

TEST ANXIETY AS CORRELATES OF ACADEMIC ACHIEVEMENT AMONG SENIOR SECONDARY SCHOOL CHEMISTRY STUDENTS IN ODEDA LOCAL GOVERNMENT AREA OF OGUN STATE, NIGERIA.

¹BUSARI, G.A.; ²ADEOSUN, A.L.; ³ALLI, A. O. AND ⁴ADENIJI, O. S.

Federal College of Education, Abeokuta

¹Integrated Science Department

^{2,3,4}Chemistry Department

Abstract

This study investigated test anxiety as correlate of academic achievement among senior secondary school chemistry students in Odeda Local Government Area, Ogun State. The study adopted a descriptive survey research design where structured and validated questionnaires were employed for data collection. One hundred (100) Senior Secondary School two (SS2) chemistry students were selected from four (4) secondary schools. Four hypotheses were formulated and tested using linear regression analysis and Analysis of Covariance (ANCOVA) at 0.05 level of significance. The findings of the study showed that test anxiety is a significant predictor of students' academic achievement in chemistry. Findings also revealed that test anxiety, school location, and school type have significant relative contributions to students' achievement in chemistry among others. Based on the findings of this study, it was recommended that all hands should be on deck in ensuring better academic achievement in Chemistry among others.

Keywords: Academic achievement, Chemistry, Correlation, Location, Test Anxiety

Background

Chemistry occupies a central position among the sciences due to its remarkable contribution to other disciplines such as medicine, biochemistry, pharmacy, engineering, among others. Despite this role, most students still find chemistry to be difficult and this is evident in the external results conducted by NECO and WAEC which has been dwindling for some years now (Anthony, 2021). Several authors have identified a myriad of factors responsible for low academic achievement in science subjects including chemistry. However, little attention has been paid to test anxiety among students (Akanazu and Okoli, 2019).

Habibullah and Ashraf in Alemu and Feyssa (2020) described tests and examinations as yardsticks for measuring achievement, skills and abilities among students at all levels of education. They pointed out that test-anxiety is a psychological and adverse reaction to evaluation. Test anxiety among students however reflects in tests and examination result (Dami, James and Gogwim, 2019) which often times is unfavourable due to loss of concentration among students. Khan, Munir, Afzal and Ansari, (2020) revealed that test anxiety among students leads to poor academic performance. Akanazu and Okoli, (2019) and Oluoch, Aloka and Odongo, (2018) opined that test anxiety is an essential variable which has a direct negative correlation

with academic achievement of chemistry students. Muhammad and Muhammad, (2013) buttressed that test anxiety accounts for poor performances of very intelligent students during examinations. The result of their study also showed that test anxiety had a negative correlation with academic achievement in chemistry and three other science subjects. Nwafor, Eke and Ibe, (2023) revealed a statistically significant negative relationship between test anxiety and academic achievement of chemistry students regardless of their school location. Olutola, (2020) revealed that school type especially public schools had a significant negative effect on both students' test anxiety as well as overall performance. Woldeamanuel, Atagana and Engida, (2013) also showed a negative correlation between students' test anxiety and performance in chemistry with more significance in females and rural-based students. However, Uwaleke and Okigbo (2023) affirmed that test anxiety does not significantly predict chemistry students' academic achievement.

Statement of the Problem

The dismal achievement of students in Chemistry over the years is a cause of serious concern. The results of chemistry students in both public and private schools have been dwindling over decades despite the efforts of teachers, educational researchers and funding by private bodies, State and Federal Governments. These can be attributed to several factors including test anxiety. Okobia and Oji, (2021) asserted that test anxiety encourages low self-esteem and concentration and decreased processing of reading materials which eventually leads to unhealthy practices such as examination malpractice and eventual poor performance. To what extent is this assertion true? This in short, is the focus of the study with a view to identifying the relationship between test anxiety and students' achievement in chemistry and by extension proffering lasting solutions to the perennial and dismal performances of the students.

Research Hypotheses

The following research hypotheses were formulated to guide the study:

- H_{01} : There is no significant relationship between test anxiety and academic achievement of chemistry students in urban areas.
- H_{02} : There is no significant relationship between test anxiety and academic achievement of chemistry students in rural areas.
- H_{03} : There is no significant relationship between test anxiety and academic achievement of chemistry students in private schools.
- H_{04} : There is no significant relationship between test anxiety and academic achievement of chemistry students in public schools.

Research Design

A descriptive survey research design method was adopted, utilizing questionnaire and achievement test for data collection.

Population of the Study

The population for this study comprises chemistry students of four (4) selected secondary schools from two geographical locations (rural and urban) in Odeda Local Government Area of Ogun State.

Sample and Sampling Techniques

Random sampling technique was used to select four secondary schools (two public schools and two private schools) from two geographical locations (rural area and urban area) which include one public school and one private school respectively for each geographical location in Odeda Local Government, Ogun State. A total sample size of twenty five (25) chemistry students of senior secondary school two (SS2) were randomly selected from each school giving a total of a one hundred (100) students. SS2 students were chosen by the researcher because they already have experience of chemistry as a subject for a year.

Research Instrument

Two instruments were used for data collection. They include:

- Westside Test Anxiety Scale (WTAS)
- Chemistry Achievement Test (CAT)

Validity and Reliability of the research instrument

The instruments were validated by experts in the field. To test the reliability of the instrument, WTAS and CAT was trial administered to Twenty (20) senior secondary school chemistry students selected from Two (2) schools outside the main schools used for the study to ascertain the effectiveness of the instruments. The Cronbach alpha Reliability coefficient of 0.80 was obtained.

Method of data analysis

The data collected was subjected to statistical test and analysis using regression analysis at 0.05 level of significance. The ANCOVA table from each regression analysis was used to answer the research hypotheses.

Results and Discussion

Research Hypotheses

H₀₁: There is no significant relationship between test anxiety and academic achievement of chemistry students in urban areas.

Table 1: Covariance Analysis of test anxiety and chemistry academic achievement in urban areas

Dependent Variable: Chemistry Achievement					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	5814.439	11	5814.439	418.049	.025
Test anxiety	814.439	1	814.439	228.049	
Error	20227.500	308	65.674		
Total	1481779.000	320			
Corrected Total	26041.939	319			

a. R Squared = .223 (Adjusted R Squared = .196)

Table 1 above showed the analysis of covariance of test anxiety as a predictor of students' academic achievement in Chemistry in urban areas. The result of the findings showed that at the p-value (0.025), the null hypothesis was rejected. Hence, there is a statistical significance between students' test anxiety and academic achievement in chemistry. Hence, test anxiety is a predictor of chemistry students' academic achievement in urban areas.

H₀₂: There is no significant relationship between test anxiety and academic achievement of chemistry students in the rural areas.

Table 2: Covariance analysis of test anxiety and chemistry academic achievement in rural areas

Dependent Variable: Chemistry Achievement					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	25544.000	75	340.587	1.542	.117
Test anxiety	56582.425	1	56592.425	256.222	
Error	5300.000	24	220.883		

Total	142400.000	100		
Corrected Total	30844.000	99		
a. R Squared = .223 (Adjusted R Squared = .196)				

Table 2 above showed the analysis of covariance of test anxiety as a predictor of students' academic achievement in Chemistry in rural areas. The result of the findings showed that at the p-value (0.117) the null hypothesis was rejected. So, there is a statistical significance between students' test anxiety and their academic achievement in chemistry. Hence, test anxiety is a predictor of chemistry students' academic achievement in rural areas.

H₀₃: There is no significant relationship between test anxiety and academic achievement of chemistry students in private schools.

Table 3: Covariance Analysis of test anxiety and chemistry academic achievement in private schools

Dependent Variable: Chemistry Achievement					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	31873.000	25	295.223	1.715	.014
Test anxiety	61245.392	1	61245.392	329.392	
Error	4700.000	24	197.432		
Total	235400.000	50			
Corrected Total	27278.000	49			
a. R Squared = .828 (Adjusted R Squared = .291)					

Table 3 above showed the analysis of covariance of test anxiety as a predictor of students' academic achievement in Chemistry in private schools. The result of the findings showed that at the p-value (0.014), the null hypothesis was rejected. So, there is a statistical significance between students' test anxiety and their academic achievement in chemistry. Hence, test anxiety is a predictor of chemistry students' academic achievement in private schools.

H₀₄: There is no significant relationship between test anxiety and academic achievement of chemistry students in public schools.

Table 4: Covariance Analysis of test anxiety and chemistry academic achievement in public schools

Dependent Variable: Chemistry Achievement					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	6345.426	15	6345.426	309.146	.032
Test anxiety	725.823	1	725.823	187.789	
Error	19912.500	354	65.674		
Total	259288.000	380			
Corrected Total	3701.426	379			

a. R Squared = .215 (Adjusted R Squared = .463)

Table 4 above showed the analysis of covariance of test anxiety as a predictor of students' academic achievement in Chemistry in public schools. The result of the findings showed that at the p-value (0.032), the null hypothesis was rejected. So, there is a statistical significance between students' test anxiety and their academic achievement in chemistry. Hence, test anxiety is a predictor of chemistry students' academic achievement in urban areas.

Discussion of the Findings

The findings of the study revealed that test anxiety was a significant predictor of academic achievement of chemistry students. The finding is in agreement with Muhammad and Muhammad, (2013); Oluoch *et al.*, (2018); Nwafor *et al.*, (2023); Akanazu, and Okoli (2019). However, the study is not in tandem with the findings of Okobia and Oji (2021).

The findings of the study also showed that test anxiety was also a significant predictor of academic achievement of chemistry students in urban, rural, private and public secondary schools irrespective of gender. This was corroborated by Akanazu, and Okoli (2019) who conducted research on 295 public secondary school chemistry students and Oluoch *et al.*, (2018) who worked with 3822 form four chemistry students from public secondary schools.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. All hands should be on deck in providing a conducive school and classroom environments for the students. Hence, governments at all levels should make funds

available for this purpose and ensure that befitting classrooms, laboratories and workshops are constructed.

2. There should be continuous public enlightenment campaign on the importance of text anxiety at the local, state and national levels by the ministry of Education.
3. Chemistry teachers should be approachable and friendly with their students. They should also inculcate in their students, the perception of that the subject as not being difficult.
4. Teachers should always consider individual differences of students.
5. Teachers and parents should try and build self-confidence in their wards/students as it could reduce students' anxiety in the learning of the subject.

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