

Effect of Gender on Students' Academic Performance in Computer Studies in Secondary Schools in New Bussa, Borgu Local Government of Niger State

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Abstract

This research studied the relationship between student's gender and academic performance in computer science in New Bussa, Borgu local government of Niger state. Questionnaire which consist of 30 multiple-choice items drawn from Senior School Certificate Examination past questions as set by the West Africa Examination Council in 2014 multiple choice past question was used as the research instrument consist. The questionnaire was administered to 275 students from both private and public schools in the study area. The students' responses were marked and scored, afterward analysed using independent t-test. The results of the study showed that even though the male students had slightly better performance compared to the female students, it was not significant. This better performance was found to be pronounced in the private school which was shown to possess the best male brains found in the study area. Based on the findings of this study, recommendations were made. Parents are encouraged to provide the right education they can afford for their children irrespective of gender. Also, there should be a deliberate Federal Government policy to encourage absorbance of female students into further study in computer science. Furthermore, it was recommended that stake holders in the education industry should make use of these findings and try to research into ways of making gender sensitive policies.

Keywords: Effect, Gender, Academic, Performance, Computer Studies, Secondary Schools

1. Introduction

The problem of students' under-performance in secondary schools in Nigeria has been a much discussed educational issue. In solving any problem however, it is pertinent to understand the causes of such problems. Many causes or agents have been studied as the etiological starting point for investigating the phenomena of school failure or success. These causes are looked into from several perspectives including the role of the students, teachers, parents or family, school environment, society, government etc. Notable works among these are effects of: students' study habits (Ayodele & Adebisi, 2013; Obasoro & Ayodele 2012), school environment (Adesoji & Olatunbosun, 2008; Okoro, 2004), teachers' competencies (Akiri & Ugborugbo, 2009), parents' economic status (Osonwa et al, 2013), continuous assessment (Kolawole & Ala, 2014; Okwu & Orum, 2012), educational funding (Ugwulashi, 2012). Nonetheless, there seems to be agreement among most authors to explain failure from a multi causal perspective where the phenomenon is analysed at several levels, and where multiple variables are involved.

Gender is one of such factors also mentioned in literature to have considerable effects on students' academic performances especially in science subjects. Gender is the range of physical, biological, mental and behavioural characteristics pertaining to and differentiating between the feminine and masculine (female and male) population. The importance of examining performance in relation to gender is based primarily on the socio-cultural differences between girls and boys. Some vocations and professions have been regarded as men's (engineering, arts and crafts, agriculture etc.) while others as women's (catering, typing, nursing etc.). In fact, parents assign task like car washing, grass cutting, bulbs fixing, climbing ladders to fix or remove things etc. to the boys. On the other hand, chores like dishes washing, cooking, cleaning and so on are assigned to the girls. In a nutshell, what are regarded as complex and difficult tasks are allocated to boys whereas girls are expected to handle the relatively easy and less demanding tasks. As a result of this way of thinking the larger society has tended to see girls as a weaker sex". Consequently, an average Nigerian girl goes to school with these fixed stereotypes.

In view of the belief that students' gender may have impact on the students' academic performance, this study will study the relationship between them if any. Gender differences in achievement have been examined for some time resulting in a substantial body of literature (Jegade & Iyang (1990); Okeke (1990); Osakwe (1991); Mordi (1992); Umeoduagu (1995); Njoku (1997); Ogunkola (1997); Jack & Johannes (2001); Talabi, Emiola & Ogunsakin (2003); Mustafa, Khan & Fabunmi (2004); Rusillo & Arias, (2004); Adeyemi & Ajibade (2011); Akinsola (2007), Nenty (2010), Kyei et al, 2011; Awofala, Adeneye & Nneji (2011) & Amosun (2011), Apata (2011); Dania (2014); Agbaje & Alake, (2014); Atovigba et al, (2012) etc.). Some of these researchers pointed out that there is no significant gender difference in students' academic achievement and retention in various

subjects while others found significant difference with either the boys or the girls performing better.

So many factors contribute to the varied conclusions arrived at by all researchers. Some of such factors include campaign for, understanding and implementation of gender equality in the study area. Nigeria has been the site of numerous kingdoms and consists of several tribes with different sociocultural backgrounds and belief systems, therefore, campaign, understanding and implementation of gender equality in different parts of the country varies from one place to another. Another reason for the varied conclusion is the subject on which the gender equality is being measured on. For example, there has been global concern about gender differences in students' performance in mathematics and some researches have been undertaken in many parts of the globe in this respect. Although some researchers have found that there are no significant differences in male-female mathematics performance at any level, most have identified gender differences (Atovigba, 2012). In fact, it has been the general belief in most parts of the country that male students tend to perform better compared to the female students in mathematical related or technology based subjects.

Development of any nation is a measure of her development in the area of Technology. Technological growth of a nation leads to its social and economic development. In the world today, science and technology has become a dominant power development indicator. America, Russia, Japan and China are typical examples of nations which are now referred to as developed, as a result of their development in the area of Science and technology. At the heart of science and technology is information communication technology (ICT). In fact, literacy is now being said not to be a function of ability to read or write, rather literacy is now digitally divided.

Computer science is the study of the theory, design, use and analysis of computer devices. This entails knowing the computer itself, its operation, what it can do, how it can do it and why it's doing it, these form the basis of computer studies curriculum in secondary school. Therefore, computer studies, a recently introduced subject in the senior secondary school curriculum in Nigeria which introduces students to ICT needs to be given due recognition because of its unquantifiable significance to introducing students to ICT on a wider scope.

1.1 Purpose of the study

Being a recently introduced subject in the senior secondary school and being mathematical and technology related, the issue of gender differences in the academic performance of the students in computer studies is necessitated. The purpose of this study is therefore to investigate the influence of gender on senior secondary school students' academic achievement in computer studies in New Bussa, Borgu local government of Niger state. The objectives of this study include:

- To determine the academic performance of secondary school male and female students in computer studies?
- To determine the academic performance of secondary school male and female students in private and public schools in computer studies?

1.2 Research Hypotheses

- i. There is no significant relationship in gender performance i.e. there is no significant difference in male and female students' performance in computer studies.
- ii. There is no significant difference in private and public school students' performance in computer studies.
- iii. There is no significant difference in gender performance due to ownership type of school (private or government/public owned).

2. Methodology

2.1 Research Design and Sampling techniques

This study is centred on senior secondary school students in New Bussa, Borgu local government of Niger state, Nigeria. The research design for this study is the expo-facto design since there is no special treatment given to the subjects and there is no control group. Data were obtained using the multistage stratified sampling. School type is the strata, hence there are two major strata, namely public and private owned. In each stratum, first stage units are the classes and only Senior secondary school class 3 (SS3) students are the classes, these students are final year students of secondary school which were believed to be studying for Senior Students Certificate Examination (SSCE) which was due to commence in few months' time as at the time of research. The offering of computer studies constitutes the second stage units.

2.2 Instrumentation, Sample size and Data collection

The instrument used in this study was the achievement instrument tagged "Computer Studies Achievement Test" (CSAT). This consisted of 30 multiple-choice items drawn from Senior School Certificate Examination past questions as set by the West Africa Examination Council in 2014 multiple choice past question, the achievement test was conducted to selected male and female students from private and public schools. The selected students

were administered the test question at the beginning of the second term of school year 2014-15 academic session (precisely March and April, 2015), the penultimate term to the conduct of annual West African Examination Council (WAEC, 2015) SSCE examination for SS 3 students, their answer sheets were marked, graded on percentages and their results were used for answering the research questions that were developed and used to test the hypotheses generated for the purpose of this study.

A sample size of n=275 of students was considered where the sample size for each school was chosen using proportional allocation. The sample size for each school was calculated as follows:

$$S_s = \frac{N_s}{N_{SS}} * 275$$

Where S_s is the sample size chosen from a particular school, N_s is the number of students offering computer studies or data processing in the that school, N_{SS} is total number of students offering computer studies or data processing in the entire six (6) schools. The selected students were asked to fill out questionnaire which include achievement test items of thirty (30) multiple choice questions which were randomly selected from WAEC (2014) multiple choice questions.

The schools with population of students offering computer studies included in the sample schools are; Comet Foundation College (Comet - 30 students), Federal Government Girls College (FGGC - 92 students), Alhaji Musa Muhammed Kigera third Science College (AMMK III – 107 students), Government Day Secondary School Dogongari (GDSS - 99 students), Mainstream Energy solution limited secondary school (MESL - 90 students), National Institute of Fresh water Fishery Research secondary schools (NIFFR – 97 students). Therefore, the total population of the students offering computer studies the entire schools (N_{SS}) is 515.

Using the relation above, 16 students were selected from Comet foundation, 49 students from FGGC, 57 students from AMMK III, 53 students from GDSS, 48 students from MESL and 52 students from NIFFR.

2.3 Method of data analysis

Since a person is not randomly assigned to be a male or female. This necessitated the need to ensure that differences in other factors are not masking or enhancing a significant difference in means, hence the need to test whether the gender difference is influenced by the ownership type of the school (privately owned or government owned). This informed the reason why school type formed part of the stratified analysis required in the study. The method to be used in analysing the data is descriptive statistics (tabulation of percentages, mean and variance, etc.) and independent t-test using SPSS data statistical package.

3. Presentation of Results

TABLE 1: Distribution of respondents according to sex

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------|-----------|---------|---------------|--------------------|
| Valid | Male | 118 | 42.9 | 42.9 | 42.9 |
| | Female | 157 | 57.1 | 57.1 | 100.0 |
| | Total | 275 | 100.0 | 100.0 | |

Table 1 shows that 42.9% of the respondents (students) are males while the remaining 57.1% are females; this shows approximately even distribution of the students' gender.

Hypothesis 1: There is no significant relationship in gender performance i.e. there is no significance difference in male and female students' performance in the test.

Table 2a: Descriptive statistics of the gender based performances of the entire students

| Sex | | N | Mean | Std. Deviation | Std. Error Mean |
|-----------|--------|-----|-------|----------------|-----------------|
| Score (%) | Male | 118 | 12.86 | 4.84 | 0.45 |
| | Female | 157 | 11.38 | 4.05 | 0.32 |

Table 2a show the mean performance of the entire male and female respondents (students) results. It showed that the male students perform better compared with the female students. However, the male students vary a little more around average compared to the female students.

Table 2b: T-test of the gender based performances of the entire students

| Variable | Df | Mean difference | t-value | Sig. (2-tailed) | Remark |
|----------|-----|-----------------|---------|-----------------|-------------|
| Gender * | 273 | 1.48 | 2.76 | 0.08 | Significant |
| Score | | | | | |

Table 2b show the t-test statistics of the students' gender performances. The table shows that 1.48 more mark gotten by the male students is not significant since the significance value of the test (0.08) is more than 0.05.

Hypothesis 2: There is no significant difference in private and public school students' performance in the test.

Table 3a: Descriptive statistics of performances of the students in private and public schools

| | SchType | N | Mean | Std. Deviation | Std. Error Mean |
|-----------|---------|-----|-------|----------------|-----------------|
| Score (%) | Private | 116 | 15.15 | 3.46 | 0.35 |
| | Public | 159 | 9.72 | 3.41 | 0.27 |

Table 3a show the mean performance of the entire private and public school respondents (students) results. It showed that the private school students perform better compared with the public school students. However, the private school students vary a little more around average compared to the public school students with most of the private school students having better than average performance.

Table 3b: T-test of the performances of students in private and public schools

| Variable | Df | Mean difference | t-value | Sig. (2-tailed) | Remark |
|---------------|-----|-----------------|---------|-----------------|-------------|
| School type * | 273 | 5.42 | 12.44 | 0.00 | Significant |
| Score | | | | | |

Table 2b show the t-test statistics of the students' gender performances. The table shows that 5.42 more mark gotten by the private school students is significant hence not due to chance alone since the significance value of the test (0.00) is less than 0.05.

Hypothesis 3: There is no significant difference in gender performance due to ownership type of school (private or government/public owned).

Table 4a: Descriptive statistics of the gender based performances of students in public schools

| | PublicSex | N | Mean | Std. Deviation | Std. Error Mean |
|-------------|-----------|-----|-------|----------------|-----------------|
| PublicScore | Male | 53 | 9.02 | 3.16 | 0.43 |
| | Female | 106 | 10.08 | 3.50 | 0.34 |

Table 4a shows the mean performances of male and female students in the public schools. It showed that the female students perform better compared to the male students. Also, the female students have a higher deviation around the average compared to the male counterparts.

Table 4b: T-test of the gender based performances of students in public schools

| Variable | df | Mean difference | t-value | Sig. (2-tailed) | Remark |
|-------------|-----|-----------------|---------|-----------------|--------------|
| Public Sex* | 157 | -1.06 | -1.85 | 0.07 | NS (Not sig) |
| Score | | | | | |

Table 4b show that 1.06 more marks which was gotten by the female students is not significant since the significance value of the test (0.07) is more than 0.05, it can be concluded therefore that the better performance of the female students in the public schools is due to chance alone. The implication of this is that, both genders have similar performances in public schools.

Table 4c: Descriptive statistics of the gender based performances of students in private schools

| | [Private] Sex | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------|---------------|----|-------|----------------|-----------------|
| [Private] Score | Male | 65 | 15.98 | 3.56 | 0.44 |
| | Female | 51 | 14.08 | 3.81 | 0.53 |

Table 4c shows the mean performances of male and female students in the private schools. It showed that the male students perform better compared to the female students. However, the female students have a higher deviation around the average compared to the male counterparts.

Table 4d: T-test of the gender based performances of students in private schools

| Variable | df | Mean difference | t-value | Sig. (2-tailed) | Remark |
|---------------|-----|-----------------|---------|-----------------|-------------|
| Private Sex * | 114 | 1.91 | 2.78 | 0.01 | Significant |
| Score | | | | | |

Table 4d show that 1.91 more marks which was gotten by the male students was significant since the significance value of the test (0.01) is less than 0.05, it can be concluded therefore that the better performance of the male students in the public schools is not due to chance alone. The implication of this is that, male students have better performances compared with the female students in private schools.

4. Discussion of Results

The results of the study were discussed based on the three research hypotheses:

The result from tables 2a and 2b revealed no significant difference in the slightly better performance of the male students with their female counterparts in computer studies (i.e. mean difference = 1.48; t-test = 0.08 at 0.05). The higher deviation around the mean of the male students revealed that the performances of the male students are not as uniform as the female students that is, the entire female students have similar performances as opposed to the male students. This explains the reason why the male students' better performances are not significant because the sets of male students with good performances and the sets with bad performances did so most likely due to certain variables which are treatments the students are exposed to, which necessitated the

reason this study measures the gender performances in private and public schools. This result agrees with the findings of (Jegade & Iyang (1990), Mordi (1992), Chin- Tin (1993), Fabunmi (2004) and Dania (2014)) that students' performance is not determined by gender in terms of the interaction of gender and treatment on students' academic achievement.

Table 3a and 3b shows significant better performances of private school students against their public school counterparts (i.e. mean difference = 5.42; t-test = 0.00 at 0.05). This result agrees with the findings of (Afolabi (2004), Knudson (2005), Adebayo (2009), Philius & Wanjobi (2011), Okon & Archibong (2015)) that reiterated that the type of schools, (single sex or mixed, private or public) has effect on the academic performance of students. This finding dispelled the rumour that private schools are just money-making schools without good academic standards. Indeed in this study, the mean difference shows that students' performance in private schools is a non-arguably better than in public school and support the words of Adebayo (2009) that regardless of whatever level of education (primary, secondary and tertiary) one considers, the trend seems to be the same.

Table 4a – 4c therefore shows the gender performances of the students in public and private schools. In public schools (i.e. mean difference = -1.06; t-test = 0.07 at 0.05) the female students performed slightly better than their male counterparts, however, the better female performance was not significant. Meanwhile, the better performances (i.e. mean difference = 1.91; t-test = 0.01 at 0.05) of the male students in private schools was found to be significant. Going by NCES (1997) that said private schools are attended by choice and Okon & Archibong (2015) that said that the private primary and secondary schools are meant for privileged people or class while the public schools is meant for the general public. Furthermore, table 3a and 3c supports Okon & Archibong (2015) that said private schools screen the candidates for admission after completion of primary education. Therefore many private schools acquired the best students leaving the lower achievers to the public schools and going by Okon (2013) that it is in the northern part of Nigeria (where the study area lies), that you find people that believed it is not “healthy” for women to receive an education hence, private primary and secondary schools have higher male attendance. It is ascertainable that the results gotten from the public schools is weightier compared to that of private schools because this is even more pronounced in the study area. Therefore, the result of testing this hypothesis also complement that of hypothesis one (H_01) and it is deducible that higher male or female academic performance in computer studies in the study area is only due to chance and not significantly different.

5. Conclusion

Based upon the findings of this study, it was concluded that there is no significant difference in students' academic achievement and retention in computer studies. This implies that there are no longer distinguishing cognitive, affective and psychomotor skill achievements of students in respect of gender. The female achievements scores in the administered test were even slightly better compared to their male colleagues in public schools even though without significant difference.

6. Recommendations

In view of the findings in this study, the following recommendations were made.

- i. Female students should be admonished to approach every subject without inferiority complex to the male students.
- ii. Parents are encouraged to provide the right education they can afford for their children irrespective of gender.
- iii. There should be a deliberate Federal Government policy to encourage absorbance of female students into further study in computer science.
- iv. Furthermore, it is recommended that stake holders in the education industry should make use of these findings and try to research into ways of making gender sensitive policies.

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