A COMPARATIVE STUDY OF ACADEMIC PERFORMANCE OF MALE AND FEMALE PHYSICS STUDENTS IN SELECTED SENIOR SECONDARY SCHOOLS IN ONITSHA EDUCATION ZONE OF ANAMBRA STATE

by
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Abstract
The study was designed to compare the secondary school male and female students’ academic performance in physics from 2009 – 2013 academic years. A survey research design was used for the study. The sample comprised of senior secondary two (SS2) physics students (both male and female) from ten selected government owned secondary schools in Onitsha Education Zone of Anambra State. The instrument used for data collection was the students’ annual physics results sourced from the school administrators. The data collected for the study were analysed using mean, standard deviation and t-test. The major findings showed that there is no significant difference in the mean academic performance of male and female students in physics in secondary schools from 2009 – 2013. The study recommends that government and teachers should live up to their responsibilities to ensure a quality science education and improve students’ academic performance in physics to an excellent level as expected.

Keywords: Performance, academic, physics, male and female

Introduction
Background of the Study
Education is an important instrument for the all-round development of an individual as well as a vital tool for rational development. According to Kirk (2007), education is the systematic training and instruction that result in acquiring knowledge and abilities, mental power and development of characters.

Science education is of great importance for the technological advancement of any nation, this is why the National Policy on Education (NPE, 2004) emphasized the need for teaching and
learning of science subjects. The teaching of sciences offers students the ability to access a wealth of knowledge and information which will contribute to an overall understanding of how and why things work like they do. Science is able to explain natural phenomena and also equips students with useful knowledge for solving scientific problems.

Egbugera (1985) has argued that a basic issue in having physics in the school curriculum is purposeful. Further, he stated that for every endeavor, there should be a purpose, an objective goal which may be general or specific of short or long term nature. The purpose of teaching physics in most developed countries is not just to have another subject on the school curricular, it is clearly defined and relates very shortly to specific and unambiguous policies and manifestation in good curricular planning and innovations.

The primary aim of including physics in the school syllables is to understand how nature works. Physics is about finding things out and understanding what lies behind everyday phenomenon. In Nigeria, physics has not been given a priority place, efforts towards promoting science generally have not been in full scale for students in senior secondary schools and have not been encouraging and needs urgent attention.

Adegboye (1991), states that some factors responsible for the decay and poor performance of male and female students in physics are as follows.

i. Poor attitude on the part of the students
ii. Apathy on the part of the students and teachers
iii. Lack of infrastructure like laboratories teaching resources, etc.
iv. Mathematical factor
v. Poor quality for teaching staff in terms of training and competency in physics.

The controversy could therefore be said to continue as to which of the gender have a better academic performance in physics. The study therefore assessed difference in academic performance of male and female in physics of selected secondary schools in Onitsha Educational Zone of Anambra State.

**Statement of the Problem**

The research findings of Ogbodo (1990) clearly revealed that many of the students have negative attitudes toward physics and this resulted to their poor results in the subject, physics. Efforts must be geared towards presenting students with the good background and solid base for good results on the Senior Secondary School Certificate Examination (SSCE).

The main problem of this research work was to compare the difference between the performance of male and female in physics in secondary schools for the years 2009 – 2013 in Onitsha Educational Zone.

**Purpose of the Study**

The main purpose of the study is to ascertain the performance of male and female in physics students in senior secondary schools. Specifically, the study sought to:
A comparative study of academic performance in Physics of male and female students …

i. Find out the mean academic performance of male and female students in senior secondary school physics from 2009 – 2013.


iii. Ascertain whether male perform better than female in the annual result in physics.

Research Questions
What are the mean academic performance of the male and female students in senior secondary school physics from 2009 – 2013?
Is there any significant difference between the mean academic performance of male and female students in physics in senior secondary schools from 2009 – 2013?
Do male perform better than female in physics in secondary schools?

Research Hypotheses
Ho₁: There is no significant difference in the mean academic performance of male and female students in senior secondary school physics from 2009 – 2013.
Ho₂: The mean academic performance of male students is not significantly greater than that of the female students in senior secondary school physics from 2009 – 2013.

Method
Design of the Study
In this research, the researcher used survey research design for the study. A survey research is one in which the result from the sample will be used to generalize for the entire population and this is the intention of this study.
The study was designed to cover all the government owned secondary schools in Onitsha Educational Zone of Anambra State. The education zone is made up of three Local Government Areas, Onitsha North, Onitsha South and Ogbaru.
The population of the study consisted of all the Senior Secondary two (S.S.2) physics students in the thirty-one (31) government owned secondary schools in Onitsha educational zone of Anambra State from 2009 – 2013 with their annual physics results.
The sample of the study comprised of all the Senior Secondary two (SS2) physics students of purposively selected ten (10) secondary schools out of the thirty-one (31) government owned secondary schools in Onitsha educational zone with their annual physics results from 2009 – 2013. The researcher used non-probability sampling technique in selecting the five (5) male secondary schools and five (5) female secondary schools from the educational zone that made up the ten (10) sample schools. The researcher used the physics examination annual results of the senior secondary two (SS2) physics students of the sampled schools from 2009 – 2013.

Validity and Reliability of the Instrument
The instrument used for the study was the schools document from dependable primary source and these results have passed through some psychometric testing (i.e. reliability and validity), the instrument is valid and reliable unless these results are questionable, then the instrument will lack reliability and validity.
The Senior Secondary Two (SS2) physics students’ annual physics results of the selected schools were collected personally from the principals of the schools with the assistance of the physics teachers.

Methods of Data Analysis
The data collected (i.e. physics annual results) were analyzed using mean and standard deviation. The hypotheses were tested at 0.05 level of significance using t-test. The t-test was used to test the null hypotheses because the sample size was analyzed based on the ten (10) schools and five (5) years interval, which is less than thirty and the hypotheses involve difference between two population mean.

Research Question 1
What are the mean academic performance of male and female students in the secondary school physics from 2009 – 2013?

Table 1 and 2 below show the mean scores of male and female students in senior secondary school physics from 2009 – 2013.

Table 1: Male Secondary Schools Mean Annual Physics Result

<table>
<thead>
<tr>
<th>YEAR</th>
<th>MEAN PHYSICS SCORE OF THE STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>2009</td>
<td>64.26</td>
</tr>
<tr>
<td>2010</td>
<td>66.25</td>
</tr>
<tr>
<td>2011</td>
<td>72.12</td>
</tr>
<tr>
<td>2012</td>
<td>58.12</td>
</tr>
<tr>
<td>2013</td>
<td>75.46</td>
</tr>
</tbody>
</table>

Table 2: Female Secondary Schools Mean Annual Physics Result

<table>
<thead>
<tr>
<th>YEAR</th>
<th>MEAN PHYSICS SCORES OF STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>2009</td>
<td>65.41</td>
</tr>
<tr>
<td>2010</td>
<td>57.44</td>
</tr>
<tr>
<td>2011</td>
<td>61.29</td>
</tr>
<tr>
<td>2012</td>
<td>54.26</td>
</tr>
<tr>
<td>2013</td>
<td>73.19</td>
</tr>
</tbody>
</table>

Where A, B, C, D, E are five selected schools.

In Tables 1 and 2 above, all the items (schools) have grand mean score of 50.0 – 69.9.
The results show that both male and female physics students performed well physics from 2009-2013.

**Research Question 2**
Is there any difference between the mean academic performance of male and female students in senior secondary school physics from 2009 – 2013?

**Table 3: Grand Mean, Scores and Standard Deviation of Annual Physics Result of the Male and Female Secondary Schools (2009 – 2013)**

<table>
<thead>
<tr>
<th>GENDER</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>TOTAL MEAN</th>
<th>GRAND MEAN</th>
<th>S.D</th>
<th>MEAN DIFF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>60.01</td>
<td>69.91</td>
<td>58.54</td>
<td>63.34</td>
<td>69.69</td>
<td>321.49</td>
<td>64.30</td>
<td>4.75</td>
<td>0.47</td>
</tr>
<tr>
<td>Female</td>
<td>68.65</td>
<td>60.41</td>
<td>68.56</td>
<td>58.26</td>
<td>63.27</td>
<td>319.15</td>
<td>63.83</td>
<td>4.21</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 above shows that the mean scores of the boys in annual physics results from 2009 – 2013 were 60.01, 69.91, 58.54, 63.34 and 69.69 respectively with a grand mean of 64.30 and standard deviation of 4.75. Also, the mean scores of girls in annual physics results from 2009 – 2013 were 68.65, 60.41, 68.56, 58.26 and 63.27 respectively with a grand mean of 63.83 and standard deviation of 4.21. The results also revealed that the difference between the male and female grand mean scores was 0.47.

**Research Question 3**
Do male perform better than girls in physics in secondary schools?

**Table 4: Male and Female Grand Mean Annual Physics Result (2009 – 2013)**

<table>
<thead>
<tr>
<th>GENDER</th>
<th>NO. OF YEARS</th>
<th>TOTAL MEAN</th>
<th>GRAND MEAN</th>
<th>S.D</th>
<th>MEAN DIFF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5</td>
<td>321.49</td>
<td>64.30</td>
<td>4.75</td>
<td>0.47</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>319.15</td>
<td>63.83</td>
<td>4.21</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 above revealed that for the period of five years under study, the secondary school boys scored a total mean of 321.49 with grand mean score of 64.30 and standard deviation of 4.75; while the female scored a total mean of 319.15 with grand mean score of 63.83 and standard deviation of 4.21 in their mean annual physics results. The results suggested that male performed relatively better than girls in secondary school physics with a slight difference of 0.47 grand mean score above the female.

**H01:** There is no significant difference in the mean academic performance of male and female students in senior secondary school from 2009 – 2013.
Table 5: t-test Comparison of the Mean Academic Performance (scores) of Boys and Girls Students in Physics in Secondary Schools from 2009 – 2013.

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. Of Years</th>
<th>Total Mean</th>
<th>Grand Mean</th>
<th>S.D</th>
<th>Mean Diff.</th>
<th>t-cal</th>
<th>t-crit</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5</td>
<td>321.49</td>
<td>64.30</td>
<td>4.75</td>
<td>0.47</td>
<td>0.496</td>
<td>2.306</td>
<td>Accept Ho₁</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>319.15</td>
<td>63.83</td>
<td>4.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In Table 5 above, the calculated value of t (t-cal) which is 0.496 is less than the critical value of t (t-crit) which is 2.306. Since this is the case, the researcher therefore accepts the null hypothesis which states that there is no significant difference in the mean academic performance (scores) of male and female students in physics schools from 2009 – 2013.

Ho₂: The mean academic performance of male is not significantly greater than that of the male in physics in secondary schools from 2009 – 2013.


<table>
<thead>
<tr>
<th>Gender</th>
<th>Grand Mean</th>
<th>S.D</th>
<th>Mean Diff.</th>
<th>t-cal</th>
<th>t-crit</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>64.30</td>
<td>4.75</td>
<td>0.47</td>
<td>0.496</td>
<td>2.306</td>
<td>Accept Ho₂</td>
</tr>
<tr>
<td>Female</td>
<td>63.83</td>
<td>4.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In table 6 above, the t-cal is less than the t-crit. Therefore, the researcher accepted the null hypothesis. Hence, the mean academic performance of boys is not significantly greater than that of the girls in physics in senior secondary schools from 2009 – 2013.

Conclusion
From the results of the analyses, the study has shown that both the male and female physics students in senior secondary schools had good performance in physics within the period under study, but they could not maintain excellent performance in physics. It was also found that there is no significant difference in the academic performance of male and female in secondary school physics. The researcher therefore concluded that academic performance of boys and girls in physics in secondary schools does not depend on gender. Thus, male students in do not significantly perform better than female students in senior secondary school physics as perceived by some people.

Recommendations
Government should endeavor to live up to their responsibilities by supplying adequate facilities to schools.

The federal and state government as well as those responsible for recruiting teachers in government secondary schools should employ the services of well-qualified and experienced physics teachers.

Teachers’ promotion should be based on effectiveness and students performance in both internal and external examinations that is checkmated from bias and manipulations.
Both the male and female students should be encouraged for a healthy academic competition especially in science studies.

References


