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A Comparison of SSCE Questions Set by the West African Examinations Council and the National Examinations Council, Nigeria

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Abstract

The purpose of this study was to compare the Senior School Certificate Examination (SSCE) essay questions set by the West African Examinations Council (WAEC) and the National Examinations Council (NECO) in terms of how much they were distributed across the various levels of the cognitive domain. To this effect, the essay question papers set by WAEC and NECO in Biology, Chemistry and Economics in 2004, 2005, 2006 and 2007 were obtained. These questions were analyzed by three experts in Measurement and Evaluation in terms of how many of them fell under the various levels of the cognitive domain. The result showed that for both examining bodies, most of the questions were knowledge and comprehension questions. When the distributions of the questions across the various levels of the cognitive domain, set by WAEC and NECO were compared, no significant difference was obtained. The conclusion therefore is that, as far as the distribution of questions across the levels of the cognitive domain is concerned, WAEC and NECO are similar.

Prior to independence, and for some years after it, the West African Examinations Council (WAEC), established in 1952, had the sole responsibility of conducting examinations for Nigerian students who had completed their secondary school education. Apart from conducting examinations for this group, the Council also conducted a number of other examinations for Nigeria such as the Teachers' Grade II Certificate, Royal Society of Arts (RSA), National Business Certificate and National Technical Certificate examinations (Dibu-Ojerinde and Faleye, 2006). In the early years of its establishment, WAEC did not have much problem coping with the number of candidates who registered for the various examinations. By the 1970s, the situation appeared to be getting too much for WAEC to handle. The release of results was becoming unnecessarily delayed. Cases of leakage of examination paper were rampant, the climax being that of 1977.

Following the massive leakage of question papers in 1977 and various complaints from members of the society regarding the performance of WAEC, the Federal Government of Nigeria, in 1977, set up the Sogbetan Commission of Inquiry to investigate this leakage of question papers. It was the report of this inquiry as well as those of other panels that were set up in subsequent years on examinations in Nigeria that gave birth to the National Examination Council (NECO) in 1999, charged then 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 Examinations Council, 2003).

A number of criticisms followed the establishment of this body. According to the National Examinations Council (2003), while some Nigerians saw its arrival as an opportunity for choice of examination body for candidates to patronize, others doubted its capacity to conduct reliable examinations that could command widespread national and international respect and acceptability. Some people saw the establishment as an attempt to bridge the educational gap between the different geographical sections of the country (Famakinwa, n.d.) Apart from reactions to the establishment of this new examining body, the first examination it conducted in 2000 attracted more criticisms than commendation (Omole, n.d).

Reacting to criticisms and fears by people, the National Examinations Council (1999) and Ojerinde (2004), as cited by Dibu-Ojerinde and Faleye (2006) observed that Nigerians are often afraid of change, and that this fear makes them to be satisfied with the status quo rather than trying something

new. They further observed that similar anxiety would be generated if any new examination body is established to conduct examination at any level of the education system.

Following doubts about the credibility of NECO, a number of studies have been carried out aimed at assessing its activities or comparing it with the WAEC, which has acquired international acceptability. While some of these studies see the two bodies as comparable, others see one as being superior to the other.

In one of the studies aimed at assessing NECO, Ariyibi (n.d.) sought the views of teachers regarding some qualities such as: legibility of question papers, clarity of test items, appropriateness of test items, adequacy of question papers and other materials, promptness in providing the question papers, adequacy of manpower to supervise the examinations, and care taken in the process of collecting and packaging of the answer scripts. Following their responses, Ariyibi gave a pass mark to NECO. In their studies, Ogunjemilua (2001) and Dibu-Ojerinde and Faleye (2005) did not see any difference between NECO and WAEC, when they were compared. In the study by Dibu-Ojerinde and Faleye, they compared the performances of students who entered with NECO Senior School Certificate (SSC) and WAEC SSC, using their First and Second Semester GPAs for the First Year.

While the above studies had findings favourable to NECO, some others had portrayed NECO as being inferior to WAEC. A number of studies, for example, have sought to find the opinions of principals, teachers and students regarding the conduct of SSC examinations by WAEC and NECO. In the opinions of the respondents, NECO was said to be inferior in terms of quality of question papers set and credibility of grades awarded to candidates, among others (Daniel, 2005, Adegun, n.d; Omole, n.d.). In another study by Famakinwa (n.d), the GPAs of students who were admitted with WAEC and NECO SSC were computed for years I to III, semester by semester. The results showed that in each semester of each year, the students with WAEC SSC had higher GPA than those with NECO. This finding contradicts that of Dibu-Ojerinde and Faleye (2005). Still on superiority of WAEC over NECO, Obioma and Salau (2007), who used WAEC, NECO and University Matriculation Examinations results to predict Year I and Final Year CGPAs, found that WAEC results had greater predictive power than the NECO results.

Looking at studies that have attempted to compare WAEC and NECO, it would be observed that most of them were based on opinions. While recognizing the fact that opinions could serve as indicators, they are not the best to be used in taking decisions, when it is possible to obtain facts. Those authors that did not rely on opinions attempted to compare grades obtained in the university by holders of the two certificates.

Apart from the comparison of grades, Maiwada (2006) had called for a comparison of the question papers set by the two examination bodies to see if the variances in the performances of candidates possessing the two certificates could be explained using them. Daniel (2005) had made an attempt to do this comparison, but he merely asked teachers and students their opinions about the bodies. It therefore becomes necessary to do a physical comparison of these questions.

One is aware that in arriving at the final grade of a candidate in the WAEC or NECO SSC examination, scores from various papers are used, such as, practical, objective and theory papers. This study focused on the theory papers.

A good essay test is expected to have its items covering the various levels of the cognitive domain of Bloom's taxonomy of educational objectives – knowledge, comprehension, application, analysis, synthesis and evaluation. In an earlier study, Olatunji (1974) had analyzed essay questions set in different departments of a university, to ascertain how many questions were set from each level of the cognitive domain. It should however be noted that in this study, Olatunji used her own model of the levels of the cognitive domain (a modification of that of Bloom), in which application was at the apex and synthesis deleted, because, according to her, synthesis is subsumed in application. It is therefore necessary to carry out this type of analysis using WAEC and NECO SSC examination question papers, with a view to finding out if the distributions of questions across the various levels of the cognitive domain by the two examination bodies are similar or different.

The purpose of this study therefore is to examine the distributions, across the various levels of the cognitive domain, of SSC examination questions set by WAEC and NECO and then compare them for the two bodies.

To address this problem, one research question was posed and one null hypothesis stated:

Research Question How are the questions, for each examining body, distributed across the various levels of the cognitive domain?

Hypothesis:
There is no association between the examining body and the distribution of questions across the various levels of the cognitive domains.

Method
The study was an evaluative research because it was aimed at ascertaining the extent to which the questions were distributed across the expected levels of the cognitive domain. It belongs to the comparative content analysis method, which, according to Mertler and Charles (2008) is a type of evaluation research and which, among others, involves the evaluation of tests.
The population of the study was made up of the essay questions set by WAEC and NECO in biology, chemistry and economics

WAEC and NECO conduct O' level examinations twice a year -May/June (for school based candidates) and November/December (for private candidates). The sample for the study was obtained from the May/June essay questions in biology, chemistry and economics. Randomness was not used in obtaining the samples; rather, the question papers of the immediate past four years (2004, 2005, 2006 and 2007), at the time of this study, were used.

The researchers reproduced the essay question papers in Biology, Chemistry and Economics set by WAEC and NECO in the years 2004 to 2007. These questions were given to three Measurement and Evaluation experts in Nnamdi Azikiwe University Awka, each of senior lecturer rank, who were requested to classify each question according to the level of the cognitive domain it belonged. Two of these experts had background in science. It should however be noted that knowledge in the subject area was not very important in the classification. What guided the classification was the action verb used in posing the question. Each of the experts was given a list of action verbs for each level of the cognitive domain, to guide him/her in the classification. Where a question had sub-sections, each of them was treated as an individual item, but where these various subsections were guided by one action verb, they were treated as one question.

After the experts had indicated the levels, the researchers, for each question, noted the levels assigned to it by the three experts. Any level assigned to a question by two or three of the experts were regarded as the level for that

question, but in any case where the three experts assigned different levels to a particular question, the researchers took decision on what level is should belong. Such cases were very few.

Having identified the levels assigned to various questions, the researchers, for each subject and for each examining body, took count of the number of questions that were asked at the various levels.

In testing the hypothesis, the chi-square statistical technique was used. This was appropriate because the information handled were frequencies. For the research question, the percentage was used for analysis.

Result

The results relating to the research question and the hypothesis are presented in the sections that follow:

Research Question

This was concerned with examining the distributions of questions across the various levels of the cognitive domain for each of the examining bodies. In the tables that follow, the number and percentages of questions set in the various subjects by each examining body are presented.

The result in table one shows that most of the questions were knowledge questions, followed by comprehension questions. For both bodies, there were no questions for some levels above the comprehension level. WAEC question paper contained more number of questions than those of NECO

The result in table 2 shows that questions covered all the levels of the cognitive domain with the exception of 2007 for NECO. As in the previous situation, knowledge level had the highest percentage of questions followed by compression.

The result in table 3 shows that questions were distributed across the levels for the two bodies, up to the analysis level. Beyond analysis level, there were either few questions or none. One striking feature is that comprehension, in nearly all the cases, had the highest percentage of questions. As in the other subjects, over fifty percent of the questions, in each of the situations, came from knowledge and comprehension.

Summarizing the findings in the three subjects, one would say the following, for the two examining bodies:

1. Most of the questions for each body were knowledge and comprehension questions.
2. For Biology and Economics, there were very few questions and in some cases none, in the levels beyond comprehension, while for Chemistry, questions cut across those higher levels for both examining bodies.
3. In each year and for each subject, WAEC set more number of questions than NECO.

Test of Hypothesis

The hypothesis for this study was concerned with ascertaining if there was an association between the examining body and the distribution of questions across the various levels of the cognitive domain. Following the finding that for all subjects, and for each year, questions were set at the knowledge and comprehension levels while some had no questions at application, analysis, synthesis and evaluation levels, the researchers, for purposes of this hypothesis testing, pooled the last four levels into one level referred to as the Higher Mental Cognitive Process level (Tuckman, 1975). This then gave rise to three levels: knowledge, comprehension and the higher cognitive levels. The chi-square tests of distributions for the three subjects are shown in tables 4 to 6. For each level, the observed numbers of questions are outside the bracket while the expected numbers (frequencies) are in brackets.

From table 4, the calculated chi-square is less than the critical value in each of 2004, 2005 and 2007, while in 2006 it was greater. This then means that for 2004, 2005 and 2007, the hypothesis of no significant difference in the distributions is upheld while for 2006, it is rejected.

From table 5, the hypothesis of no difference in the distributions of questions for the two groups is upheld for 2004, 2005 and 2007, since the calculated value of chi-square is greater than the critical value in each of those years. The hypothesis is rejected for 2006 because the calculated value of chi-square is greater than the critical value.

From table 6 the calculated chi-square value for each of the years 2004 to 2006 is less than the critical value (5.99) at .05 alpha level and 2 degrees of freedom. On the other hand, the calculated value for 2007 is greater than the critical value. Based on the above, the hypothesis of no significant difference

between the distributions of the grades for the two examining bodies is upheld in 2004, 2005 and 2006, but rejected in 2007.

In summary the results of the test of hypothesis, show that out of the twelve pairs of distributions compared, there were no significant differences in nine.

Discussion of Results

From the result, it was found that for each subject and for each examining body, the bulk of the questions set, came from knowledge and comprehension levels. This result is similar to that obtained by Olatunji (1974) when she analyzed the essay questions set in different departments of a university. The predominance of these two levels of questions could be as a result of the fact that they are usually easier to set. The surprising thing however was that for chemistry, there were questions set by the two bodies at each of the levels of the cognitive domain and for all the years. It could be possible that chemistry, by its nature, is more amenable to questions at higher cognitive levels.

The result also showed that in each year and for each subject, WAEC set more number of questions than NECO. This could be explained by the fact that NECO, being younger in the exercise, would want to start with fewer number of questions.

In the only hypothesis for the study the distributions of the questions across the various levels of the cognitive domain were compared for the two bodies. Out of the twelve pairs of distributions that were compared, no significant difference was obtained in nine. One, on the basis of this, could therefore say that there is no significant difference in the ways the two examining bodies distribute their questions across the levels of the cognitive domain.

The similarity in the distributions of questions could be explained in terms of the fact that these two bodies essentially draw their examiners from the same pool. For this reason they are guided by the same tendencies and idiosyncrasies. This goes further to explain why distributions for Chemistry stood out for all the years.

Summary and Conclusion

The urge to carry out this study was propelled by the fears of some individuals regarding the comparability of WAEC and NECO in their examining functions. This therefore called for a need to compare these bodies in terms of various aspects. This study took up the aspect of comparing the two bodies in terms of how they distributed their questions across the various

levels of the cognitive domain. Findings show that in nearly all the situations, in the years studied, there was no significant difference between the distributions of questions by the two examining bodies for biology, chemistry and economics.

In conclusion therefore, one would say that as far the distribution of questions across the various levels of the cognitive domain is concerned, WAEC and NECO are comparable with respect to biology, chemistry and physics.

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Table 1: Number and Percentage of Biology Questions Set at each Level of the Cognitive Domain by WAEC and NECO.

WAEC

Cognitive Level	Year			
	2004	2005	2006	2007
Knowledge	17(57.6)	16(45.7)	19(65.5)	14(50)
Comprehension	10(33.3)	11(31.4)	9(31)	11(39.3)
Application	-	2 (5.7)	-	-
Analysis	2(6.7)	3 (8.6)	1(3.4)	3(10.7)
Synthesis	1(3.3)	-	-	-
Evaluation	-	3(8.6)	-	-
Total	**30**	**35**	**29**	**28**

NECO

Cognitive Level	Year				
	2004	2005	2006	2007	
Knowledge	11(68.8)	10(62.5)	6(37.5)	13(68.4)	
Comprehension	2(12.5)	4(25)	5(31.3)	3(15.8)	
Application	1(6.3)	1(6.3)	-	1(5.2)	
Analysis	1(6.3)	1(6.3)	5(31.3)	1(5.2)	
Synthesis	-	-	-	-	
Evaluation	1(6.3)	-	-	1(5.2)	
Total	**16**		**16**	**16**	**19**

Note: Numbers is brackets are percentages.

Table 2: Number and Percentage of Chemistry Questions Set at each Level of the Cognitive Domain by WAEC and NECO.

WAEC

	Year			
Cognitive level	2004	2005	2006	2007
Knowledge	29(47.5)	33(45.7)	23(37.1)	27(47.4)
Comprehension	7(11.5)	15(20.8)	18(29)	12(21)
Application	5(8.2)	5(6.9)	7(11.3)	7(12.3)
Analysis	8(13.1)	12(16.7)	5(8.1)	4(7)
Synthesis	7(11.5)	6(8.3)	7(11.3)	5(8.8)
Evaluation	5(8.2)	1(1.4)	2(3.2)	2(3.5)
Total	**61**	**72**	**62**	**57**

NECO

	Year			
Cognitive Level	2004	2005	2006	2007
Knowledge	27(52.9)	26(52)	24(53.3)	34(60.7)
Comprehension	9(17.6)	8(16)	4(8.9)	10(17.9)
Application	5(9.8)	6(12)	6(13.3)	2 (3.6)
Analysis	6(11.8)	4(8)	3(6.7)	4(7.1)
Synthesis	3(5.9)	5(10)	4(8.9)	6(10.7)
Evaluation	1 (2)	1(2)	4(8.9)	-
Total	**51**	**52**	**45**	**56**

Table 3: Number and percentage of Economics Questions set at each Level of the cognitive Domain by WAEC and NECO

WAEC

Cognitive Level	Year 2004	2005	2006	2007
Knowledge	8(27.6)	8(28.6)	8(30.8)	14(43.8)
Comprehension	9(31)	10(35.7)	10(38.5)	5(15.6)
Application	8(27.6)	7(25)	5(19.2)	7(21.9)
Analysis	4(13.8)	3(10.7)	2(7.7)	5(15.6)
Synthesis	-	-	-	-
Evaluation	-	-	1(3.8)	1(3.1)
Total	**29**	**28**	**26**	**32**

NECO

Cognitive Level	Year 2004	2005	2006	2007
Knowledge	4(21.1)	4(20)	6(25)	3(15)
Comprehension	12(63.1)	13(65)	11(45)	12(60)
Application	1(5.3)	3(15)	3(20.8)	1(5)
Analysis	1(5.3)	-	2(8.3)	2(10)
Synthesis	-	-	-	-
Evaluation	1(5.3)	-	-	2(10)
Total	**19**	**20**	**24**	**20**

Table 4: Chi-square Analysis of the Distributions of WAEC and NECO Questions in Biology

2004

Examination Body	Cognitive Level: Knowl.	Comp.	Higher Cognitive Level	Total	x^2cal	X^2crit
WAEC	17(18.3)	10(7.8)	3(3.9)	30	2.82	5.99
NECO	11(9.7)	2(4.2)	3(2.1)	16		
Total	**28**	**12**	**6**	**46**		

2005

Cognitive Level

Examination Body	Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2 crit
WAEC	16(7.8)	11(10.3)	8(6.9)	35	1.3	5.99
NECO	10(8.2)	4(4.7)	2(3.1)	16		
Total	**26**	**15**	**10**	**51**		

2006

	Cognitive Level					
Examination Body	Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	19(16.1)	9(9)	1(3.9)	29	7.62	5.99
NECO	6(8.9)	5(5)	5(2.1)	16		
Total	**25**	**14**	**6**	**45**		

2007

	Cognitive Level					
Examination Body	Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	14(16.1)	11(8.3)	3(3.6)	28	3.08	5.99
NECO	13(10.9)	3(5.7)	3(2.4)	19		
Total	**27**	**14**	**6**	**47**		

Table 5: Chi-square Analysis of the Distributions of WAEC and NECO Questions in Chemistry

2004

	Cognitive Level					
Examination Body	Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2
WAEC	29(30.5)	7(8.7)	25(21.8)	61	1.94	5.99
NECO	27(25.5)	9(7.3)	15(18.21)	51		
Total	**56**	**16**	**40**	**112**		

2005

	Cognitive Level					
Examination Body	Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	33(37.9)	15(14.8)	24(25.7)	72	1.67	5.99
NECO	26(26.3)	8(10.3)	16(17.9)	50		
Total	**59**	**23**	**40**	**122**		

2006

	Cognitive Level					
Examination Body	Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	23(27.2)	18(12.7)	21(22)	62	7.28	5.99
NECO	24(19.8)	4(9.3)	17(16)	45		
Total	47	22	38	107		

2007

Examination Body	Cognitive Level: Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	27(30.8)	12(11.1)	18(15.1)	57	2.25	5.99
NECO	34(30.2)	10(10.9)	12(14.9)	56		
Total	61	22	30	113		

Table 6: Chi-square Analysis of the Distributions of WAEC and NECO Questions in Economics

2004

Examination Body	Cognitive Level: Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	8(7.3)	9(12.7)	12(9.1)	29	5.28	5.99
NECO	4(4.8)	12(8.3)	3(5.9)	19		
Total	12	21	15	48		

2005

Examination Body	Cognitive Level: Knowl.	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	8(7)	10(13.4)	10(7.6)	28	5.3	5.99
NECO	4(5)	13(9.6)	3(5.4)	20		
Total	12	23	13	48		

2006

Examination Body	Cognitive Level: Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	8(7.3)	10(10.9)	8(7.8))	26	0.29	5.99
NECO	6(6.7)	11(10.1)	7(7.2)	24		
Total	14	21	15	50		

2007

Examination Body	Cognitive Level: Knowl	Comp.	Higher Cognitive Level	Total	X^2cal	X^2crit
WAEC	14(9.8)	5(9.8)	13(11.1)	32	10.09	5.99
NECO	3(6.5)	12(6.5)	5(6.9)	20		
Total	17	17	18	52		