificate Examination (JSCE) In English And Mathematics

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Abstract

The study investigated the predictive power of school based assessment scores on students' achievement in Junior Secondary Certificate Examination (JSCE) in English and Mathematics. Two hypotheses tested at 0.05 level of significance guided the study. The study adopted an ex-post facto research design. A sample of 250 students were randomly drawn from ten (10) schools out of twenty (20) Junior secondary schools in Obio-Akpor Local Government Area of Rivers State. The instrument used for data collection was titled "Students Academic Record Inventory" (SARI). The instrument involves the students SBA score for JS1, JS2, JS3 and JSCE scores in English and Mathematics. The data generated were analyzed using multiple regression. The result revealed that the combination of the SBA scores significantly predicted students' English and Mathematics achievement in JSCE, and there are relative effectiveness of SBA scores in students' English and Mathematics achievement. Based on the findings of the study, recommendations were made including that school-based assessment should be encouraged and made compulsory for every secondary schools especially in core subjects which include English and Mathematics.
Key words: Predictive power, school based, assessment, achievement.

Introduction

In schools teaching and learning take place. Teaching is the guidance on learning which involves the action a teacher takes in order to aid the students to acquire and retain knowledge, attitude, beliefs, values and skills. George (2011) defined teaching as a complex act of guiding learners through variety of selected and sequentially planned and arranged learning experience for the acquisition, utilization and manifestation of knowledge. Learning is the act or process of acquiring knowledge, attitude, beliefs or skills which is associated with behavoural changes in the cognitive, affective and psychomotor domains. Nwankwo (2007) defined learning as an activity that occurs inside an organism and it cannot be directly observed but can be inferred from the behaviour of the organism. How do one infer that learning has taken place after teaching? It is through change in behaviour which is determined through assessment.

Assessment is the process of identifying, gathering and interpreting information about students learning. The main purpose of assessment is to provide information on students' achievement and progress and set the direction for ongoing teaching and learning. Nitko cited in Onuka and Adesina (2007) defined assessment as a process of obtaining information that is used for making decisions about pupils, curricula, programmes and educational policy. Assessment is a powerful process that can either optimize or inhibit learning, depending on how it is applied. All the activities teachers used to help students learn and judge their progress is known as assessment. There are different types of assessment such as formative and summative assessments. Formative and summative assessment are usually referred to as assessment for learning and assessment of learning respectively Assessment for learning is generally formative in nature and is used by teachers to consider approaches to teaching and next steps for individual learners and the class (Earl 2003). It is also referred to as educative assessment- Assessment of learning occurs at the end of a class, course, semester or academic year. It is summative in nature and intended to measure learning outcomes and reports these outcomes to students, parents and administrators.

These two assessments (formative and summative) are embedded into the school based assessment Osunde and Ethe (2007) defined school based assessment (SBA) as an assessment practice that broadens and expands the form, mode, means and scope of assessment in the school in order to facilitate and enhance learning. Ukwuije and Opara (2013) defined SBA as a comprehensive, systematic, continuous, diagnostic and integrative teacher-directed assessment procedure. School based assessment needs to be continuous and integrated the three domains of cognitive, affective and psychomotor. It allows for the collection of a number of samples of students performance over a period of time in tests, assignments, projects, quizzes, interviews etc. SBA as teacher-directed assessment procedure involves the teachers from the beginning to the end that is from planning the

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assessment programme to the administration. It can also involve self, peer and teacher assessment. SBA within the educational context comprised of continuous and final assessment carried out in the schools. The SBA known as teacher-made assessment serve numerous purposes such as diagnosing individual strengths and weaknesses, monitoring and certifying students progress, prescribing instruction, providing feedbacks to students and parents, improving teacher's instructional procedures, discovering the strengths and inadequacies in curriculum content and organization (Kemjika, 1995b).

Omole (2007) states that SBA is considered as internal examination and it is quite different from certificate examinations conducted by specified examination bodies/agencies outside the schools direct control. Certificate examinations are called External Examination (EE) or Externally Based Assessment (EBA). They are those examinations conducted by external examiners. An external examiner according to Nwana (2007) is construed or understood as any person who is outside the immediate educational environment or authority as that of those being tested. This implies that he or she does not belong to that environment and the testees are not familiar with him or her. In Nigeria, Junior Secondary Certificate Examination (JSCE) is regarded as one of the external or public examination which is taken at the end of a programme. They are conducted by each state of the Federation through their respective Ministry of Education (MOE), for final year students of Upper Basic Education (UBE) programme at the end of junior secondary schooling. Omole (2007) opined that this type of examination is external to the schools control and most commonly produces summative evaluation of candidates at the end of a particular instructional programme. The Junior Secondary Certificate Examination (JSCE) which is the focus of this paper in relation to school based assessment (SBA) has core subjects in which English and Mathematics are among (FRN 2004).

In the Nigerian educational system, English is used as a medium of instruction in our secondary schools and higher institutions. English has emerged as Nigerian's official language and is needed for effective teaching and learning and that makes it to be one of the compulsory subjects one must pass at credit level before gaining admission in any higher institution. Egbe, Onyishi, and Omeje (2011) opined that the comprehensive use of the English language among Nigerian students for academic purposes and poor performance of students especially in external examination is very alarming.

Mathematics as one of the compulsory subject is referred to as mother of all sciences because all science courses in the university or any other institutions of higher learning require a credit pass in it at ordinary level (Akintomide & Akintomide 2011). It is among the important subjects on the school curriculum of most countries. Mathematics is learnt at all levels of education in Nigeria, that is why at the upper basic level (ie JS 1 – JS3) one must pass it before he or she is promoted to a class or has credit level before gaining admission in any higher institution (Opara, 2012). It is one of those subjects that has a record of very poor students' performance in external examinations which includes JSCE. Now that more emphasis are laid on SBA, the researcher deemed it necessary to investigate the predictive power of SBA on students' English and Mathematics achievement in JSCE.

In a real sense, school based assessment scores in any subject for a particular student should reflect his or her achievement in the external examination. Obviously, some researchers such as Orubu (2013) and Ogunkola (2007) investigated on SBA scores as predictors of students final grades in Delta and Ogun States respectively, and found out that SBA scores predicted students performance in JSCE mathematics and integrated science respectively Omole (2007) also did a comparative study of students performance in SBA and certificate examination in the Federal Capital Territory (FCT). He found out that students scores in SBA are significantly higher than their scores in Certificate examination in English and Mathematics at the upper basic education. The gap in this study, to the best of the researchers knowledge is that most of the studies in this regard are actually outside Rivers State. There is therefore, need to carry out more study in this area, so as to have empirical facts on the subject matter of predictive power of SBA on students' English and Mathematics achievement in Junior Secondary Certificate Examination (JSCE).

The aim of this study is to investigate the predictive power of SBA scores on students' achievement in JSCE in English and Mathematics. In other to achieve the specific objective of this study, the following null hypotheses were postulated at 0.05 level of significance.

1. The combination of SBA scores of students in Junior Secondary one to three do not significantly predict their achievement in English and Mathematics in Junior Secondary Certificate Examination (JSCE).

2. SBA scores of the students in Junior secondary one to three do not significantly have effect on their achievement in English and Mathematics in Junior Secondary Certificate Examination (JSCE).

Method

The study adopted an ex-post facto design. The design is ideal and relevant for the study because the variables of the study are already in place. The target population was the students who sat for the Junior Secondary Certificate Examination (JSCE) in 2012/2013 academic session in Obio-Akpor Local Government Area of Rivers State. Simple random sampling technique via balloting was used in drawing ten (10) schools out

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of twenty (20) junior secondary schools in Obio-Akpor Local Government Area. A sample of 250 students which included 98 males and 152 females was used for the study. Simple random sampling technique was also used in drawing 25 students from each of the ten (10) schools chosen which summed up to 250 students. The study was restricted to only students' scores in School Based Assessment (SBA) and JSCE grades in English and Mathematics. The independent variables are the SBA scores obtained by the students in JS1, JS2 and JS3 respectively, while the dependent variables are the final grade in JSCE in English and Mathematics. The instrument for data collection was titled "Students Academic Record Inventory" (SARI). For the purpose of scoring JSCE grades of A,C.P and F., A = 100 – 60; C = 59-50; P = 49-40 and F = 39-0 where A is the Alpha grade, C is credit, P is pass while F indicates failure. The average grade of each of the different levels (A,C,P and F) was used for the study. Multiple regression was used for data analysis and the level of significance was 0.05.

Results
The results of the study are presented below:
Hypothesis 1: The combination of SBA scores of students in Junior secondary one to three do not significantly predict their achievement in English and Mathematics in Junior Secondary Certificate Examination (JSCE).
Table 1: Summary of multiple regression in English
R   =   0.788
R square   =   0.622
Adjusted R   =   0.617
Standard error =   9.82219
Analysis of variance

Model	Sum of square	df	Mean square	F	Sig
Regression	38999.165	3	12999.722	134.747	.000
Residual	23732.938	246	96.475		
Total	62732.100	249			

* Significant level = 0.05
Dependent variable: JSCE
Predictors (constant) SBA 3, SBA 2, SBA 1.
Table 2: Summary of multiple regression in Mathematics
R   =   0.795
R square   =   0.632
Adjusted R squared =   0.627
Standard error   =   10.08567

Analysis of variance

Model	Sum of square	Df	Mean square	F	Sig
Regression	42951.605	3	14317.202		
Residual	25023.295	246	101.721	140.750	.000
Total	67974.900	249			

* Significant level = 0.05
Dependent variable: JSCE scores
Predictors (constant) SBA 3, SBA 2, SBA 1.

        Table 1 reveals that the combination of three school based assessment (SBA 1, SBA 2, and SBA 3) scores for the students in predicting their English achievement in JSCE yielded a coefficient of multiple regression of 0.788; a multiple R square of 0.622 and adjusted R square of 0.617. This implies that 61.7% of the variance in students' JSCE in English can be explained by the combined influence of the school based assessment scores. The table also shows that the analysis of variance for the multiple regression produced an F-value of 134.747 which is significant at 0.05 alpha level. This indicates the predictive power of SBA scores on students' English achievement in JSCE.
        Table 2 shows that the combination of three school based assessment (SBA 1, SBA 2, and SBA 3) scores for the students in predicting their mathematics achievement in JSCE yielded a coefficient of multiple regression of 0.795; a multiple R square of 0.632 and adjusted R square of 0.627. This implies that 62.7% of the variance in students JSCE in mathematics can be explained by the combined influence of the school based assessment scores. The table also reveals that the analysis of variance for the multiple regression produced an F-

value of 140.750 which is significant at 0.05 alpha level. This indicates the predictive power of SBA scores on students' mathematics achievement in JSCE.

Hypothesis 2: SBA scores of the students in Junior secondary one to three do not significantly have effect on their achievement in English and mathematics in Junior Secondary Certificate Examination (JSCE).

Table 3: Relative effects of the predictor variables in English

	Unstandardized coefficient		Standardized coefficient		
Model	B	Std Error	Beta	t	Sign
(constant)	-66.652	7.095		-9.394	.000
SBA 1	.368	.123	.135	3.005	.003
SBA 2	.670	.100	.326	6.697	.000
SBA 3	1.024	.108	.476	9.453	.000

Dependent variable: JSCE scores.

Table 4: Relative effects of the predictor variables in Mathematics

	Unstandardized coefficient		Standardized coefficient		
Model	B	Std Error	Beta	t	Sign
(constant)	-73.665	6.939		-10.616	.000
SBA 1	.561	.120	.212	4.664	.000
SBA 2	.646	.104	.302	6.197	.000
SBA 3	.990	.111	.442	8.943	.000

Dependent variable: JSCE scores.

In table 3 above, the Beta weights provide an indication of relative effects of each of the predictor variables on the prediction of students English achievement in JSCE when the other variables are controlled. The value of t-ratio associated with the SBA scores in JS1, JS2 and JS3 are significant at .003, .000 and .000 respectively which are less than the probability level of 0.05. It is observed from the table that the SBA scores of the students in JS three (SBA 3) has the greatest influence, followed by SBA scores of the students in JS two (SBA 2) and lastly scores in JS one (SBA 1).

In table 4 above, the Beta weights provide an indication of relative effects of each of the predictor variables on the prediction of students mathematics achievement in JSCE when the other variables are controlled. The values of t-ratio associated with the SBA scores in JS1, JS2 and JS3 are significant at .000, .000 and .000 respectively which are less than the probability level of 0.05. It is also observed from the table that the SBA scores of the students in JS three (SBA 3) has the greatest influence, followed by SBA scores of the students in JS two (SBA 2) and lastly scores in JS one (SBA 1).

Discussion of the Findings

The findings revealed the predictive power of school based assessment scores on students' achievement in Junior Secondary Certificate Examination in English and Mathematics. The combined influence of school based assessment scores accounted for 61.7% and 62.7% of the variance in students' JSCE in English and Mathematics respectively. The analysis of variance for the multiple regression produced F-ratios of 134.747 and 140.750 for English and Mathematics respectively which are significant at 0.05 alpha level. These show the predictive power of SBA scores on students' English and Mathematics achievement in JSCE.

The findings also revealed that in English achievement, SBA scores of the students in JS3 is more effective than their SBA results in JS2 which is more effective than their SBA results in JS1. In mathematics achievement, the SBA scores of the students in JS3 is more effective, followed by SBA scores of the students while in JS2 and lastly their SBA scores while in JS1. The findings of SBA scores effectiveness in English achievement is in disagreement with the study of Omole (2007) who found out that students scores in promotion examination from JS1 to JS2 is significantly higher than their scores from JS2 to JS3.

The findings also agreed with the study of Ogunkola (2007) and Orubu (2013) who found out that SBA scores of the students in integrated science and mathematics respectively predicted their performance in their final grades in JSCE with the SBA scores in JS3 being the most effective followed by SBA scores in JS2 and lastly SBA scores in JS1. Irrespective of the sample size location, and subjects, the three studies gave almost the same results. This revealed the predictive power of SBA scores on students' achievements in JSCE.

Conclusion

From the results of the study, the following conclusions were drawn.

- SBA scores significantly predicted students' achievement in Junior Secondary Certificate Examination in English and Mathematics.

- There are relative effectiveness of SBA scores in students achievement in English and Mathematics.

Recommendations

Based on the findings of this study, the researchers made the following recommendations.

- School-based assessment should be encouraged and made compulsory for every secondary schools especially in core subjects which include English and Mathematics.
- Teachers should endeavour to administer school based assessment regularly right from JS1 which is the Basic of Upper Basic Education level.

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