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**GENDER AND SCHOOL TYPE AS PREDICTORS OF PERFORMANCE OF
SENIOR SECONDARY SCHOOL PHYSICS STUDENTS IN ILORIN, KWARA
STATE**

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Abstract

The study investigated gender and school type as predictors of performance of senior secondary Physics students in Ilorin, Kwara State, Nigeria. The study was a descriptive survey. A total of six hundred and twenty five Physics students participated in the study. A validated Proforma was used to collect records of students that sat for 2014 (WASSCE) in Physics which were converted to scores and were analyzed using mean, and t-test statistical techniques. The finding showed that there was a significant difference in the academic performance of male and female senior school students in Physics in favor of male students, there was a significant difference in the academic performance of senior school students in private schools and those in public schools in Physics in favor of private schools, there was a significant difference in the academic performance of male senior school students in private and public schools in Physics in favor of private schools while there was no significant difference in the academic performance in physics between female students in private and public senior schools in Ilorin. It was recommended that Physics teachers should be more gender-sensitive in their pedagogical approaches as well as in the implementation of the Physics curriculum. Physics teachers in public schools should make genuine effort towards improving the academic performance of students in the subject so as to equal the private schools in terms of students' academic performance.

Keywords: Physics, performance, Senior secondary school, Predicators, School type

Introduction

Science teaching in Nigerian secondary schools has started back since 1859 with the teaching of nature study and later expanded to the three separate sciences, that is Physics, Chemistry and Biology. Physics is one of the science subjects taught at the senior secondary level of the Nigerian Educational system which offers the students an opportunity to think critically, to reason analytically and to acquire the spirit of enquiry. The importance of Physics as a yardstick for technological advancement cannot be over-emphasized, since Physics as a scientific discipline is one of the fundamental ingredients of technology.

Despite the efforts of the Nigeria government, the situation of Physics in our school is worrisome to the people most especially Physics educators and researchers (Adeyemo, 2010). Researchers such as (Adegoke, 2011; Omosewo, & Akanbi, 2013; Isola, 2010; Onadeko, 2009) generally observed low and poor performance of students in Physics. The low enrolment and poor performance of students in Physics is indicative of a serious variance between the expectations of the National Policy on Education (FRN, 2013) and the actual situation of Physics in our schools and calls for a critical look at the strategies for the teaching and learning of Physics (WAEC, 2008).

In both developed and developing nations of the world, low enrolment and poor performance of students in Physics at all levels have been recorded. In kekunle and vojtech (2008) reported poor performance of students in Physics in the Czech Republic while in the United States of America, Spencer (2011) pointed out the poor performance of United States students in international assessments of their achievement in Physics. In the developing world for example, Wambugu and Chengeiywo (2008) in their study showed that the performance in Physics in Kenya was poor and the subject was less popular among students in Kenya secondary schools as compare to other science subjects. Also, Businge (2010) identified the science as recording the worst performance in the 2009 Ordinary level examinations. Businge noted specifically that only 0.6% of the over 211,000 candidates who sat for Physics passed with distinction. Anyo and Ibeagha (2011) identified poor performance of Nigeria senior secondary school students in Physics as what informed their examination of the causal effect of some senior secondary school factors as it affects students' performance in Physics. Generally, students' poor performance in Physics as been attributed to inadequate laboratory facilities, gender effect, unqualified, inexperience teachers, and poor learning environment (Akanbi, 2009; Akinbobola, 2009; Alimen, 2009; Obaidat & Malkawi, 2009; Onah & Ugwu, 2010).

Gender according to Onah and Ugwu (2010) has very significant effect on performance of students in Physics at the secondary school level. Onah and Ugwu identified gender as a very good predictor of performance in Physics at this level. Researches on gender and Physics education have been predominantly concerned with comparisons of male and female students' attitude and/or achievements (Danielesson, 2011; Egun & Tibi, 2010). Several of these studies on gender issues in Physics education noted differing views. Afolabi and Akinbobola (2009) showed no significant difference in the mean performance between boys and girls in the manipulation of the same instructional materials, as well as, in their rate of contribution and class participation. Aina and Akintunde (2013) examined the analysis of gender performance in Physics in college of education in kwara state and shows no relationship existed between male and female students performance in Physics. Alao and abubakar (2011) reported no significant difference in the performance of male and female students in Physics class. Smith (2006) observed some gender differences in the introductory Physics courses where the males out-scored females on both pre-test, post-test and in class examinations.

Some posited that male students perform better than female students, (Apata, 2011; Danmole, 1998; Novak & Mosunda, 1991; Oboh, 1998). Others argued that female students perform better than male students (Lawal 1995). Nworgu, Ugwanyi and Nworgu (2013) examined school location and gender

as factors in senior secondary school and it was stated that female students tendered to be supreme to their male counterparts but it was not consisted across school location.

However, Akiri and Ugbirugbo (2009) observed deterioration in the academic achievement, attitude and values of secondary school students in public secondary schools, one wonders if the high failure rates and the poor quality of the students is not a reflection of the instructional quality in the schools. But is there a significant difference in the performance of students from both the private and public schools? There is a need to look at what transpires in our public and private schools with regards to students' understanding of science concepts especially Physics. Some researchers in this area, showed conflicting views. Baser and Durmus (2010) reported significant difference in favour of one or the other while others reported no significant difference. For example, Ariyo and Ibeagha (2011) pointed out that school type has both direct and indirect causal linkages in students' achievement in Physics.

Olatoye and Agbatogun (2009) in their study discovered that public school students were lagging behind in their performance in mathematics and sciences when they were compare with those in private schools. Lubianski and Lubianski (2006) in their study reported that students in regular public schools do as well as students in private schools when presented with equal learning opportunities. However, students come from different home and as a result have different challenges to contend with (Adeyemo, 2010). In addition to this, Students' educational outcome and academic success is greatly influenced by the type of school which they attend. The school one attends is the institutional environment that sets the parameters of a students' learning experience. Depending on the environment, a school can either open or close the doors that lead to academic achievement. According to Considine and Zappala (2007) the type of school a child attends influences educational outcomes.

Purpose of the Study

The main purpose of this study was to investigate gender and school type as predictors of performance of senior secondary Physics students in Ilorin, Kwara State, Nigeria. Specifically, this study investigated the influence of:

- i. gender on the senior school students' performance in Physics
- ii. school type on senior school students' performance in Physics.
- iii. school type on senior school students' performance in Physics based on gender.

Research Hypotheses

The following null hypotheses were formulated and tested in this research work:

- Ho₁: There was no significant difference in the academic performance of male and female senior school students in Physics in Ilorin.
- Ho₂: There was no significant difference in the academic performance of students in public and private senior schools in Physics in Ilorin.
- Ho₃: There was no significant difference in the academic performance of male students in private and public senior schools in Physics in Ilorin.
- Ho₄: There was no significant difference in the academic performance of female students in private and public senior schools in Physics in Ilorin.

Methodology

This study was a descriptive survey. The target population was made up of all Physics students that sat for May/June 2014 West African Senior School Certificate Examination (WASSCE) in Physics in the senior secondary schools in Ilorin. The sampled schools were selected through proportionate random sampling

techniques. Forty Senior secondary schools (private and public) were specifically selected from the schools that constituted the population of in Ilorin, Nigeria. A total of six hundred and twenty five students participated in the study. (Three hundred and two students were from private schools and 323 students were from public schools with 287 female and 338 male students). A validated Proforma was used to collect information on academic records of students that sat for 2014 (WASSCE) in Physics. The grades of students collected from the selected schools were converted to scores and were analyzed using mean and t-test at 0.05 level of significance.

Results

Ho₁: There is no significant difference in the academic performance of male and female senior school students in Physics in Ilorin.

Table 1: t-test Analysis Showing Difference in Scores of Female and Male Students in Physics

Variables	No	Mean	Standard Deviation	df	Cal t-value	Sig.	Decision
Female	287	46.72	13.21	623	1.96	0.036	NS
Male	338	70.40	15.86				

$P < 0.05$

It can be seen from Table 1 that the calculated t-value. (0.036) was less than the 0.05 level of significance with degree of freedom of 623. Therefore Ho₁ was rejected. This means that there was a significant difference in the academic performance of male and female senior school students in Physics. To ascertain where the significant difference lies, the mean of the academic performance of the male students was compared with the mean of the academic performance of the female students. From Table 1, the mean score of the male students (70.40) was greater than the mean score of female students (46.72). This implies that the academic performance of male students in Physics was better than the academic performance of female students in Ilorin, Kwara State.

Ho₂: There would be no significant difference in the academic performance of students in public and private senior schools in Physics in Ilorin.

Table 2: t - test Analysis Showing Difference in Physics Scores of Private and Public Students

Variables	No	Mean	Standard Deviation	df	Cal t-value	Sig.	Decision
Private	302	68.55	12.52	623	1.87	0.038	S
Public	323	51.09	15.51				

$P < 0.05$

It can be seen from Table 2 that the calculated value. (0.038) was less than the 0.05 level of significance with degree of freedom of 623. Therefore the research hypothesis Ho₂ was rejected. This means that there was a significant difference in the academic performance of senior school students in private schools and those in public schools in Physics. To ascertain where the significant difference lies, the mean

score of the academic performance of senior school students in private schools was compared with the mean of the academic performance of the senior school students in public schools. From Table 2, the mean score of the senior school students from private schools (68.55) was higher than the mean score of senior school students from public schools (51.09). This implies that the academic performance of students in private senior schools in Physics was better than the academic performance of students in public senior schools in Ilorin.

Ho₃: There would be no significant difference in the academic performance of male students in private and public senior schools in Physics in Ilorin.

Table 3: t-test Analysis Showing Difference in Physics Scores of male students in public and private senior schools

Variables	No	Mean	Standard Deviation	df	Cal t-value	Sig.	Decision
Private (M)	152	87.58	18.88	336	2.06	0.027	S
Public (M)	186	56.36	17.21				
$P < 0.05$							

It can be seen from table 3 that the calculated t-value. (0.027) was less than the 0.05 level of significance with degree of freedom of 336. Therefore the research hypothesis Ho₃ was rejected. This means that there was a significant difference in the academic performance of male senior secondary school students in private and public schools in Physics. To ascertain where the significant difference lies, the mean of the academic performance of male students in private senior schools was compared with the mean of the academic performance of the male students in public senior schools. From Table 3, the mean score of male students in private senior schools (87.58) was greater than the mean score of male students in public schools (56.36). This implies that male students in private senior secondary schools performed academically better in Physics than male students in public senior secondary schools.

Ho₄: There would be no significant difference in the academic performance of female students in private and public senior schools in Physics in Ilorin.

Table 4: t-test Analysis Showing Difference in Physics Scores of female students in public and private senior schools

Variables	No	Mean	Standard Deviation	df	Cal t-value	Sig.	Decision
Private (F)	150	49.26	13.43	285	1.97	0.103	N.S
Public (F)		43.96	16.09				
	137						
$P < 0.05$							

It can be seen from Table 4 that the calculated t. value (0.103) was greater than the 0.05 level of significance with 285 degree of freedom. Therefore the research hypothesis HO₄ was not accepted. This means that there was no significant difference in the academic performance of female students in private

and public senior secondary schools in Physics. However, comparing the mean scores, female students in private senior schools (49.26) performed slightly better than female students in public senior schools (43.96).

Discussion of Findings

The findings of this research also showed that male Physics students perform academically than their female counterpart. This is likely due to lack of interest by female students because they believe that Physics is men's profession or it might be other social reasons such as heavy workload in the home. This finding agrees with those of Bamigbala, (2006); Oludipe, (2012); Rosser, (2005) and Simpson & Oliver, (1985).

It was also found out in this research that students from private senior schools perform academically better than their counterparts in public senior schools as deduced from Table 2. On the basis of gender, male students in private senior schools were observed to perform significantly better than male students in public schools, whereas, no significant difference was found in the academic performance of female students in both private and public senior schools in Ilorin. This shows that school type influences male senior school students in Physics than their female counterparts. Factors such as level of education of parents, family income, parental involvement in child's learning, value and believe about the goals and purpose of schooling are some of the factors identified by Greene (2001) to be responsible for observed better academic performance of private schools compared to public schools. This finding concur with those of Ball (2003), Bosetti (2001), Coleman (1988), Reay & Ball (1998), and Reay & Lucey (2000) in which they all agreed that students from private schools perform academically better than those in public schools.

Conclusion

Based on the findings, this study concluded that male senior secondary school students perform academically better than their female counterpart in Physics in secondary schools in Ilorin. Students in private senior schools perform academically better than their counterparts in public senior schools. Male students in private senior schools performed significantly better in Physics than male students in public senior schools, whereas, no significant difference was observed in the academic performance of students in private and public senior schools in Physics in Ilorin. No significant difference in the performance of female students in private and public senior schools in Physics observed, but the means score of female students in private senior schools was slightly better than female students in public senior schools.

Recommendations

Based on the findings and the conclusion drawn on the study, the following recommendations were put forward

- i. Physics teachers should also be more gender-sensitive in their pedagogical approaches as well as in the implementation of the Physics curriculum.
- ii. Physics teachers in public schools should make genuine effort towards improving the academic performance of students in their subject so as to catch up with private schools in terms of students' academic performance.
- iii. Physics teachers in public should make cogent and additional effort in the process of discharging their professional duties so as to improve the academic performance of students in their subject which will make them catch up with private schools in terms of students' academic performance.

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