COMPARATIVE ANALYSIS OF THE ACADEMIC PERFORMANCE OF NATIONAL DIPLOMA (ND) STUDENTS IN POLYTECHNICS IN SOUTH-WEST, NIGERIA.

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Abstract
This study did a comparative analysis of polytechnic ownership, students' gender, course of study, age, and school of study on the academic performance of national diploma students of the Polytechnics in South-West, Nigeria. The design used for the study was the ex-post facto research design; the population for the study consisted of 1,785 National Diploma (ND) II students in the three selected Polytechnics (Federal, State and Private) among all the Polytechnics in the South-West, Nigeria. A sample of 360 students' academic records was randomly selected and used for the study, and the multi-stage sampling procedure was used. Inferential Statistics such as: t-test, Kruskal Wallis test, and Analysis of Variance, (ANOVA) were used to test the null hypotheses at 0.05 level of significance. Results collected from the Management Information System Unit were cross-matched with the approved ones collected from the Exams and Records of the Polytechnics to attest the validity and reliability of the students' results. The results showed that each of: polytechnic ownership, course of study, age and school of study, has comparable effect on students' academic performance in the Nigerian Polytechnic education system, while sex was not statistically significant to students' academic performance among the national diploma students of Polytechnics in South-west, Nigeria. In conclusion, the study showed that the academic performance of national diploma students in Nigerian Polytechnics is high and impressive, and that school ownership, course of study had significant relationship with the academic performance of Nigerian Polytechnic students among others while the sex of a student does not. It was therefore recommended that: enrolments for courses in all Nigerian Polytechnics should not be restricted to any particular sex since gender has no influence on the level of academic performance of students in different courses in Nigerian Polytechnics; the same conditions for admission should be made available and implemented to promote healthy participation and guide against any discrimination in the admission of students to courses among others.
Keywords: Academic performance, Polytechnic students, School ownership, Course of study

Introduction

Education plays a vital role in the development of the human capital as well as the individual's well-being which helps to provide opportunities for better living. The importance of education to man cannot be over-emphasized; this is because education is a fundamental right that should be provided to all beings solely by reasons of being human. Awareness among the masses (both old and young) to get good education is on the increase; because the number of public and private schools, polytechnics and universities had amply increased so as to be able to accommodate the increasing number of students' intake. The trend with which people go for higher education is also increasing remarkably since there seems to be a common feeling that professional education will help the people to secure better and more lucrative jobs; thus, a person's level of education has become a good indication of his status in the society. This is so because education is seen as the important channel through which a man can attain full development; and for one to have a major breakthrough in life, he or she must have attained some significant level of education. According to Oni in Olatiilu (2016) education varies widely in its forms,

philosophy, contents, and methods as there are different societies in the world. He further stated that education is one of the basic means of human and cultural self-realization of the productive power of a nation. Since culture differs from one society to another, every society ultimately has its own system for training and educating the youth. Hence the goal of education and the method of approach may differ from place to place, nation to nation and from people to people.

The Polytechnic Education in Nigerian is a programme of study designed to equip students with vocational and technical skills in the different occupational fields. It is aimed at helping the graduates to become self reliant in the face of paucity of paid employment. The Federal Government of Nigeria in 1977 introduced the National Board for Technical Education, (NBTE) as an organ of the Federal Ministry of Education to be in charge of Vocational and Technical Education with a focus to providing the middle level technical manpower which is needed for the industrial and technical development of the country. Certificates of National Diploma (ND) and Higher National Diploma (HND) are awarded to the Polytechnic graduates at the end of their training.

According to Oladele (2016), success in learning is not only measured by the number of better grades that is, academic performance but also measured by increase in critical thinking, motivation, winning of academic laurels, self esteem, ability to complete a level of education, problem solving or creativity and improved interpersonal relationship of the students. Classroom interaction is also an essential part of the teaching-learning process. It is referred to as the various activities of the class which take place between the teacher and the learner, the teacher and materials as well as the learners and the materials. It is suffix to say that positive classroom interaction among other factors, will engender positive students' attitude and thus affect the academic performance of the class.

According to Akomolafe and Olorunfemi-Olabisi (2011) stakeholders in Nigerian educational system ranging from; parents, guardians, lecturers, family members, counselors, and many others, are so much concerned about students' achievements and academic standard. Student's academic performance is paramount to every institution as well as the other stakeholders. For a student to progress and stay in the institution she or he should excel in all the examinations that would be conducted. Students are assessed on their performance with their Grade Point Average (GPA) as well as their Cumulative Grade Point Average (CGPA). This determines how the student is performing throughout the period of studentship. The CGPA is very important to students, employers and other stakeholders in the educational sector (Plant, Ericsson, Hill & Asberg, 2005; Sunday, 2012). It is an objective tool for assessing the performance of students (Bacon & Bean, 2006; Kaur, Chung, & Lee, 2010) and this helps the institution to be aware of students who will be promoted, repeated, or withdrawn from the programme of study.

The issue of poor academic performance of students in Nigerian Polytechnics has therefore become a source of concern to most parties involved in the delivery of quality education within the country. This unhealthy situation has led to the widely acclaimed fallen standard of education in Nigeria (Akiri and Ugborugbo, 2009; Bamidele and Bamidele, 2013). Studies in the past have identified study habit, student's self-concept, teacher's qualification, teaching method, school environment and government as factors influencing students' academic performance as well as the primary environment of the students which is the home, and it stands to exert tremendous impact on student's academic performance.

The investigations of the factors that influence academic performance of students in Nigerian Polytechnics have attracted the interest of most stakeholders in the education sector in Nigeria and this is because of the public outcries concerning

the low standard of education in the country (Wiseman, 1973; Sogbetun, 1981 cited in Sunday, 2012). This study therefore compared the influence of school ownership, student's gender, age, course of study as well as school of study, as each affects the academic performance of national diploma students in Polytechnics in the south-west, Nigeria with a view to understand some of the factors for success which may lead to innovative ways of providing a more successful academic atmosphere in the Polytechnics.

Statement of the Problem

It was observed that some Polytechnics in Nigeria discriminate against one another, with some claiming superiority over the others based on some acclaimed assumptions in the areas of admission and academic performance of students. Some were not admitting National Diploma graduates of some other Polytechnics into their Higher National Diploma programmes; while some entrepreneurs seem to prefer the graduates from Federal Polytechnics to those of State and Private Polytechnics for employment based on the assumption that products of Federal Polytechnics are believed to be more academically brilliant and well trained than those of the other Polytechnics (Oluwole, 2014). Some even believe that more rigorous academic works are being done in the Federal Polytechnics than in the other two while some are of the opinion that managements of Private and State Polytechnics appear to be more generous with marks in the assessment of the students than in the Federal Polytechnics. Some also consider the academic performance of the Polytechnic student's right from the weight of JAMB UTME marks scored by the candidates offered admission into the Polytechnics. They are of the opinion that most of the candidates offered admission into the Federal Polytechnics scored higher than those admitted into the State and Private Polytechnics, hence they are more brilliant (Eze & Obi, 2015).

In light of the above, this study compared the influence of polytechnic ownership, gender, course of study, student's age distribution, and school of study as it influences students' academic performance among Polytechnics in the South-western Nigeria. In doing this the study found out if there exists some differences between the selected variables and academic performance which were measured by using the students' Cumulative Grade Point Average of their final examination.

Purpose of the Study

The purpose of the study was to:

8. compare the level of academic performance of the Polytechnic students, based on ownership of institution and school of study.
9. determine if there is difference in the level of academic performance of male and female Polytechnic students in Nigeria;
10. compare the level of academic performance of the students based on their choice of courses of study;
11. find out if there will be any difference in the level of academic performance of the Polytechnic students based on age;

Research Questions

The following research questios were raised for the study:

16. Are the academic performance of National Diploma students comparable in Polytechnics in Nigeria?
17. What are the factors influencing the comparability of academic performance of students in Nigeria Polytechnics?

Research Hypotheses

The following hypotheses were postulated for the study and tested at 0.05 level of significance:

4. There is no significant difference between school ownership and the level of academic performance of Polytechnic students in Nigeria.
5. There is no significant difference between gender and the level of academic performance of Polytechnic students in Nigeria.

6. There is no significant difference between the choice of courses of study and the level of academic performance of Polytechnic students in Nigeria.
7. There is no significant difference between age distribution and the level of academic performance of Polytechnic students in Nigeria.
8. There is no significant influence of choice of school of study and the level of academic performance of Polytechnic students in Nigeria.

METHODOLOGY

The study employed the Ex-post facto research design. The population for this study consisted of 1,785 National Diploma (ND) II students in three selected Polytechnics among all the Polytechnics in South West, Nigeria. A sample of 360 students were randomly selected from the schools of study in the chosen Polytechnics using the multi-stage sampling procedure. First stage involved grouping of all Polytechnics in the South West zone of Nigeria into three based on ownership structure (federal, state, and private); and one Polytechnic was conveniently selected from each of the three groups. The second stage involved the selection of three schools out of the academic schools of study in each of the chosen Polytechnics which are: School of Business Studies, School of Engineering and School of Science & Computer Technology.

Third stage involved random selection of two departments from each of the sampled schools making a total of 360 students randomly selected from all the sampled Polytechnics and 120 students from each Polytechnic, and the stratified sampling technique was then used to separate the samples into distributions on the basis of gender, course of study, age, and school of study.

Research Instrument

The instrument used for the study was approved results of all National Diploma (ND) students from the selected schools and departments in the sampled Polytechnics in South West, Nigeria. These were the approved results of the last semester of ND II for the 2014/2015 academic session.

Data Collection Procedure

The researcher personally visited Management Information System (MIS) Units of the three selected Polytechnics in turn for collection of photocopies of approved final results of ND II students for the 2014/2015 academic session. The final grade points (CGPA) of the collected results were arranged in descending order of performance after which results of the first 20 students were selected from each department for use in the study. Appendices II and V contain the final grade points of the selected students in the 6 selected departments of the Polytechnics of study.

Data Analysis

The data generated were analyzed using descriptive and inferential statistics. The descriptive statistics which include frequency counts, percentages, mean $(\bar{x})$ and Standard Deviation (SD) were used to answer questions raised in the study. Inferential statistics were used to test the null hypotheses. The Kruskal Wallis non parametric ANOVA was used to test hypothesis 1, the student's t-test was used to test hypothesis 2, while hypotheses 3, 4 and 5 were tested using Analysis of Variance (ANOVA). All hypotheses were tested at 0.05 level of significance and post-hoc analysis was done where a significance result was obtained.

RESULTS AND DISCUSSION

Research Questions

Question 1: Are the academic performance of students offering National Diploma comparable in Polytechnics in Nigeria?

Frequency counts and percentages of the students' results according to their performances in the final ND II examination were obtained based on the type of polytechnic as presented respectively in Table 1 and Figure 1 below:

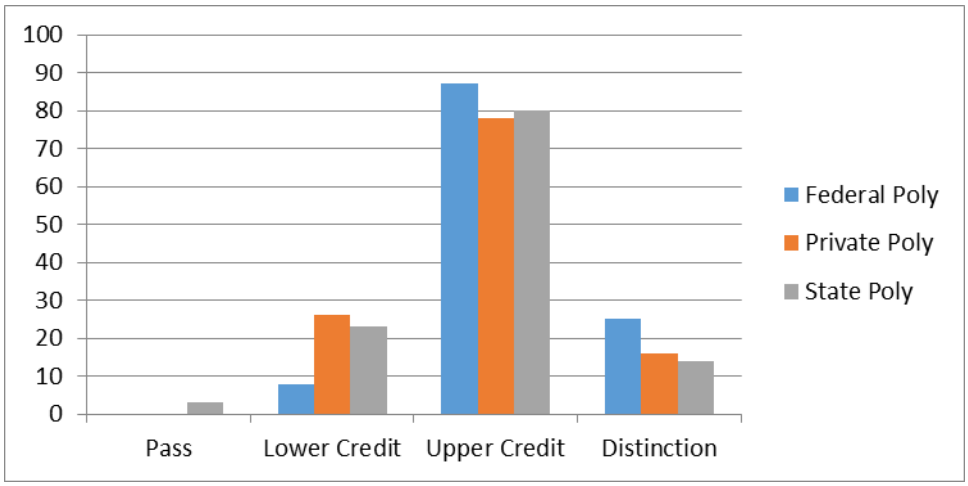
Table 1: Level of academic performance of students in Federal, State and Private Polytechnics in Nigeria

Polytechnic	Performance			
	Pass	**Lower Credit**	**Upper Credit**	**Distinction**
Federal Poly	0(*0*)	8(*2.2*)	87(*24.2*)	25(*6.9*)
Private Poly	0(*0*)	26(*7.2*)	78(*21.7*)	16(*4.4*)
State Poly	3(*0.8*)	23(*6.4*)	80(*22.2*)	14(*3.9*)
Pooled	**3(*0.8*)**	**57(*15.8*)**	**245(*68.1*)**	**55(*15.3*)**

Source: Field Survey, 2016. Percentages are enclosed in parentheses

Table 1 depicts the students' academic performance according to polytechnic by ownership (Federal, State and Private). From the table, the 3 students who had the Pass grade were from the State Polytechnic representing 0.8% of the entire students sampled. Out of the 57 students who had the Lower Credit grade, 8(2.2%) were from the Federal Polytechnic, 23(6.4%) from the State Polytechnic while 26(7.2%) from the Private Polytechnic. Similarly, Out of the 245 students who had Upper Credit grade, 87(24.2%) were from the Federal Polytechnic, 80(22.2%) from the State Polytechnic and 78 (21.7%) from the Private Polytechnic. The table further revealed that 25(6.9%) of the students who had Distinction were from the Federal Polytechnic, 14(3.9%) were from the State Polytechnic while 16(4.4%) were from the Private Polytechnic. This analysis implies that students' academic performance in the Federal Polytechnic was better than those of the state and private counterparts. The distribution of the academic performance of the students based on the type of ownership by polytechnic was further illustrated in Figure 1 as follows:

Figure 1: The level of students' academic performance in Federal, State and Private Polytechnics



Question 2

What are those factors influencing the comparability of academic performance of students in Nigeria Polytechnics?

To answer this question, attention must be paid to identify some of the basic factors that will influence the level of academic performance of students in general. In this study, the following factors were considered in turn: school ownership, gender, courses of study, age distribution, and school of study. Frequency counts and percentages of the students' results according to their performances in the final ND II examination were obtained based on school ownership, gender, course of study and school of study as presented in subsequent tables and figures:

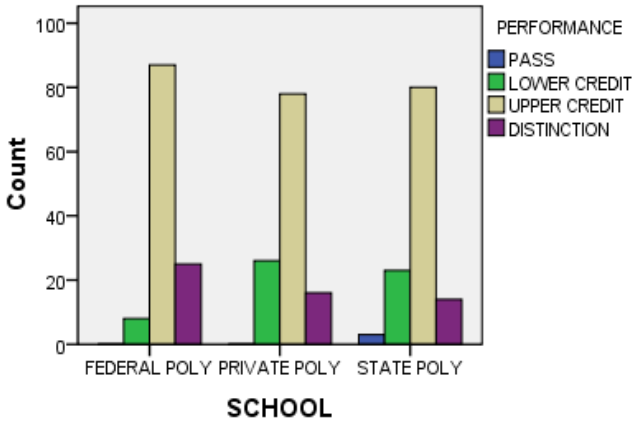
Table 2: Influence of School Ownership on Students' Academic Performance

School Type	Performance				
	Pass	**Lower Credit**	**Upper Credit**	**Distinction**	**Total**
Federal	0(*0.0*)	8(*2.2*)	87(*24.2*)	25(*6.9*)	120(*33.3*)
State	3(*0.8*)	23(*6.4*)	80(*22.2*)	14(*3.9*)	120(*33.3*)
Private	0(*0.0*)	26(*7.2*)	78(*21.7*)	16(*4.4*)	120(*33.3*)

Source: Field survey, 2016. Percentages are enclosed in parentheses

Table 2 expressly defined the distribution of the sampled students according to their level of academic performance based on the type of Polytechnic they attended (i.e. federal, state, and private). In each of the Polytechnics of study, 120 students were sampled for the study. The 3 students who had the Pass grade came from State Polytechnic; while among the 57 students who had the Lower Credit grade, 8(2.2%) were from the Federal Polytechnic, 23(6.4%) came from the State Polytechnic while the remaining 26(7.2%) were from the Private Polytechnic. Out of the 245 students who had Upper Credit grade, 87(24.2%) were from the Federal Polytechnic, 80(22.2%) came from the State Polytechnic while the remaining 78(21.7%) were from the Private Polytechnic. While 55 students of the sampled population had Distinction grade, 25(6.9%) came from the Federal Polytechnic, 14(3.9%) were from the State Polytechnic and the remaining 16(4.4%) were from the Private Polytechnic. Diagrammatically, the distribution of the level of academic performance of the students based on the Polytechnic of study is further illustrated in the Figure 2.

Figure 2: Chart showing the influence of school ownership on students' academic performance



The chart distinctly reveals the standing of the students' academic performances in the terminal examination such that the highest proportion of the students' population fell within the Upper Credit grade. While more students had the Distinction grade in the Federal Polytechnic than in both the State and Private Polytechnics, more students had Lower Credit in both State and Private Polytechnics than in the Federal Polytechnic. The chart further reveals that the few students who had Pass grade came from the State Polytechnic.

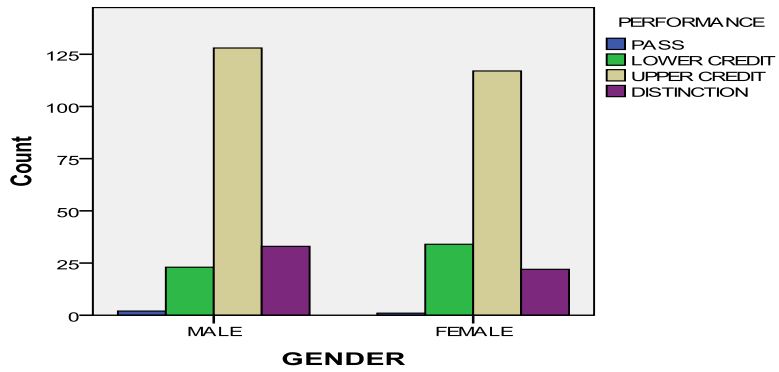
Table 3: Influence of Gender on Students' Academic Performance

Gender	Performance			
	Pass	Lower Credit	Upper Credit	Distinction
Male	2(*0.6*)	23(*6.4*)	128(*35.6*)	33(*9.2*)
Female	1(*0.3*)	34(*9.4*)	117(*32.5*)	22(*6.1*)
Total	3(*0.8*)	57(*15.8*)	245(*68.1*)	55(*15.3*)

Source: Field Survey, 2016. Percentages are enclosed in parentheses

Table 3 clearly shows the distribution of the results of the sampled students based on gender (i.e. males and females) according to their level of academic performance. From the table, only 3 students comprising of 2 males and 1 female had the Pass grade, and this represents only 0.8 percent of the sampled population. 57 students had Lower Credit, (comprising of 23(6.4%)) males and 34(9.4%) females). 245 students had Upper Credit out of which 128(35.6%) were males and 117(32.5%) were female students. 55 students had the Distinction grade out of which 33(9.2%) were males and 22(6.1%) were females. The distribution of the level of academic performance of the students based on gender is further illustrated in the Figure 3.

Figure 3: Chart showing the influence of gender on students' academic performance



The chart reveals the standing of the students' academic performance in the terminal ND II examination such that the highest proportion of both male and female students' population were in the Upper Credit grade. While more males had the Upper Credit and Distinction than their female counterparts, more females were in the Lower Credit grade than the male students.

Table 4: Influence of Course of Study on Students' Academic Performance

Department	Performance			
	Pass	Lower Credit	Upper Credit	Distinction
Accountancy	0(*0.0*)	7(*1.9*)	40(*11.1*)	13(*3.6*)
Business Admin & Management	0(*0.0*)	2(*0.6*)	52(*14.4*)	6(*1.7*)
Agric & BIO-Environmental.	0(*0.0*)	12(*3.3*)	37(*10.3*)	11(*3.2*)
Engineering Elect/Elect.	3(*0.8*)	18(*5.0*)	34(*9.4*)	5(*1.4*)
Engineering Computer Science	0(*0.0*)	9(*2.5*)	43(*11.9*)	8(*2.2*)
Science Technology	0(*0.0*)	9(*2.5*)	39(*10.8*)	12(*3.3*)

Source: Field Survey, 2016. Percentages are enclosed in parentheses

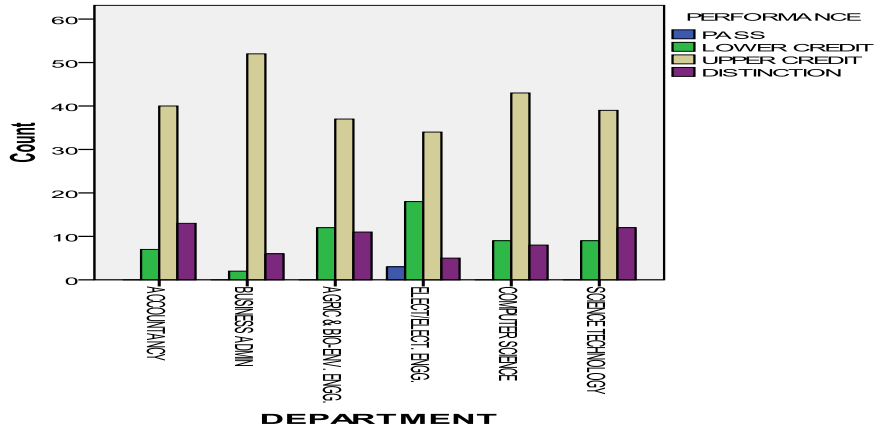
Table 4 clearly shows the distribution of the results of the sampled students and their

level of

academic performance based on their courses of study. From the table, the 3 students who had the Pass grade studied Electrical/Electronic Engineering. Out of the 57 students who had the Lower Credit grade, 7(1.9%) studied Accountancy, only 2(0.6%) students studied Business Administration and Management, 12(3.3%) were in Agriculture and Bio-Environmental Engineering; 18(5.0%) students studied Electrical/Electronic Engineering, while 9(2.5%) of the students were in each of Computer Science and Science Technology. From the table, it could be observed that the two Engineering courses had the highest numbers of students in the Lower Credit grade and with the Business courses having the least number of students in the Lower Credit grade.

Out of the 245 students who had Upper Credit, 40(11.1%) were in Accountancy, 52(14.4%) were in Business Administration and Management, 37(10.3%) were in Agriculture and Bio-Environmental Engineering; 34(9.4%) students studied Electrical/Electronic Engineering, while 43(11.9%) studied Computer Science and 39(10.8%) studied Science Technology. It was observed that the range of performance of the students in the Upper Credit grade is between 9% and 15%. Among the 55 students who had Distinction, 13(3.6%) were in Accountancy, 6(1.7%) studied Business Administration and Management, 11(3.2%) were in Agriculture and Bio-Environmental Engineering; 5(1.4%) students studied Electrical/Electronic Engineering, while 8(2.2%) studied Computer Science and 12(3.3%) studied Science Technology. The distribution of the academic performance of the students based on their courses of study is further illustrated diagrammatically in the Figure 4.

Figure 4: Chart showing students' academic performance based on course of study



From the chart, the academic standing of the students was revealed according to their courses of study in the terminal examination. In each of the courses, the highest proportion of the students' population fell in the Upper Credit grade. Business Administration and Management had the highest number of Upper Credit and closely followed by Computer Science. Accountancy had the highest number of students in the Distinction grade which were being closely followed by Science Technology, and Agriculture and Bio-environmental Engineering. Electrical/Electronic Engineering recorded the highest number of Lower Credit as well as being the only course which some students were in the Pass grade.

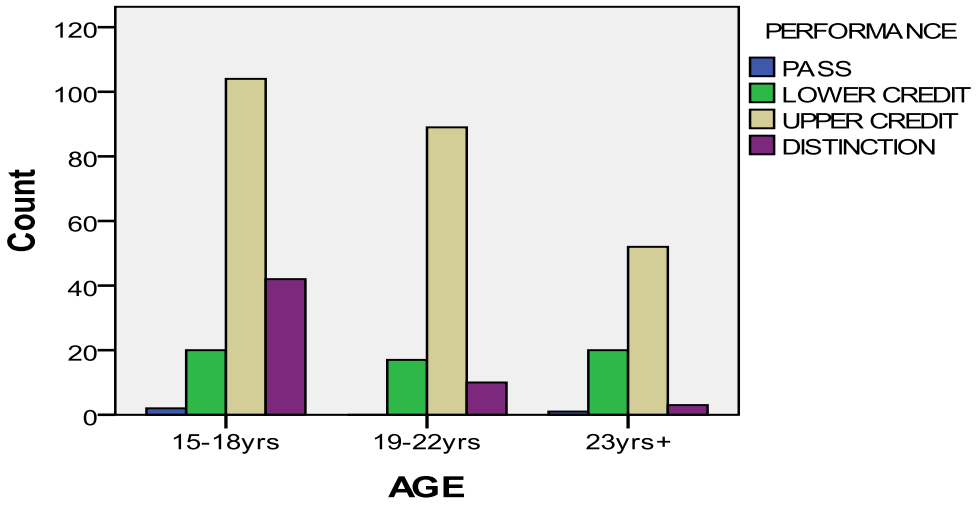
Table 5: Influence of Age Distribution on Students' Academic Performance

	Performance				
Age Distribution	**Pass**	**Lower Credit**	**Upper Credit**	**Distinction**	**Total**
15-18yrs	2(*0.6*)	20(*5.6*)	104(*28.9*)	42(*11.7*)	168(*46.7*)
19-22yrs	0(*0.0*)	17(*4.7*)	89(*24.7*)	10(*2.8*)	116(*32.2*)
23yrs+	1(*0.3*)	20(*5.6*)	52(*14.4*)	3(*0.8*)	76(*21.1*)

Source: Field Survey, 2016. Percentages are enclosed in parentheses

Table 5 expresses the distribution of the sampled students according to their level of academic performance based on Age grade of the students (i.e. 15-18year, 19-22years, and 23years+). Out of the 360 students chosen for the study, 168(46.7%) fell within the age range of 15-18years, 116(32.2%) were in the 19-22years Age range while the remaining 76(21.1%) were in the 23years+ of Age range. 2(0.6%) of the 3 students who had Pass grade were in the 15-18years Age range while the remaining 1(0.3%) was in the 23years+ Age range. Out of the 57 students who had Lower Credit, 20(5.6%) were in both age categories of 15-18years and 23years+ respectively while the remaining 17(4.7%) of the Lower Credit grade were in the 19-22years Age range. 104(28.9%) students out of the 245 who had Upper Credit were in the 15-18years Age range; 89(24.7%) of them were in the 19-22years Age category while the remaining 52(14.4%) came among the 23years+ Age range. 42(11.7%) of the 55 students who had the Distinction grade were within the age group of 15-18years; 10(2.8%) of them were in the 19-22years age group while the remaining 3(0.8%) fell in the 23years+ Age range. The distribution of the level of academic performance of the students based on Age Grade range is further illustrated in diagrams as contained in the Figure 5.

Figure 5: Chart showing the influence of age distribution on students' academic performance



The chart shows the levels of academic performance in the terminal examination by age distribution. In all, 15-18 years category recorded the highest proportion of the students in all the performance grades (i.e. Distinction, Upper Credit, Lower Credit and Pass). There is clear distinction that more students belonged to this age grade than is contained in the other two categories.

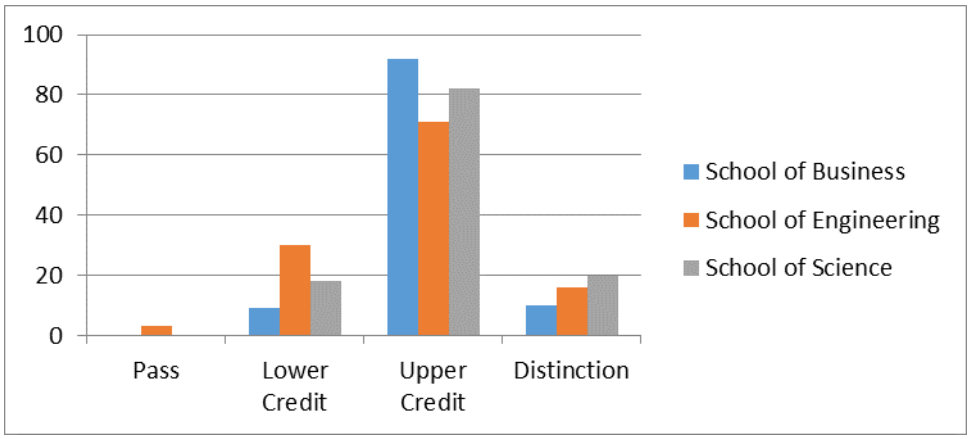
Table 6: Influence of School of Study on Students' Academic Performance

	Performance				
School Type	**Pass**	**Lower Credit**	**Upper Credit**	**Distinction**	**Total**
Business	0(*0.0*)	9(*2.5*)	92(*25.5*)	19(5.*3*)	120(*33.3*)
Engineering	3(*0.8*)	30(8.*3*)	71(19.*7*)	16(*4.6*)	120(*33.3*)
Science	0(*0.0*)	18(5.*0*)	82(*22.7*)	20(5.*5*)	120(*33.3*)

Source: Field survey, 2016. Percentages are enclosed in parentheses

Table 6 expressly defines the distribution of the sampled students according to their level of academic performance based on the school of study which they belonged (i.e. Business, Engineering, and Science). In each of the academic schools of study, 120 students were sampled for the study. The 3 students who had the Pass grade came from School of Engineering; while among the 57 students who had the Lower Credit grade, 9(2.5%) were from the School of Business Studies, 30(8.3%) came from the School of Engineering while the remaining 18(5.0%) were from the School of Science. Out of the 245 students who had Upper Credit grade, 92(25.5%) were from the School of Business, 71(22.7%) came from the School of Engineering while the remaining 82(22.7%) were from the School of Science. While 55 students of the sampled population had Distinction grade, 19(5.3%) came from the School of Business, 16(4.6%) were from the School of Engineering and the remaining 20(5.5%) were from the School of Science. Diagrammatically, the distribution of the level of academic performance of the students based on the choice of school of study of study is further illustrated in the Figure 6.

Figure 6: Chart showing the influence of school of study on students' academic performance.



The chart distinctly reveals the standing of the students' academic performances in the terminal examination such that the highest proportion of the students' population fell within the Upper Credit grade. While more students had the Distinction grade in the School of Science than in both Schools of Business and Engineering, more students had Lower Credit in both Schools of Business and Engineering than in the School of Science. The chart further reveals that the few students who had Pass grade came from the School of Engineering.

Testing of Hypotheses

All the sampled students' results data collected from the chosen Polytechnics were divided into distribution tables (according to the independent variables) and tested using the Statistical Package for Social Sciences, (SPSS ver. 22) based on the stated hypotheses.

H_1: There is no significant difference between school ownership and the level of academic performance of Nigerian Polytechnic students.

The Kruskal Wallis non parametric Analysis of Variance, was conducted on the level of performance of the students as contained in the Tables 8 and 9.

Table 7: Kruskal Wallis test on the influence of school ownership on students' academic performance.

Grouping Variable (Poly)	Mean Rank	N	Chi-Square	df	Asymp. Sig.
Federal Poly	*204.18*	*120*	*13.851*	*2*	*0.001*
Private Poly	*170.28*	*120*			
State Poly	*167.03*	*120*			
Total		**360**			

Table 7 indicates that the Chi-Square calculated value of 13.851 with 2 degree of freedom and significant probability value of 0.001 was obtained. This is less than alpha of 0.05 level of significance. This shows that the result is statistically significant, and it thus implies that there is possible statistical reason to reject the null hypothesis. A multi-comparison Post-Hoc investigation was then conducted so as to determine the polytechnic(s) that is/are significantly different in the comparison with students' level of academic performance, and this is contained in the table 9.

Table 8: Least Significant Difference (LSD) Post Hoc Analysis on the influence of school ownership on students' Academic Performance.

(I) SCHOOL	(J) SCHOOL	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
FEDERAL POLY	*PRIVATE POLY*	*.22500**	*.07450*	*.003*	*.0785*	*.3715*
	STATE POLY	*.26667**	*.07450*	*.000*	*.1202*	*.4132*
PRIVATE POLY	*FEDERAL*	*-.22500**	*.07450*	*.003*	*-.3715*	*-.0785*
	STATE POLY	*.04167*	*.07450*	*.576*	*-.1048*	*.1882*
STATE POLY	*FEDERAL POLY*	*-.26667**	*.07450*	*.000*	*-.4132*	*-.1202*
	PRIVATE POLY	*-.04167*	*.07450*	*.576*	*-.1882*	*.1048*

*. The mean difference is significant at the 0.05 level.

From Table 8, there exists a significant difference when comparing the influence of the choice of Federal Polytechnic with both State and Private Polytechnics. This is because the significant probability value is lesser than α=0.05 in each case. However, there exists no significant difference in the performance of students of both State and Private Polytechnics because the level of significance in each case (i.e. 0.576) is greater than the alpha level (i.e. α=0.05); and in addition, the lower and upper bounds in the Confidence Interval have different signs (+, -) in each pair-wise investigation.

H_2: There is no significant difference between gender composition and the level of academic performance of Polytechnics students in Nigeria.

Here, the t-test analysis was conducted using the student t-distribution table as contained in the Table 9.

Table 9: t-test Analysis on the influence of Gender on students' Academic Performance.

	N	$\bar{X}$	SD	Df	t-cal	Sig.(2-tailed)
Gender						
Male	*186*	*3.0323*	*0.68728*	*358*	*1.826*	*0.069*
Female	*174*	*2.9195*	*0.58336*			

Table 9 indicates that the calculated t-value of 1.826 with 358 degree of freedom and significant probability value of 0.069 were obtained. This is greater than the alpha value of 0.05 of level of significance, and thus this shows that the result is statistically insignificant. The table also revealed that the average performance of both male and female students is almost the same (i.e. 3.0323 and 2.9195 respectively).

H_3: There is no significant influence of choice of courses of study on the level of academic performance of Polytechnic students in Nigeria.

The inferential statistics of one way Analysis of Variance, ANOVA was used to test the influence of course of study on the academic performance of Nigerian Polytechnic students as contained in the Table 11.

Table 10: Analysis of Variance (ANOVA) on the influence of Course of Study on students' Academic Performance.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	*6.889*	*5*	*1.378*	*4.171*	*.001*
Within Groups	*116.933*	*354*	*.330*		
Total	*123.822*	*359*			

From the table above, a significant probability value is 0.001 was obtained. This value is lesser than the alpha level of 0.05. This implies that there is possible statistical reason to reject the null hypothesis. This indication from the ANOVA table shows that a significant influence exists between the choice of courses of study and the level of academic performance of Nigerian Polytechnic students. Hence a multi-comparison Least Significant Difference (LSD) post-Hoc investigation was conducted so as to determine the courses that significantly influence the students' level of academic performance.

Table 11: LSD post Hoc Comparison test on the influence of Course of Study on students' Academic Performance.

(I) DEPARTMENT	(J) DEPARTMENT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
ACCOUNTANCY	*BUSINESS ADMIN*	*.03333*	*.10493*	*.751*	*-.1730*	*.2397*
	AGRIC & BIO-ENV. ENGG.	*.11667*	*.10493*	*.267*	*-.0897*	*.3230*
	ELECT/ELECT. ENGG.	*.41667**	*.10493*	*.000*	*.2103*	*.6230*
	COMPUTER SCIENCE	*.11667*	*.10493*	*.267*	*-.0897*	*.3230*
	SCIENCE TECHNOLOGY	*.05000*	*.10493*	*.634*	*-.1564*	*.2564*

Table 11a: LSD post Hoc Comparison test on the influence of Course of Study on students' Academic Performance (continued).

(I) DEPARTMENT	(J) DEPARTMENT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
BUSINESS ADMIN	*ACCOUNTANCY*	*-.03333*	*.10493*	*.751*	*-.2397*	*.1730*
	AGRIC & BIO-ENV. ENGG.	*.08333*	*.10493*	*.428*	*-.1230*	*.2897*
	ELECT/ELECT. ENGG.	*.38333**	*.10493*	*.000*	*.1770*	*.5897*
	COMPUTER SCIENCE	*.08333*	*.10493*	*.428*	*-.1230*	*.2897*
	SCIENCE TECHNOLOGY	*.01667*	*.10493*	*.874*	*-.1897*	*.2230*
AGRIC & BIO-ENV. ENGG.	*ACCOUNTANCY*	*-.11667*	*.10493*	*.267*	*-.3230*	*.0897*
	BUSINESS ADMIN	*-.08333*	*.10493*	*.428*	*-.2897*	*.1230*
	ELECT/ELECT. ENGG.	*.30000**	*.10493*	*.005*	*.0936*	*.5064*
	COMPUTER SCIENCE	*.00000*	*.10493*	*1.000*	*-.2064*	*.2064*
	SCIENCE TECHNOLOGY	*-.06667*	*.10493*	*.526*	*-.2730*	*.1397*
ELECT/ELECT. ENGG.	*ACCOUNTANCY*	*-.41667**	*.10493*	*.000*	*-.6230*	*-.2103*
	BUSINESS ADMIN	*-.38333**	*.10493*	*.000*	*-.5897*	*-.1770*
	AGRIC & BIO-ENV. ENGG.	*-.30000**	*.10493*	*.005*	*-.5064*	*-.0936*
	COMPUTER SCIENCE	*-.30000**	*.10493*	*.005*	*-.5064*	*-.0936*
	SCIENCE TECHNOLOGY	*-.36667**	*.10493*	*.001*	*-.5730*	*-.1603*
COMPUTER SCIENCE	*ACCOUNTANCY*	*-.11667*	*.10493*	*.267*	*-.3230*	*.0897*
	BUSINESS ADMIN	*-.08333*	*.10493*	*.428*	*-.2897*	*.1230*
	AGRIC & BIO-ENV. ENGG.	*.00000*	*.10493*	*1.000*	*-.2064*	*.2064*
	ELECT/ELECT. ENGG.	*.30000**	*.10493*	*.005*	*.0936*	*.5064*
	SCIENCE TECHNOLOGY	*-.06667*	*.10493*	*.526*	*-.2730*	*.1397*
SCIENCE TECHNOLOGY	*ACCOUNTANCY*	*-.05000*	*.10493*	*.634*	*-.2564*	*.1564*
	BUSINESS ADMIN	*-.01667*	*.10493*	*.874*	*-.2230*	*.1897*
	AGRIC & BIO-ENV. ENGG.	*.06667*	*.10493*	*.526*	*-.1397*	*.2730*
	ELECT/ELECT. ENGG.	*.36667**	*.10493*	*.001*	*.1603*	*.5730*
	COMPUTER SCIENCE	*.06667*	*.10493*	*.526*	*-.1397*	*.2730*

*. The mean difference is significant at the 0.05 level.

Tables 11 and 11a show that there is significant difference in the performance of students in Electrical Electronics Engineering and other courses since the significant probability value is less than 0.05 in each case. While performance in Accountancy, Business Administration, Agriculture and Bio-Environmental Engineering, Computer Science and Science Technology do not reflect any significant difference in performance among the students of Polytechnics in Nigeria because in each of the cases, the lower and upper bounds of the Confidence Interval have different signs (i.e. +,-).

H_4: There is a no significant difference between age distribution and the level of academic performance of Polytechnic students in Nigeria.

The inferential statistics of one way Analysis of Variance, ANOVA was used to test the influence of age distribution on the academic performance of Nigerian Polytechnic students as contained in the Table 13.

Table 12: Analysis of Variance (ANOVA) on the influence of Age Distribution on students' Academic Performance.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	*6.923*	*2*	*3.462*	*10.571*	*.000*
Within Groups	*116.899*	*357*	*.327*		
Total	*123.822*	*359*			

In the table above, a significant probability value is 0.000 was obtained. This value is grossly lesser than the alpha level of 0.05. This indicates that there is established statistical reason to reject the null hypothesis. It can therefore be inferred that there exists a significant relationship between age of students and their level of academic performance in the Nigerian Polytechnic system. Going further in the investigation, a multi-comparison LSD post-Hoc test was conducted as contained in table 13 which revealed the level of significance between age distribution and the level of academic performance of Nigerian Polytechnic students.

Table 13: Least Significant Difference (LSD) post Hoc test on the influence of Age Distribution on students' Academic Performance.

					95% Confidence Interval	
		Mean Difference				
(I) AGE	**(J) AGE**	**(I-J)**	**Std. Error**	**Sig.**	**Lower Bound**	**Upper Bound**
15-18yrs	*19-22yrs*	*.16749**	*.06908*	*.016*	*.0316*	*.3033*
	23yrs+	*.35714**	*.07911*	*.000*	*.2016*	*.5127*
19-22yrs	*15-18yrs*	*-.16749**	*.06908*	*.016*	*-.3033*	*-.0316*
	23yrs+	*.18966**	*.08445*	*.025*	*.0236*	*.3557*
23yrs+	*15-18yrs*	*-.35714**	*.07911*	*.000*	*-.5127*	*-.2016*
	19-22yrs	*-.18966**	*.08445*	*.025*	*-.3557*	*-.0236*

*. The mean difference is significant at the 0.05 level.

Table 13 shows that there exists some significant difference between students' age distribution and their level of academic performance because all the significant probability values are lesser than $\alpha = 0.05$ under the table. In addition, the values under the lower and upper bounds of the Confidence Interval maintained the same signs (i.e. +,+; -,-) in each pair-wise investigation.

H_5: There is no significant influence in the choice of school of study and the level of Academic Performance of Polytechnic

Students in Nigeria.

The inferential statistics of one way Analysis of Variance, ANOVA was used to test the influence of school of study on the level of academic performance of Nigerian Polytechnic students as contained in the Table 14.

Table 14: Analysis of Variance (ANOVA) on the influence of choice of School of Study on students' Academic Performance.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	*8.118*	*3*	*2.706*	*.416*	*.001*
Within Groups	*1041.883*	*357*	*2.927*		
Total	*1050.000*	*359*			

Table 14 shows that there is established statistical reason to reject the null hypothesis, since the significant probability value of 0.001 obtained from the table is less than the alpha level of 0.05. This therefore implies that there exists some significant influence of the choice of school of study on the level of academic performance of the Nigerian Polytechnic students. Hence, a multi-comparison Duncan post-Hoc test was conducted in order to further investigate the extent of the level of the influence; and this is contained in the Duncan post Hoc test in Table 15.

Table 15: Duncan post Hoc test on the influence of choice of School of Study on students' academic performance.

		Subset for alpha = 0.05	
School	**N**	**1**	**2**
Schl. of Business	*120*	*3.0834*	
Schl. of Science	*120*	*3.0250*	
Schl. of Engg.	*120*		*2.833*
Sig.		*.576*	*1.000*

The figures in Table 15 show that there no significant difference in the performance of students of Schools of Business Studies and Science Technology which recorded the mean values of 3.0834 and 3.0250 respectively and a significant probability value of 0.576. However, the performance of students in the School of Engineering is significantly different from those of the other two schools for having on average the students' performance of 2.833 and the probability value of 1.000.

Discussion

Question 1 posited that the type of ownership of school plays some significant influence on the academic performance of the students. The performance of students in both State and Private Polytechnics are almost the same. This is exposed by the total average performance of 167.03 and 170.28 respectively recorded for both State and Private Polytechnics in the study. However, the average performance of 204.18 was recorded for students of the Federal Polytechnic. Based on Duncan post-hoc investigation, the students' academic performance revealed a significant value of 0.576. The Nigerian Polytechnic education system consists of school ownership in which the students in federal, state and private polytechnics are made to compete on fairly equal ground. This is because all of them are taught and assessed using the same curricular, which are being supervised and moderated by the National Board for Technical Education, NBTE.

Federal Polytechnics were established by the central government, and their establishment had more priority than those of State and Private Polytechnics and as such, they tend to involve better methods and core values in teaching. In terms of the qualification of lecturers, all Federal and State Polytechnics have lecturers who are

more qualified professionally, while most of the lecturers in Private Polytechnics could be seen as mere hustlers, who sought the job for survival. Therefore, it is important to note that school of study has some considerable influence on the level of students' academic performance. Students need schools with favorable learning facilities to perform well, more so when the school environment is enriched with modern educational facilities facilitate learning. The result of this research agreed with the opinion of most psychologists; that weak relationship between teachers and students often has diverse effects on students' attitude in respect of events in teaching-learning environment. Therefore, the teacher should be friendly and not mean, appear admirable but not seductive. He should attend more to the needs of students and be aware of the differences that exist between them but be fair and firm in dealing with them. It is important to note that when a healthy teacher-student relationship exists in school, it goes a long way in promoting learning among the students; and this tends to enable them to share knowledge and experience that will enhance better school environment (Sunday, 2012), (Anita, 2013), and (Orlu, 2013).

Findings of the study, with respect of research question 2 showed that there existed some factors (such as: gender, course of study, age and school of study) that are influential on the level of academic performance of students of Polytechnics in Nigeria. For instance, more male students had Distinction and Upper Credit grades than females in the overall performance; but more female students had Lower Credit grades than their male counterparts (Makinde, 1988). This is in line with Makinde's assertion that men tend to have superior sex and are as well, dominant intrinsically as they have better brains to learn than women. However, going by the overall performance indicator, a narrow performance existed between the male and female students in each of the classes of grades. The finding of the second hypothesis showed no statistical reason to reject the null hypothesis, due to the fact that no significant difference existed between the level of academic performance of male and female students among the selected Nigerian Polytechnics. This is in line with Mackintosh's view which opined that there is no sex difference in general intelligence (Mackintosh, 1998).

Findings with respect to hypothesis 3 did not show any significant difference in the overall performance of the students in their respective courses of study (see Table 4). This is because the overall performance of students in each of the courses ranged between 16.5 and 17.1. This is in line with the view of Okafor and Egbon (2011), that there is no significant difference between male and female academic performance in undergraduate Accounting courses. Also in line with the finding is the assertion of Awoniyi in Awe (2016) which compared academic performance in Mathematics and Accounting, and the result was insignificant to the courses of study. However, the result obtained from hypothesis 3 stated that some significant difference existed between academic performance of the Polytechnic students and their courses of study.

According to the data in Table 4, Business Administration and Management recorded significant performance in Upper Credit grade than in any other course, and going by the ANOVA analysis of table 12, the significant probability value of 0.001, which is less than the alpha level of 0.05, was recorded. This means that there also existed some significant difference between the academic performance of the Polytechnic students and their courses of study. This corroborates the view of Hussain when comparing the academic performance of science and arts students: that the female science students performed better than female arts while the male science students performed better than male arts students, but in the overall performance, male science students performed better than all others (Hussain et al, 2011). The situation required a multi-comparison Post-Hoc test in order to determine the departments that are significantly different

in the academic performance of the students. Some significant difference in performance was observed between Electrical/Electronic Engineering and other courses since the significant probability was less than 0.05 in all cases. However, the level of performance in the other courses did not reflect any significant difference among the students because in each of the cases, the lower and upper bounds of the Confidence Interval had different signs.

The findings also to question 2 showed that greater percentage of the age category of 15-18 were within the Upper Credit and Distinction grades than in the other two age categories (see Table 5). This reflects that the older the age, the lesser the level of percentage of academic performance. According to Lynch, there exists some difference between academic performance and age grade of students as the older students performed lesser based on the fact that they have varying needs when compared to the younger ones (Bishop-Clark & Lynch, 1992). Furthermore, hypothesis 4 showed that significant difference existed between the level of academic performance of the polytechnic students and their age grade distribution. A post hoc investigation revealed that some significant difference existed between students' age distribution and the level of academic performance since the lower and upper bounds in the Confidence Intervals have the same signs (i.e. +,+ ; -,-) in each pair-wise investigation. This is in line with Alli's assertion that age grades significantly affect the level of academic performance of graduate students (Alli, 2013).

The findings in the study further revealed that 20 students had Distinction, 90 had Upper Credit, and 10 had Lower Credit respectively in School of Business Studies across the three Polytechnics. 16 had Distinction, 61 had Upper Credit, 30 had Lower Credit, and 3 had Pass grades respectively in School of Engineering across the three Polytechnics; while 21 had Distinction, 80 had Upper Credit, and 19 had Lower Credit respectively in School of Science and Technology across the three Polytechnics. This shows that there existed some significant influence between students' academic performance across the three academic schools of study. The fact that the school of study significantly influences students' academic performance is in line with Haller's view which caveats that school type influences different schools in different ways (Monk & Haller, 1993). Going further on hypothesis 5, the post Hoc investigation revealed that there was no significant difference in the performance of students of Schools of Business Studies and Science Technology while a significant difference existed between the performance of students in the School of Engineering and those of the other two schools.

Summary

The study compared the level of academic performance of the National Diploma students of the Polytechnics in the South-west geo-political zone of Nigeria based on such factors as: polytechnic ownership, gender, course of study, age distribution and school of study. Literature review of many authors was consulted for the purpose of the study.

Data collection for the study was the final academic results of ND II students for the 2014/2015 academic session of the three sampled Polytechnics (one each from federal, state and private owned polytechnics) in the area of study. A total of 360 students' academic records were randomly selected with 120 respondents from each selected Polytechnic of study. All the data were divided according to the independent variables (polytechnic ownership, gender, course of study, age and school of study). The Statistical Package for Social Sciences (SPSS) was used for the data analysis which enabled the compilation of the frequency counts, percentages, and the bar charts; while the inferential statistics such as: the t-test, Kruskal Wallis non parametric Analysis of Variance, ANOVA were used to test the hypotheses at 0.05 level of significance.

Findings revealed that four out of the null hypotheses (polytechnic ownership, students' course of study, age and school of

study) were statistically significant while gender has no statistical relationship with the level of students' academic performance. However, the following findings were made available for consideration:

13. The level of academic performance of Nigerian Polytechnic students is high and impressive.
14. That there is significant difference between the school ownership and the level of academic performance of Polytechnic students in Nigeria.
15. That there is no significant difference between gender and the academic performance of Polytechnic students in Nigeria.
16. That there exists significant influence of the choice of course of study on the level of academic performance of Polytechnic students in Nigeria.
17. That there is significant difference between students' age distribution and the level of academic performance of Polytechnic students In Nigeria.
18. That there is significant influence of the choice of school of study on the level of academic performance of the Polytechnic students in Nigeria.

Conclusion

The following conclusion were drawn:

viii. The ownership of a school determines the level of academic performance of the students in the school.
ix. A student's choice of course of study influences his level of academic performance of the student.
x. Male students in Nigeria Polytechnic system are not academically superior to their female counterparts.
xi. The distribution of students by age grade has influence on their level of academic performance of the students.
xii. The type of school of study of a student has influence on his level of academic performance.

Recommendations

Based on the findings, the following recommendations were made:

1. Enrolment for courses in all Nigerian Polytechnics should not be restricted to any particular sex such that admission of candidates should be gender free, since gender has no influence on the level of academic performance of students in different courses in Nigerian Polytechnics;
2. The same conditions for admission should be made available and implemented to promote healthy participation and guide against any discrimination in the admission of students to courses in all Nigerian Polytechnics;
3. Activities and programmes in all Nigerian Polytechnics should be harmonized and made to operate under the same conditions of administration in order to guide against any difference being created by ownership influence. The NBTE should ensure that equal standards of administration are maintained through regular supervision of Polytechnic programmes;
4. The physical environments of Federal, State and Private Polytechnics should be relatively similar and made conducive for more effective teaching-learning process to be achieved;
5. At least one Federal Polytechnic should be established in each state of the federation to provide avenue for more candidates to have access to acquiring basic technical and vocational training, and to enable even distribution of federal presence among the citizenry;
6. The NBTE as the regulating agency, should regularly monitor and evaluate the programmes and personnel of all Polytechnics to ensure that there is compliance in standard with the existing rules and regulations guiding the Polytechnics;

7. Adequate funds should be provided by the central government for all Polytechnics for infrastructural facilities to ensure that the students enjoy similar benefits.

Limitation of the Study

In the course of this study, certain problems were encountered. The research design contained the following limitation:
The time taken for the collection of the data used for the study. Due to incessant strike actions embarked upon by some staff unions of the sampled institutions, the researcher had to make several trips before he could have access to the data, and this caused some delay in the processing and analysis of the data.

Contribution to Knowledge

The study had established that some relationships exist between school ownership, gender, course of study, age distribution and choice of school of study and the level of academic performance of students of Polytechnics in South West, Nigeria.

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