



Performance Appraisal of NECO and WAEC SSCE: An Empirical Evidences from Mathematics and Physics

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ABSTRACT

This study compares the performance of secondary school students on WAEC and NECO SSCEs from 2000 to 2013 using a public school in Osun State as a case study. The researchers, having reasons to doubt the parallel nature of the examinations conducted by WAEC and NECO, undertook a quantitative comparative analysis on the performances of candidates in the SSCE in mathematics and physics. Yearly time series data was collected between 2000-2013 on number of students who passed mathematics and physics at credit level or above in WAEC and NECO. Descriptive and deductive research approaches were used namely t-distribution and correlation analysis to detect the significance of the difference of means and correlation coefficients respectively between the successes recorded in WAEC and NECO in the two subjects. In both cases null hypotheses were rejected at 0.05 level of significance, while bar chart and line graph were employed to visually substantiate the aforementioned statistical decisions. The study showed that WAEC and NECO successes in both subject are not correlated, and that difference of means between the two groups are statistically significant.

Keywords: Correlation Coefficient, Examination, Performance, Success, NECO, WAEC.

INTRODUCTION

The setting of public examination is highly skilled and professional which involves not only the setting of questions and devising activities of testing the achievement of a comprehensive range of curriculum objectives, but also of ensuring that many different examiners and script markers work to the same standard. The standard of achievement has to be established not only for each subject of paper, but care has to be taken to ensure that the levels expected in one curriculum subject are comparable with those of all other subjects (Bande, 2013).

National Examination Council (NECO) was established in 2001 following the passage of an Act of the National Assembly. It was established as an alternative to West African School Certificate Examination (WASCE) for secondary schools. Consequently, students who are not opportune to register for the WAEC Senior School Certificate Examination (SSCE), could register for the NECO SSCE and ever since its establishment in 2001, it has prospered. Presently there is NECO examination for both junior and senior secondary schools including NECO General Certificate in Education (GCE). Despite its teething problems, which occasioned discrimination against its result by some institutions of higher learning in the country, it has continued to subsist. At first, there was low enrolment resulting from initial misgivings about the quality of the examination and its acceptability worldwide. The initial misgivings were based on comparative assessment between WASC and NECO. As it were, WASC had acquired a better reputation as a sub-regional examination, while NECO is entirely a Nigerian examination. Those who harboured the intention to use their results beyond the African shores were not comfortable with NECO

examination. But with the federal government solidly behind NECO, it has been able to overcome its initial hiccups and has acquired its reputation as an examination body.

The two O' Level examination bodies in Nigeria were found to similar considering the distribution of examination across the levels of the cognitive domain is concerned (Okoye and Nwafor, 2009). Public examination for deciding movement on the ladder of educational pursue in Nigeria is generally accepted by Nigerian students (Longe and Ajike, 2014; Bolu-Steve *et al.*(2014).

Literature Review

Alimi *et al.*, (2012) in a research conducted in Ondo state opined that education in Nigeria is productive and that the declination in educational system is not as it is being noised. The research emphasized that with input increase of 30%, there is a noticeable output increase ranging between 39 and 139 percent. Academic performance of students in JSC and SSCE examinations in Ondo and Ekiti states were discovered to be low (Adeyemi, 2011). Obioma and Salawu discovered that out of all O'Level examination bodies in Nigeria, students' performance in WASSCE examination is the best predictor of student performance in higher institution when they are admitted into any Nigerian Universities (Obioma and Salau, 2007). A research conducted among 1800 students in Benue State, Nigeria revealed that NECO Biology was found to be of lower reliability (200-2002) than WAEC because the Standard Error of Measurement (SEM) of WAEC was higher (Obinne, 2011).

Ajayi and Awogbemi, (2012) studied the relationship between WAEC and NECO examination Mathematics results in Osun State and discovered that there is a statistically significant relationship. Bamidele and Adewale, (2013) opined that WAEC, NECO and NABTEB mathematic achievement Examinations are highly reliable, and valid. It also revealed that these examination bodies are comparable and equivalent (Bande, 2013; Bamidele and Adewale, 2013). Mamman and Eya (2014) studied performance pattern in Mathematics for ten years consecutively (2004-2013) and opined that there existed an unstable performance pattern and the observed and predicted rates indicated that less than 50% of the candidates passed at credit level in Nasarawa state, Nigeria. There is no significant difference in students' performance in WAEC and NECO mathematics based on gender but location (urban or rural) of the school is a factor as revealed by research in Cross River state (Anagbogu, Ihejamaizu and Uba, 2014). Test objective questions from the two testing bodies are equal (Kolawole, 2007; Anagbogu *et al.*, 2014). A correlational analysis of students' achievement in WAEC and NECO mathematics from four selected secondary school in Ifedayo, Osun state revealed that there is a significant positive relationship between mathematics performance in WAEC and NECO (Ajayi and Awogbemi, 2012). Daniel discovered that more items on NECO SSCE were at higher level of difficulty and were generally less discriminatory than WASSCE mathematics questions while more WASSCE items were at appropriate level of difficulty and had better discriminating indices (Daniel, 2014). Performance of students in Mathematics has been persistently poor over the years. Moreover, the projection between 2014 and 2020 reveals poor performance except a drastic step is taken to rescue the situation (Mama and Eya, 2014).

Amuche *et al.* (2014) in a research that considered candidate from year 2008 to 2012 inclusive, discovered that students in private secondary school in Taraba performed more in WAEC physics than NECO physics while their counterpart from public schools performed more in NECO physics than WAEC physics (Amuche *et al.*, 2014).

Statement of Problem

In a country that is aiming at science and engineering development for sustainable economic, such as Nigeria, performance of students in backbone subjects (Physics and Mathematics) cannot but be a point of concentration. Many researches had been conducted on performance of students in WAEC and NECO in different states of the federation but much has not been done in Osun State, Nigeria. Hence this research which evaluates performance of students in these subject in pursuance of vision 20:2020.

MATERIAL AND METHOD

Time series data collected from record department of St. Michael Grammar School, Ode-Omu was used. The data spanned a period of fourteen years (2000-2013) which has to do with the number of successes recorded by students in Mathematics and Physics. Student’s performance was tagged success when it is 50% and above i.e. C_6 and above.

Test for Equality of Means

This test was carried out using Student t distribution.

Hypothesis:

$$H_0: \mu_1 = \mu_2$$

Versus

$$H_1: \mu_1 \neq \mu_2$$

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \quad (1)$$

Correlation Coefficient

The quantity r, called the linear correlation coefficient, measures the strength and the direction of a linear relationship between two variables. The linear correlation coefficient is sometimes referred to as the Pearson product moment correlation coefficient in honor of its developer Karl Pearson. According to Ajayi *et al.*, (2012), computational formula for correlation coefficient, r, as defined or deduced by Karl Pearson is given below:

$$r = \frac{n \sum xy - (\sum x)(\sum y)}{\sqrt{n(\sum x^2) - (\sum x)^2} \sqrt{n(\sum y^2) - (\sum y)^2}} \quad (2)$$

Where n is the number of pairs of data. The value of r is such that $-1 \leq r \leq +1$.

Hypothesis

$$H_0: \rho = 0$$

versus

$$H_1: \rho \neq 0$$

RESULTS AND DISCUSSION

Table 1: Mathematics results of students in WAEC and NECO (2000-2013)

| YEAR | WAEC | | | NECO | | |
|------|----------------|------|------|----------------|------|------|
| | NO OF STUDENTS | PASS | FAIL | NO OF STUDENTS | PASS | FAIL |
| 2000 | 151 | 71 | 80 | 55 | 36 | 19 |
| 2001 | 133 | 60 | 73 | 90 | 65 | 25 |
| 2002 | 170 | 72 | 98 | 67 | 51 | 16 |
| 2003 | 112 | 49 | 63 | 77 | 64 | 13 |
| 2004 | 99 | 32 | 67 | 70 | 30 | 20 |
| 2005 | 108 | 40 | 68 | 84 | 70 | 14 |
| 2006 | 121 | 63 | 58 | 90 | 72 | 18 |
| 2007 | 105 | 15 | 90 | 85 | 69 | 16 |
| 2008 | 93 | 21 | 72 | 72 | 61 | 11 |
| 2009 | 110 | 20 | 90 | 115 | 98 | 17 |
| 2010 | 115 | 54 | 61 | 112 | 91 | 21 |
| 2011 | 93 | 37 | 58 | 102 | 69 | 33 |
| 2012 | 91 | 36 | 55 | 99 | 71 | 28 |
| 2013 | 101 | 40 | 61 | 83 | 59 | 24 |

Source: St. Michael Grammar School, Ode-Omu.

Table 2: Physics results of students in WAEC and NECO (2000-2013)

| YEAR | WAEC | | | NECO | | |
|------|----------------|------|------|----------------|------|------|
| | NO OF STUDENTS | PASS | FAIL | NO OF STUDENTS | PASS | FAIL |
| 2000 | 55 | 21 | 34 | 21 | 13 | 8 |
| 2001 | 50 | 23 | 27 | 35 | 24 | 11 |
| 2002 | 69 | 28 | 41 | 27 | 18 | 9 |
| 2003 | 47 | 18 | 29 | 31 | 19 | 12 |
| 2004 | 40 | 16 | 24 | 24 | 16 | 8 |
| 2005 | 41 | 18 | 23 | 33 | 23 | 10 |
| 2006 | 43 | 15 | 28 | 38 | 25 | 13 |
| 2007 | 39 | 13 | 26 | 36 | 22 | 14 |
| 2008 | 35 | 15 | 20 | 29 | 20 | 9 |
| 2009 | 42 | 19 | 23 | 48 | 38 | 10 |
| 2010 | 44 | 17 | 27 | 45 | 30 | 15 |
| 2011 | 40 | 12 | 28 | 42 | 35 | 7 |
| 2012 | 38 | 14 | 24 | 43 | 31 | 12 |
| 2013 | 43 | 18 | 25 | 34 | 28 | 6 |

Source: St. Michael Grammar School, Ode-Omu

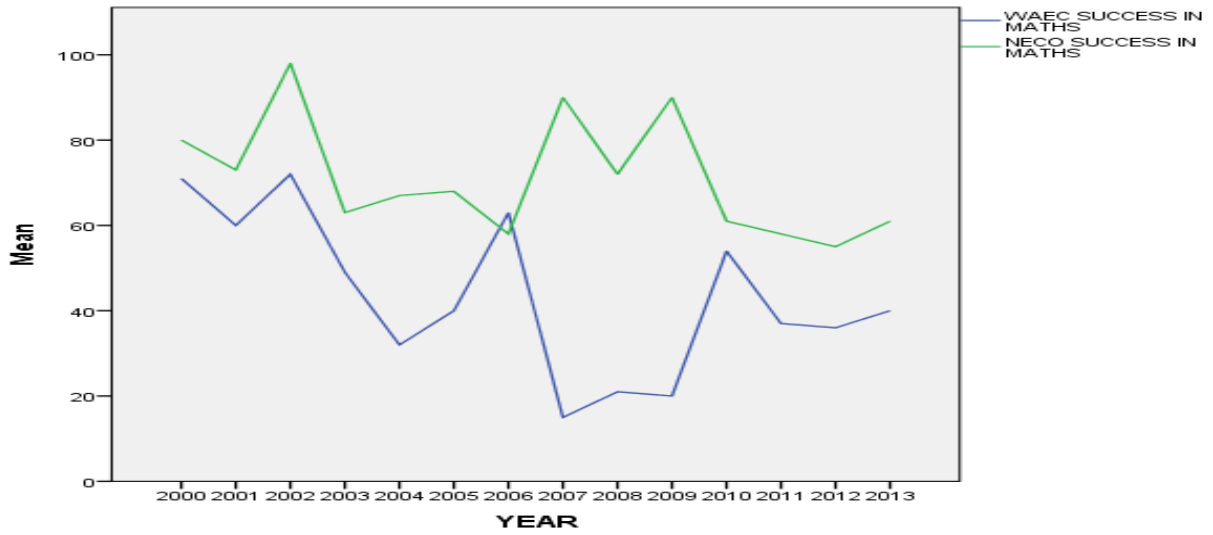


Figure 1: Line graph showing success of students in WAEC and NECO

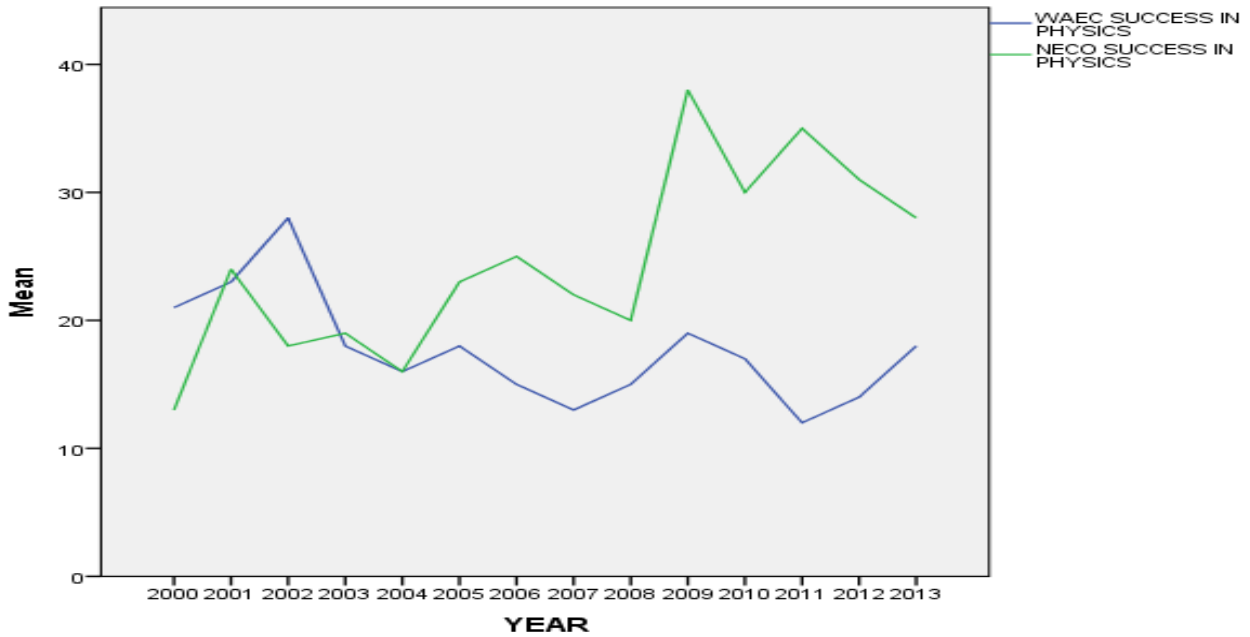


Figure 2: Line graph comparing students' success in WAEC and NECO Mathematics

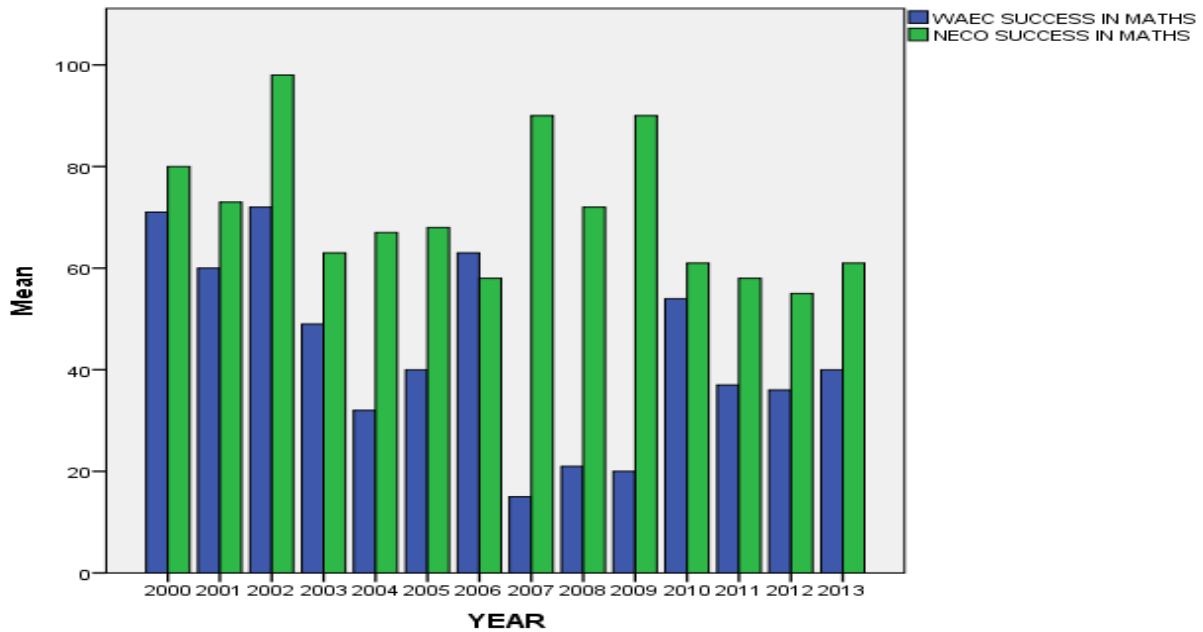


Figure 3: Bar chart comparing successes in WAEC and NECO mathematics.

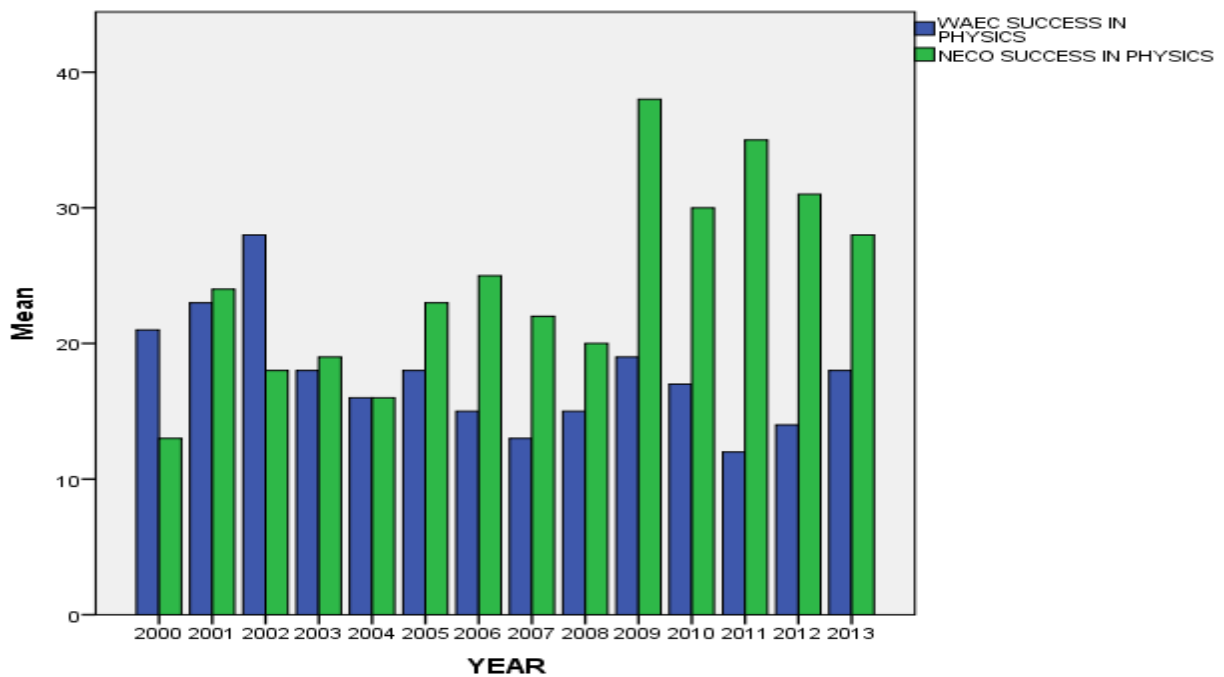


Figure 4: Bar chart comparing successes in WAEC and NECO physics.

Table 3: Descriptive statistics for WAEC and NECO Mathematics

| Descriptive Statistics | | | |
|------------------------|-------|----------------|----|
| | Mean | Std. Deviation | N |
| WAEC SCORES IN MATHS | 43.57 | 18.579 | 14 |
| NECO SCORES IN MATHS | 71.00 | 13.644 | 14 |

Table 4: Correlation of WAEC and NECO Mathematics

| Correlations | | | |
|----------------------|---------------------|-------------------------|-------------------------|
| | | WAEC SCORES IN MATHS | NECO SCORES IN MATHS |
| WAEC SCORES IN MATHS | Pearson Correlation | 1 | -.020 |
| | Sig. (2-tailed) | | .945 |
| | N | 14 | 14 |
| NECO SCORES IN MATHS | Pearson Correlation | -.020 | 1 |
| | Sig. (2-tailed) | .945 | |
| | N | 14 | 14 |

Table 5: Descriptive statistics for WAEC and NECO Physics

| Descriptive Statistics | | | |
|------------------------|-------|----------------|----|
| | Mean | Std. Deviation | N |
| PHWAEC | 17.64 | 4.236 | 14 |
| PHNECO | 24.43 | 7.251 | 14 |

Table 7: Correlations of WAEC and NECO Physics

| Correlations | | | |
|--------------|---------------------|--------|--------|
| | | PHWAEC | PHNECO |
| PHWAEC | Pearson Correlation | 1 | -.355 |
| | Sig. (2-tailed) | | .212 |
| | N | 14 | 14 |
| PHNECO | Pearson Correlation | .355 | 1 |
| | Sig. (2-tailed) | .212 | |
| | N | 14 | 14 |

Table 8: T-Test table for the exams in Mathematics

| Group Statistics | | | | | |
|------------------|-------------------|----|-------|----------------|-----------------|
| | GROUPING VARIABLE | N | Mean | Std. Deviation | Std. Error Mean |
| MATHNECOWAEC | WAEC | 14 | 43.57 | 18.579 | 4.966 |
| | NECO | 14 | 71.00 | 13.644 | 3.646 |

Table 9: T-Test table for the exams in Mathematics

| Independent Samples Test | | | | | | | | | | |
|--------------------------|-----------------------------|---|------|------------------------------|--------|-----------------|-----------------|-----------------------|---|---------|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | T | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| MATHNECOWAEC | Equal variances assumed | 1.820 | .189 | -4.452 | 26 | .000 | -27.429 | 6.161 | 40.092 | -14.765 |
| | Equal variances not assumed | | | -4.452 | 23.862 | .000 | -27.429 | 6.161 | 40.147 | -14.710 |

DISCUSSION

Having extensively analyzed the data using appropriate statistical tools, the following results evolved and are briefly discussed as follows: Table 3 revealed that success rate in Mathematics is better than that of Physics. WAEC and NECO average scores for students in Physics are respectively 17.64 and 24.43 while in mathematics, the average scores are 43.57 and 71 respectively. The null hypothesis was rejected for correlation coefficient of $r = -0.02$. It can be concluded that successes recorded by students in mathematics in both NECO and WAEC are not correlated. The result obtained for physics where the correlation coefficient $r = -0.355$ is similar to that of mathematics. The successes of students in the two examination bodies are not correlated as revealed in tables 4 and 5.

It was also shown that the numbers of successes recorded in both subjects are not the same when juxtaposed using WAEC and NECO subject matter as revealed in tables 6 and 7. In view of the foregoing, it can be concluded that the two examinations are not parallel because of noticeable gaps when compared and the fact that the number of successes recorded by the two examination bodies are not correlated. The scope of the study is however limited to the school used as case study within the coverage of 2000-2013.

CONCLUSION AND RECOMMENDATION

It was concluded that the examination conducted by these two bodies are not parallel because students who perform very well in WAEC mathematics should be able to perform very well in NECO mathematics and students who perform very well in WAEC physics should be able to perform very well in NECO physics so as to confirm the notion that the two bodies produce equivalent results.

In other to achieve uniformity in standard, it is recommended based on the result of the findings that there should be a Joint Evaluation Committee that will be comprised of representatives of WAEC, and NECO as well as other stake holders to serve as monitoring team for the constructions of examination items, conduct of examinations and certifications. It is also recommended that as much as possible, examination fraud must be eradicated both at urban and rural areas.

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