Entry Requirements into colleges of Education Integrated Science programme and Students performance in North-Central Zone, Nigeria

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Abstract
The study investigated students' entry requirement on achievement in Integrated science and their possible progressiveness at Colleges of Education. Four research questions and Three Hypotheses were answered and tested respectively. An expo-facto design method was adopted for the study. The sample comprised 300 graduated students randomly selected from three Colleges of Education who possessed either WAEC/NECO or NABTEB certificate. Results of the students from NCE I-III were obtained from the departmental files of the colleges involved in the research and were categorized into 4-point Likert scale for analysis using inferential statistics. The result showed that there was a significant difference: in the entry requirement of the admission of NCE students to study Integrated Science; a significant relationship with students' academic performance; and a significant difference in the male and female students' academic performance in Colleges of Education in North-central Zone Nigeria. It was recommended amongst others that the test and measurement unit of NCCE should be saddled with the responsibility of conducting post-JAMB examination to discover the interest and ability of students admitted into NCE programmes and that emphasis should be shifted from, just obtaining a grade in an examination or certificate to knowledge acquired in evaluating the students' ability. It was concluded that there was significant difference in male and female students' academic performance based on entry requirement into college of education in North Central zone of Nigeria, that is, female students performed better than their male counterpart.
Keyword: *Entry Requirement, Academic Performance, Integrated Science and Colleges of Education*

I.   Introduction

The Nigeria policy on Education (2008, 2014) compels prospective ordinary level (O'level) students seeking admission into tertiary institutions or job placements to possess at least any of West African Schools Certificate (WASC), National Examination Council Certificate (NECO), General Certificate in Education (GCE) obtainable at the end of Senior Secondary School Certificate Examination (SSSCE) which are coordinated by West African Examination Council (WAEC) or National Examination Council (NECO). Maduabum (2007) stated that a credit pass in senior secondary school certificate in five science subjects at one or two sitting is required for admission into science and technology based courses in the universities. However, science courses admission requirements for Colleges of Education from O'level candidates are four (4) credits in not move than two sittings including English and mathematics as specified by 2012 Nigeria Certificate in Education Minimum Standard (Rufai, 2013).

In the Nigeria secondary schools, science is taught through two main categories as basic science and technology in primary but as basic science in Junior Secondary Schools and and as separate science subject as Biology, chemistry and physics in Senior Secondary Schools (Okeke, 2007). The need for continuity and smooth sail through the tide of science courses has made Nigeria education policy makers and curriculum experts to make Basic science a core and compulsory subject (Okeke, 2007).

Candidates, wishing to study Integrated Science must satisfy the general admission requirements which include credit passes from any two of groups of subject: Biology/Health/Agricultural Science; Physics; Chemistry or General Science/Integrated Science. Likewise a pass in pre-NCE chemistry final examination or Interim Joint Matriculation Board (IJMB) is acceptable but candidates with such prerequisite must enroll for and write the selected examination organized for candidates by an accredited body such as Joint Admission and Matriculation Board (JAMB) (minimum standard, 2013).

Integrated Science plays prominent roles in uniting all sciences and in the daily lives of individuals, despite such roles students' performances in the subject in Colleges of Education are appalling. Accordingly, academic performance is a psychological construct that measures level of knowledge acquired and skills developed in school subjects, generally indicated by marks obtained in tests in a term, annual or semester

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examination as the case may be (Joseph & Ikechukuwo, 2018). The realization of this is usually through concerted efforts and synergy of the many stakeholders which may include but not limited to: parents, teachers and school factors such as school environment, teaching and learning facilities and school weather. WAEC and NECO chief examiners as well as JAMB registrar have on several occasions in their reports on students' performance in various subjects at SSCE level complained bitterly of students' poor performance in science subjects. Since it is the secondary school graduates that feed the Colleges of Education, the continuous poor performances of students call for questions such as; (i) will the students be able to cope in Colleges of Education Integrated Science programme? (ii) will the students who are good achiever in WAEC/NECO/GCE 'O' level be good achiever in the same order in NCE? (iii) will there be progression or retrogression in performance of students in colleges of Education Integrated Science programme? These types of questions demand researches that are correlated-based. This however, has led to lots of researches being carried out to find out the causes of the problem (Galadima & Yushan, 2007). For instance, Ojeleye and Ebeh (2012) investigated the entry qualifications grade and NCE final examination outcomes in Mathematics. Maduabum (2007) also ascertained the extent to which further mathematics prepares science students in higher education in Nigeria.

A quantum of researches have been carried out in Integrated Science on students' entry qualifications into higher education and their performance in various subjects at the final year examination, yet, none has reflected an enquiry into NCE I-III in any Colleges of Education in North central zone of Nigeria. Embarking on this research at Colleges of Education level is in line with the research conducted by Ma and Xu (2004) on achievement and progression across secondary schools students where they discovered that junior secondary students who performed well in basic science also progressed favorably in senior secondary science subjects.

The contributing factor of gender became crucial in this research because the colleges are co-educational. Sex-role stereotyping has affected the type of education provided for the male and female in both secondary schools and institutions of higher learning in Nigeria and many parts of Africa (Olikpe & Amedi, 2011). Sex-role stereotyping influences performance and classroom interaction patterns of students and teachers. Gender stereotyping in Integrated Science therefore arises from different social roles, which ultimately affect the way student learn and consequently affect the academic performance. In a research conducted by Sunday (2104), he found out that "there was no significant difference in achievement of male and female secondary school students in Edo State". This paper therefore examined the relationship between Colleges of Education students' entry requirements and their performance in Integrated Science programme in the North central zone of Nigeria.

Aims and objectives
This study determined**:**
1. the influence of entry requirements on Integrated Science students admission in College of Education North Central Zone of Nigeria.
2. the influence of entry requirements integrated science students academic performance in College of Education in North Central zone of Nigeria.
3. the progress of Integrated Science students from 100L to 300L in Colleges of Education in North Central zone of Nigeria.
4. The entry requirements and the difference in the academic performance of male and female integrated science students in College of Education in North Central zone of Nigeria.

Research questions
1. To what extent does entry requirements influence integrated science students' admission in Colleges of Education in North Central Zone of Nigeria?
2. How does entry requirements influences integrated science students' academic performance in Colleges of Education in North Central zone of Nigeria?
3. How does entry requirements influence the progression in academic performance of integrated science students' from 100L to 300L in College of Education in North Central Zone of Nigeria?
4. What is the contribution of entry requirements to the academic performance of male and female integrated science students in College of Education in North Central Zone of Nigeria?

Research hypotheses
The following null hypotheses were tested at 0.05 alpha level of significance
HO$_1$:   There is no significant difference in the entry requirements of the integrated science students offered admission in Colleges of Education in North-central Zone of Nigeria
HO$_2$:   There is no significant relationship between the entry requirement of integrated csience students and their academic performance in Colleges of Education in North-Central Zone of Nigeria

HO$_3$:   There is no significant difference in the entry requirements of male and female integrated science students and their academic performance in Colleges of Education in North-Central Zone of Nigeria

II.   Methodology
The study adopted an expost –facto research design since no variable was manipulated.

Population
        The population of the study comprised all graduating 300L integrated science students from three Colleges of Education, (FCE, Kontagora (A) COE, Ilorin Kwara State (B) and COE, Akwanga, Nasarawa State (C)). 50 males and 50 female students were selected from each of the three Colleges of Education randomly to give a total of 300 integrated science students from the Colleges. These students were admitted into the colleges in 2013/2014 academic year through JAMB and their admission was based on meeting the entry requirements/qualification.

Instrumentation
        No instrument was either adopted or adapted for the study; rather, data were generated from the admission files of students. These files contain information about students Entry qualification (SEQ). Similarly, the raw scores and grades of integrated science students from 100L to 300L provided data for their academic performance. An adequate 5- point likert rating scale was used to code the grading as A=5, B=4, C=3, D=2, E=1, F=0.

III.   Results
        Mean and Standard deviation were used in analyzing the data to answer the research questions, ANOVA, correlation was used to analyze the data for testing the hypothesis one and t-test were used to analyze the data for testing the hypotheses.

Result presentation

Table 1: Grading System for NCE Semester Score

Grade	Score	Interpretation
A	70% and above	Distinction
B	60-69	Credit
C	50-59	Merit
E	40-49	Pass
F	0-39	Fail

Source: NCCE minimum standard (2012)

The table 1 shows the NCCE minimum standard pattern of grading NCE semester examinations.

Table 2: Grades Obtained by selected NCE I Students in Integrated Science from the Three Schools

	GRADE						
	Distinction A	Credit B	Merit C	Pass D	E	Fail F	Total
A	11	39	36	11	2	1	100
B	2	13	31	28	7	19	100
C	1	21	73	2	1	2	100
Total	**14**	**73**	**140**	**41**	**10**	**12**	**300**

Table 2 shows that only 14 students made distinction grade "A" in Integrated Science in NCEI, 73 made credit grade "B" 140 made "C" grade,41 10 made "E" grade while 22 failed.

Table3: Grade Obtained by NCEII Students in Integrated Science from the Three College of Education.

	GRADE						
	Distinction A	Credit B	Merit C	D	Pass E	Fail F	Total
A	13	20	40	15	7	1	100
B	0	18	27	38	5	12	100
C	1	28	61	6	2	1	100
Total	**14**	**66**	**128**	**59**	**14**	**14**	**300**

Table 3 shows that only 14students made distinction grade "A" in integrated science in NCEII, 66 made credit grade "B", 128 made merit grade "C", 59 made "D" grade, 14 made "E" grade while 20 failed.

Table 4: Grades Obtained by the same selected Students in NCEIII in Integrated Science by the Three Schools

| | GRADE | | | | | | |
	Distinction A	Credit B	Merit C	Pass D	E	Fail F	Total
A	8	15	19	28	2	28	100
B	0	19	35	34	3	9	100
C	1	15	81	3	0	0	100
Total	**09**	**49**	**135**	**65**	**05**	**37**	**300**

Source: Integrated science Department Approved Results

Table 4 shows that only 9students made distinction grade "A" in integrated science in NCE III, 49 made credit grade "B", 135 merit made grade "C", 65 made "D" grade, 5 made "E" grade while 37 failed.

Table 5: Distribution of Entry Level Requirement (ELR) from the Three Schools

School	ELR 9	%	ELR 8	%	ELR 7	%	ELR 6	%	ELR 5	%
A	14	4.67	36	12	39	13	11	3.37	O	0
B	14	4.67	21	7	23	7.67	20	6.67	22	7.33
C	1	0.33	4	1.33	1	0.33	7	2.33	87	29
Total	**29**	**9.67**	**61**	**20.3**	**63**	**21**	**38**	**12.7**	**109**	**36.3**

Source: Department of Integrated Science

Table 5 showed that school A had a better standing in the entry level requirements with 89 students having between 9 to 7 entry level requirements. The next was school B with 58 students having between 9 to 7 entry level requirements while the least was school C with only 8 students having between 9 to 7 entry level requirements.

Research question 1: What is the influence of entry requirement on the admission of NCE students to read Integrated Science subject in College of Education in North Central zone of Nigeria?

Table 6: Mean and Standard Deviation of Entry Level Requirement of NCE Students

Group	N	X	SD
A	100	2.453	1.264
B	100	2.851	1.359
C	100	1.252	0.757

Table 6 reveal the mean entry level requirement and standard deviation of students' offerings Integrated Science in College of Education in North Central, Nigeria. The table showed that the mean entry level requirement of the three Colleges of Education differs, where school B had the highest score of 2.851 with standard deviation of 1.359, it was followed by school A which had mean score of 2.453 with standard deviation of 1.264 while school C had mean score of 1.264 with standard deviation of 0.757.

Research question 2: What is the influence of entry requirement on NCE students' academic performance in Colleges of Education in North Central zone of Nigeria?

Table 7: Mean and Standard Deviation of Academic Performance of NCE Students

Group	N	X	SD
A	100	3.134	1.072
B	100	2.642	0.888
C	100	3.144	0.450

Table 7 reveals the means academic performance and standard deviation of students offering Integrated Science in Colleges of Education in North Central, Nigeria. The table showed that the mean academic performance of the three schools differs, where school C had the highest mean score of 3.144 with deviation of 0.450, it was followed by school A which had mean score of 3.134 with standard deviation of 1.072 while the school B had mean score of 2.642 with standard deviation of 0.888.

Research question 3: Are there geometric progression or otherwise from NCE I-III in academic performance of NCE students in Colleges of Education in North Central zone of Nigeria?

Table 8: Grade Obtained by same students from NCE I-III in Integrated Science Between the Three Colleges of Education

	GRADE																	
	A			B			C			D			E			F		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
A	11	13	8	39	20	15	36	40	19	11	15	28	2	5	2	1	7	28
B	2	0	0	13	18	19	31	27	35	28	38	34	7	5	3	19	12	9
C	1	2	1	21	28	15	73	61	81	2	6	3	1	2	0	2	1	0
Total	**14**	**15**	**9**	**73**	**66**	**49**	**140**	**128**	**135**	**41**	**59**	**65**	**10**	**12**	**5**	**22**	**20**	**37**

Key: *Distinction "A", Credit "B", Merit "C", pass "D", and Fail "F"*

Table 8 shows the geometrical progression or otherwise from NCE I-III in academic performance of integrated science students in Colleges of Education in North Central Zone of Nigeria. From the table, it was observed that students with distinction increased by 1 between NCE 1 and 111 while there was a decrease between NCE II and III. It was also observe that there was a geometrical retrogression of student with credit from 73 students to 66 and eventually to 49students. For the student with merit, there was a decrease from NCE I to NCE II while at NCE III, students with merit increased which should be as a result of struggling to graduate with a better grade. In the same vein, students with pass grade increased geometrical from 41 to 59 and to 65. But it was notice that the number of student that fail increase geometrical especially at school A, but there was decrease at school B and C. This implies that most students in these schools under study need constant reorientation especially at school for a higher level of commitment to academic performance.

Research question 4: Is there any Difference in the Academic Performance of Male and Female Student of NCE in College of Education in North Central Zone Nigeria?

Table 9: Mean and Standard Deviation of Academic Performance of Male and Female NCE students.

Group	N	X	SD
Male	150	2.873	0.849
Female	150	3.074	0.891

Table 9 reveals the mean academic performance and standard deviation of male and female students offering Integrated Science in Colleges of Education in North Central, Nigeria. The table showed that the mean academic performance of the two gender group differs, where female students had the highest mean score of 3.074 with standard deviation of 0.891, male students had Mean score of 2.873 with standard deviation of 0.849. This implies that female students performed better than their male counterpart.

Testing the Stated Hypothesis

Ho₁: There is no significant difference in the entry requirement of the admission of NCE students to Integrated Science subject in College of Education in North Central Zone of Nigeria.

Table 10: Summary of ANOVA Result of the Entry Requirement of the Admission of NCE Students.

Source of variation	Sum of squares	Df	Mean squared	f-value	P
Between groups	138.667	2	69.333	51.706	.000
Within groups	398.250	297	1.341		
Total	**36.917**	**299**			

Table 10 shows the ANOVA comparison of the entry level requirements of integrated science students offered admission in to College of Education in North Central zone of Nigeria. An examination of the table shows a significant score difference in the entry level requirement of the three groups $F_{(2,297)} = 51.706$, P value=0.000, P<0.05). This shows that there was significant difference in the entry requirement of the admission of Integrated Science students offered admission in to Colleges of Education in North Central zone of Nigeria. Hence, hypothesis one was rejected.

Ho₂: There is no significant relationship in the entry requirement on the NCE students' academic performance in College of Education in North Central zone of Nigeria.

Table 11: Model Summary of Entry Level Requirement on NCE Students Academic Performance.

Model	R	Adjusted R square	Std. Error of the Estimate
1	0.144[a]	0.017	0.867

a. **Predictors: (Constant), Entry Level Requirement**

Coefficients [a]

Model Sig.B	Unstandardized coefficients Std. Error Beta		Standardized coefficients		T	
1 (constant)	3.175	0.096	33.136	0.000		
groups	-0.094	0.037	0.144	2.506		0.013

b. Dependent variable: Academic performance

From the above regression analysis, the output model table shows the summary and overall fit statistics. We found R value to be 0.144 while adjust R2 of our model is 0.00. Also from the coefficient table it can be seen that t-test value is significant with value of 0.013 (for significant value, p<0.05). It can therefore be said that entry requirement have a statistically significant relationship with NCE students' academic performance. Hence, the hypothesis was rejected.

H0₃: There is no significant difference in male and female students' academic performance based on entry requirement into College of Education in north central zone of Nigeria.

Table 12: Summary of t-test Analysis on the Male and Female Students Academic Performance.

Group	N	DF	X	SD	t-value	p-value
Male	150		2.873	0.849	0.718	0.041
Female	150	298	3.074	0.891		

Table 12 shows the t-value was 0.718 the p-value was 0.0041 which is P 0.05. This means it was significant as such the hypothesis was rejected. The mean score of male student was 2.873 with standard deviation of 0.849 while the female students had Mean score of 3.074 with Standard deviation of 0.891. This implies that there was significant difference in male and female students' academic performance based on entry requirement into college of education in north central zone of Nigeria. Hence, the hypothesis was rejected.

IV. Discussion of the Findings

The table 1 showed the distribution of the entry requirement (ELR) from the sample school as indicated, 29 of the sample had nine (9) credit which is 9.67%, 61, that is 20.30% had eight (8) credits, 63 (21.00) had up to seven (7) credits, while 38 which is 12.70% had 6 credits and majority of them which is one hundred and nine (109) students i.e 36.30% of them had five credits. Hence, all the candidates investigated in the study have required entry qualification. That all the candidate admitted are qualified, indicate that none was given any conditional admission.

In comparison of the entry level requirement of the admission of NCE student to read Integrated Science subjects in College of Education in North Central of Nigeria, the result in table 6 showed that there is significant difference based on the result of the three groups. This is in agreement with MS, (2013) that the candidate wishing to study integrated science must satisfy the general admission requirement. On this note, hypothesis one was rejected, that stated that there is no significant difference in the entry requirement of the admission of NCE students to read integrated science subject in Colleges of Education in North Central zone of Nigeria.

The outcome of the research uncovered that entry requirement have a statistically significant relationship with NCE students' academic performance, this is in line with Joseph and Ikechukwu, (2018) that said academic performance is a psychological construct that measure the level of knowledge required and skills developmental in school and it is generally indicated by mark obtained in any standard examinations like WASSCE or NECO. Obioma and Salawu (2007) also saw that students performance in WASSCE or any other 'O' level examination bodies is the best predictor of their performance in higher institution. The hypothesis that said, there is no significant relationship in the entry requirement on the NCE students' academic performance in Colleges of Education in North Central of Nigeria was rejected.

Table 8 that showed the geometrical progression or otherwise from NCE I-III in academic performance of NCE student in college of education in north-central of Nigeria revealed that distinction student increased by 1 between NCE I and II while there was decrease between NCE II and III. There was geometrical retrogress of student with credit from 73 to 66 and eventually to 49. For student with merit there was a decrease from NCE I to II while at NCE iii, there was an increase. This could be as a result of struggling to graduate with better grade, in the same vein, student with pass grade increase geometrically and the number of students that failed also increase geometrically. This is in agreement with the research conducted by Ma&Xu (2004) on achievement and progression across secondary schools students where they discovered that Junior secondary school students that performed well in basic science also progress favorably in senior secondary science subjects.

The result also showed that there was significant difference in male and female students academic performance based on entry requirement into College of Education in North Central zone of Nigeria. This is in

agreement with Sunday (2004) who found out that there was significant difference in achievement of male and female students learning of physics subject in senior secondary school in Edo state, Nigeria. The t-test analysis showed that there was difference in male and female students academic performance based on entry requirement into College of Education in north central zone of Nigeria and such, the hypothesis was rejected.

V.   Recommendations
The following recommendation has been advanced to help in the improvement of students performance in integrated science in Nigeria Certificate in Education (NCE) level.
1. Students should be allowed to make their choice of one particular institution during JAMB registration, so as to correct the existing anomalies of making college of education as the last option for student in admission process (i.e 1st, 2nd and 3rd choices should either be in College of Education or Universities.)
2. Test and measurement unit of National Commission for College of Education (NCCE) should be saddled with the responsibility of conducting post-JAMB examination which will be aimed at discovering the interest and ability of students admitted into the programmes run by the College of Education.
3. Emphasis must be shifted from just obtaining a grade in an examination or certificate but must be placed on knowledge acquired in evaluating the students.
4. The existing scholarship award the students that have cumulative grade point of 3.5 and above in our various institution by the Federal Government should be sustained. We also encourage the NCCE to cue into this lofty programme.
5. There should be collaboration in term of sponsorship and funding of Teacher Education by government and private sectors. This will help to take care of indigent student who are willing to become science teachers in future

VI.   Conclusion
This paper was able to establish that;
1. There was geometrical retrogression of students with credit pass and progression by one of the distinction students. In the same vein, student with pass increased geometrically from 41 to 65.
2. There was significant difference in male and female students' academic performance based on entry requirement into college of education in North Central zone of Nigeria. That is, female students performed better than their male counterpart.

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