

Gender Analysis on Students Performances In Ondo State Public Secondary Schools

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ABSTRACT

The study evaluated gender analysis of students' performances in Ondo State Public Secondary Schools. The source of data was secondary and was collected from the Ondo State Bureau of Statistics. The aim is to investigate whether students' performance is independent of sex across the 18 LGAs. The methodology employed the use of chi-square test, t-test and correlation analysis. The result of the analysis revealed that students' performance is independent of sex across the 18 LGAs in the State using chi-square test. Also, performance of male students is not equal to performance of female students across the 18 LGAs in the State using t-test. Furthermore, results of t-test on each LGA revealed that there are significant differences in the performance of male students and female students in 3 LGAs namely Ese-Odo LGA, Ilaje LGA and Odigbo LGA. Finally, correlation analysis on each of the LGA revealed that only one LGA namely Akure South LGA has a negative correlation. Test of correlation also revealed that Akure South LGA has no correlation between male and female performances while there is correlation between male and female performances in each of the remaining 17 LGAs. Based on my research (prima facie), it was observed that year 2012 performance of 37.97% is an improvement over 2009 and 2010 performances that have 21% and 30.18% respectively.

Keywords: Gender Analysis, Students' Performances, Public Schools, Chi Square Test, t-test, Test for Correlation.

INTRODUCTION

The origin of education in Ondo State dated back to 1919 when the first secondary school was established by the Christian missionaries (Ondo State Ministry of Education, 1981). By 1960, when Nigeria attained independence, the number had increased to 39. Since independence, the demand for education increased tremendously such that by 1979 when the free education was launched, the number had increased by 251 (Ondo State Ministry of Education, 1985). Students' enrolment increased from 149, 037 to 304, 452 in 1983 (Ondo State Ministry of Education, 1985). However, as a result of the economic crunch in the country, there was huge reduction in the number of secondary schools from 483 in 1986 to 281 in 1996 (Ondo State Ministry of Education, 2006). Since the country returned to democratic government, the State government has been playing important role in the education sector, notably is the payment of WAEC and NECO exams fees and as well as organizing extra moral lesson sessions for SS6 students after school lectures (Ige, A.K., 1997).

Education is placed at the front burner in the State development agenda. This is so as education is the bedrock of sustainable human development (Ige, A.K., 1997).

This research work is intended to highlight students' performance in SSCE in public secondary schools in Ondo State in 2011/2012 session. As we all know that education is the act or process of imparting or acquiring general knowledge, developing the powers of reasoning and judgment and generally of preparing oneself or others intellectually for mature life (Adeyegbe, S.O., 2004).

Information was obtained on the 2012 WASSCE on local government basis. Kindly find the overall performance of public schools in Ondo State as under listed:

- Total no of candidates that were registered for the exam = 27,402
- Total no of candidates that their results were released = 25, 763.
- Total no of candidates that met the criteria stated above = 9,782
- Total no of candidates that did not meet the criteria stated above = 14, 699.
- State performance for public schools = 37.97%

Provisions contained in the 4th edition of National Policy on Education (NPE, 2004) states that 60% of the Senior Secondary School (SSS) learners should pass the National and Public Examination (SSCE) at Credit level in 5 papers including English language and Mathematics (Federal Ministry of Education, September, 2012). From my analysis, the State public schools performance falls short of the prescribed standard by 22.03%.

Charles Uwakwe in his book “Academic Achievement Analysis” explained the concept of Academic Success, Academic Failure, Poor and Good Academic Performance (Charles B. Uwakwe, 2010).

Academic Success is described as the scholastic standing of a student at a given moment. It refers to how an individual is able to demonstrate his/her intellectual abilities. This scholastic could be explained as the grades obtained in a course or groups of courses and the way in which a student has attained the grades including the time he or she passed examination too. (Daniels and Schouten, 1970) argued that a prediction of a future examination result could be made with reasonable success on the basis of the results of an earlier examination and the grades may serve as prediction measures and as criterion measures.

Academic Failure is described as a performance (cognitive aspect) that falls below a specified standard called pass mark. This pass mark is relative and may be referred to as criterion of excellence. It is a score which anybody who has gone through a specified institutional programme in an educational institution must attain to be deemed to have passed (Charles B. Uwakwe, 2010).

Poor and Good Academic Performance: Poor academic performance is one that falls below a desired standard. The concept of both poor and good performance is more subjective than academic failure because, a desired standard can be interpreted in various ways. Hence poor academic performance is therefore any performance that falls below the adequate, appropriate, wished and wanted standard. Poor academic performance can span from zero to one hundred percent. A pass mark on the prime facie may be poor depending on the expectation or standard desired (Charles B. Uwakwe, 2010).

AIM AND OBJECTIVES OF THE STUDY

- It is to study the performances of students in Ondo State Public Secondary Schools. The objectives are:
 - To test the independency of students’ performance on sex across the 18 LGAs.
 - To test whether performance of male students is equal to performance of female students in each of the 18 LGAs.
 - To test whether performance of male students is equal to performance of female students across the 18 LGAs.
 - To find out if there exist relationship between male and female performances on Local Government basis.
 - To identify percentage of State’s performance.

METHODOLOGY

The methodologies employed are chi-square test, t-test, correlation analysis and the following tests were considered:

- Test for independency
- Test for equality.
- Test for association.

CHI-SQUARE TEST

Chi-square test was first investigated by Karl Pearson in 1900. It is a statistical test used to assess two types of comparison (tests of goodness of fit and tests of independence).

- Test of goodness of fit establishes whether or not an observed frequency distribution differs from a theoretical distribution.
- Test of Independence assesses whether paired observations on two variables, expressed in a contingency table are independent of each other.

PROCEDURES FOR TESTING IN CHI-SQUARE

1. Calculate the chi-square test statistic X^2 which resembles a normalized sum of squared deviations between observed and theoretical frequencies.
2. Determine the degrees of freedom, d of that statistic which is essentially the no of frequencies reduced by the number of parameters of the fitted distribution.
3. Compare X^2 to the critical value of number significance from the X^2 distribution.

SIGNIFICANT TESTS AND DEGREES OF FREEDOM

The critical values of the 0.05 and 0.01 significant levels are measured on the tabulation as X^2_{95} and X^2_{99} respectively for chi-square value. The chi-square distribution of the number of degree v , is given for $r > 1$ and $c > 1$ by $v = (r - 1)(c - 1)$.

Assumptions

- There are n random samples or trials.
- There are c and r possible outcomes for each trial.
- The probabilities of the c and r outcomes remain the same between trials.
- The trials are independent.
- The sample size n is large enough so that for every cell, the repeated cell count will be greater than 1.

T-TEST

The t-test was introduced in 1908 by William Sealy Gosset, a chemist working for the Guinness brewery in Dublin, Ireland. The name 'student' was his pen name. Gosset devised t-test as a cheap way to monitor the quality of stout. t-test is a statistical hypothesis test in which the test statistic follows student's t distribution if the null hypothesis is supported. It is used to determine if two sets of data are significantly different from each other. My focus is paired-sample t-test. This type of t-test is used when we are comparing the scores of the same respondent on two variables.

The appropriate hypothesis to be tested could be any of the following:

$$H_0: \mu_1 - \mu_2 = 0 \text{ (or } \mu_1 = \mu_2) \text{ vs}$$

$$H_1: \mu_1 - \mu_2 > 0 \text{ (or } \mu_1 > \mu_2)$$

Or $H_1: \mu_1 - \mu_2 < 0 \text{ (or } \mu_1 < \mu_2)$

Or $H_1: \mu_1 - \mu_2 \neq 0 \text{ (or } \mu_1 \neq \mu_2) \text{ (non-directional)}$

The test statistic is given as:

$$Sp \sqrt{\frac{\bar{X}_1 - \bar{X}_2 - (\mu_1 - \mu_2)}{1/n_1 + 1/n_2}}$$

$$Sp = \frac{(n_1 - 1) S^2_1 + (n_2 - 1) S^2_2}{n_1 + n_2 - 2}$$

CORRELATION ANALYSIS

Correlation is the study of the degree of association between two variables or more variables. The degree of relationship connecting three or more variables is called multiple correlations. Correlations may be linear, i.e. when all the points (x,y) on scatter diagram seem to cluster near a straight line or non-linear when all points seems to near curve. The variables may have a positive correlation or negative correlation or may be un-correlated and this holds for linear and non-linear correlation.

Correlation analysis has serious limitations as it does not give room for assumption about the nature of the relationship between X and Y. Correlation theory does not establish or prove any functional relationship between the variables. It does not suggest the variation say Y is caused by variation in X.

The Karl Pearson correlation coefficient popularly known as product moment correlation coefficient denoted by r is given by:

$$r = \frac{n \sum XY - \sum X \sum Y}{\sqrt{[n \sum X^2 - (\sum X)^2] [n \sum Y^2 - (\sum Y)^2]}}$$

In case where X and Y has an exact linear relationship, for example X = Y, the covariance is equal to the variances. Hence, we have cov(XY) = Var X = Var Y.

The correlation coefficient r may be stated in the form.

$$r = \frac{\text{Cov XY}}{\sqrt{\text{Var X, Var Y}}}$$

TESTING THE CORRELATION COEFFICIENT (r)

Since the knowledge of the statistic r is calculated from a sample and hence we cannot predict or say anything about the population correlation coefficient (R) then it will be better to investigate sampling distribution of r.

$$R = \rho + \epsilon \sqrt{vr}$$

Thus, r is an unbiased estimator but its variance depends upon the value of $\epsilon \ell$. If the value of $\rho = 0$, we say the distribution is symmetric. The test statistics is given by:

$$t_{cal} = r \sqrt{\frac{n - 2}{1 - r^2}}$$

Hypothesis statement:

$H_0: \rho = 0$ (there is no correlation)

$H_1: \rho \neq 0$ (there is correlation)

RESULTS AND DISCUSSIONS

Using Strata software for the analysis of the data, P-value vs 0.05 (α -value) was employed. The result showed that p-value is 0.000 which is less than 0.05 (specified alpha level), we rejected H_0 and concluded that students performance is independent of sex across the 18 Local Government Areas of Ondo State in the 2012 WAEC results. This means that performance has no relationship with the gender of the students. However, another tool (t-test) was adopted to test whether performance of male students is equal to performance of female students in each of the 18 Local Government Areas in WAEC May/June 2012 result. In the analysis of the data, P-value vs 0.05 (α -value) was also employed. I observed that out of the 18 Local Government Areas, there are significant differences in the performance of male students and female students in 3 LGAs namely Ese-Odo Local Government, LGA and Odigbo LGA respectively. The results are as follow: -

For Ese-Odo LGA: From t-test analysis, p-value is 0.0361; i.e. $0.0361 < 0.05$ (specified alpha level), we rejected H_0 and concluded that performance of male students is not equal to performance of female students in Ese-Odo Local Government in the 2012 WAEC May/June results. i.e. there is significant difference in the performance of male students and female students in Ese-Odo Local Government.

For Ilaje LGA: From t-test analysis, p-value is 0.0274; i.e. $0.0274 < 0.05$ (specified alpha level), we rejected H_0 and concluded that performance of male students is not equal to performance of female students in Ilaje Local Government in the 2012 WAEC May/June results. i.e. there is significant difference in the performance of male students and female students in Ilaje Local Government.

For Odigbo LGA: From t-test analysis, p-value is 0.0370; i.e. $0.0370 < 0.05$ (specified alpha level), we rejected H_0 and concluded that performance of male students is not equal to performance of female students in Odigbo Local Government in the 2012 WAEC May/June results. i.e. there is significant difference in the performance of male students and female students in Odigbo Local Government.

There are no significant differences in the performance of male students and female students in the remaining 15 LGAs which are Akoko North East LGA, Akoko North West LGA, Akoko South East LGA, Akoko South West LGA, Akure North LGA, Akure South LGA, Idanre LGA, Ifedore LGA, Irele LGA, IleOluji-OkeIgbo LGA, Okitipupa LGA, Ondo East LGA, Ondo West LGA, Ose LGA and Owo LGA respectively.

Also, t-test was employed to test whether performance of male students is equal to performance of female students in all the 18 Local Government Areas in WAEC May/June 2012 result.

In the analysis of the data, P-value vs 0.05 (α -value) was considered. The output showed that p-value is 0.0326; i.e. $0.0326 < 0.05$ (specified alpha level), we reject H_0 and conclude that performance of male students is not equal to performance of female students across 18 LGAs in Ondo State in the 2012 WAEC May/June results. i.e. there is significant difference in the

performance of male students and female students across 18 LGAs in Ondo State in the 2012 WAEC May/June.

However, correlation analysis and test for correlation were employed to carry out whether there is association between male and female performances in each LGA. The result of the correlation coefficient between male and female students in each of the LGA showed that Akure South LGA has negative correlation. It means that an increase in the performance of male students led to decrease in the performance of female students in Akure South LGA.

The remaining 17 LGAs recorded positive correlations which means that an increase in the performance of male students is associated with an increase in the performance of female students in each of the remaining 17 LGAs and vice versa.

Furthermore we test for correlation in each LGA and the result showed that Akure South LGA has negative value while the remaining LGAs recorded positive values. Finally, only in Akure South LGA we do not reject H_0 since $-0.3712 < 2.052$. i.e. there is no correlation between male and female performances while we reject H_0 in the remaining 17 LGAs since $t_{cal} > t_{\alpha/2}^{(n-1)}$ in each of the 17 LGAs. This means that there is correlation between male and female performances in each of the remaining 17 LGAs.

CONCLUSION

The State's education standard of good performance is religiously pivoted on candidates' scores of at least 5 credit passes including English Language and Mathematics. This standard was adopted because it is the national benchmark standard in Quality Assurance (QA) process in institutions below the tertiary level. We could see that the 2012 State performance for public secondary schools is 37.97%; it falls short of the benchmark by 22.03%. From the project work, it is concluded that some students performed better in LGAs in the riverine areas than in LGAs in the dry land areas. We do not want to jump into conclusion that students in the riverine areas are well taught than students in the dry land areas. From Appendix 3, I observed that Ondo South Senatorial district recorded 55.24% of the total performance while Ondo North recorded 23.56% and Ondo Central came third with 23.30%. The findings led to the conclusion that students' performance is independent of sex across the 18 Local Government Areas of Ondo State in the 2012 WAEC results. It also shows that male performance is not equal to female performance across the State using combined t-test analysis. However, t-test analysis was also employed to test equality of students' performance in each LGA and we observed that male students' performance is not equal to female students' performance in 3 out of the 18 LGAs. It is an unhealthy development to observe that only one LGA had above 75% which is the national benchmark for an outstanding performance. Correlation analysis showed that only Akure South LGA has negative correlation which implies that high performance in male students led to low performance in female students in Akure South LGA. The remaining 17 LGAs recorded positive correlations which means that high performance in male students is associated with high performance in female students in each of the remaining 17 LGAs and vice versa. We also test for correlation in each LGA and the result showed that Akure South LGA has negative value while the remaining LGAs recorded positive values. Finally, it is only in Akure South LGA we do not reject H_0 since $-0.3712 < 2.052$. i.e. there is no correlation between male and female performances while we reject H_0 in the remaining 17 LGAs since $t_{cal} > t_{\alpha/2}^{(n-1)}$ in each of the 17 LGAs. This means that there is correlation between male and female performances in each of the remaining 17 LGAs.

RECOMMENDATION

Based on the findings of the study, it is recommended that Government need to broaden access to quality education, service delivery through e-classroom interaction/learning/or virtual learning for the basis of the robust innovation. However, it can thus be taken that the innovation and therapy of government through the '5i' initiatives has been yielding results in Ondo South Senatorial District. Government need to concentrate more to the other two senatorial districts. Training and re-training of teachers on modern ways of teaching should be encouraged. Government should improve quality of water systems around public schools. There should be review of school curricula to align with WAEC syllabus. Government should employ more teachers to meet United Nations recommendation of 27:1 students: teacher ratio. It is recommended that the State must initially meet the national benchmark standard of excellence in order to produce globally competitive schools and learners (Male and Female). Government should design rounded intervention programmes on the two key subjects (Mathematics and English Language) to include comprehensive capacity buildings for teachers using experts from National Mathematical Centre and the Universities, embracing of e-classroom interaction. Working on the psyche of learners, ensuring effective guidance counseling in the areas of study habit, preparation and succeeding in examinations and the use of the concepts of Learning for Mastery (LFM) and Personalized System of Instruction (PSI) by teachers among others.

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