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Comparative Analyses of Physics Candidates Scores in West African and National Examinations Councils

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Abstract
The study is a comparative analysis of physics candidates' scores in West African and National Examinations Councils. It also investigates influence of gender. Results of 480 candidates were randomly selected form three randomly selected Senior Science Colleges using the WASSCE and NECOSSCE computer printout sent to the schools, transformed using the stained scale classified into WASSCE, NECOSSCE and gender of the candidates and analyzed using the t-test statistics. The results of the study showed that 5940 and 6136 candidates registered for the WASSCE and NECOSSCE respectively for the period under study showing a 3.30% increase of NECOSSCE over the WASSCE candidates. There exists a significant difference in performances between the two examinations and also in their gender. All hypotheses were tested at 0.05 level of significance. This study also reveals a higher mean performance of NECOSSCE over the WASSCE. Encouragement of candidates to study hard for the two examinations, payment of Examination fees for WASSCE candidates and alteration in who conduct the examination first in each year were recommended.

Introduction
Physics being a fundamental science course has numerous applications and constitute the bedrock of development of science and technology in any nation. Achieving proficiency in physics should, therefore, be of a national concern. In our State for instance there has been a steady increase in the number of students registering and writing the examination in the West African Senior School Certificate Examinations (WASSCE) and National Examinations council Senior School certificate Examinations respectively.

Table 1 below shows the number of candidates who registered and write physics in WASSCE and NECOSSCE in Senior Science Colleges for the period covered in this study (2009-2012).

Table 1: Table showing the number of candidates in Akwa Ibom State Senior Science Colleges who registered and write the May/June and June/July WASSCE and NECOSSCE respectively from 2009 to 2012 given Gender.

YEARS	WASSCE			NECOSSCE		
	Number of Candidates	**GENDER** MALE	FEMALE	Number of Candidates	**GENDER** MALE	FEMALE
2009	1250	632	618	1320	647	673
2010	1390	731	659	1421	697	723
2011	1575	825	750	1582	769	813
2012	1725	875	850	1813	894	919
2009-2012	5940	3063	2877	6136	3007	3129

Source: WASSCE/NECOSCE computer printout 2009-2012

In recent years in the state, candidates have been writing the two examinations (WASSCE and NECOSSCE). However neither of the examinations has been appraised. Considering the similarities of the two examinations been taken by the same set of candidates in the state, it is considered worthwhile to investigate the effect of the performances of candidates in one examination on the other.

The present study, therefore seeks to investigate a possible deference between WASSCE and NECOSSCE candidates' performances in physics. The study also seeks to determine the influence of gender on the performances of candidates involved in the study.

Aims of WASSCE and NECOSSCE
The two examination bodies have common aims which include the following:

i) To organize terminal examinations for SS3 students.
ii) To administer qualifying examinations for admission of students into the Universities and other tertiary institutions.
iii) To issue certificates on merit to graduate for used for employment and further practical training.
iv) To administer examinations to school candidates in the third year of the senior secondary school education programme.

v) To administer examinations to private candidates who may not have the opportunity of going to a formal school or who did not make their grades in the school examinations.

The West African Examinations Council (WAEC) was established in December 1951 through Ordinance No. 40 of Gold Coast Legislative Assembly later made effective by similar acts by the Governments of Nigeria, Sierra Leone and the Gambia. The Ordinances charged the Council with determining the examinations required in the public interest in West African States and empowered it to conduct such examinations and to award certificates, provided that the certificates did not represent a lower standard of attainment than equivalent certificates of examination authorities in the United Kingdom.

The Council conducts four categories of Examinations namely:

i) National Examinations
ii) International Examinations
iii) Examinations conducted in collaborations with other examining body.
iv) Examinations conducted on behalf of other Examining boards

The West African Senior School Certificate Examination (WASSCE) was introduced in 1998 as part of the educational reform programmes of the member countries and it is administered twice a year-in May/June and November/December. One unique feature of the new examination is that it combines school based continuous assessment results with the council's own assessment on a ratio of 30:70.

The National Examinations Council (NECO) was created in 1992 by General Ibrahim Babangida administration and an enabling Decree was promulgated in 1993. At the inception of the Olusegun Obasenjo administration in May, 1999, it was discovered, curiously, that no one could produce a signed copy of the promulgated decree. Only drafts of the decree were seen. It stands to the credit of the Obasenjo's administration that a way out was found in the constitution of a management board for the legally existent (NBEM) National Board for Educational Management which was supposed to have metamorphosed into NECO by the decree. The Obasenjo presidency had to fashion a bill to give proper legal backing to NECO in Lieu of the decree which could not be found. The NECO Bill was submitted to the National Assembly in 2000. The senate passed it on 11th November, 2001 and House of Representatives passed same with minor amendments on 14th December, 2001 signed into law on 18th February, 2002 as the National Examinations Council, NECO, Act 2002. The Act empowers NECO to conduct June/July and November/December NECOSSCE along with WACE, one after the other.

The council conducts the following examinations:

i) National Examinations (SSCE)
ii) Junior Schools Certificate Examinations (JSCE)
iii) Gifted Children Examinations
iv) National Common Entrance Examinations (NCEE)

These two Examination bodies (WACE and NECO) have the following in common:

- Members of the Association of Educational Assessment in Africa (AEAA)
- Members International Association of Educational Assessment (IAEA)
- Release their examination Results within 90 days from the date of the last paper of the particular examination.
- On-Line Result checker
- GSM (SMS) Result checker
- On-Line confirmation of Results
- On-Line Registration
- Same science (Physics) curriculum
- Candidates taught by the same teachers
- Examinations marked and graded by almost the same set of examiners
- Uses the same set of continuous assessment score to compute the final results (School based candidates)
- Almost the same set of students write the examinations in a given year
- Uses the same set of equipment's and examination environment
- The same set of textbooks
- The co-ordination and marking session are conducted in the same way
- Their certificates and grading systems are the same and results can be combined for the purpose of admission and any other use in the country.

The SSCE examinations in the state can be likened to a Practice Effect Design where a single group is observed at different times. The SSCE candidates are exposed to the state MOCKSSCE, WASSCE and NECOSSCE at a chin interval, this arrangement is likely to make the candidates practices perfect (Onwioduokit, 2002) and so make students to perform higher in NECOSSCE since this is the last in the series of the examinations they are writing. According to Utibe (2003), Gender has a significant influence on the performances of physics students in the Remedial and Year One physics examinations. Others (Pidgeon, 1977;

Egwuasi, 1980; Bee, 1988 and Baughman and Dahistron, 1998) are also in support of this trend.

Purpose of the Study

The general purpose of this study was to compare the performances of physics candidates in senior secondary school certificate examinations conducted by West African Examinations Council (WAEC) and National Examinations Council (NECO). Specifically this study sought to:

(i) Determine the difference between the performances of physics candidates in WASSCE and NECOSSCE?

(ii) Determine the effect of the genders of candidates on their performances in physics in WASSCE and NECOSSCE?

Research Questions

Answers to the following questions were sought.

(i) What difference exists between the performances of physics candidates in WASSCE and NECOSSCE?

(ii) To what extent do the genders of candidates influence their performances in physics in WASSCE and NECOSSCE?

Research Hypotheses

To guide the researcher in the conduct of the study, the following null hypotheses were formulated and tested:

1. There exists no significant difference between the performances of physics candidates in WASSCE and NECOSSCE
2. There is no significant influence of gender on performances of physics candidates in WASSCE and NECOSSCE.

Research Method

The ex-post facto design was employed to carry out this study, since the phenomena concerned in this study had already taken place and cannot be manipulated.

480 physics candidates were randomly selected from three randomly selected Senior Science Colleges in Akwa Ibom State. To ensure spread and even distribution, ten percent of the candidates from each of the Senior Science Colleges were selected for each of the years (2009-2012).

The instruments that were used for the collection of data for this study were:

(i) May/June WASSCE results computer sheet for 2009, 2010, 2011 and 2012.

(ii) June/July NECOSSCE results computer sheet for 2009, 2010, 2011 and 2012. Already validated data from the WASSCE and NECOSSCE approved results of the May/June and June/July candidates respectively for the academic years 2009-2012 were adopted and used for this study.

The scores of the candidates were extracted from the instruments, grades transformed using the stanine scale and identified along with the gender of the candidates. The grade according to WASSCE and NECOSSCE ranges from A_1 as the highest to F_9 as the lowest. But the stanine transform scale used here transformed the grades for A_1-F_9 as A_9-F_1 to aid in the computations.

The data generated in the study were analyzed using t-test statistics among others.

Results

Table 2: t-test comparison of mean performances of candidates in WASSCE and NECOSSCE physics for years 2009-2012 and for the four years combined (2009-2012)

YEARS	Groups	N	Mean $\overline{X}$	SD	Df	t-crit	t-cal	Decision at p<0.05
2009	WASSCE Candidates	60	4.73	1.10	118	1.96	7.78	*
	NECOSSCE Candidates	60	6.17	0.13				
2010	WASSCE Candidates	60	4.83	1.00	118	1.96	8.97	*
	NECOSSCE Candidates	60	6.35	0.86				
2011	WASSCE Candidates	60	4.98	1.00	118	1.96	7.65	*
	NECOSSCE Candidates	60	6.28	0.89				
2012	WASSCE Candidates	60	4.68	0.93	118	1.96	9.72	*
	NECOSSCE Candidates	60	6.43	1.00				
2009 2012	WASSCE Candidates	240	4.88	1.30	238	1.96	13.47	*
	NECOSSCE Candidates	240	6.25	0.89				

*- Significant at P<0.05

Table 3: t-test comparison of mean scores of male and female physics candidate's performance in May/June WASSCE and June/July NECOSSCE for years 2009, 2010, 2011, 2012 and for the four years combined (2009-2012).

Years	Groups	N	Mean $\overline{X}$	S.D	D.f	t-crit	t-cal	Decision at p<0.05
2009	Male WASSCE Candidate	30	4.97	6.10	58	2.00	3.27	*
	Male NECOSSCE Candidates	30	6.36	6.66				
	Male WASSCE Candidate	30	5.07	6.25	58	2.00	2.08	*
	Male NECOSSCE Candidates	30	5.90	5.71				
2010	Male WASSCE Candidate	30	5.77	7.23	58	2.00	3.14	*
	Male NECOSSCE Candidates	30	7.00	4.54				
	Male WASSCE Candidate	30	3.97	4.16	58	2.00	5.06	*
	Male NECOSSCE Candidates	30	5.70	6.10				
2011	Male WASSCE Candidate	30	5.77	4.97	58	2.00	4.09	*
	Male NECOSSCE Candidates	30	6.97	3.84				
	Male WASSCE Candidate	30	4.20	5.43	58	2.00	3.72	*
	Male NECOSSCE Candidates	30	5.60	5.860				
2012	Male WASSCE Candidate	30	5.50	5.90	58	2.00	1.47	NS
	Male NECOSSCE Candidates	30	6.07	5.71				
	Male WASSCE Candidate	30	3.87	3.72	58	2.00	6.81	*
	Male NECOSSCE Candidates	30	6.20	6.55				
2009-2012	Male WASSCE Candidate	120	5.50	6.22	238	1.96	11.38	*
	Male NECOSSCE Candidates	120	6.60	5.38				
	Male WASSCE Candidate	120	4.28	5.16	238	1.96	16.66	*
	Male NECOSSCE Candidates	120	5.85	6.15				

*Significant at P<0.05 NS- Not Significant at P<0.05

Table 4: t-test comparison of mean scores of male and female physics candidate's performance in May/June WASSCE and June/July NECOSSCE for years 2009, 2010, 2011, 2012 and for the four years combined (2009-2012).

Years	Groups	N	Mean $\bar{X}$	S.D	D.f	t-crit	t-cal	Decision at p<0.05
2009	Male WASSCE Candidate	30	4.97	6.10	58	2.00	0.24	NS
	Female NECOSSCE Candidates	30	5.07	6.25				
	Male WASSCE Candidate	30	6.37	6.66	58	2.00	1.14	NS
	Female NECOSSCE Candidates	30	5.90	5.71				
2010	Male WASSCE Candidate	30	5.77	7.23	58	2.00	4.74	*
	Female NECOSSCE Candidates	30	3.97	4.16				
	Male WASSCE Candidate	30	7.00	4.54	58	2.00	3.67	*
	Female NECOSSCE Candidates	30	5.70	6.10				
2011	Male WASSCE Candidate	30	5.77	4.97	58	2.00	4.53	*
	Female NECOSSCE Candidates	30	4.20	5.43				
	Male WASSCE Candidate	30	6.97	3.84	58	2.00	4.24	*
	Female NECOSSCE Candidates	30	5.60	5.8600				
2012	Male WASSCE Candidate	30	5.50	5.90	58	2.00	5.08	NS
	Female NECOSSCE Candidates	30	6.87	3.72				
	Male WASSCE Candidate	30	3.07	5.71	58	2.00	0.32	NS
	Female NECOSSCE Candidates	30	6.20	6.55				
2009-2012	Male WASSCE Candidate	120	5.50	6.22	238	1.96	12.86	*
	Female NECOSSCE Candidates	120	4.28	5.16				
	Male WASSCE Candidate	120	6.60	5.38	238	1.96	7.81	*
	Female NECOSSCE Candidates	120	5.85	6.15				

*Significant at P<0.05 NS- Not Significant at P<0.05

As shown in Table 3, there is a significant difference in the performance of male WASSCE and NECOSSCE and female WASSCE and NECOSSCE Physics candidates for years 2009, 2010, 2011, 2012 and

for the four years combined 2009 to 2012 with calculated t-test values of 3.27, 2.08, 3.14, 5.06, 3.72, 6.18, 11.38, and 16.66 greater than the table values of 2.00 and 1.96 at 0.05 alpha level. Therefore, the null hypothesis with respect to this is rejected. The result of the findings is in line with the works of Utibe, 2003; Pidgeon, 1977; Egwuasi, 1980; Bee, 1988 and Baughman and Dahistron, 1998.

As shown in Table 4, there exist a significant influence of gender in the performances of male and female WASSCE and NECOSSCE physics candidates for years 2010, 2011, 2012 and for the four years combined (2009-2012) with calculated t-test values of 4.74, 3.67, 4.53, 4.24, 5.08, 12.86 and 7.81 greater than the table values of 2.00 and 1.96 at 0.05 alpha level. Therefore, the null hypothesis with respect to this is rejected. These results are in line with the works of Utibe, 2003: Egwuasi, 1980 and Bee, 1988.

Discussion of Findings

The findings of the work as shown in Table 1 shows that every year the number of physics candidates who registered and write our public examinations (WACE and NECO) increase and from the table it can also be seen that more candidates registered for NECO than WAEC. With a 3.30% increased in the total number of NECO Candidates over their WAEC counterparts. The increase can be attributed to the fact that the NECO Examination fee in the State is free and this enables more students to register and write the examination.

From Table 2, it can be seen that there exist a significant difference between the performance of WASSCE and NECOSSCE Physics Candidates for years 2009, 2010, 2011, 2012 and for the four years combined 2009 to 2012. This finding is in agreement with the works of Utibe, (2003) and Onwioduokit (2002).

From Table 3, it is evident there in that there exist a significant difference in the performances of male WASSCE and NECOSSCE and female WASSCE and NECOSSCE candidates for years 2009, 2010, 2011, 2012 and for the four years combined 2009 to 2012. These results are inline with the works of Utibe, 2003: Pidgeon, 1977 and others.

From Table 4, it is evident there in that there exist a significant influence of gender in the performances of male WASSCE and female WASSCE and male NECOSSCE and female NECOSSCE for years 2009, 2010, 2011, 2012 and for the four years combined (2009 to 2012). These results are in agreement with the works of Utibe, 2003 and Egwuasi, 1980.

Conclusion

It can be inferred from these findings that there is a consistent higher performance in NECO than in WAEC with a mean performance of 6.2 and 4.9 equivalent to C_4 and C_5 respectively, that there is a significant difference in the performances of candidates in the two examinations, and that there is a significant influence of gender in the performances of candidates in the two examinations.

Recommendations

Based on the findings of this study, it is recommended that the State Ministry of Education should improve the equipments in the Science Colleges to take care of the consistent increase in the number of students in our schools, the Federal Ministry of Education should alternate from time to time who conducts Senior Secondary Certificate Examination first in each year (WACE and NECO), that all the stakeholders in our education system should monitor our examination so that the result obtained would be able to predict the performance/standard of education in the Country, that the Government of Akwa Ibom State should extend their financial support to candidates writing WACE and pay their examination fees, the Federal, State, Local Government and stakeholders in Education should ensure tight security network during the conduct, marking and publication of the results in the two examinations.

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