STUDENT'S PERFORMANCE IN HIGHER INSTITUTION DEPENDS ON THEIR O-LEVEL RESULT AT THE DEPARTMENT OF HOSPITALITY MANAGEMENT OF NASARAWA STATE POLYTECHNICS, LAFIA.

By

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Abstract

Many researches have been carried out to examine the factors affecting higher institution students' performance. The focus of this research is on the performance of polytechnic students with regards to their performance in the Senior Secondary Certificate Examination(SSCE). Sample of 50 students were randomly selected from a population of 152 registered students in their second year academic sessions. Results of National Diploma II and Senior Secondary Certificate Examination(SSCE)were obtained. The methodology employed was Simple Regression Analysis with Estimated Model as $Y= \hat{\beta}_0 + \hat{\beta}_1 x$.$Y= 2.009 + 0.019x$,$Y= 3.069 - 0.041 x$. The test proved that the academic performance of students in the polytechnic did not depend on their SSCE performance from the analysis computed since the calculated p-value is (0.002) < α-value (0.05), we reject the Null hypothesis and concluded that students' performance at higher institution is independent of their o-level performance. The researched recommended that students with low performance in their o-level result can proceed to higher institution of learning like polytechnics.

1.0   Introduction

Statistics as a field of study has a wide range of applications and its statistical methods can be applied to a variety of areas, including Biology, Engineering, Medicine, Public Health, Psychology, Marketing, Economics, Sports and Education.

The necessity of applying statistical methods to education and the academic environment can only be adequately comprehended by having a vivid understating of what education really means.

According to Deway (1944), He states that "Education is the process of learning. This process involves a transfer of knowledge, skills, values, beliefs and habits from a person or a group of people to others through discussion, training or research". Education is commonly and formally divided into stages such as Preschool or Early Childhood Education, Primary Education, Secondary Education and then Tertiary/Higher Education (Colleges of Education/Agriculture, Polytechnic, University or Apprenticeship i.e. Vocational Training). Education can take place in formal or informal settings. With the development of society, education has taken many shapes such as Child Education, Adult Education, Technical Education, and Physical Education and so on. Whatever shape and form education take and at whichever stage it is practiced, it plays a vital role in making life productive and good. Education is a lifelong process to each person that needs to be reinforced throughout life. Higher education, also called tertiary education is an educational level that comes after obtaining a Senior Secondary (SSCE). Tertiary education normally includes undergraduate and postgraduate education, as well as vocational education and training.

Academic achievement (performance) of student especially at the elementary school level is not only a pointer to the effectiveness or otherwise of schools but a major determinant of the future of youths in particular and the nation in general. This phenomenon has been

variedly referred in literature as academic achievement, or scholastic functioning. Academic achievement of learners has attracted attention of scholars, parents, policy makers and planners. Adeyemo (2001) pointed that "the major goal of the school is to work towards attainment of academic excellence by students". Performance is defined as the observable or measurable behavior of a person, an animal in a particular situation usually experimental situation (Simpson and Weiner 1989). This means that performance measures the aspect of behavior that can be observed at a specific period. To determine performance, a performance test is conducted. Singer (1999) defined performance test as the type of mental test in which the subject is asked to do something rather than to say something.

Performance test is the type of test which throws light on the ability to deal with things rather than symbols (Drever, 1981).

In relation to educational research, academic performance of a student can be regarded as the observable and measurable behavior of a student in a particular situation. For example, the academic performance of a student in Social Studies includes observable and measurable behavior of the student at all point in time during the course. In Social Studies students' academic performance consists of his scores at any particular time obtained from a teacher- made test. Therefore, we can equate academic performance with the observed behavior or expectation of achieving a specific statement of or statement of educational intention in a research. Academic performance of students consists of scores obtained from teacher-made test, first term examination, and mid-semester test, and so on.

Achievement is defined as measurable behavior in a standardized series of tests Simpson and Weiner (1989) Achievement test is usually constructed and standardized to measure proficiency in school subjects. In most cases, according to them. "Accomplishment" is sometimes used in place of "achievement". According to Bruce and Neville (1979) educational achievement is measured by standardized achievement test developed for school subjects. What this means is that academic achievement is measured in relation to what is attained at the end of a course, since it is the accomplishment of medium or long term objective of education.

The question of interest is 'what role do statistical methods play in all these'? This research work will utilize secondary school performance of student in relation to their higher institution performance in the Department of Hospitality Management of School of Science and Technology, Nasarawa State Polytechnic; Lafia to interfere their future performance in advance studies. It is also to determine whether student's performance in o-level depends on academic session or whether student's performance in polytechnic depends on academic session.

This research will be of good great importance to parent and guardian, even to the institution and will serve as a reference material for the next intended research.
The study will cover only the registered students of Hospitality Management Department, of School of Science and Technology, Nasarawa State Polytechnic, Lafia from 2012/2013 to 2016/2017 and their performance during SSCE years. It is limited only to five because of time constraint.

1.1 Statement of the Problem

Student performance after first and second year in higher institution is matter of concern to parents, Government that mandate the researcher to work on the above mention topic.

1.2   Hypothesis

H_0: Students' Performance at the Tertiary Institution is dependent of their SSCE Result

H_1: Students' Performance at the Tertiary Institution is independent of their SSCE Result

2.2   Secondary School Education

Glass (1994) in his study on the academic performance of New Jersey's public school children stated that data from the 1992 National Assessment of Education Progress (NAEP) were used to compare the performance of New Jersey Public School Children with those from other participating states. The comparisons were made with the raw mean scores and after standardizing all states scores to a common (National US) demographic mixture. It was argued that for most plausible questions about performance of the public schools the standardized scores were more reliable and useful for knowing the academic achievement of students. This is an indication to support the earlier submission that academic performance is short term and can be teacher made test scores, while achievement are medium or long term and standardized achievement test scores.

Secondary education is being divided into two major stages which are Junior and Senior Secondary School. Students spend six years in secondary school, that is, three years in JSS (Junior Secondary School) and three years in SSS (Senior Secondary School). At the end of the Senior Secondary School (i.e. SSS3), students write the Senior Secondary Certificate Examination (SSCE). The SSCE Level is conducted at the end of their Studies in May/June. The General Certificate of Education (GCE) is conducted in October/November as a supplement for those student who did not get the require credits from the SSCE results. The standards of the two examinations are basically the same. A body called West African Examination Council (WAEC) conducts both the SSCE and the GCE. This body has been conducting this examination since 1952 in the following countries: Ghana, Nigeria, Sierra Leone, and Gambia.

A second body called National Examination Council (NECO) which was formed in April, 1999 conducts the SSCE and the GCE in June/July and December/January respectively. The National Business and Technical Examination Board (NABTEB) established in 1992 is another examination body that conducts National Technical Certificate (NTC)/National Business Certificate (NBC) examinations which are listed by the Joint Admission and Matriculation Board as a prerequisite for admission into tertiary institutions.

A maximum of nine and minimum of seven subjects are registered for the examination by each student with Mathematics and English Language which are compulsory. A maximum of nine grades are assigned to each subject ranging from: A1, B2, B3 (Distinctions grade). C4, C5, C6 (Credits grade).D7, E8 (Pass grade), F9 (Fail grade). Credit grades and above are considered academically adequate for entry into any tertiary institution in Nigeria.

The West African Senior School Certificate Examination (WASSCE) held in May/June 2014 had a total of 529,425 candidates representing 31.28% who obtained credits in five subjects and above including English Language and Mathematics indicating that 69% of the students failed. 58.05% obtained five credits and above while 46.75% obtained six credits and above In 2015, 616,370 candidates from the 1,593,442 indicating 38.68% who sat for the WASSCE obtained credit passes and above in five subjects including English Language and Mathematics .

The National Examination Council (NECO) released the results of the 2015 June/July Senior School Certificate Examination with a total of 664,747 candidates representing 68.56% recording five credits and above including English Language and Mathematics. The results showed over 12% increase in the number of candidates that passed the examination as against 52.29% in 2014.

WAEC performance dropped nationwide, 26% candidates' score five credit including English Language and Mathematics. Only 26 percent of the private candidates who wrote the 2017 Senior Secondary Certificate Examination. SSCE had five credit including English Language and Mathematics representing a sharp drop in the result recorded in 2016. According to him, there can be a reason for the sharp drop of the performance all over this category, which we have not proved scientifically. Cases of malpractice are so wide spread as to discredit a high number of passes that are being recorded, leading to an important question. How good is the performance of these 'eligible' students when they are admitted into higher institution of learning? According to (Ali *et al*. 2009), higher institution students are responsible for social and economic development of any country. However, polytechnics in Nigeria just like other institutions of learning across the country are facing problems of poor performances of students in most of the undergraduate programs which is causing high rate decrease of growth and development of the nation (Ayuba and Muhammed, 2014).

2.3 Education in Tertiary Level (Polytechnic)

Polytechnic education in Nigeria is one out of the three arms of tertiary education in Nigeria. The polytechnic education is charged with the primary responsibility of producing the technical manpower needed for industrial growth in Nigeria. This is a responsibility the polytechnics discharge alongside with Universities of Technology in Nigeria. It offer courses (programmed) in various fields of Technology and Applied Sciences leading to the award of National Diploma (ND) Certificate for the first two years of study and a Higher National Diploma (HND) Certificate for the second phase of the four year programme in the polytechnic. In each phase (that is, The National Diploma or Higher National Diploma) the students are expected to undergo a one year (internship) Industrial Training on completion of the programme registered for.

Specifically, polytechnic education in Nigeria is meant to provide technical learning that would assist the Nigerian society in meeting her industrial aspirations. One distinctive mark of polytechnic education is the strong emphasis it has on practical based learning, with work-attachment as part of the practical curriculum (Tayo 2014). The entire curriculum design and instructional delivery pattern are targeted at enabling the students to have on-the-job work experience. The education provided by the polytechnic is directly focused on the students' future career. Thus, Nigerian polytechnics place emphasis on the attachment of requisite skills acquisition in every facet of course delivery. The target here is to develop students' self-belief and critical faculties which are essential for eventful involvement in societal growth and development (Addison 2002).The author further noted that the development of polytechnic education is fundamental, if Nigeria must succeed in her quest for economic diversification. The essence of polytechnic education in Nigeria is therefore, to train students in technical areas where they can graduate and be self–employed, and also create employment opportunities for others. Polytechnic education can be a means to an end out of the present economic hardship that is characterized by graduate unemployment. It is in fact, a tool for securing employment and emancipation of recipients from poverty, especially,

through the provision of necessary knowledge and skills. The relevance of polytechnic education cannot be over-emphasized, and can serve as a panacea to economic problems of unemployment and youths' restiveness (Eta 2017). David (2013) noted that for Nigeria to attain accelerated technological development, polytechnics across the country must function effectively; and they must be effectively managed and appropriately structured to have the expected capacity to enable the country to be among the twenty (20) best and largest economies in the world by 2020. Unfortunately, the tragedy is that polytechnics in Nigeria are gradually losing their allure (Eta, 2017). Currently, it is very difficult to see Jamb candidates opt for polytechnic education. Most of those who find themselves in the polytechnic system are there due to their inability to gain admission into their dream universities. In line with the above assertion, David (2013) had earlier opined that polytechnic system in Nigeria need effective hands of administration in order to attract UME candidates restore the past glories of Nigerian Polytechnics and re-direct its focus to the desired objectives. It is a general knowledge that education is the bedrock of growth and development of any nation. Its roles to the overall national development cannot be over stressed. In fact, education is important for the achievement of sustainable and significant magnitude of development in a country (David, 2013). Specifically, Polytechnic education in Nigeria is therefore, designed and structured to impart knowledge and necessary skills in order to provide competent and well skilled labor force for industrial and technological development in Nigeria. It is therefore, made to be skills acquisition-oriented, scientific, practical and research-oriented as well.

Academic performance has been defined as the degree to which a student accomplishes his/her tasks and studies (Al-jewair *et al*, 2010). Academic performance is the product of education. It is the level to which a teacher, an institution or a student has accomplished their goals and targets academically. It is commonly measured by examination or continuous assessment but there is no general agreement on how it is best tested or which aspect are most important, procedural knowledge (skills) or declarative knowledge (facts). Academic performance can also be measured by more curricular-based criteria such as grades or performance on an educational achievement test and cumulative indicators of academic achievement such as educational Degrees, Diplomas and Certificates. All criteria are common in that they represent intellectual endeavors and thus, more or less, mirror the intellectual capacity of a person (Steinmayr, *et al.*2014)

Academic performance in most polytechnics or (higher institution) including ours are measured by the GPA (Grade Point Average). Most of the researchers around the world use the GPA to measure the students' performance. It is a numeric average in which letter grades are transferred in numbers. Each grade is assigned to a number of grade points e.g. an 'A' grade receive 4 points, 'AB' grade receive 3.5 points, 'B' grade receive 3.25 points, 'BC' = 3.00, 'C'= 2.75, 'CD'= 2.50, 'D'= 2.25, 'E' = 2.00 and 'F' = 0 according to the new grading system approved for National Diploma and Higher National Diploma by the National Board for Technical Education (NBTE). These grade points are multiplied by the course credits or units.

3.0   Methodology
3.1   Introduction
In this section, the Simple Regression Analysis will be estimated to find performance of Students in their O-level and Higher institution of learning.

3.2   Population of the Study

The targeted population of this study is the entire registered students of Department of Hospitality Management for the period of five years. From 2012/2013 to 2016/2017 with a total population of 154 students (N=154).

3.3   Sample and Sampling Technique

Sampling is a non-parameter estimation technique concerned with selection of a subset of observations from a statistical population using an appropriate sampling scheme to estimate characteristics of the whole population. The representative portion selected is called a sample and it is denoted by n. A population is a well-defined collection of distinguishable elements denoted by N.The population of the data collected can be viewed as a composition of five subpopulations and samples are to be drawn from each subpopulation. The subpopulations are called strata. The population of N units is divided into N_1, N_2, N_3, N_4, N_5 homogenous but unequal strata. The total sample of size n to be drawn from N is divided into n_1, n_2, n_3, n_4, n_5 subsample to be taken from strata 1,2,3,4 and 5 respectively. The sample size of each stratum is proportional to the population size of the stratum.

$$\text{Proportional sampling} = N_i\left(\frac{n_i}{N_i}\right) = \frac{n_1}{N_1} = \frac{n_2}{N_2} = \frac{n_3}{N_3} = \frac{n_4}{N_4} = \frac{n_5}{N_5}$$

$$= \frac{n_1 + n_2 + n_3 + n_4 + n_5}{N_1 + N_2 + N_3 + N_4 + N_5} \qquad \textbf{3.3.1}$$

3.4   Method of Data Collection

According to statistics there are two methods of data collection which is primary and secondary. But for the purpose of this research work, the data collected for this research is from a secondary method. Students' personal academic information was obtained from Department of Hospitality Management of School of Science and Technology, in Nasarawa State Polytechnic, Lafia. The data collected was for the whole population of students in the department who were registered in 2012/2013 to 2016/2017 academic session. Two set of data were collected, National Diploma II (NDII) examination results and the Senior School Certificate Examination results which summaries and represents their secondary school academic performance.

3.5   Method of Data Analysis

The following method will be used in data Analysis:

3.5 .1 Simple Regression Analysis

Regression analysis is the study of relationships among variables. When only two variables are involved, it is called a simple regression analysis. The letters x and y are used as variables in a regression analysis. Let y is the dependent variable while l x is the independent or explanatory variable. Our objective in regression analysis is the prediction of a dependent variable given a value of the independent variable. Regression analysis is used when two or more variables are thought to be systematically connected by a linear relationship. In simple regression, the required model is of the form

$y = \beta_0 + \beta_1 x + \varepsilon$.

3.5.1.1

The variable ε represents the random error associated with the prediction of y for a known or assumed value of x which is unpredictable. The value of ε for any given observation will depend on the possible error of measurement and the values of variables other than x which might have an influence on y.

3.5.2 Assumptions of Regression Analysis:

1. Relationship between predictor variable and response variable is linear (Note: transformations may be used to make it linear)

2. Error term is assumed to be normal (bell shaped distribution) with homogeneous variance

3. Samples are independent

4. ε is a random variable, which may have both positive and negative values, so E (ε) = 0

The standard deviation of ε, that is σ, is constant over the whole range of variation of x. This property is called homoscedasticity

. Alternately, this could be called a homogenous variance.

Since E (ε) = 0, We are supposing that

$E(y) = \beta_0 + \beta_1 x + E (\varepsilon)$

$y = \beta_0 + \beta_1 x$ **3.3.1.2**

For $\hat{\beta}_0$ (Intercept): $H_0 : \hat{\beta}_0 = 0$ (The intercept parameter is not significant)

$H_1 : \hat{\beta}_0 \neq 0$ (The intercept parameter is significant)

For $\hat{\beta}_1$ (Slope): $H_0 : \hat{\beta}_1 = 0$ (The Slope parameter is not significant)

$H_1 : \hat{\beta}_1 \neq 0$ (The Slope parameter is significant)

Level of Significance: $\propto = 0.05$

Decision Rule: Reject H_0 if $t_{cal.} \geq t_{tab.} \alpha/2$, (n-2), otherwise accepts.

Test Statistic: $t_{cal} = \dfrac{\hat{\beta}_i - 0}{SE(\hat{\beta}_i)} \sim t_{tab.}$ (n-2), 3.5.1.3

4.0 DATA PRESENTATION AND RESULTS

Table 1: The population and sample selected in each academic Session of polytechnic

Years	Population N=154	Sample N=50
2013	29	9
2014	27	9
2015	39	13
2016	27	9
2017	32	10

Table 2: Shows averages of O' Level and ND results.

Years (Y)	O' Level Average (X_1)	ND Average (X_2)
2013	**1.89**	**3.06**
2014	**2.23**	**2.98**
2015	**1.98**	**2.88**
2016	**2.26**	**2.93**
2017	**1.97**	**2.88**

TABLE 3: Shows the Regression Estimate and Statistic Value of O' Level results.

MODEL	$\hat{\beta}_i$	SE($\hat{\beta}_i$)	$t_{cal.}(\hat{\beta})$	P-Value	95% Confidence Interval.	
					Lower Boundary	Upper Boundary
INTERCEPT	$\hat{\beta}_0 = 2.009$	= 0.199	10.072	0.002	1.374	2.644
X	$\hat{\beta}_1 = 0.019$	= 0.060	0.316	0.773	-0.172	0.210

Note: Dependent Variable: Y, Regression Estimate Model: Y= 2.009 +0.019x

TABLE 4: Shows the Regression Estimate and Statistic Value of ND results

MODEL	$\hat{\beta}_i$	SE($\hat{\beta}_i$)	$t_{cal.}(\hat{\beta})$	P-Value	95% Confidence Interval.	
					Lower Boundary	Upper Boundary
INTERCEPT	$\hat{\beta}_0$ = 3.069	= 0.048	63.804	0.000	2.916	3.222
X	$\hat{\beta}_1$ = -0.041	= 0.015	-2.827	0.066	-0.087	0.005

Note: Dependent Variable: Y, Regression Estimate Model: Y= 3.069 -0.041X 0.041 x

Results

The results in table 1 shows numbers of population and sample drawn from the Department of Hospitality management of Nasarawa State Polytechnic, Lafia for a period of five years from 2013-2017 academic session with highest numbers of students in 2015 and lowest number in 2014 and 2016 respectively. While in table 2 shows the average performance of students during their West African Examination council (WAEC)and National Diploma Examination (ND result) where results show that students in higher institutions have higher average of 3.06 in 2013 academic session while that of secondary have higher average of 2.26 in 2016 academic session.

In table 3 the results show that the intercept of 2.009 with standard error of 0.199 and calculated valve and p-value of 10.072 and 0.002 respectively. While the slope has 0.019 with standard error of 0.060 and calculated valve and p-value of 0.316 and 0.773 respectively. While in table 4the results shows that the intercept of 3.069 with standard error of 0.048 and calculated valve and p-value of 63.804 and 0.000 respectively. While the slope has -0.041 with standard error of 0.015 and calculated valve and p-value of -2.827 and 0.066 respectively.

5.0   Conclusion

This study examined the academic performance of polytechnic students in the light of their previous academic records, precisely their Senior Secondary Certificate Examination results. After the whole analysis, it is observed that the two academic records are independence and significantly different. That is The P-value (0.002) <∝-Value (0.05), we will reject H_0 and conclude that the intercept parameter is statistically significant)from result of table 3 while in table 4 shows thatThe P-value (0.000) <∝-Value (0.05), we will reject H_0 and conclude that the intercept parameter is statistically significant. While on the parameter slope the result disagree that The P-value (0.773) >∝-Value (0.05), we will accept H_0 and conclude that the slope parameter is not statistically significant and The P-value (0.066) >∝-Value (0.05), we will accept H_0 and conclude that the slope parameter is not statistically significant. Hence, the values of one variable leave the other unaffected. In reality, this can further confirm the fresh start and new opportunity available to every student after admission into the polytechnic. The learning environment in the polytechnic offers freedom, healthy competition and an opportunity to jointly share ideas with other students. All these can be positively channeled into optimum use by every student despite his/her previous academic performance.

Furthermore, the result obtained validates a significant improvement in students' performance after admission into the polytechnic. This goes further to settle that the learning environment in the polytechnic promotes a better academic performance.

On the other hand, the lack of independence of student's polytechnic academic performance on his/her O' level grades can further point out possible loop holes in the standard of education in Nigeria. Situation where good SSCE performance yield poor academic results in

the polytechnic depict a possible case examination malpractice if a negative change of study attitude is not involved.

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