Predictive Validity of Students' Achievement Scores in Basic Education Certificate Examination (BECE) on Achievement in Senior School Certificate Examination (SSCE) Conducted by NECO in Mathematics

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Abstract
This study, investigated Predictive Validity of Students' Achievement Scores in Basic Education Certificate Examination (BECE) on Achievement in Senior School Certificate Examination (SSCE) conducted by NECO in Mathematics. Three research questions and three null hypotheses guided the study. The sample of the study comprised 3910 candidates sampled from 7 randomly drawn unity schools within Ebonyi and Abia states of Nigeria for the period under study (2014 – 2019). The official BECE scores and SSCE scores in mathematics of the students domiciled in NECO headquarters Minna, Niger state, Nigeria served as data for the study. Data collected were analyzed using Pearson's Product Moment Correlation to answer the research questions and Multiple Regression statistics to test the hypotheses at 0.05 level of significance. The analysis of the data revealed that BECE scores have a strong validity with the students' achievement in SSCE mathematics examination. Furthermore, there was a statistically significant relationship between the students BECE scores and their achievement in SSCE mathematics examination. Based on the findings of the study, it was recommended among others that the BECE preparation of the students should be given serious attention because of its proven predictive value on achievement at the SSCE level.
Keywords: Mathematics, Predictive Validity, and Academic Achievement

1.0 Introduction

Mathematics could be described as the mother of all sciences that deals with the logic of shape, quantity, measurement and arrangement. Mathematics is all round us and in everything we do. Its knowledge is used and applied in virtually everything in our society. Ugwuanyi (2015) described mathematics as a science that deals with the meaning of numbers and their relationships to space, measurements and quantities. Adeniyi and Suleiman (2015) described mathematics knowledge as an indispensable tool in every society because it has application in all other human endeavours including basic science, technology, social sciences and in the arts. Mathematics is the bedrock and an important tool that provides the springboard for scientific, technological and economic advancement in the society. The development of any nation depends highly on its applications and any nation aspiring for growth and development in science and technology must not neglect mathematics (Iji, 2010). Ekwueme and Menechukwu (2013) described mathematics as the life wire for technological advancement. According to Ugwuanyi (2015), the attainment of vision 20:2020 especially in science and technology education in Nigeria may not be achieved unless the general apathy for mathematics among students in our secondary schools abates. Bamidele (2015) expressed that Nigeria transformation agenda cannot be sustained without mathematics. This is to say that the application of mathematics to problem areas depend on the discipline and understanding of the concepts and the principles of mathematics by the problem solver.

It is not surprising that mathematics is recommended as a core subject in secondary schools across Nigeria and in indeed all over the world. This is because Mathematics is an instrument that aids the facilitation of thinking capabilities of an individual in the learning of other subjects. In the stance of Nigerian Educational Research and Development Council (NERDC, 2008), with a credit or pass in the subject at the BECE level, one should be able to forecast students that would likely do well in the subject at the SSCE level. But judging from results of researches such as (Ugwuanyi, 2015; Egbulefu, Amaele, & Osaat, 2015; Ajai & Imoko, 2015; Adeniyi & Salman, 2015), students' performance in the subject has been very poor especially in the Senior School Certificate Examination (SSCE). To ensure that there is a close connection between students' learning at the primary and junior secondary school as well as to ensuring that student's academic achievement is sustained as they move from one education level to another, a change was deemed necessary from 6years basic education to a 9year basic education.

The 6-3-3-4 system of education in Nigeria which was changed to 9-3-4 system (also known as 9-year Universal Basic Education, UBE) established in the year 1999 may have eliminated the disconnection that earlier existed between primary and junior secondary school programmes. According to O'kwu and Orum (2013), Ugwuda and Abonyi (2013), the new policies under UBE made the integration of primary and junior secondary

schools into a continuous system of schooling possible. With its (9-year basic education) introduction, all forms of examinations for entrance or certification prior to the Junior School Certificate Examination (JSCE) which was later renamed Basic Education Certificate Examination (BECE) in April, 2011 have been abolished. This has made the BECE the certificate examination encountered by students in the first 9-years of formal schooling.

Achievement can be described as the degree to which an individual or group of individuals has attained qualitatively and quantitatively in a programme over a specified period of time (Ugwuanyi, 2015). Achievement can also be conceptualized as the quality and quantity of task a student is able to achieve over a specified period of time in measurable rate. For instance, the extent of a student achievement at the end of secondary school education. Based on the foregoing, mathematics achievement can be conceptualized to mean the level of accomplishment (qualitatively and quantitatively) in a mathematics programme of activity over a period of time. It could be termly, yearly or at the end of a certain education level (primary, secondary, or tertiary). For instance, achievement of students' in mathematics at the end of secondary school education. It could also mean the extent to which the curriculum of mathematics has been actualized measurably using students' achievement scores over a given period of time.

Academic achievement at every terminal of schooling is crowned with certificate for those who successfully completed the requisite subjects/or courses with accepted pass mark grades. For example, at the end of the 9-year basic education programme, students in JSS3 class are expected to sit for the BECE conducted by the States Ministries of Education or that conducted by the National Examination Council (NECO) for unity schools. A graduate of 9-year UBE is qualified for admission into the 3-year Senior Secondary School programme if only the candidate possesses a minimum of credits/passes in five subjects including Mathematics. Possession of five credits in the five core subjects is not exclusive of any gender (i.e. the same criterion is considered in judging both male and female students).

As reported by Elishama (2014), whether or not past performance can predict future performance has been a highly debated issue with gender differences being considered. The author reported that the best predictor of achievement of students in a task is previous achievement. This was in agreement with studies conducted by Sacket, Kunal, Arneson, Cooper and Waters (2009) which stated that scores on admission tests were indeed predictive of academic performance as indexed by grades. However, the authors reported that there are differences in achievement of both male and female students in mathematics in African nations such as, Kenya, Botswana, Ghana, Cameroon and Nigeria. The study further reported a higher correlation between the predictor and criterion examination for male learners compared to female learners. The question of gender differences in academic achievement in secondary schools is neither conclusive nor unanimous. Due to the inconclusive findings on gender differences in academic achievement, this study investigated gender difference in the predictive validity of BECE mathematics scores on SSCE mathematics scores of students in the study area.

Predictive validity refers to the extent to which a test could accurately forecast the extent to which a person would perform in a future related task. The probability that a student will pass or fail in a future task based on present or earlier achievement interpreted in terms of the predictive validity of the earlier task is referred to as predictive validity. Afolabi (2012) described predictive validity as the degree of correlation between the scores on a test and some other measures that the test is designed to predict. It is concerned with how well a test can predict subsequent behaviour. Statistically, predictive validity is obtained by correlating the predictor variable and the criterion variable. Primarily, the essence of calculating a validity coefficient is to set-up the regression equation for the data such that prediction can be made when future individuals take the same test (Olupemi, 2014). When new students or applicants take the same tests in the future, their scores can be referred to the regression equation and a probability statement can be objectively made regarding their success at the end. The uniformity of the predictor variable in predicting the criterion variable is good consideration.

Consistency in predictive validity refers to uniformity of achievement on the predictor variable in predicting achievement on the criterion variable. In this study, the researchers examined the consistency of achievement scores in BECE in predicting achievement scores in SSCE in the years under study. This enabled firm and informed decision on whether achievement in mathematics at the BECE has consistently predicted achievement scores in SSCE mathematics over the years.

Although there are differences in the curriculum of junior and senior secondary school levels in Nigeria, they still share in common some basic core subjects like, Mathematics, English Language, Computer Studies, Nigeria's three main Languages (Igbo, Hausa, Yoruba), Agricultural Science, French Language (or Arabic Language), Christian Religious Knowledge/Islamic Religious Knowledge and Arts (Ugwuda & Abonyi, 2013; NERDC, 2008). It is believed that achievement of students in these subjects at the BECE, which also stands as entry qualification for the Senior Secondary school programme could positively predict student's achievement in Senior School Certificate Examination (SSCE). In Nigeria, there are two versions of SSCE: the one conducted by the National Examination Council (NECO) and the one conducted by the West African Examination Council (WAEC). This study focused on the SSCE conducted by NECO.

Even with the establishment of NECO, there is no doubting the fact that the modes of selecting candidates

for admission and certification in various programmes require constant re-examination (Ugwuda & Abonyi, 2013; Koul, 2009). Test represents one of the devices of evaluation in schools and testing concerns specific achievement of a student in terms of given objectives (Olupemi, 2014; Afolabi, 2012; Ukwuije, 2009). The issue of whether or not performance of students in the aforementioned core subjects (particularly Mathematics) in NECO-BECE would positively predict achievement in mathematics in the NECO-SSCE remains uncertain and inconclusive. In addition, research reports on the influence of gender on achievement of students are also not conclusive. Establishing the predictive validity of BECE on achievement in SSCE conducted by NECO would go a long way in fulfilling some of the important uses of evaluation for placement and certification.

1.1 Problem Statement

Students' admission into any Nigeria Senior Secondary School (SSS) in Nigeria is a function of having passed at least five subjects in basic education certificate examination (BECE), as prescribed by the Senior Secondary School of choice. In addition, the candidate may be required to score a high mark in the newly introduced National Entrance Examination for admission into Federal Government Unity Secondary Schools/Colleges (NEEFUSSC). The NEEFUSSC is conducted by NECO for candidates who wish to gain admission into the Senior Secondary Schools. The Basic Education Certificate Examination and SSCE are also conducted by NECO while WAEC conducts its SSCE differently. The extent to which the BECE identifies students that would perform well in the SSCE conducted by NECO has remained uncertain and inconclusive.

At the conclusion of the basic education (9-year universal basic education programme) majority of the students who sat for the BECE record high scores in mathematics. But at the senior secondary certificate examination, majority of the students record below credit pass. Judging from the fact that the curriculum of the senior secondary in mathematics is built from concepts/topics in the junior secondary mathematics curriculum in Nigeria, one would wonder why the students who recorded high achievement scores at the BECE tend to record poor achievement scores in the SSCE. Could it be that achievement in the BECE (9-year basic education programme) which serves as criteria for admission into the senior secondary level is not sufficient an examination for certification and placement? More so, considering the fact that the BECE and SSCE being compared in this study are conducted by the same examination body (NECO) and the fact that students tend to achieve better at the BECE without matching the same fit at the SSCE (Ugwuda & Abonyi, 2013), it becomes expedient to ascertain if achievement in the BECE is a valid predictor of achievement in SSCE. The problem of this study stated in question form was therefore; what is the predictive validity of students' achievement scores in basic education certificate examination (BECE) on achievement in senior school certificate examination (SSCE) conducted by NECO in mathematics?

1.2 Objectives of the Study

The study determined:
1. the extent to which students' achievement scores in BECE mathematics could predict their achievement scores in SSCE mathematics;
2. the extent to which the predictive validity of BECE achievement score on SSCE achievement scores in mathematics could be influenced by gender; and
3. the extent of consistency of students' achievement scores in BECE mathematics in predicting their achievement scores in SSCE mathematics between 2013 – 2018.

1.3 Research Questions

1. What is the validity of students' achievement scores in NECO-BECE mathematics in predicting their academic achievement scores in NECO-SSCE mathematics?
2. What is the validity of NECO-BECE in predicting the achievement of male and female students in NECO-SSCE in mathematics?
3. What is the consistency of NECO-BECE in predicting the achievement of students in NECO-SSCE in mathematics between 2013 – 2018?

1.4 Hypotheses

Ho$_1$: There was no statistically significant relationship between students' achievement scores in BECE on their achievement scores in SSCE mathematics conducted by NECO.

Ho$_2$: The predictive strength of students' achievement scores in NECO-BECE mathematics on their achievement scores in NECO-SSCE mathematics will not be significantly moderated by gender.

Ho$_3$: There was no statistically consistent significant relationship between students' scores in NECO-BECE (2013, 2014 and 2015) and their scores in NECO-SSCE (2016, 2017 and 2018).

2.0 Methodology

This study adopted the Correlational survey research design to investigate the relationship between achievement in NECO-BECE (predictor variable) and the achievement of students in NECO-SSCE (criterion variable). Specifically, this study adopted the Longitudinal Correlation design to provide useful information with respect to the direction and the degree of relationship between variables over a long period of time (2014 – 2018).

2.1 Area of the Study

The area of the study was Ebonyi and Abia states. The states are within the South East geopolitical zone of Nigeria. The states have a homogenous language group-the Igbo Language. The two states host the two categories of secondary schools that present candidates for NECO-BECE. For instance, Ebonyi state hosts two Federal Unity schools and a Command Secondary School while Abia state hosts three Federal Unity schools and a Command Secondary School.

2.2 Population of the Study

The population of this study comprised all students who sat for both BECE and SSCE and graduated from the same Federal Unity Schools, and Command Secondary Schools in Ebonyi and Abia states between 2014 and 2019. The students' population as obtained from NECO headquarters in Minna Niger State, Nigeria in 2019 was 3910. The population of the students (3910) was used as sample, thus, there was no sampling.

2.3 Instrument for Data Collection

The Students' Mathematics achievement records in BECE and SSCE obtained from NECO headquarters in Minna, Niger state was used as data for the study. The BECE achievement scores were for the years; 2014, 2015 and 2016 while the SSCE scores were for the years 2017, 2018 and 2019. The researcher obtained the raw scores of the students by computing the average of the range of scores of each grade as prescribed by NECO. That is, for SSCE, A1 (80 – 100), B2 (70 – 79), B3 (65 – 69), C4 (60 – 64), C5 (55 – 59), C6 (50 – 54), D7 (45 – 49), E8 (40 – 44), and F9 (0 – 39). For BECE, A (70 – 100), B (60 – 69), C (50 – 59), D (45 – 49), P (40 – 44), and F (0 – 39). The raw score for a student who got A1 at the SSCE after taking the average of the range of scores 80 – 100 both inclusive was 90, B2 = 75, etc. While at the BECE, a student who got A after taking the average of the range of scores 70 – 100 both inclusive was 85, B = 65, etc.

The result sheets which were made use of are official documents domiciled in the NECO headquarters in Minna, Niger state. It was therefore valid and reliable and was not subjected to any other validity and reliability assessment tests. The scores of the students in BECE were matched with their scores in SSCE. Scores of students in BECE was tagged data X while their SSCE scores was tagged data Y. Specifically, the scores for BECE 2014 was matched with SSCE scores for 2017; BECE 2015 was matched with SSCE 2018, and BECE scores for 2016 was matched with SSCE 2019.

Research questions were answered using the Pearson's Product Moment Correlation coefficient (r), coefficient of determination (r^2), stepwise and Multiple Linear Regression (MLR) procedures. The hypotheses were tested using the t-test significance of correlation coefficient for large samples at the 0.05 level of significance. The acceptance range for 'r' value was as follows:

≤ 0.499 = low but positive correlation

> 0.499 = high and positive correlation.

The coefficient of determination (r^2) indicated the percentage of variation in the criterion variable (SSCE) that was explained by the predictor variable (BECE).

3.0 Results

3.1 Research Question 1

What is the validity of students' achievement scores in NECO-BECE mathematics in predicting their academic achievement scores in NECO-SSCE mathematics?

The BECE scores of the students were collected and correlated with the SSCE scores of the students in mathematics. This was done for the academic sessions 2014, 2015 and 2016 for BECE and 2017, 2018 and 2019 for SSCE. The index of relationship was used to determine the predictive strength of BECE scores on SSCE scores of the students'. Summary of result is presented in table 1.

Table 1: *Correlational Matrix of Students Achievement in NECO-BECE and NECO-SSCE.*

Period	N	Computed r	r^2
2014 – 2016 BECE on 2017 – 2019 SSCE	3910	0.023	0.00053

Number of Cases = 3910

As shown in Table1, the computed 'r' between BECE (2014 to 2016) scores and SSCE (2017 to 2019) scores

in mathematics was 0.023 which falls within the range ≤ 0.499. Thus, the computed 'r' value indicated a low but positive relationship between the BECE scores and the students' scores in SSCE mathematics. The coefficient of determination (r^2) for the computed (r) which was 0.00053 indicated that 0.05% of the variation in students' achievement scores in SSCE was explained by their scores in BECE mathematics.

3.2 Research Question 2

What is the validity of NECO-BECE in predicting the achievement of male and female students in NECO-SSCE mathematics?

Table 2: *Correlation Matrix between Male and Female Students' Achievement in NECO-BECE and NECO-SSCE*

Gender	N	Computed r	r^2
Male	1541	0.021	0.00044
Female	2369	0.029	0.00084

From Table2 above, the Pearson's 'r' for the male students was 0.021 and that of the female students was 0.029 which falls within the range ≤ 0.499. This indicated low but positive correlation between male and female students' achievement in BECE and their achievement in SSCE mathematics. The coefficient of determination (r^2) of 0.00044 for males and 0.00084 for females indicates 0.04% and 0.08% of the variations in the male and female students' scores in SSCE mathematics were explained by their scores in BECE mathematics.

3.3 Research Question 3

What is the consistency of students' achievement scores in NECO-BECE mathematics in predicting their academic achievement scores in NECO-SSCE mathematics?

The BECE scores of the students were collected and correlated with the SSCE scores of the students in mathematics. This was done for the academic sessions 2014, 2015 and 2016 for BECE and 2017, 2018 and 2019 for SSCE respectively. The index of relationship was used to determine the predictive strength of BECE scores on SSCE scores of the students' for the different periods. Summary of result is presented in table 3.

Table 3: *Correlational Matrix of Consistency of Students Achievement in NECO-BECE and NECO-SSCE.*

Period	N	Computed r	r^2
2014 – 2017	1065	0.034	0.00116
2015 – 2018	1444	0.083	0.00689
2016 – 2019	1401	0.018	0.00032

As shown in Table3, the computed 'r' between BECE (2014) scores and SSCE (2017) scores in mathematics was 0.034, between BECE (2015) and SSCE (2018) was 0.083 and between BECE (2016) and SSCE (2019) was 0.018 and they all fall within the range ≤ 0.499. Thus, the computed 'r' values indicated a low but positive relationship between the BECE (2014, 2015 and 2016) scores and the students' scores in SSCE (2017, 2018 and 2019) mathematics. The coefficient of determination (r^2) for the computed (r) values which were 0.00116, 0.00689 and 0.00032 respectively, indicate that 0.1%, 0.7% and 0.03% of the variations in students' achievement scores in SSCE mathematics for 2017, 2018 and 2019 were explained by their scores in BECE mathematics.

3.4 Hypotheses

Ho1: *There was no statistically significant relationship between students' scores in NECO-BECE and their scores in NECO-SSCE.*

Regression analysis was employed in determining the significance of relationship between NECO-JSCE and NECO-SSCE. Summary of analysis is presented in table 4.

Table 4: *Significance of the relationship between NECO-BECE scores and NECO-SSCE scores of the students' in Mathematics*

Computed r	R-square	Adjusted R-square	Std. Error	Beta	t.cal.	Sig. t
0.023	0.00053	0.0028	7.20192	0.023088	1.444	0.1489

As indicated in Table 4, the calculated 't' value of 1.444 was greater than the significance of 't' value 0.1489. The researchers therefore rejected the null hypothesis and conclude that there was significant relationship between students' scores in NECO-BECE and their scores in NECO-SSCE, mathematics.

Ho2: *The predictive strength of NECO-BECE scores on NECO-SSCE scores of male and female students in mathematics was not statistically significant.*

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Table 5: Significance of the relationship between NECO-BECE Scores of Male and Female Students and their NECO-SSCE Scores in Mathematics

Computed r	R-Square	Adjusted R-Square	Std. Error	Beta	t-cal.	Significance t
0.210	0.00042	0.00023	7.30686	0.020569	0.807	0.4197
0.029	0.00089	0.00040	7.11572	0.028672	1.395	0.1630

As indicated in Table 5, the calculated 't' values 0.807 for male students and 1.395 for the female students were greater than the significance of 't' values 0.4197 and 0.1630 respectively. The researcher therefore rejected the null hypothesis and concludes that there was significant relationship between male and female students' scores in NECO-BECE and their scores in NECO-SSCE, mathematics.

Ho3: *There was no statistically consistence significant relationship between students' scores in NECO-BECE (2014, 2015 and 2016) and their scores in NECO-SSCE (2017, 2018 and 2019).*

Regression analysis was employed in determining the significance of relationship between NECO-BECE and NECO-SSCE for the periods. Summary of analysis is presented in table 6.

Table 6: Significance of the consistency of relationship between NECO-BECE (2014, 2015 and 2016) Scores of the Students and their NECO-SSCE (2017, 2018 and 2019) Scores in Mathematics

Periods	Computed r	R-Square	Adjusted R-Square	Std. Error	Beta	t-cal.	Sig. t
2014 – 2017	0.034	0.00116	0.00027	6.62575	0.033998	1.140	0.2545
2015 – 2018	0.083	0.00697	0.00636	7.56794	0.083470	3.394	0.0007
2016 - 2019	0.018	0.00032	0.00030	7.54647	0.017972	0.719	0.4724

As can be seen in Table 6, the calculated 't' values 1.140, 3.394 and 0.719 were greater than the significance of 't' values 0.2545, 0.0007 and 0.4724 for the periods. The researcher therefore rejected the null hypothesis and concludes that there was significant relationship between students' scores in NECO-BECE (2014, 2015 and 2016) and their scores in NECO-SSCE (2017, 2018 and 2019), mathematics.

4.0 Discussion of Findings

Finding as presented in Table 1 revealed that there was a low but positive relationship between students' NECO-BECE scores in mathematics and their academic achievement scores in NECO-SSCE mathematics at r = 0.023. The coefficient of determination (r^2) of 0.00053 showed that 0.05% of the variation in students' achievement scores in SSCE mathematics was predicted or explained by their achievement scores in BECE mathematics. In addition, the relationship between students' achievement scores in NECO-BECE on their achievement scores in NECO-SSCE was statistically significant. The result showed that students' achievement in mathematics at the basic level (BECE) has a positive relationship although low on the academic achievement of the students at the senior secondary level (SSCE). The above result is in consonance with the study-finding of Ahmadu and Amuda (2013) who reported a positive and significant relationship between students' scores in teacher-made tests and the students' scores in SSCE mathematics. Also, the finding is related to that of O'kwu and Orum (2013) who reported a significant positive relationship between students' continuous assessment scores and their achievement scores in JSCE mathematics. More so, the above finding is in agreement to that of Kolawole and Ala (2013) who recorded a positive cum significant relationship between students' continuous assessment scores and their achievement scores in NECO-SSCE mathematics. The results showed that previous assessment measures such as continuous assessment and BECE been examined in this study have predictive value on students' future academic achievement. It therefore follows that assessment at the basic education level should be critically carried out to ensure that they maintain their future predictive value as has been espoused in this study and other related empirical studies.

Result of the study presented in table 2 showed that there was a low but positive relationship between male and female students' NECO-BECE scores in mathematics and their academic achievement scores in NECO-SSCE mathematics at r = 0.210 and 0.029. The coefficient of determinations (r^2) of 0.00042 and 0.00089 showed that 0.04% and 0.08% of the variations in male and female students' achievement scores in SSCE mathematics were predicted or explained by their achievement scores in BECE mathematics. In addition, there was significant relationship between male and female students' achievement scores in NECO-BECE and their achievement scores in NECO-SSCE in mathematics. This implies that the students' achievement scores in NECO-BECE on their achievement scores in NECO-SSCE was not moderated or influenced by their gender. This result has discredited the popular opinion that science subjects like mathematics is peculiarly meant for the male gender and as such, the female students are not expected to perform at par with them. With this result, members of the academia and the general public will be made to understand that achievement in mathematics is not gender sensitive and therefore, the issue of gender stereotype in students' achievement in mathematics should not be a thing of continued debate.

Result of analysis presented on table 3 revealed that NECO-BECE scores consistently predicted the academic

achievement scores of the students' in NECO-SSCE between 2014 – 2019. The r-indices of 0.034, 0.083 and 0.018 showed a positive but low relationship between the students' achievement scores in BECE and their achievement scores in SSCE mathematics conducted by NECO for the academic sessions under study. The coefficient of determination (r^2) of 0.00116, 0.00689 and 0.00032 also revealed that 0.1%, 0.7% and 0.03% of the variations in the students' achievement scores in SSCE were explained or predicted by their achievement scores in BECE. The implication of the results is that the students achievement scores in BECE in predicting their achievement scores SSCE was consistent for 2014 and 2017, 2015 and 2018, as well as 2016 and 2019 respectively. This result has added credence to and as well justified the operational value of the new 9years basic education program. It therefore follows that stakeholders in the education sector should keep improving on the standard of operations hitherto; the teaching of mathematics and assessment standards at the basic level since its outcome has been proven to have futuristic impact on students' academic achievement especially at the senior secondary school level.

5.0 Conclusions of the Study
In line with the findings, the following conclusions were drawn:
1.   The BECE scores of the students had a low but positive relationship with their achievement scores in SSCE;
2.   The BECE scores of the students predicted achievement in SSCE; and
3.   The predictive validity of BECE on SSCE was not significantly moderated by gender because BECE scores positively predicted both male and female students' achievement in SSCE respectively.

6.0 Recommendations of the Study
Based on the findings of the study, the following recommendations were made:
1.   The BECE preparation of the students should be given serious attention because of its proven predictive value on achievement at the SSCE level.
2.   The Federal Ministry of Education should ensure that only professionally trained and qualified teachers are recruited to teach mathematics especially at the basic level.
3.   Secondary school administrators and guidance and councilors should consider the NECO-BECE in determining the future performance of students and in counseling them appropriately in making career choice.
4.   Mathematics teachers should improve on their instructional behaviour to ensure adequate coverage of the junior secondary curriculum content and instructional practice in order to enhance students' performance at junior secondary level which could translate to enhanced performance at the senior secondary level.
5.   The NECO should continually improve on the examination conduct in terms of administration and reportage.
6.   Countries across the world should at intervals access the predictive strength of students' achievement on a predictor examination on the students achievement in a criterion examination.

References
[1]. Achor, E.E., Aligba, O.S. & Omananyi, O.E. (2010). Predictive power of two selected examination scores in senior secondary certificate examination result of pre-degree science students of Benue state University, Markurdi, Nigeria. *Journal of Science and Technology Education Research,* 1(2), 37-43.
[2]. Adeniyi, C.O. & Suleiman, M.F. (2015). Effect of personalized system of instruction on students achievement in mathematics. ABACUS: *Journal of Mathematical Association of Nigeria (MAN),* 40(1), 122-133.
[3]. Ahmadu, M. & Amuda, M.Y. (2013). Predictive Validity of teacher made tests in relation to students performance in sciences in Maiduguri secondary schools of Borno state, Nigeria. *International Journal of Technology and Educational Research,* 1(1), 90-96.
[4]. Ajai, J.T. & Imoko, I.I. (2015). Gender differences in mathematics achievement and retention scores: A case study of problem based learning method. *International Journal of Research in Education and Science (IJRES),* 1(1), 45-50.
[5]. Azuka, B.F. (2013). Activity-based learning strategies in the mathematics classroom. *Journal of Education and Practice,* 4(13), 8-14.
[6]. Bamidele, A.F. (2015). Predictive validity of students entry qualifications into mathematics programme in Nigeria Osun and Oyo States colleges of education. *Journal of Education and Human Development,* 4(4), 209-217.
[7]. Bashir, N., Abubakar, K.O. & Garba, B.K. (2016). *The importance of mathematics teaching and learning: Problems and prospects*. Oxford: Oxford University Press.
[8.]. Elishama, L.J. (2014). Predictive validity of junior secondary school examination in Yola south local government area of Adamawa state. *Journal of Education and Policy Review,* 6(2), 111.118.
[9]. Evroro, E.S. (2015). Predictive validity of UTME scores in Delta state university Abraka, Nigeria. *International Journal of Multidisciplinary Academic Research,* 3(1), 9-17.

[10]. Hinneh, J.T. & Nenty, H.J. (2016). Analysis of the predictive validity of students' performance in core sciences on Liberian SHSCE with WASSCE as the criterion. *Journal of Research and method in Education,* 6(4), 25-31.

[11]. Komba, S.C., Kafanabo, E.J., Tryphone, D., & Kira, E.S. (2013). The predictive validity of form two secondary education examination (FTSEE) on students' performance in the certificate of secondary education examination (CSEE) in Biology subject: A Tanzania perspective. *Journal of Education and Practice,* 4(4), 111-117.

[12]. Nigeria Educational Research and Development Council (NERDC, 2008). Public examination as predictors of university students' academic achievement. Zero Draft Research Report, ABUJA: NERDC.

[13]. O'kwu, E.I. & Orum, C.C. (2013). Junior secondary school certificate examination results as predictor of students' performance in mathematics in the senior secondary school certificate examination in Benue state, Nigeria. *International Journal of Educational of Research,* 4(2), 130-133.

[14]. Olaewe, O.O. & Abioye, B.A. (2014). Predictive validity of UTME scores on the final degree results of university students in Nigeria. *Research Journal in Organizational Psychology and Educational Studies,* 3(3), 225-229.

[15]. Olupemi, P. (2014). Relationship between continuous assessment and junior school certificate examination mathematics scores in Ekiti State. *International Journal of Liberal Arts and Social Sciences,* 2(6), 54-64.

[16]. Onuka, A.O., Ragi, M.A.A. & Onabamiro, A.T. (2010). The predictive power of junior secondary school achievement on senior secondary school achievement. *West African Journal of Education,* 10(20), 84-90.

[17]. Orubu, M.E.N. (2013). A comparative study on the predictive validity of students' performance at the senior secondary certificate mathematics from junior secondary certificate scores in Delta and Edo states, Nigeria. *Journal of Educational Research and Evaluation,* 12(4), 153-165.

[18]. Orubu, M.E.N. (2012). UME and POST-UME scores as predictors of undergraduate academic performance in Delta state university, Nigeria. *Journal of Educational Research and Evaluation,* 11(1), 60-70.

[19]. Tewari, D.D. (2014). Is matric mathematics a good predictor of students' performance in the first year of university degree? A case study of faculty of management studies, university of Kwazulu-Natal South Africa. *International Journal of Educational Science,* 8(1), 233-237.

[20]. Ugwuanyi, C.C. (2015). Effectiveness of cooperative learning method in mathematics achievement in Nigeria. *International Journal of Cross-Disciplinary Subjects in Education (IJCDSE),* 6(2), 2159-2164.

[21]. Ugwuda, S.O. & Abonyi, O.S. (2013). Predictive validity of NECO-JSCE on students' achievement in NECO-SSCE examinations. *Journal of the Science Teachers Association of Nigeria (JSTAN),* 48(1), 95-103.

[22]. Wushishi, D.I. & Usman, H. (2013). Relationship between senior secondary school certificate examination (SSCE) mathematics grades and final Nigeria Certificate of Education (NCE) mathematics students results of state colleges of education. *International of Humanities and Social Science Invention,* 2(2), 6-21.