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Achieving Quality Teaching in the Era of Insecurity: Implications for Chemistry Education

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Abstract
This study investigated 'Achieving Quality Teaching in the Era of Insecurity with implication on Chemistry Education among Secondary Schools in Uyo Local Government Area of Akwa Ibom State, Nigeria'. The survey design was adopted for the study. The study used proportional sampling technique to select the teachers. A total of 60 secondary school Chemistry teachers were selected for the study. Two research questions guided the study, two hypotheses were formulated and tested at 0.05 level of significance. The instrument used for the study was "Achieving Quality Chemistry Teaching Questionnaire (AQCTQ). Data was analyzed using mean, standard deviation and t-test. The result of the study indicated that there is significant influence of utilization of modern technological devices and qualified teachers with knowledge of modern technological devices for teaching on the quality teaching of Chemistry in secondary schools. This study therefore recommends that Government both at the federal and state level, school owners, principals and school administrators should make virtual teaching compulsory in the educational sector among others.

Keywords: Quality teaching, Insecurity, Chemistry teachers, Uyo

INTRODUCTION

Chemistry Education has been identified to be one of the major bedrock for the transformation of a nation's economy. It is needed for the production of the needed technologists, technicians, engineers, medical practitioners who are required to turn the nation's economy around and usher in the desired technological advancement which is very much required for sustainable development. Chemistry is a branch of pure and basic science which deals with the study of nature, composition, properties (physical and chemical) and uses of

matter, and the changes matter would undergo under different conditions (Adeyemo, 2010). Chemistry in its entirety has a central role to play in promoting sustainable development through basic research skills, chemical innovations and technology.

No nation can develop without sound education. Education has over the years been given much attention and priority in African countries, especially in Nigeria. The government has discovered that the quality of education offered in Nigerian educational system determines the quality of development experienced. So, even in the face of insecurity, quality education should still be given to students using whatever means necessary.Insecurity and terrorism have been a major challenge to the Nigerian government in recent times. The activities of Boko Haram have led to loss of lives and properties in the country especially in the Northern part of Nigeria. Some of these activities include bombings, suicidal bomb attacks, sporadic shooting of unarmed and innocent citizens, burning of police stations, churches, kidnapping of school girls and women among others. Kidnapping, rape, armed robbery, and political crises, murder, destruction of oil facilities by Niger Delta militants alongside the attacks carried out by Fulani Herdsmenon some communities in the North and South have been a major insecurity challengefacing the country.According to Precious and Adamu (2010), Nigeria has been included among one of the terrorist countries of the world. Many lives and properties have been lost and a lot of citizens rendered homeless. Families have lost their loved ones; women have lost their children and husbands. This has implications for education, especially Chemistry education. Ofcourse, schools cannot function in the midst of insecurity. Schools at various levels have been closed down for months in the country due to insecurity. Students cannot meet in class to obtain lectures. Government had made frantic effort to curb the menace of insecurity in the country but the rate of insecurity is still high.

Education prepares the citizens for variety of functions within the economic, social, political, religious and other structures of the societies. It makes individuals responsive, responsible and fit into the society. Teachers continually ought to be updated with the changes in educational delivery globally.

According to Precious and Adamu (2010), Chemistry education is considered as a key agent of development, either as a way of developing human capacity, increasing the skilled workforce for modernization, or as a matter of personal freedom, developing capability and empowerment. Chemistry education is the study of the teaching and learning of Chemistry in all schools, colleges and universities. Chemistry education also includes the understanding of how students learn Chemistry, how best to teach Chemistry, and how to improve learning outcomes by changing teaching methods and appropriate training of Chemistry instructors (Taber, 2012).

RESEARCH METHODOLOGY

The method adopted in the investigation of the problem of the study was organized under the following sub-headings: research design, area of the study, population of the study, sample and sampling techniques, instrumentation, validation of the instruments, reliability of the instrument, research procedure and method of data analysis.

Research Design

The survey research design was adopted for the study. This is because it examined ways of achieving quality teaching of Chemistry education amidst insecurity in secondary schools in Uyo LGA, Akwa Ibom. The study was centered on utilization of modern technological devices like computers, phones, projectors and online platforms like zoom in teaching and knowledge transfer by teachers as they influence quality teaching of Chemistry in secondary schools in Uyo without the researcher manipulating the independent variable.

Area of Study

Uyo Local Government is the capital of Akwa Ibom State, Southern part of Nigeria. It became the capital on September 23, 1987 when Akwa Ibom State was created from the former Cross River State. Uyo lies between Oron and Ikot Ekpene. Ibibio is the primary indigenous language spoken. It has a vast number of educational facilities like the world class E-library among others. There are many secondary schools located in Uyo LGA, both public and private.

Population of the Study

The population for this study consisted of 60 Chemistry teachers randomly selected from 20 secondary schools in the study area.

Sample and Sampling Technique:

A proportional sampling technique was used to select 60 Chemistry teachers from 20 secondary schools in Uyo LGA which formed the sample frame for the study.

Instrument of the Study:

The instrument for the study was a researcher-made questionnaire tagged, "Achieving Quality Chemistry Teaching Questionnaire (AQCTQ) which had 12 items.

Validity and Reliability of the Instrument:

The instrument was subjected to face validity by two experts in Science Education, University of Uyo, Uyo. This ensured that the contents were relevant, clear and unambiguous. The corrections made by them were incorporated into the final draft. The instrument, which had 12 items, was adopted after due validation and tested for reliability using the Cronbach alpha formula, with a reliability estimate of 0.69.

Data Analysis:

The secondary schools were visited and the relevant data were collected using the instrument. The data was analyzed using independent t-test compared at 0.05 level of significance.

Data Collection:

A letter was gotten from Department of Science Education, University of Uyo, Uyo by the researcher to be given to the principal of secondary schools used for the research purpose. Thereafter the instrument issued out was collected for analysis**.**

Method of Data Analysis:

Mean and standard deviation were used to answer the research questions. All hypotheses were tested at 0.05 level of significance and analyzed using independent t-test.

RESULTS

Data analysis was carried out on the two hypotheses, the results were interpreted and discussion of findings.

Research Question 1

How does the utilization of modern technological devices like computers, phones, projectors and online platforms in teaching influences quality teaching of Chemistry in secondary schools in Uyo Federal Constituency?

Mean and Standard Deviation were used in answering the research question and summary data shown in Table 1 below. The upper limit of these numbers was regarded as point of crossing from one level of agreement to the other. For a four point scale, 2.4 was used to cross from agree to disagree.

Table 1: Mean and Standard Deviation of teachers who agreed to the influence of utilization and those who disagreed (N = 60)

Group	N	$\bar{X}$	SD
Teachers who agreed	40	24.45	4.23
Teachers who disagreed	20	12.11	2.83

Table 1 reveals the mean of teachers who agreed with 24.45greater than teachers who disagreed with 12.11. Therefore, the utilization of modern technological devices influences quality teaching of Chemistry in secondary schools.

Research Question 2

How do qualified teachers with knowledge of modern technological teaching devices like computers, phones, projectors and online platforms influence quality teaching of Chemistry in secondary schools in Uyo Federal Constituency?

Mean and Standard Deviation were used in answering the research question and summary data shown in Table 2 below:

Table 2: Mean and Standard Deviation of teachers who agreed and those who disagreed (N=60)

Group	N	$\bar{X}$	SD
Teachers who agreed on influence	40	23.77	2.48
Teachers who disagreed	20	12.41	2.16

From Table 2, it is revealed that the mean of teachers who agreed to the influence was 23.77 greater than those who disagreed with mean of 12.41. Therefore, qualified teachers with knowledge of modern technological teaching devices influence quality teaching of Chemistry in secondary schools.

Test of Hypothesis 1

There is no significant influence of the utilization of modern technological devices like computers, phones, projectors and online platforms on the quality of teaching of Chemistry in secondary schools in Uyo Federal Constituency.

The independent t-test was used in testing the hypothesis and summary data are shown in Table 3.

Table 3: Independent t-test of influence of utilization of modern technological devices (N – 60)

Group	N	$\bar{X}$	SD	df	t-cal	t-crit
Teachers who agreed to influence	40	24.45	4.23			
				198	4.37	1.96
Teachers who disagreed	20	12.11	2.83			

The null hypothesis is rejected since the computed t of 4.37 is greater than the critical t of 1.96 at degrees of freedom of 198 and 0.05 level of significance. Therefore, there is a significant influence of utilization of modern technological devices on quality teaching of Chemistry in secondary schools.

Test of Hypothesis 2

There is no significant influence of qualified teachers with knowledge of modern technological devices like computers, phones, projectors and online platforms for teaching on quality teaching of Chemistry in secondary schools in Uyo Local Government Area.

The independent t-test was used to test the hypothesis and summary data are shown in table 4.

Table 4: Independent t-test of influence of qualified teachers on quality teaching of Chemistry (N – 60)

Group	N	$\bar{X}$	SD	Df	t-cal	t-crit
Teachers who agreed to influence	40	23.77	2.48			
				198	3.18	1.96
Teachers who disagreed	20	12.41	2.16			

**Significant P < 0.05; df = 198.*

The null hypothesis is rejected because the obtained t value of 3.18 is greater than the critical t value of 1.96 at degree of freedom of 198 and 0.05 level of significance. This therefore implies significant influence. Hence, there is a significant influence of qualified teachers with knowledge of modern technological devices on the quality of teachingof Chemistry in secondary schools.

Major Findings

(i) There is a significant influence of utilization of modern technological devices on quality teaching of Chemistry in secondary schools.

(ii) There is a significant influence of qualified teachers with knowledge of modern technological devices on the quality of teaching of Chemistry in secondary schools.

DISCUSSION

Data analyzed in hypothesis 1 revealed the mean score of group of respondents who agreed to significant influence of utilization of modern technological devices like computers, phones, projectors and online platforms in teaching on the quality of teaching of Chemistry in secondary schools was greater than the mean score of group of respondents who disagreed. Also the calculated t-value was 4.37 greater than the critical t-value of 1.96 signifying significant influence of utilization of modern technological devices like computers, phones, projectors and online platforms on the quality of teaching of Chemistry in secondary schools. This finding is supported by Ololube (2005) who observed that the advent of information and computer technology has taken the educational sector to a great height. Nowadays technological devices have taken over school libraries and textbooks. Most students rely on the internet for all their researches. According to Umar (2016), information technology makes management of information easier due to technological devices used. This has really influenced quality teaching processes positively in schools. He further opined that the advent of computers has brought total changes in the educational system and that with the help of computer aided instructions or computer based technology, desired information from the internet is downloaded by students. Furthermore, according to Mulkey (2005), a great number of schools both secondary and tertiary now exist online. Innovations in Information and computer technology have tremendous potentials in teaching processes. Insecurity in the country is one of the factors militating against quality education, but with technological devices, e-learning is achieved stress-free in the comfort of one's home. Data analyzed in hypothesis 2 revealed the mean score of group of respondents who agreed to significant influence of qualified teachers with knowledge of modern technological devices like computers, phones, projectors and online platforms for quality teaching of Chemistry in secondary schools was greater than the mean score of group of respondents who disagreed. Also the calculated t-value was 3.18 greater than the critical t-value of 1.96 signifying significant influence of qualified teachers with knowledge of modern technological devices like computers, phones, projectors and online platforms for quality teaching of Chemistry in secondary schools. This is in agreement with this study as Abu (2013) opined that itis one thing for a teacher to have a good curriculum material and an effective teaching method and that it is another thing to have the knowledge of the instructional materials to enable him communicate the content very well to his students. He further revealed that the knowledge of technology assisted tools known as technical devices are employed by teachers to facilitate teaching processes. A teacher with a good modern technological knowledge functions very well in his line of work. He will be able to use the technological devices to teach the students well. According to Mulky (2005), the knowledge of the use of technological devices like still projection materials such as filmstrips, microform slides, transparencies and projected materials, motion projected materials, audio materials, flat graphic materials, three dimensional materials and programmed materials enhances the teacher to function in all levels of education. This is in agreement with this study that there is a significant influence of qualified teachers with knowledge of modern technological devices on quality of teaching of Chemistry in secondary schools in Uyo LGA.

Recommendations

(i) Teachers should be trained on the use of technological devices at all levels of education and give room for upgrade so as to compete with the world at large.

(ii) Virtual learning should be made a compulsory part of the educational system by decision makers in the educational sector.

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