



**SCHOOL–BASED ASSESSMENT AS A PREDICTOR OF
STUDENTS' ACADEMIC ACHIEVEMENT IN BASIC
EDUCATION CERTIFICATE EXAMINATION (BECE) IN BASIC
SCIENCE IN NSUKKA EDUCATION ZONE, ENUGU, STATE**

**Ogbu, Sunday, Agugoesi, Oluchi Janehilda, Owolawi, Olaniyi & Ugwu, Felicia
Chinyere**

Abstract

This study investigated the predictability of students' academic achievement in Basic Education Certificate Examination (BECE) Basic Science using students' School-Based Assessment (SBA). The study was conducted in Nsukka Education Zone, Enugu State. A correlational research design was adopted for the study. One research questions and one hypothesis were generated to guide the study. Three thousand and sixteen (3016) students who sat for 2018 BECE in the Nsukka Education Zone were the population for the study. The size of sample was three hundred and sixty (360) candidates selected through multi-stage sampling technique. Students' SBA and BECE records served as the instrument for data collection. The collected data were analyzed using, regression analysis and t-test. The findings revealed, among others, that students' SBA scores significantly predict students' BECE scores in Basic Science. It was recommended, among others, that effective SBA monitoring teams should be established at state level, zonal level and school level to enhance uniformity in assessment; and as well, in reporting students' academic achievements.

Keywords: School-Based Assessment, Academic Achievement, Basic Education and Basic Science

Introduction

Education is an essential tool for development of individual and nations. Technological and economic differences among nations lie in educational system being adopted by different nations. It has been noted that Education is of paramount importance, because it aids in improving the quality of individuals' life styles and the society in general (Miftahu & Hazri, 2015). Many nations have recognized the roles of education and therefore are making various policies and programmes that are aimed at promoting quality and affordable education for all citizens. In America, for instance, the policy of “No Child Left Behind” was put in place to improve students' achievement and close achievement gaps in American schools (U.S Department of Education, 2004). Similarly, in Nigeria, there have been numerous changes in policies and programmes in Nigerian education system. For example, the 6-3-3-4 system of education which stipulates 6 years for primary education, 3 years for junior secondary school, 3 years for senior secondary school and 4 years for university education. All these changes are geared toward utilizing of benefits of education. The latest change in Nigerian education system pays a special emphasis on basic education.

Basic education , according to National Policy on Education (NPE, 2004), is a nine (9) year programme, consisting of six (6) years that starts from primary one to six (or lower basic) and three (3) years that starts from Junior Secondary One to Junior Secondary One Three (upper basic). It is equally stipulated that basic education shall: be free and compulsory, including adults and children who are out of schools using informal education programmes. The basic education being emphasized in Nigeria could also be referred to as Universal Basic Education (UBE). Universal Basic Education is an education programme that is compulsory and free for all children whose ages fall within six (6) years to fifteen (15) years and also a programme for literacy training of adult members of the society (Samuel & Eseoghene, n.d). Universal Basic Education is geared towards integrating out of school children into classrooms. It is hoped that UBE, which last for a period of nine (9) years, would lay solid foundations for students to pursue their desired careers. Tahir (2005) maintained that having completed, the students are expected to possess great level of numeracy and literacy; communicative and psychomotor skills that should make them employable and useful to the society.

For useful skills to be acquired by a child, at basic education level, the contents of various subjects taught at this level should reflect the societal demands. It is the pursuit of useful education that ushered in the new basic education programme. It has been noted that the new basic education curriculum has been structured to include: contents for lower basic programme (for first-three years in primary), contents for middle basic education programme (for for last three years of primary education) and contents for upper basic education programme (for first three years of secondary school education) (Obioma,

2007). Upper Basic Education, formally known as Junior Secondary School Education, marks the end of basic education in Nigeria. This level of education, especially JSS3, is very important, as it determines the career choices in which students, who would like to further their education, could be placed after graduation from basic education. Basic Science is one of the most important subjects, taught at the Upper Basic Education and which prepare students to pursue careers in sciences and science related disciplines.

Of all the sciences and science related subjects students come across at secondary school level, Basic Science, formally called Integrated Science, is the first (Anna, 2015). Basic Science is a revolutionary new introductory science curriculum developed for students, considering a career in science (Trustees of Princeton University [TPU], 2013). Basic Science is not only restricted to students in Upper Basic Education. It has been observed that Basic Science and Technology as a subject has been introduced as a science subject to be offered at lower and middle basic level (Ogungbesan, 2012). Basic science is planned to inculcate in the students the basic principles of sciences. It is therefore, expected that after passing through junior secondary education, that students should develop interest in studying sciences. The content of Basic Science is made up of elementary aspect of Biology, Physics and Chemistry. These subjects, which are offered at senior secondary school level, have their foundations in Basic Science. For students to develop lasting interest in studying sciences, the first step is to enhance their interest in studying Basic Science. It is possible that most students who enrolled in science subjects in their senior secondary school had better performance in Basic Science as compared to their counterparts in Arts classes. The benefits derive in learning Basic Science cannot be emphasised.

The need for learning Basic Science can be well appreciated by examining the objectives of teaching Basic Science at JSS level. Bilesanmi-Awoderu and Oludipe (2012) opined that the objectives of teaching Basic Science in Nigerian secondary school, stipulate that: basic Science equip learners at the upper basic level, with good scientific principles for furthering education in single science and also enhances scientific literacy of the citizenry. These objectives can be achieved if schools are equipped with both materials and human resources. Teachers are charged with the responsibilities of determining the level of attainment of these objectives through periodical assessment of learning outcomes.

Assessment is the gathering of information systematically, from many sources to make sound educational judgments and decisions. These decisions include effectiveness of instructional techniques, students' classification, promotion, guidance, certification, selection for a duty (Assessment, n.d.). Assessment as a means of determining change in learners' behaviour can take place at the end of instruction or programme or during instruction or programme. Assessment that takes place during instruction or during

ongoing programme is referred to as formative assessment. This type of assessment is used for improving learning and efficacy of instruction. On the other hand, an assessment that takes place at the end of instruction or at the end of programme is summative assessment. In summative assessment, the objective of the assessors is to summarize or describe learning. More often, the result of summative assessment is for promotion, certification and placement of learners. Both formative and summative assessment can be carried out in school system. The umbrella term for both formative and summative assessment of students in school is School-Based Assessment (SBA)

School-Based Assessment is defined as a system for collecting periodic information on pupils' learning status for the purpose of planning improvement programmes in the performance of pupils (School-Based Assessment, n.d.) School-Based Assessment enables schools to describe students' performance on both theory and practical skills knowledge using marks obtained in take-home assignments, quizzes, class works, fieldworks and end-of-term examinations. School-Based Assessment emphasizes that students should learn from varieties of sources, such as from teachers, from fellow students, from library and from internet. It is through SBA that the outcomes of learning from these varieties of sources are captured. The general characteristics of SBA include: periodic collection of assessment information, use of different testing methods, inclusion of more complex thinking skills in testing programmes, emphasis on students' centered learning and standardization of SBA (School- Based Assessment, n.d.). From the characteristics of SBA, it can be seen that schools contribute a lot for certification of students. To obtain basic education certificate, school based assessment and the final examination for the junior secondary school level are combined (O'kwu & Orum, 2013). For instance, thirty (30) percent mark is an internal mark that comes from school while seventy (70) percent mark comes from students' performance at Basic School Certificate Examination (BECE).

Basic Education Certificate Examinations also known as Junior Secondary Certificate Examinations are examinations candidates sit for at the end of first-three years of secondary education across all schools in Nigeria (Umar & Lawal, 2017). It can be said that BECE is an end of programme (basic education) assessment aims at determining whether students can be awarded Basic Education Certificates or not. Basic Education Certificate Examinations are external examinations that are conducted by individual States (for States' Secondary Schools) and National Examination Council (for Unity School) in Nigeria. Effective implementation of UBE is expected to reflect in students' academic achievement in both BECE and SBA.

Academic achievement is measured by performance outcome that reflect the degree to which specific goals of activities or instructional activities are achieved in an environment such as schools, colleges and universities (Ricarda, Anja, Anne & Linda,

2017). Academic achievement is the output of education which is seen in the extent to which achieved educational goals are achieved by teachers, students or institution at large (Omenu, 2018). Students' academic achievement is the measure of students' demonstration of positive change in cognitive, affective and psychomotor domain of learning. Most often, schools are focused mainly on cognitive abilities of the students. It is expected that SBA should capture students' learning outcomes in all the domains of educational objectives. Hence, SBA has been adopted to compliment end-of-programme examinations in Nigeria. It has to be noted that neither the SBA alone nor external examinations alone is enough for ascertaining the actual ability of students, hence the need for combination of SBA and external examinations. Researchers, although, have shown that SBA predicts students' scores in BECE in areas such as Agricultural Science (Nwaobi, 2016), Mathematics (Orubu, 2013) and English (Opera, Onjekwuru & Njoku, 2015), not much is known on the use of SBA for predicting of students BECE scores in Basic Science.

It is obvious from the ongoing discuss that schools do not give similar assignments, class works, fieldworks, quizzes and end-of-term examinations to students of the same class level. Class size, innovativeness of teachers, availability of teaching and assessment materials and standards of schools could influence how school-based assessment is carried out in Nigeria. It is expected that with comprehensive school-based assessment guidelines, there should be uniformity in school-based assessment among secondary schools in Nigeria. In determining students' performance in BECE, schools provide 30 percent of the overall marks while 70 percent comes from external examination bodies. The implication of this is that, differentials in schools' performance in BECE are likely to be hinged on the non-uniformity in standards of SBA marks awarded to the students. Where schools are liberal in awarding SBA marks, the students' performance in BECE might be inflated.

Considering the rate of proliferation of schools with its concomitant competitions in Nigeria and also the fact that parents judge the quality of schools based on students' performance in external examinations, how SBA scores are awarded should be a matter of concern to educators. It has been observed that some students, whom, at their junior secondary, had worked hard to be enrolled in science classes at senior secondary level, could not achieve their dreams. In some schools, at times, some students are being moved from Science classes to Arts classes for their inability to cope in that in science classes. Most schools use students' performance in BECE to place students in science, arts or commercial classes at senior secondary. A pertinent question is how correct could schools be in placement of students into different classes at senior secondary level if the component of SBA scores in BECE is considered. Therefore, a study on School-Based Assessment as a predictor of students' academic achievement in BECE in Basic Science is imperative. The thrust of this study was to assess the predictability of students' achievement in BECE using the students' SBA scores.

Research Questions

1. What variation in students' BECE score could be attributed to their SBA score in Basic Science?

Research Hypotheses

This hypothesis tested at 0.05 level of significance guided the study:

1. students' scores in SBA do not significantly predict their scores in BECE Basic Science.

Methods

Correlational research design was adopted for the study. Correlational research design, according to Leedy and Ormrod (2010), is concerned with establishing relationships or associations between two or more variables in the same population or between the same variables in two populations. Three thousand and sixteen (3016) students who sat for BECE 2017/2018 academic session in fifty-nine (59) public schools in Nsukka Education Zone was the population for the study (Post-Primary School Management Board Nsukka [PPSMBN], 11th May, 2019). The sample size for the study was three hundred and sixty (360) students. The choice for the sample was based on Cohen, Manion and Morrison (2007) table of sample size which indicates that a population of about 3016 would require a sample of 360 at a confidence level of 0.05. The sample size was drawn from the population through multi-stage sample procedure. In the first place, purposive sampling was used in selection of all the schools that have up to twenty students that sat for BECE 2017/2018 academic session. Thereafter, simple random sampling technique through balloting was used in selection of ten (10) schools for the study. Lastly, thirty-six (36) students were selected through systematic sampling procedure from each of the ten (10) selected schools thereby making a sample of 360 students. Researchers developed Proforma titled "Students' Academic Achievement in Basic Science Proforma (SAABSP) was used for collection of data. The average scores of the students in their First and Second Term JSS3 results in Basic Science constituted SBA scores. The students' scores in Basic Science BECE in Enugu State 2017/2018 session constituted BECE Basic Science scores. Student' BECE grades were coded as follows: F = 34.5, P = 44.5, D = 55.5 and C = 65.5 for analysis purpose. The collected data were analyzed using, regression analysis and t-test statistic. The research questions that guided the study were answered using correlation coefficients, coefficient of determination and regression analysis. The hypothesis was answered using t-test statistic.

Results

Research Question One: What variation in students' BECE scores is attributed to their SBA score in Basic Science?

Table 1: R Square and Adjusted R Square for Students' Scores in SBA and BECE Basic Science

Model	R	R Square	Adjusted R Square
1	.784 ^a	.615	.614

a. Predictors: (Constant), SBA Scores
 b. Dependent Variable: BECE Scores

Table 1 shows that the values for R, R Square and Adjusted R Square are .784, .615 and .614 respectively. This implies that 61.5 percent of variation in students' performance in BECE Basic Science is attributed to their performance in School-Based Assessment in the subject. This represents a large amount of proportion of variance explained between the BECE and SBA scores

Hypothesis One: Students' scores in SBA do not significantly predict their scores in BECE Basic Science

Table 2: ANOVA Summary Table for the Regression of BECE Scores on SBA Scores

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	47863.491	1	47863.491	571.438	.000 ^b
	Residual	29985.965	358	83.760		
	Total	77849.456	359			

a. Dependent Variable: BECE Scores
 b. Predictors: (Constant), SBA Scores

Table 2 show an ANOVA summary of the regression of BECE scores on SBA scores, it is indicated that SBA scores in Basic Science was significantly predicted by students' scores in BECE Basic Science $F_{(1,358)} = 571.438, p < 0.001$). This is further confirmed by Table 3.

Table 2: ANOVA Summary Table for the Regression of BECE Scores on SBA Scores

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	47863.491	1	47863.491	571.438	.000 ^b
	Residual	29985.965	358	83.760		
	Total	77849.456	359			

a. Dependent Variable: BECE Scores
 b. Predictors: (Constant), SBA Scores

Table 2 show an ANOVA summary of the regression of BECE scores on SBA scores, it is indicated that SBA scores in Basic Science was significantly predicted by students' scores in BECE Basic Science $F_{(1,358)} = 571.438, p < 0.001$). This is further confirmed by Table 3.

Table 3: Unstandardized and Standardized Coefficient for predicting Students' BECE scores using SBA scores in Basic Science

Model		Unstandardized Coefficients B	Standardized Coefficients Beta	t	Sig.
1	(Constant)	14.324		14.317	.000
	SBA Scores	.767	.784	23.905	.000

a. Dependent Variable: BECE Scores

Table 3 shows a regression model, $BECE\ score = 14.324 + .767 (SBA\ score)$ for predicting students' BECE scores using their SBA scores in Basic Science. It can be seen that SBA score beta weight of .784 is significant ($t = 23,905, p < 0.001$). The positive value of the beta coefficient, .784 implies that as there is a corresponding increase in BECE scores with increase in SBA scores,

Discussion

From the hypothesis, it was revealed that School-Based Assessment scores significantly correlates with and predict students' BECE scores in Basic Science. These findings suggest that students, who performed well in their SBA as measured through teacher-made tests, would also perform well in the BECE. Similarly, students who performed poorly in School-Based Assessment would also perform poorly in their Basic Education Certificate Examination in Basic Science. This is not surprising because all the schools and teachers might have been following the same curriculum in teaching their students. This finding is in consonance with Nwaobi (2016) which shows that school-based assessment scores predicts positively to students' performance in JSCE Agricultural science examination. This also agrees with that of Orubu (2013) which reported that school-based assessment scores positively predict the performance of students in JSCE Examination in Mathematics. It also agrees to that of Opara, Onyekwuru and Njoku (2015) whose results revealed that the combination of the school-based assessment scores significantly predicts students' performance in English and Mathematics.

Conclusion

From the results of the study, it was conclusively affirmed that scores in School Based Assessment are significantly associated with their scores in Basic Education Certification Examination and that SBA scores significantly predict BECE scores in Basic Science.

Recommendation

Based on the findings, the following recommendations were made:

1. effective SBA monitoring teams should be established at state level, zonal level and school level to enhance uniformity in assessment; and as well, in reporting students' academic achievements.
2. government, teachers, parents and school administrators should not encourage students who have not shown much improvement in SBA to register or enroll in external examinations.
3. teachers should ensure that students' SBA scores should be reliable by adopting good teacher-made test, eliminating examination malpractices and ensuring that SBA covers all the required aspect of curriculum.
4. students, especially those in junior secondary classes be given adequate attention, because if they do well in their previous class Examination (SBA) they will certainly perform well in BECE.

References

- Anna, A. (2015). Challenges and prospects in the teaching of Basic Science at the upper basic level in Nigeria. *Journal of Quality Education*, 11(1). <http://www.globalacademicgroup.com/journals/qualitative%20education/Anna5.pdf>
- Assessment, (n.d). SSS Manual For School Based Assessment Proces, http://www.education.gov.yk.ca/pdf/schools/SSS_Manual_F_School_Based_Assessment_Process.pdf
- Bilesanmi-Awoderu, J. B. & Oludipe, D. I. (2012). Effectiveness of cooperative learning strategies on Nigeria junior secondary students' academic achievement in Basic Science. *British Journal of Education, Society and Behaviour Sciences*, 2(3), 307-325
- Cohen, L. Manion, L & Morrison, K. (2007). *Research methods in education* (6th ed.). London and New York: Routledge.
- Federal Republic of Nigeria (2004). *National Policy on Education* 4th Edition. Lagos: NERDC Press.
- Leedy, P. D. & Ormrod, J. E. (2010). *Practical research: planning and design* (9th ed.). Boston: Pearson Educational International.
- Muftahu, J. S. & Hazri, J. (2015). Policy of universal basic education in Nigeria: an examination of its effectiveness on implementation of management. *American International Journal of Contemporary Research*, 5(6). http://www.ajcernet.com/journals/Vol_5_No_6_December_2015/20.pdf
- Nwaobi, O. J. (2016). School based assessment as a predictor of students academic achievement in Agricultural science JSCE Examination.
- O'kwu, E. I. & Orum, C. C. (2013). Junior secondary school examination results as a predictors of students' performance in Mathematics at the senior secondary school certificate examinations in Benue State, Nigeria. *Educational Research*, 4(2), 130-133. <https://www.interestjournals.org/articles/junior-secondary-school-certificate-examination-results-as-predictors-of-students-performance-in-mathematics-at-the-seni.pdf>
- Obioma, G. (2007). *9-years Basic Education Curriculum*. Abuja: Nigerian Education Research and Development Council (NERDC).
- Ogungbesan, O. T. (2012). Evaluating of the implementation of the Basic Science curriculum component of the Universal Basic Education programme in South-West Nigeria. *Doctorate Thesis*, University of Ibadan. Retrieved from <file:///C:/Users/user/Downloads/file.pdf>

- Omenu, F. (2018). School climate and students' academic achievement in Edo State public secondary schools. *International Journal of Scientific Research in Education*, 11(2), 175-186. [http://www.ij sre.com/assets/vol.%2C-11\(2\)-omemu.pdf](http://www.ij sre.com/assets/vol.%2C-11(2)-omemu.pdf)
- Opara, I. M., Onyekwuru, B. U & Njoku, J. U. (2015). Predictive power of school based assessment scores on student's achievement in junior secondary certificate examination (JSCE) in English and mathematics. *Journal of Education and Practice*, 6(9), 112-116
- Orubu, M. E. N. (2013). School based assessment as a predictor of students performance in junior school certificate mathematics examination in Delta State. *Nigeria Journal of Educational Research and Evaluation*, 12(1), 38-47.
- Ricarda, S., Anja, M., Anne, F. W., & Linda, W. (2017). *Academic achievement*. <https://www.oxfordbibliographies.com/view/document/obo-9780199756810/obo-9780199756810-0108.xml>
- Samuel, R. A. & Eseoghene, D. (n.d). Implementing the Universal Basic Science Education curriculum for development in Nigeria beyond 2020. *Academic Excellence*. www.globalacademicgroup.com/journals/academic%20excellence%20/Samuel.pdf
- School-Based Assessment. (n.d.). <https://mingycomputersgh.files.wordpress.com/2016/09/sba-p5-final-4-10-11docx-1-10-11.pdf>
- Tahir, G. (2005). The UBE programme: Issues and challenges and implication for teacher education institutions. Convocation lecture delivered at Federal College of Education, Kano, 24th November.
- Trustees of Princeton University (2013). Overview-Princeton University Integrated Science. www.princeton.edu/integratedscience/
- U.S Department of Education (2004). No Child Left Behind: A toolkit for teacher. Archived Information, <https://www2.ed.gov/teachers/nclbguide/nclb-teachers-toolkit.pdf>
- Umar, Y. U. & Lawal, A. (2017). *Predictive validity of junior secondary school certificate examination on students' performance in senior school certificate examinations in Mathematics*. *Journal of Education Policy and Entrepreneurial Research*, 4(2), 53-58.