

**AVAILABILITY OF SCIENTIFIC EQUIPMENTS IN THE
LABORATORY AND STUDENTS ACADEMIC PERFORMANCE IN
CHEMISTRY IN SENIOR SECONDARY SCHOOLS IN AKWA IBOM**

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Abstract

The study examines the availability of scientific equipment in the laboratory and students academic performance in Chemistry in secondary school in Akwa Ibom State. Two research questions were formulated for the study. A survey research design was adopted. Five out of all the public secondary schools in the study area were selected to constitute a sample of the study. A check-list titled Chemistry Laboratory Equipment Evaluation Check-list titled Chemistry Laboratory Equipment Evaluation Check-list (CLEEC) was used to collect data on the equipment present in the school' Chemistry laboratory. Results of SSCE/NECC, for 2008-2012 were also collected for data analysis for the analysis of data, frequency counts, percentages and spearman rank order correlation co-efficient were used. Results reveal low level of facilities and no correlation between availability and adequacy- of equipment and performance In SSCE/NECO examination, it was recommended among other recommendations that government should provide a good and high level of scientific equipment to the public secondary schools in Akwa Ibom State for the effective teaching and learning of Chemistry.

**Availability of Laboratory Equipment
and Students Academic Performance**

Okebukola (1997) attributed the prior poor performance in Chemistry to

topic difficulty, overloaded curriculum and inadequate facilities in the Chemistry laboratories of many schools. In fact, he went on to write that what is commonly

observed in most schools is a classroom space called the laboratory. One or two “leeuwen hock” type (archaic) microscopes, a few hand lenses and a few dried up specimen in bottles. Odunkoya (1995) also wrote that many of the schools in Nigeria hardly have adequate material resources in their laboratories and libraries. Bajah (1979) wrote in terms of “teaching methods and provision of adequate and quality instructional materials”.

Danjuna (2006) explains that there is need for proper dissemination of Chemistry knowledge in senior secondary schools. The study of Chemistry can be successfully done through practicals which are conducted in well equipped laboratories. The quality of education that our children receive bear direct relevance to the availability or lack of physical facilities and the overall atmosphere in which teaching and learning take place.

Similarly, Asiyai (2006):196) also observed that “adequate supply (If instructional resources will help to enhance teaching and learning process towards the achievement of set goals and objectives”. She also added that good quality schools depend largely on the provision and utilization and management of educational resources, that instructional facilities identified for effective teaching of Chemistry include, laboratories which are equipment, audio visual aid etc.

In another perspective, Inyang4bia (2011) in addition in addition recommended the use textbooks, journals, magazines, video and radio cassettes, and recorders as instructional materials and

aids. He also identified phenomenal provision of instructional materials as being effective for teaching and learning success.

Similarly, Madumere (2006:327) also is in support of the view ‘the use of natural environment could serve as effective resource teaching primary science’ She observes that poor performance attributed to either ineffective teaching method or insufficient use of relevant instructional materials in a lesson.

Importance of Laboratory Facilities in the Teaching and Learning of Science

Without laboratory facilities, teaching and learning of science will place effectively, especially in STM where the teachers must always be around to guide and direct students in their learning process (Nkwocha, 1998). On the other hand a teacher can only achieve his objectives in teaching if enough resources are made available to him, more importantly in Chemistry where we need teaching resources that will ensure that the learner is exposed to a learning experience that ensures the cultivation of scientific spirit. Teaching resources play important role in observation, an aspect of scientific knowledge which is of much importance in Chemistry.

Due to inadequate supply of laboratory equipment to secondary schools, in Akwa Ibom State, it has therefore, became necessary to find out about the availability of facilities for the effective teaching and learning of Chemistry.

Purpose of the Study

The purpose of this study is to find out the extent to which none availability of Chemistry laboratory equipment has effect on the performance of students at SSCE Chemistry in selected secondary schools in Akwa Ibom State.

Research Questions

The following questions were formulated to guide this study:

1. To what extent does the school selected for the study have adequate physical structures utilized for Chemistry practical?
2. How do adequacy of the materials affect the academic performance of students at SSCE for the selected years?

Research Design

The study employed a survey research design to investigate the equipment situation in secondary schools in Akwa Ibom State. The performance of students in Chemistry SSCE/NECO examinations from 2008 – 2012 in these school were also involved.

Population of the Study

The study population was 10, 375. This consists of all the senior secondary three (SSS3), students in the public secondary schools in the study area (source: Akwa Ibom School Board: 2007-2012).

Sample and Sampling Technique

A stratified random sampling method was used to select five out of the fourteen

Public Secondary schools in the study area(source: Akwa Ibom School Board: 2007-2012). The schools selected have been graduating SSCE students for not less than five years. This was to ensure that the schools selected were WAEC/NECO recognized

Data Presentation

Research Question 1

To what extent do the schools selected for the study have available facilities in their Chemistry laboratory.

Table 1: Level of Adequacy of experiment

Schools	Basic facilities	Chemistry apparatus	Chemistry glass ware	Chemistry re-agent
A	54.8%	29.8%	21.6%	31.6%
B	48.6%	31.6%	28.5%	48.5%
C	38.4%	17.5%	26.5%	46.5%
D	23.0%	11.6%	16.0%	26.0%
E	18.3%	8.5%	18.5%	22.5%

A thorough study of the data presented in table 1 reveals that the state of the laboratories in each of the schools. It will be observed that none of the schools had up to 50% level of adequate Chemistry laboratory equipment.

Research Questions 2

How do adequacy of the materials affect the academic performance of students at SSCE for the year selected?

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The data presented in Table 2 showed the mean performance of the students in Chemistry in the period of five years which reveals the general poor performance, as none of the schools had up to 50% mean pass.

Table 2: Performance of students in SSCE Chemistry 2008 – 2012 in the selected schools

Schools	2008		2009		2010	2011		2012		mean	
	%P	%F	%P	%F	%P	%P	%F	%P	%F	%P	%F
A	29.4	70.6	81.9	91.1	20.5	79.5	38.6	21.3	62.7	24.7	75.3
B	32.9	67.1	47.7	52.3	24.2	75.8	23.6	76.4	35.5	64.5	32.6
C	64.1	35.9	25.8	74.2	49.6	50.4	48.2	52.8	49.7	50.3	49.7
D	57.6	42.4	67.7	32.3	23.6	76.4	42.7	57.3	32.0	68.0	44.7
E	20.0	80.0	40.0	60.0	9.0	91.0	50.0	50.0	93.0	7.0	93.0

On comparing the means of the performance and the means of available facilities, spearman's Rank order of correlation was used. The result revealed calculated value of $r = +0.50$ and $df = n - 2$ ie. $(5 - 2) = 3$, at 0.05 level of significant and a tail test $r = 0.805$, the calculated value 0.05 is less than table value of 0.805 and as such the research questions of no correction between adequacy of laboratory equipment and performance of students in Chemistry SSCE is answered. Thus there

is no significance relationship between the adequacy of the materials and the academic performance of the student at SSCE for the years selected.

Discussion of Findings

Data presented in table I and interpretation shows the level of adequacy of physical structures of the three schools were 48%, 42% and 39% respectively. The other two schools utilized multipurpose laboratory room for all science practicals. The result reveals a very low level of the physical structures as well as equipment in the laboratories of the schools studies as none had up to 50% level of adequacy. This finding is in line with the findings of Nwocha (1998) who opined, that without laboratory facilities teaching and learning of science will not take place effectively.

Conclusion

Based on the findings of this study, it is concluded that availability and the level of adequacy of scientific equipment in the laboratory in learning and teaching of Chemistry improved academic performance amongst secondary school students. In addition, there was no significant correlation between the adequacy of laboratory equipment and academic performance of the students.

Recommendations

The following recommendations are made based on the findings:

1. Public secondary school in Akwa Ibom State should have available

scientific equipment in teaching learning of Chemistry.

2. School authorities should endeavor to provide a good and standard Chemistry laboratory for the teaching and learning of Chemistry.

3. Government should provide a good and high level of scientific equipment to the public secondary schools Akwa Ibom State for the effective teaching and learning of Chemistry.

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