

Mode of Entry and Gender as Determinants of Nigerian Pre-service Teachers' Performance in Degree Mathematics and Science Courses

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Abstract—This study investigated the effects of mode of entry and gender on pre-service teachers' performance in degree mathematics and science courses. Data were drawn from students' (125 males and 121 females) final year results in four disciplines in education (mathematics, physics, chemistry and biology) from a conventional university in Nigeria. Independent samples t-test and one-way analysis of variance (ANOVA) were used to analyze the data. The results showed that there was a significant effect of mode of entry on pre-service teachers' performance in degree (a) biology, (b) chemistry, (c) mathematics, and (d) physics in favour of the entrants by direct entry mode. Entrants by direct entry mode consistently showed better performance in degree mathematics and science courses than entrants by pre-degree science education mode and entrants by unified tertiary matriculation examination mode. However, there was no significant effect of gender on pre-service teachers' performance in degree (a) biology, (b) chemistry, (c) mathematics, and (d) physics. This showed that gender might not be a potent factor in pre-service teachers' performance in degree mathematics and science courses in the Nigerian universities. It was therefore recommended that equal admission opportunities be given to both male and female prospective entrants into the degree mathematics and science education courses in Nigerian universities. More so, the faculties of education in the Nigerian universities should give priority to the holders of the Nigerian Certificate in Education or its equivalent in their admission policy.

Keywords— Mode of entry, gender, pre-service teacher, Nigerian, mathematics, science courses, performance.

I. INTRODUCTION

University education in Nigeria started in 1948 with the establishment of the first university-level institution in the country as a college of the University of London. Apart from the externally trained Nigerians, the University College, Ibadan was the only industry responsible for the production of higher-level manpower for the country between 1984 and the time Nigeria got her independence from the British Colonial Masters. At Independence in 1960, Nigeria could only boast of two universities: University College, Ibadan weaned as University of Ibadan and University of Nigeria, Nsukka with a total student enrolment of less than 2000. By 2010, the number of universities in Nigeria had risen to 104 with a pooled student enrolment of about 1.5million [4]. In 2011, 13 new universities were added making a total of 117. At present, the list of Nigeria universities has swollen to 122, following the approval of five new private universities by the Federal Government. There are currently three categories of universities across the country, in terms of ownership. These are federal, state and private individuals and groups. The return of Nigeria to a democratically elected government on 29th of May 1999 has witnessed an upsurge in the creation of universities catalyse by private participation. Between 1999 and 2012, -a space of 13 years, 86 universities were established. This figure (includes 11 federal universities, 23 state universities, and 52 private universities) speaks volume

of the proliferation of university education in Nigeria with its attendant emergence of degree mills. Although, the establishment of more private universities is considered on antidote to the proliferation of illegal universities and degree-awarding mills across the country, records have shown that there are 49 degree mills under the search light of the National Universities Commission (NUC). Reference [4] provided a list of such degree-awarding mills in Nigeria whose wings must be clipped because they undermine the value of legitimate higher education institutions. The NUC established in 1964 is one of the three regulatory agencies statutorily empowered to quality assure the higher education system. It is the major accreditation body that enforces uniform standard and sets admissions capacity of every university in Nigeria. Being the capstan of the entire educational system [5] the university is regarded as a store house for knowledge and a breeding mill for inventions needed for cultivating public intelligence and meaningful living. Before now, records have shown that Nigerian universities have been producing high quality graduates many of whom have made their marks in their areas of expertise so much that some of them now rank among the best inventors and professors teaching in the best universities around the world. This is no gain saying as [5, 6] also attested to the ground breaking records of Nigerian universities output in the past.

In recent years, quality assurance process of the Nigerian university system seems to have cast aspersions on the quality of graduates produced in the country. Improvement in quality of graduates from the nation's universities was found to mismatch the quality assurance efforts [4] now that the accolade attached to Nigerian universities seems to have faded away [5]. This is against the backdrop of unsavoury criticism levelled against the nation's universities in the admission processes and the quality of graduates produced. The quality assurance of the universities entrant admission process reveals a fluctuating pattern from 1948 to 2010. In a study that rated the quality assurance process of the Nigerian university system over ten-year intervals from 1984 to 2012, [4] showed that the process of admitting students into the nation's universities was adjudged, on the average, to be above 80% in quality between 1984 and 1990, thumbed down to a record low of 54% from 1990 to 2000 and rose to 66% in 2010. Presently, the non-inclusion of any of the nation's universities in the world best 500 universities also attests to the steady decline in the status of the Nigerian universities and hence, the quality of the graduates produced. In a survey carried out by NUC in 2004 to assess the labour market expectations of graduates from the Nigerian university system revealed that there was a high rate of unemployment among the graduates and worse still, those who were fortunate enough to secure appointment into nation's industries were made to undergo remedial training in order to bridge the gulf of knowledge and skills deficit traceable to improper university training. Science graduates were overall only rated average in skills in literacy and oral communication, information technology, entrepreneurship, analytical competency, problem-solving/decision making capabilities,

subject-specific knowledge, technical capability, critical thinking, self-directed learning, and numeracy with the magnitude of weaknesses varied with the specific attributes. The only attribute in which the science graduates were rated good was in interpersonal skills [4].

In specific terms, the devaluation of Nigerian universities graduates in academic quality nullifies the central tenet of university which is basically an institution of learning established to produce high level skilled manpower for national development. The quality of candidates aspiring to have university education is a critical element in consideration of the quality of graduates. Thus, a probe into the various entry modes of entrants into the nation's universities as suggested by researchers [5] with the intent of distinguishing which of modes provides the desired academic standard could provide a clue as to why many graduates from Nigerian universities are devalued in academic quality. Presently, most Nigerian universities admit students into teacher education science programmes on the basis of their performance in either the Unified Tertiary Matriculation Examination (UTME), formerly called the Universities Matriculation Examination (UME) conducted by the Joint Admissions and Matriculation Board (JAMB), Advanced Level Examination or its equivalent in relevant science subjects, usually the Nigerian Certificate in Education for Direct Entry (DE) into 200 level or the Pre-Degree Science Education (PDSE), strictly under the auspices of the universities running such a programme. In recent years, Nigerians have blamed the JAMB-conducted UTME for the low academic quality of the undergraduates in the nation's universities and researchers [41] have pointed out that the introduction of JAMB has restricted the ability of various universities to control the number and character of successful applicants to the universities thus depriving universities of the power to determine the quality of entrants that should be admitted.

The reputation of the JAMB was put to test in the 2009 UTME in which the grading system was subject to serious controversy when the overall performance of students was one of the poorest on records. Much to JAMB's embarrassment, it was later discovered that the machines which optically graded the papers had erroneous answers which led to some students' scores being changed by a margin of 15%. Alas, the much tainted blame placed on the JAMB conducted UTME as the major cog in the wheel of academic quality of the undergraduates [5] in various universities courses is yet to be fully substantiated through empirical evidence. Notwithstanding, the inadequate quality control mechanisms instituted by the JAMB has heightened the rates of examination malpractices engaged in by UTME candidates thus compromising the quality of entrants into the nation's universities. Other causes of academic deficiency of the entrants include motley assortment of admission processes instituted by some nation's universities with their unapproved satellite campuses [4], non degree programmes mounted by some universities, particularly the pre-degree programmes coupled with lack of adequate instructional materials for teaching and researching [7] and over enrolment into the

various courses in the universities. These and the need to quality assurance of entrants have necessitated the institutionalization of post-UTME screening in the nation's universities in 2005 as a means of applying the quality rule book to promote assurance and merit-driven climate for admission. This action gained more popularity amidst the initial criticisms based on the results of a policy study carried out by the Nigerian Educational Research and Development Council (NERDC) in 2006 at the instance of the National Council on Educational (NCE). The study determined the extent to which public examinations conducted by the West African Examinations Council (WAEC), National Examinations Council (NECO), National Business and Technical Examinations Board (NABTEB) and Joint Admissions and Matriculation Board (JAMB) could predict university students' academic performances.

The results showed a low but positive relationships between each of the predictors (examinations conducted by the WAEC, NECO, and NABTEB) combined with the UTME being conducted by the JAMB, and the performance of students in the year one cumulative grade point average (CGPA). More so, the West African Senior Secondary Certificate Examination (WASSCE) conducted by the WAEC was the best single predictor of the students' CGPA in their first year in the universities whereas the UTME was not a good predictor. All the weaknesses traceable to the Nigerian university community suggest that Nigerian universities have not come up with the most desirable mode of entry for selecting quality male and female entrants into the various degree programmes in general and teacher education programmes in particular.

Teacher education has been identified as a key to nation building. Often times it is said "train the teachers, build the nation". Conventional universities in Nigeria are saddled with the responsibility of training the teachers who in turn train the students at the primary and secondary school levels. Of all the teacher education programmes mounted by Nigerian universities, degrees in science and mathematics education courses are often sort after by prospective undergraduates. This is not unconnected to the status of science and mathematics in school curriculum and the recognition given to science education in general as contained in section seven number 39 (d) in the National Policy on Education [8]. The policy stipulates that "government shall popularize the study of the sciences and the production of adequate number of scientists to inspire and support national development". (p. 29). Learning of science and mathematics by pre-service teachers demands sound entry behaviour. More so, that the quality of professional graduate teachers in science and mathematics depends so much on the quality of entrants into teacher education science and mathematics programmes in the universities. However, for Nigeria to achieve her core objectives in the teacher education programme and maintain quality teacher output in science and mathematics, quality male and female entrants into science and mathematics education courses in Nigerian universities must be carefully selected using valid and credible mode of entry so that those

males and females selected from among the eligible candidates might possess required academic competencies to pursue the chosen courses.

Gender inequality in learning science and mathematics has continued to be topical issue of global concern [1, 15, 25, 26, 39, 40] and many studies are of the empirical position that males are better in science and mathematics [19, 20, 21, 27, 28, 31]. The reason for this is not farfetched as both personal and corporate beliefs created by some genetic differences between males and females account for this difference [42]. Also, a wide range of socio-cultural factors contribute to gender inequality in science and mathematics achievement and ability. Apart from the mentioned reasons, internal and external factors have been identified as contributing to gender inequality in science and mathematics learning [30]. While the internal factors, have described in terms of biological, cognitive and affective factors, the external factors have been defined as significant others and classroom factors. Gender inequality is a subject of perennial concern with no clear cut answer as to the questions about sex differences in science and mathematics [38] and science and mathematics are considered male dominated domains in which females tend to shy away from scientific and mathematical fields. Males, therefore, tend to show a natural positive attitude to school science and mathematics while females display negative attitude. The negative attitude is situated in the stereotypical belief about males and females' performance in science and mathematics. This stereotypical belief is a common phenomenon in Nigeria [31] and school being a microcosm of society, intentionally or unintentionally perpetuates this behaviour, and, indeed, teachers within the system exhibit gender bias in the classrooms [1]. The fact that males recorded higher percentage of credit passes than females in mathematics and science subjects like biology, chemistry and physics in the West African Examinations Council ordinary level examinations between 2004 and 2011 as a test period, is a proof of gender inequality in the sciences and mathematics in Nigeria.

Studies of gender differences in science and mathematics in Nigeria and elsewhere are somewhat inconclusive and findings mixed. For instance, it has been reported that gender has significant influence on science and mathematics achievements in favour of males [15, 18, 28, 31] and in favour females [2]. Adding to this inconclusive finding on one hand, [3] noted that females' performance tends to be better than males' on tasks/problems with well-defined procedures whereas, males exhibit better performance than females on problems with less apparent problem solving strategy. On the other hand, it has been found that the influence of gender on achievements in science and mathematics is neutral [1, 12, 15, 32, 33]. These mixed findings in gender-related research should, however, be expected as studies vary in their learning contexts [1] which include the methodology, populations, geography, research tasks, and classroom settings [18]. While gender difference patterns in science and mathematics achievements vary from one ethnic nationality to the other [22, 23, 24], with

considerable attention given to gender differences in students' performance in science and mathematics [1, 15], studies that investigate the influence of pre-service teacher gender on their science and mathematics achievements are few. In a study of mathematics performance of graduating Nigerian pre-service teachers over a period of three years for possible gender differences, [1] found that the gender gap in mathematics performance among the sample data could be disappearing. Similarly, [34] found no significant gender difference in integrated science performance among Nigerian pre-service teachers with the conclusion that gender gap in integrated science achievement could be dwindling. Furthermore, a few studies have indicated that teacher gender not only have a significant influence on students' achievements in science and mathematics [35, 36] but that the variable of teacher gender has a stronger effect on students' achievements in science and mathematics than does student gender [37]. This study therefore, investigated the effects of mode of entry and gender on pre-service teachers' performance in degree science and mathematics courses in a Nigerian university.

II. RESEARCH QUESTIONS

1. Is there any significant effect of mode of entry on pre-service teachers' performance in degree (a) mathematics, (b) physics, (c), chemistry and (d) biology?
2. Is there any significant effect of gender on pre-service teachers' performance in degree (a) mathematics, (b) physics, (c), chemistry and (d) biology?

III. METHODOLOGY

Final year results of pre-service teachers with specialty in biology, chemistry, mathematics, and physics at the end of their 3-year or 4-year (depending on the mode of entry: 4 years for pre-degree and UTME candidates and 3 years for direct entry candidates) programmes were collected as the secondary data for the study. In this study, the results of pre-service teachers in biology (n = 66), chemistry (n = 65), mathematics (n = 75), and physics (n = 40) who graduated from a conventional university in the south west geo-political zone of Nigeria in 2010 were analyzed. The courses taken by the pre-service teachers were discipline related in addition to the teaching methodology and core education courses. The cognate courses in each discipline (Table 1) were in line with the curriculum approved for all conventional Universities running programmes leading to the award of B. Ed or B.Sc (Ed) degrees by the regulatory body, the NUC.

TABLE 1
APPROVED COGNATE COURSES FOR BIOLOGY,
CHEMISTRY, MATHEMATICS AND PHYSICS IN A NIGERIAN
UNIVERSITY

S/N	Course Study	Cognate Courses
1	B.Sc (Ed) Biology	General biology, invertebrates, seedless plants, aquatic Biology,

		ecology, vertebrates, genetics cell Biology, introductory microbiology, histology, developmental biology, animal behaviour, forms and functions in plants and animals, animal physiology, entomology, algology and bryology, economic botany, principle of parasitology, plant pathology, advanced taxonomy angiosperm, evolution, biological techniques, mycology, fisheries and aquaculture, and plant and environmental pollution monitoring.
2	B.Sc (Ed) Chemistry	Basic chemistry, organic chemistry, physical chemistry, inorganic chemistry, analytical chemistry, phase equilibra, electro-chemistry and redox equilibra, chemical kinetics, organic reactions, organic spectroscopy, quantum chemistry, kinetics and chemical equilibrium, polymer chemistry, chemical thermodynamics, petrol chemicals and utilization of waters, organometallic chemistry, experimental physical chemistry, molecular spectroscopy, aromatic heterocyclic and natural products chemistry, coordination chemistry, environmental and toxicology chemistry, experimental organic chemistry and protein and carbohydrate chemistry.
3	B.Sc (Ed) Mathematics	Algebra and co-ordinate geometry, trigonometry and calculus, mechanics, real analysis, abstract algebra, linear algebra, mathematical method, ordinary differential equation, vectors and tensors, numerical analysis, functional analysis, topology, group theory, partial differential equation, operation research, complex analysis, field theory, commutative algebra, theory of modules, Lebesgue measure and integration and electromagnetism.
4	B.Sc (Ed) Physics	Optics, electricity and magnetism, properties of matter and thermodynamics, classical mechanisms, optics, waves and vibration, electromagnetism, experimental physics, modern physics, thermodynamics, semi conductor devices, nuclear physics, solid earth physics, statistical physics, acoustic, quantum physics, electronics, oscillations and waves, numerical computation in physics, applied geophysics, astrophysics, solid-state physics, special relativity, nuclear reactor physics, lower atmosphere physics, ionospheric

		physics, plasma physics, x-ray crystallography, opto-electronics, and electronics circuits.
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Examination questions set by individual course lecturer were moderated by the head of department and some senior colleagues. Thereafter, the questions were further subjected to external moderation by examiners appointed for such a purpose. Marked examination scripts were vetted by a second examiner and an external examiner. These are other NUC requirements for quality control. Table 2 shows the mode of entry distribution of sample according to course of study and gender.

TABLE 2
DISTRIBUTION OF SAMPLE BY COURSE OF STUDY, MODE OF ENTRY AND GENDER

CS	G	N (%)			Total
		DE	PDSE	UTME	
B.Sc(Ed) (Biology)	Male	8 (26.7)	10 (33.3)	12 (40.0)	30
	Female	7 (19.4)	13 (36.1)	16 (44.5)	36
	Total	15 (22.7)	23 (34.8)	36 (54.5)	66
B.Sc(Ed) (Chem)	Male	8 (22.9)	10 (28.6)	17 (48.5)	35
	Female	8 (26.7)	10 (33.3)	12 (40.0)	30
	Total	16 (24.6)	20 (30.8)	29 (44.6)	65
B.Sc(Ed) (Math)	Male	10 (25.6)	12 (30.8)	17 (43.6)	39
	Female	9 (25.0)	11 (30.6)	16 (44.4)	36
	Total	19 (25.3)	23 (30.7)	33 (44.0)	75
B.Sc(Ed) (Physics)	Male	5 (23.8)	6 (28.6)	10 (47.6)	21
	Female	6 (31.6)	6 (31.6)	7 (36.8)	19
	Total	11 (27.5)	12 (30.0)	17 (42.5)	40

Collected data were subjected to one-way analysis of variance (ANOVA) and independent samples t-test. The one-way ANOVA was used to answer research question one whereas the independent samples t-test was employed to answer research question two.

IV. RESULTS

Table 2A below shows the summary of one-way ANOVA of pre-service teachers' performance in degree mathematics and science courses (physics, chemistry, and biology) based on mode of entry. It can be seen that there was a significant effect of mode of entry on pre-service teachers' performance in degree mathematics ($F_{(2, 74)} = 38.08; p = .000$), physics ($F_{(2, 39)} = 24.42; p = .001$), chemistry ($F_{(2, 64)} = 30.06; p = .000$), and biology ($F_{(2, 65)} = 31.62; p = .000$).

TABLE 2A
SUMMARY OF ONE-WAY ANALYSIS OF VARIANCE OF PRE-SERVICE TEACHERS' PERFORMANCE IN DEGREE MATHEMATICS, PHYSICS, CHEMISTRY BIOLOGY BASED ON MODE OF ENTRY

Course of Study	Source of Variation	SS	Df	MS	F
B.Sc(Ed) (Math)	Betw.grps	584.10	2	292.05	38.08*
	Withingrps	348.71	72	4.84	
	Total	932.81	74		

B.Sc(Ed) Physics)	Betw. grps	356.74	2	178.37	24.42*
	Withingrps	207.12	37	5.60	
	Total	563.86	39		
B.Sc(Ed) (Chem)	Betw. grps	498.14	2	249.07	30.06*
	Withingrps	363.16	62	5.86	
	Total	861.30	64		
B.Sc(Ed) (Biology)	Betw. grps	510.62	2	255.31	31.62*
	Withingrps	370.46	63	5.88	
	Total	881.08	65		

*Significant at $p < .05$

To specify the direction of the effect, Scheffe post hoc analyses were carried out and results displayed in Table 2B below. The results showed that entrants by direct entry mode consistently showed better performance in degree mathematics and science courses than their PDSE and UTME counterparts. Also, by comparison, entrants by PDSE showed better performance in degree mathematics and science courses than their UTME counterparts.

TABLE 2B
SCHEFFE POST HOC ANALYSIS OF PRE-SERVICE TEACHERS' MEAN PERFORMANCE IN DEGREE MATHEMATICS, PHYSICS, CHEMISTRY BIOLOGY ACCORDING TO MODE ENTRY

Course of study	Mean	Mode of Entry	PDS UTME DE		
			PDS	UTME	DE
B.Sc(Ed) (Math)	59.21	PDSE	*	*	*
	52.11	UTME	*	*	*
	63.61	DE	*	*	*
B.Sc(Ed) Physics)	63.13	PDSE	*	*	*
	55.18	UTME	*	*	*
	67.86	DE	*	*	*
B.Sc(Ed) (Chem)	57.12	PDSE	*	*	*
	50.49	UTME	*	*	*
	60.06	DE	*	*	*
B.Sc(Ed) (Biology)	53.82	PDSE	*	*	*
	50.19	UTME	*	*	*
	61.06	DE	*	*	*

*Pairs significantly different at $p < 0.05$

In terms of gender difference in performance in degree mathematics and science courses, it is observed in Table 3 below, that males consistently had higher mean scores than females. The male pre-service teacher scores in degree mathematics were 1.0 points higher than the female pre-service teacher scores, a non significant difference ($t = 0.38, p > 0.05$). In degree physics, the male pre-service teacher scores were 0.7 points higher than the female pre-service teacher scores, a non significant difference ($t = 0.17, p > 0.05$). In degree chemistry, the male pre-service teacher scores differed by 0.7 points in favour of male. An independent samples t-test indicated that this difference was not significant ($t = 0.31, p > 0.05$). The male pre-service teacher scores in degree biology were 0.3 points higher than the female pre-service teacher scores, a non significant difference ($t = 0.13, p > 0.05$).

TABLE 3

MEAN SCORES, STANDARD DEVIATIONS, AND t-VALUES FOR EACH FIELD OF STUDY

Course of study	Male			Female			t
	N	\bar{x}	SD	N	\bar{x}	SD	
B.Sc(Ed) Math	39	58.9	11.0	36	57.9	10.9	0.38
B.Sc(Ed) Physics	21	63.5	12.2	19	62.8	11.8	0.17
B.Sc(Ed) Chem	35	56.1	9.9	30	55.4	9.5	0.31
B.Sc(Ed) Biology	30	54.3	9.2	36	54.0	9.1	0.13

V. DISCUSSION

Two major findings emerged in this study. First, there was a significant effect of mode of entry on pre-service teachers' performance in degree (a) mathematics (b) physics (c) chemistry, and (d) biology. Second, there was no significant difference in the performance of male and female pre-service teachers in degree (a) mathematics (b) physics (c) chemistry, and (d) biology. The first finding revealed that entrants by direct entry mode consistently had better performance in mathematics, physics, chemistry, and biology than their UTME and PDSE counterparts. These coincided with the results of [5] who found that entrants by direct entry mode had better performance in mathematics and physics than their UTME and PDS counterparts. This finding should not come as a surprise because the entrants by direct entry mode were fewer in number, probably the best selected from similar population [5]. One other plausible explanation for this finding is that entrants by direct entry mode seem to be more matured and test wiser. This is in consonance with the views of [9, 16] that test wiseness is a contributing factor to better academic performance. It is evident that academic performance is directly proportional to maturation [10] meaning that the higher the maturity, the higher the performance. The consistent quality performance of both the entrants by direct entry and PDSE in the degree mathematics and science courses, although performance by entrants by direct entry were higher, could be attributed to their earlier exposure to the nitty-gritty of basic mathematics and sciences accompanied by their desire for and commitment to higher achievement in order to make up for their initial failure to secure admission through the UTME. This view was also noted in earlier study [5]. Students who are intrinsically motivated to learn will require little prodding [15] and often adopt strategies which emphasize efficiency [11] and better study habit [17] thereby leading to better performance. These might have being the lots of both male and female entrants by direct entry and PDSE in this study.

This study has shown that there were no statistically significant gender differences in pre-service teachers' performance in the degree mathematics and science courses. These findings support the seemingly popular claim that the era of male dominance and supremacy in mathematics and science learning is fast disappearing. More so, the popularity

of gender stereotyping in favour of the males as well as the view of science and mathematics careers being for males are waning considering the zero tolerance in gender difference and the comparable number of male and female teachers recorded in this study. This finding is pleasing in that it is a source of hope that in Nigeria the gender gap in mathematics and science performance is disappearing [1, 34] and more pleasing considering the fact that it is in consonance to a trend that has also taken root in the United States [13] and elsewhere in which gender differences tend to be weak within education systems [12]. The hypothesis that genetic reasons [14] underlie the observed gender differences in science and mathematics achievements in favour of males has been proved not to be true by the finding of this study. This position is corroborated by the submission of [15] that the trend of boys having greater natural aptitude in science than girls is not a truism.

However, based on the findings of this study, it is clear on one hand that the entrants by direct entry mode are the best for quality degree in mathematics and science education courses in Nigerian universities. On the other hand, gender has been proved not to be a potent and deciding factor in performance between male and female pre-service teachers in the degree mathematics and science courses. Thus, it is recommended that equal admission opportunities should be given to both male and female prospective entrants into the degree mathematics and science education courses in Nigerian universities. More so, the faculties of education in the Nigerian universities should give priority to the holders of Nigerian Certificate in Education or its equivalent in their admission policy. The implication of this is that the National Council on Education should re-introduce the Higher School Certificate and make it a policy that only the holders of this Certificate or the Nigerian Certificate in Education or its equivalent should be admitted into the degree mathematics and science education courses in Nigerian universities.

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