

Senior School Certificate Examinations as Predictor of Students' Academic Performance in Mathematics in Southeast Universities, Nigeria

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Abstract:

This paper examined senior school certificate examinations as predictor of students' academic performance in mathematics in southeast Nigeria universities. It also revealed the relationship between the academic performance of students in each level of the university examinations and their corresponding secondary school certificates examination. A total of 275 2018/2019 part 4 mathematics students that sat for SSCE and had complete records from part 1 to part 4 were involved in the three selected south-east universities. Ex post facto design was adopted. The grades of all the mathematics students sampled were collected from the office of admission while the cumulative grade point average were collected from department of the sampled universities. The results revealed there was relationship between SSCE mathematics scores and academic performance of mathematics students at all levels in the universities. The results also showed that there was no influence of the mode of entry on the academic performance in all levels and the two examining bodies were equivalent. Based on this finding, it was recommended that both West African Examination Council (WAEC) and National Examination Council (NECO) should be used as mode of entry into mathematics department.

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Introduction

The ultimate goal of every secondary school student is how to get into higher institution. The secondary education remains the terminal point for many who are unable to secure admission to pursue a degree course in any of sciences especially mathematics due to poor performance at ordinary level academic performance. The importance of mathematics cannot be over stressed, as it is the base of all sciences. All students must learn and pass it at the secondary school level before they advance to university (Olofin & Kolawole, 2020). Before any science student could be admitted to study mathematics in any Nigeria University, he/she must satisfy a minimum entry grade.

In a study carried out by Ojerinde (1998), he found that there was a positive and significant relationship between candidates' performance in Senior School certificate examination (SSCE) and the university performances of the same set of students, and that the SSCE has fair predictive power on university performance. Kolawole and Ilugbusi (2007) also found in their study that there was a significant linear and positive relationship between the basic entry grades and academic performance of university under graduates. The West African Examination Council (WAEC) was established in 1952 to replace university of Cambridge local Examination syndicate, the City and Guilds London institute, the London Chamber of Commerce and Royal Society of Arts. The certificate awarded has gained national and international recognition since its establishment. However, WAEC has been intensely criticized by scholars and parents for its deficiency. Some of the problems identified include examination malpractices, indiscriminate seizure of candidates' results, monopoly, delay in the release of examination results, mass cancellation of results, leakages and corrupt staff, among others (Kolawole 2001, Alonge; 2002; Ayodele, 2004).

To solve those problems committees were set up in university of London, institute of education and they recommended that other examining bodies should be set up to reduce the lapses of the embattled WAEC. Based on this recommendation, the National Board for Educational Measurement (NEBM) was transformed to National Examinations Council (NECO) to conduct national examinations simultaneously with WAEC so as to break the monopoly of WAEC thus; enabling Nigerians to monitor and maintain their own educational standard, to reduce the work load of WAEC which many believed has been over stretched beyond capability.

The purpose of this study was to examine the relative contribution of predictor variable (SSCE) on the criterion variable (Cumulative Grade Point Average) of mathematics students at all level in selected universities in south-east Nigeria.

Research Hypotheses

The following null hypotheses were generated

1. There is no significant relationship between academic performance of mathematics students in each level of universities examination and their SSCE.
2. There are no multiple relationships between mathematics students' academic performance at all levels in the university and their SSCE.
3. There is no significant difference between academic performance of mathematics students and their mode of entry in south-east universities.

Methodology

The design used for this study was an ex-post facto design. This is because all the research variables had already existed before the commencement of the study and hence, the researcher neither controlled nor manipulated the research variables. The researcher just

collected the data and used them as they occurred naturally. The study population consisted of all universities in south east Nigeria. The study sample consisted of 275 mathematics students. Stratified and purposive sampling techniques were used to select three in south-east, Nigeria universities. All 2018/2019 part 4 mathematics students in the selected universities who sat for SSCE and had complete examination records from part 1 to part 4 constituted the subject for the study.

The instruments for this study were obtained from two sets. The first set consisted of the records which contained all the WAEC/NECO grades of mathematics student admitted during the 2015/2016, academic session. The second set consisted of the records which contained all the cumulative grade point Average (CGPA) of the sampled students in mathematics for 2015/2016, 2016/2017, 2017/2018 and 2018/2019 academic sessions. The grades of all mathematics students sampled were collected directly from the admission office of the selected universities, while the Cumulative Point Average (CGPA) of the mathematics students sampled were obtained from the selected universities after getting all the necessary permission. Data collected were analyzed by t-test, regression analysis as well as the analysis of variance (ANOVA). All the hypotheses were tested at 0.05 level of significance.

Results and Discussion

The data collected were analysed for SSCE with their CGPA at all levels in selected Nigeria universities.

Tables 1 and 2

Table 1: The SSCE stannite scores and their grade

WAEC/NECO Grade	A ₁	B ₂	B ₃	C ₄	C ₅	C ₆	D ₇	E ₈	F ₉
Weights	9	8	7	6	5	4	3	2	1

Table 2: The University CGPA level and their grades

CGPA	4.50-5.00	3.50-4.49	2.40-3.49	1.50-2.39	1.00-1.49	0.00-0.99
Grade	A	B	C	D	E	F

Table 3: Analysis of variance between predictor (SSCE) and criterion variables, CGPA as criterion for mathematics students

Source of Variation	N	Part1r _c	Part2r _c	Part3r _c	Part4r _c
SSCE	275	0.58	0.51	0.62	0.55

Table 4: Analysis of variance between SSCE and CGPA of mathematics student

Source of Variation	Constant SSCE (R)		R ²	Beta	F _c	F _t
Part I	2.841	0.58	0.000	0.51	3.44	2.12
Part II	2.912	0.51	0.000	0.53	2.38	
PART III	2.714	0.62	0.000	0.52	3.52	
PART IV	2.168	0.55	0.001	0.46	2.46	

Table 5: T-test showing mode of entry and academic performance of universities undergraduate Mathematics

Level	Group	N	Mean	SD	t _c	T ₁
Part I WAEC	145	1.98	1.06	1.42	1.05	

NECO	130	2.47	1.04	1.41		1.960
Part II WAEC	145	2.29	1.09	1.04	1.408	1.960
NECO	130	2.31	1.08	1.09		
Part III WAEC	145	2.14	1.12	1.38	1.12	1.960
NECO	130	2.39	1.14	1.43		
Part IV WAEC	145	2.12	1.16	1.68	0.802	1.960
NECO	130	2.14	1.052	0.97		

Hypothesis 1: There is no significant relationship between academic performance of mathematics students in each level of the universities examination and their SSCE.

Table 3 shows that there was positive relationship between SSCE mathematics result and academic performance of mathematics students at all level in selected South-east universities. Hence, the null hypothesis is rejected.

Hypothesis 2: There are no multiple relationships between Mathematics Students' academic performance at all levels in the universities and their SSCE.

Table 4 shows that there were relationships between SSCE scores and academic performance of mathematics students at all levels in the universities. The overall CGPA revealed that SSCE scores could only explain just only 0.1% variation of all the levels in mathematics shown by the values of R^2 . Considering the contribution of SSCE scores to each of the CGPA, Beta values showed that SSCE scores had very fair predictive strength for part I, II, III and IV in mathematics. Since all F_c was greater than F_t at 0.05 level of significance, the null hypothesis is rejected. This means that there are multiple relationships between SSCE scores and academic performance of mathematics students at all levels in the universities.

Hypothesis 3: There is no significant difference between academic performance of mathematics students and their mode of entry in South-east universities.

Table 5 shows that mean scores and standard deviations showed that there was a slight difference between all levels of academic performance and SSCE scores, t-calculated is less than t-table at 0.05 level of significance. Therefore, the null hypothesis is not rejected. This implies that there is no influence of the mode of entry on universities levels. This means that NECO and WAEC are equivalent.

Conclusion

The findings of this study revealed that there was relationship between SSCE mathematics Scores and the academic performance of undergraduate mathematics students at all level of the universities. The study is in line with previous similar studies by Ojerinde (1998) who found that there was a positive and significant relationship between candidates' performance in SSCE and the university performances of the same set of students and that the SSCE has fair predictive power on university performance and also Kolawole and Ilugbusi (2007) who found in their study that there was a significant linear and positive relationship between the basic entry grades and academic performance of university undergraduates Furthermore, Table 5 showed that mean scores and standard deviations of both WAEC and NECO are valid, reliable and equivalent.

Recommendations

Based on the findings of this study the following recommendations were made.

1. WAEC and NECO results should remain the mode of entry of students into mathematics department.

2. As far as undergraduate programme is concerned in South east universities, there should be emphasis on the teaching and studying of first session courses as first session CGPA could be used to predict subsequent academic performance of mathematics students.

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