

Relationship between students' grades in WAEC and NECO Chemistry examination in Anambra State

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Abstract: Chemistry national examination results consistently for two years has recorded low grades in WAEC and NECO examinations. The recurrent poor performance of secondary school students in Chemistry in Senior School Certificate Examination (SSCE) conducted by West African Examination Council (WAEC) in Nigeria is disturbing and embarrassing. The purpose of the study was to investigate the relationship between students' grades in WAEC and NECO Chemistry examination in Anambra State. Three research questions were raised while three hypotheses were tested at 0.05 level of significance. Correlational research design was utilized for the study. The population of the study comprised 8012, 7628 and 7520 results of secondary school students who sat for WAEC and NECO Chemistry examinations respectively in Anambra State for the 2015/2016, 2016/2017 and 2017/2018 academic sessions. The sample for the study comprised 1800 results for the 2015/2016, 2016/2017 and 2017/2018 academic sessions obtained through stratified and multi-stage random sampling techniques. Data analysis was done using Pearson's Product Moment Correlation Coefficient and Pearson Correlation Critical value table. The findings showed that a positive relationship existed between students' grades in WAEC and NECO Chemistry examination across the years under review. Again, there is a significant relationship between students' grades in WAEC and NECO examinations across the years under review. It was recommended in view of the findings that test developers should ensure that rigorous item analysis is done before the administration of questions papers for both WAEC and NECO exams. This is with a view to ensuring that a positive relationship exists between the performances of students in the both exams.

I. INTRODUCTION

In Nigeria, Senior School Certificate Examination (SSCE) conducted by West African Examination Council (WAEC) has recorded a recurrent poor performance of secondary school students in Chemistry which is considered rather disturbing and embarrassing. For instance, the results released by WAEC in 2017 revealed that a high number of the candidates that sat for the examination failed Chemistry (WAEC Chief Examiner, 2017). A similar trend was observed in the most recently released West Africa Senior School Certificate Examination (WAEC) results by West Africa Examination Council which declared that a few number of the candidates were successful in Chemistry (WAEC Chief Examiner, 2018). Government, examination bodies, teachers and parents are, however passing the buck on who to blame for this worrisome trend.

In the wake of various complaints from members of the public in 1977 regarding the performance of WAEC, the Federal

Government of Nigeria in 1977 set up the Sogbetan commission of inquiry to look into these complains. Other panels were set up in subsequent years on examination in Nigeria that gave birth to the National Examination Council (NECO) in April, 1999, charged with the responsibility of conducting May/June Senior School Certificate Examinations (SSCE) for school based candidates while WAEC was to take charge of the same examination for private candidates (National Examination Council, 2003).

NECO has suffered criticism on grounds of mass failure in some subjects such as Chemistry, issuance of results to dead and absentee students, examination misconduct, examiners not sufficiently motivated, meager allowances paid late or not paid at all, poorly marked scripts or script not marked at all, rejection of certificates as universities are being compelled by law to accept NECO (Onyekwere, 2010). In addition to the above, Oluwatayo (2007) citing NECO Report, said that in June/July 2000, students who were dead before the examination eventually had results and students who were absent during the examination also had good grades.

Forty percent of total score in every subject a student will offer in NECO comes from the course assessment test organized by secondary schools while the NECO examination scores make up the remaining sixty (Ejinkeonye, 2004). Ejinkeonye further stressed that it is the desire of every school, especially the private ones that its students pass very well in order to attract more enrollments. As a result of this, there may be a tendency for some school authorities to moderate upwardly the continuous assessment scores of their students in subjects such as Chemistry. This places their students at an advantage so that no matter what they score in the NECO examination, it would be difficult not to pass. This combination of internal assessment with examination scores is apparently not practiced in WAEC. Students take NECO examination in all the school subjects, of which chemistry is one of them.

Chemistry NECO results consistently for two years has recorded low grades. For instance, far below average level was recorded in high quality grade in 2017 and 2018 respectively (NECO Chief Examiner, 2017 & 2018). This shows that in quantitative term, there was a fluctuation in the academic performance of students in chemistry. The practical issue lying just below the surface of the never-ending debate in educational circles is whether students' performance scores in WAEC Chemistry examinations are correlates of their

scores in NECO Chemistry examinations. The candidates are exposed to the WAEC and NECO examinations at a chin interval, this arrangement is likely to make the candidates to perform higher in NECO examination since this is the last in the series of the examinations they are writing in secondary schools. Additionally, the prediction of a future examination result could be made on the basis of the results of an earlier examination; hence it is presumed that a student who scored an 'A' grade in WAEC Chemistry examination should as well score the same or about the same in NECO Chemistry examination. The relationship between students' grades in WAEC and NECO chemistry examinations could be affected by a couple of factors; gender inclusive.

Gender is a common term that refers to male and female. Adesoji and Kenni (2013) observed that gender has significant influence on chemistry students' academic performance in WASSCE while it has little or no influence on chemistry students' performance in NECO. According to Anagbogu, et al. (2014), there is no significant relationship between students' gender and their performance in WAEC and NECO mathematics examination. However, it will be research-worthy to ascertain the relationship between gender and students' grades in WAEC and NECO Chemistry examination.

Salako, et al. (2017) compared 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 findings of 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. Ajao and Awogbemi, (2012) did a correlation analysis of students' achievement in WAEC and NECO Mathematics of 120 students using survey design. The analysis showed that there was a significant positive relationship between WAEC results and NECO in Mathematics in all the selected schools contrary to the hypothesis that said that there was no relationship in WAEC and NECO Mathematics results in the schools. Kpolovie, et al. (2011) investigated the performance of 1233 secondary school students in WAEC and NECO SSCES from 2004 to 2006 in selected subjects- Mathematics, English, Chemistry, Physics, Biology, Literature in English, Economics, Government, Agricultural Science, Food and Nutrition, and Geography to establish their comparability using correlational research design. The findings indicated that a statistically significant positive relationship between candidates' performance on WAEC and NECO SSCE in all the subjects existed. This shows that those who did well in WAEC also did well in NECO exams. In the light of the foregoing, the following objectives were explored:

1. The relationship between students' grades in WAEC and their grades in NECO examination in Chemistry in Anambra State?

2. The relationship between male students' grades in WAEC and their grades in NECO examination in Chemistry in Anambra State?
3. The relationship between female students' achievement grades in WAEC and their grades in NECO examination in Chemistry in Anambra State?

II. METHOD

This study utilized correlation survey design. The design is deemed appropriate for the study because, according to (Nworgu, 2015), it focuses on establishing the relationship existing between two or more variables. The target population of the study was made up of 8012, 7628 and 7520 results of secondary school students who sat for WAEC and NECO Chemistry examinations respectively in Anambra State for the 2015/2016, 2016/2017 and 2017/2018 academic sessions. The sample for the study comprised 1800 results for the 2015/2016, 2016/2017 and 2017/2018 academic sessions obtained through stratified and multi-stage random sampling techniques. Data analysis was carried out using Pearson's Product Moment Correlation Coefficient for the research questions. The coefficient (r) and the interpretation of the size of the relationship was done using the recommendation by Nworgu, (2015) as follows:

<i>Coefficient (r)</i>	<i>Relationship</i>
0.80 and above	Very High
0.60 to 0.80	High
0.40 to 0.60	Medium
0.20 to 0.40	Low
0.00 to 0.20	Very Low

Hypotheses were tested using Pearson Correlation Critical value table. In taking decisions on the hypotheses, the null hypotheses is rejected if P-value is less than the significant value of 0.05; otherwise the null hypotheses is not rejected.

III. RESULTS

Table 1: Pearson r on the Relationship between Students' Grades in WAEC and their Grades in NECO Chemistry Examination

Years	Source of Variation	N	R	Remark
2016	WAEC NECO	305	0.581	Moderate Positive Relationship
2017	WAEC NECO	313	0.374	Low Positive Relationship
2018	WAEC NECO	332	0.554	Moderate Positive Relationship

Table 1 shows that there is a moderate positive relationship between students' grades in WAEC and their grades in NECO Chemistry examination in 2016 and 2018 respectively. This is evident by the size of the Pearson's Correlation Coefficient r , which is 0.581 and 0.554 respectively for the two years. On the other hand, there is a low positive relationship between students' grades in WAEC and their grades in NECO

Chemistry examination in 2017 as depicted by the size of the Pearson's Correlation Coefficient r , which is 0.374.

Table 2: Pearson r on the Relationship between Male Students' Grades in WAEC and their Grades in NECO Examination in Chemistry

Years	Source of Variation	N	R	Remark
2016	WAEC NECO	142	0.681	High Positive Relationship
2017	WAEC NECO	153	0.467	Moderate Positive Relationship
2018	WAEC NECO	157	0.550	Moderate Positive Relationship

Table 2 shows that in 2016, a very high positive relationship of 0.681 exist between male students' grades in WAEC and their grades in NECO examination in Chemistry. On the other hand, a moderate positive relationship of 0.467 and 0.550 exist between male students' grades in WAEC and their grades in NECO examination in Chemistry in 2017 and 2018 respectively.

Table 3: Pearson r on the Relationship between Female Students' Grades in WAEC and Their Grades in NECO Examination in Chemistry

Years	Source of Variation	N	R	Remark
2016	WAEC NECO	163	0.507	Moderate Positive Relationship
2017	WAEC NECO	160	0.278	Low Positive Relationship
2018	WAEC NECO	175	0.592	Moderate Positive Relationship

Table 3 shows that there is a moderate positive relationship between female students' grades in WAEC and their grades in NECO Chemistry examination in 2016 and 2018 respectively. This is evident by the size of the Pearson's Correlation Coefficient r , which is 0.507 and 0.592 for the two years. On the other hand, a low positive relationship exist between female students' grades in WAEC and their grades in NECO Chemistry examination in 2017 as depicted by the size of the Pearson's Correlation Coefficient r , which is 0.278.

Table 4: Test of Significance of Pearson Correlation between Students' Grades in WAEC and Their Grades in NECO Examination in Chemistry

Years	Source of Variation	N	R	p-value	Remark
2016	WAEC NECO	305	0.581	0.00	Sig
2017	WAEC NECO	313	0.374	0.00	Sig
2018	WAEC NECO	332	0.554	0.00	Sig

Table 4 shows that there is a significant relationship between students' grades in WAEC and their grades in NECO examination in Chemistry in 2016, 2017 and 2018 respectively. r , (305, 313, 332)=0.581, 0.374, 0.554 and P -values <0.05. The 1st null hypothesis was therefore rejected.

Table 5: Test of Significance of Pearson Correlation between Male Students' Grades in WAEC and their Grades in NECO Examination in Chemistry

Years	Source of Variation	N	R	p-value	Remark
2016	WAEC NECO	142	0.681	0.00	Sig
2017	WAEC NECO	153	0.467	0.00	Sig
2018	WAEC NECO	157	0.550	0.00	Sig

Table 5 reveals that there is a significant relationship between male students' grades in WAEC and their grades in NECO examination in Chemistry in 2016, 2017 and 2018 respectively. The calculated r for the three years (0.681, 0.467 and 0.550) had P -values <0.05. The 2nd null hypothesis was therefore rejected.

Table 6: Test of Significance of Pearson Correlation between Female Students' grades in WAEC and Their Grades in NECO Examination in Chemistry

Years	Source of Variation	N	R	p-value	Remark
2016	WAEC NECO	163	0.507	0.00	Sig
2017	WAEC NECO	160	0.278	0.00	Sig
2018	WAEC NECO	175	0.592	0.00	Sig

Analysis in Table 6 shows that there is a significant relationship between female students' grades in WAEC and their grades in NECO examination in Chemistry in 2016, 2017 and 2018 respectively. The calculated r for the three years (0.507, 0.278 and 0.592) had P -values <0.05. The 3rd null hypothesis was therefore rejected.

Relationship between students' grades in WAEC and their grades in NECO examination in Chemistry.

The findings of the study indicated that a moderate positive relationship existed between students' grades in WAEC and NECO Chemistry examination in 2016 and 2018. This is to say that high marks in WAEC chemistry examination were replicated in NECO chemistry examination and vice versa. It further lends credence to the reliability of the two examination questions. It is apparent from the findings that what students truly learnt in preparation for WAEC examination is not at variance with that of NECO examination.

As further gleaned from the findings, a low positive relationship existed between students' grades in WAEC and NECO Chemistry examinations in 2017. The attitudes of students towards NECO examination could be responsible for the trend in 2017. This is to the extent that students have a way of showing exuding the similar disposition towards NECO examination and WAEC examination with the assumption that the standards are comparable.

The findings of the current study further indicated that a significant relationship existed between students' grades in WAEC and NECO examinations during the years under

review. This finding is in alignment with the finding Ajao and Awogbemi, (2012) that a significant positive relationship existed between WAEC results and NECO in Mathematics in all the selected schools. This leaves no one in doubt that the students who performed well in WAEC examination did not record poor performance in NECO examination. The finding of the current study is further corroborated by Kpolovie, et al. (2011) who noted that a statistically significant positive relationship between candidates' performance in WAEC and NECO SSCE in all the subjects existed. The logical deduction here, is that across all subjects, candidates' performances in NECO examination were not at variance with what was obtainable in their performance in WAEC examination.

Relationship between male students' grades in WAEC and their grades in NECO examination in Chemistry.

The finding of this study showed that while a very high positive relationship existed between male students' grades in WAEC and NECO examinations in 2016. This may not be separated from the fact that the two examinations are equivalent in terms of quality. Again, this could be due to the fact that there is consistency in the administration of assessment. In other words, there is no ambiguity in test instructions for the two examinations.

From the findings, a moderate positive relationship existed between male students' grades in WAEC and NECO examinations in Chemistry in 2017 and 2018 respectively. The fact that WAEC examination is perceived to be of similar quality with NECO examination could have motivated male students in 2017 and 2018 to study hard. Buttressing this point, a male student who considers their performance satisfactory in WAEC examination is likely to take similar consideration to NECO examination. When examination is taken seriously, improved performance is usually the logical consequence.

More so, the finding of this study revealed a significant relationship existed between male students' grades in WAEC and NECO examinations in Chemistry in the years under consideration. This is at variance with the position of Popola (2008) that no significant difference was observed between mathematics achievement of male and female students. The afore-mentioned contradictions may not be unconnected to the peculiarities of the candidates and teaching styles in the areas of study. The contradictions could further be attributed to variations in sample, age of the participants, teacher characteristics and instructional strategies employed within the areas of study.

Relationship between female students' grades in WAEC and their grades in NECO examination in Chemistry.

The finding of this study showed that a moderate positive relationship existed between female students' grades in WAEC and NECO Chemistry examinations in 2016 and 2018. It can be gleaned from this finding that female students who did well in WAEC examination, performed well in

NECO examination. This could be as a result of the objectivity of the test scorers across the two examinations. It is not surprising given that the two examinations are reputed to be standardized.

As indicated by the findings, a low positive relationship existed between female students' grades in WAEC and NECO Chemistry examinations in 2017. It can be deduced that female students who recorded passes in WAEC examination did not do as much to improve upon that in NECO examination. The logical explanation for this is that the female students within the year under review may have approached NECO examination with a low self-efficacy. Understandably, low self-efficacy will negatively affect performance.

More so, the finding of this study revealed a significant relationship existed between female students' grades in WAEC and NECO examinations in Chemistry in the years under consideration. This is contrasted by the postulation of Owoyemi (2007) that student's performance in chemistry course is not dependent on gender. The forgoing contradictions may not be separated from the teaching styles, reinforcement strategies, and socio-cultural environmental variables within the areas of study.

IV. CONCLUSIONS

In line with the findings of the study, it was concluded that a positive relationship existed between students' grades in WAEC and NECO Chemistry examination across the years under review. In addition, there is a significant relationship between students' grades in WAEC and NECO examinations across the years under review.

Significant Statement

It is believed that the findings of the study will be significant to relevant stakeholders in the educational sector viz: chemistry teachers and examination bodies. It will be helpful to them to the effect that it will reveal the relationship between grades of students in WAEC examinations and NECO examination in Chemistry. Expectedly, they will be able to take steps towards ensuring that students are adequately prepared for both examinations so that it will reflect in their academic grades in WAEC and NECO examinations.

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