

**ASSESSMENT OF THE AVAILABILITY AND USABILITY OF  
INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)  
RESOURCES IN CLASSROOM DELIVERY BY SECONDARY SCHOOL  
CHEMISTRY TEACHERS**

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**ABSTRACT**

This research is to find out whether ICT facilities and resources for classroom delivery were available in secondary schools in Benue State, and whether Chemistry teachers in those schools were utilizing the resources in their classroom delivery. The design is a survey. Thirty six (36) Chemistry teachers randomly sampled from all the secondary schools in Benue State formed the sample. A structured questionnaire was used to collect data for the study. Percentages, means and standard deviations were applied to analyze the data. Analysis of the data revealed that almost all the ICT facilities and resources for teaching Chemistry were not available in the schools used for the study. In addition, Chemistry teachers in those schools were not using ICT resources in their classroom delivery. It was concluded that ICT resources were not being used in teaching Chemistry in secondary Schools in Benue State. The researcher therefore recommended, among others, that effort should be made by the governments, non –governmental organizations, parents-teachers association and philanthropists to provide ICT facilities and resources in all the secondary Schools in Benue State. [*African Journal of Chemical Education—AJCE 7(2), July 2017*]

## INTRODUCTION

A recent development in science education and virtually other fields is the application of information and communication technology (ICT) [1]. ICT is said to be a range of technology for gathering, storing, retrieving, processing, analyzing and transmitting information. It encompasses a wide range of technology like Telephone, Computer, Satellite, Telex, Fax, Radio, Television, Software, Hard ware, Projectors, Video and Bulletin board to mention but a few [2]. The application of ICT in classroom delivery has been seen to have positive impact in the achievement of students since it has the capacity of increasing and sustaining the interest of students in the teaching and learning of every subject, especially science subjects [1].

Chemistry being one of the pure science subjects is termed a central science [3]. Chemistry permeates into other science subjects, both pure and applied, to give them value. In everyday living and in academic pursuit, Chemistry plays dominant roles. Audu [4] made it clear that Chemistry is seen in everything we do daily in our homes such as cooking, washing, cleaning and so on. In academic pursuits, reading any science course in the tertiary institutions require a credit pass in Chemistry [5]. This makes Chemistry to be the queen of all the sciences. It is not an over statement to say that Chemistry is science and any other science subject is an applied Chemistry.

Nevertheless, there has been a consistent downstream achievement in Chemistry among secondary school students in different states in Nigeria including Benue State [6-8]. Omituyaki [9] noted that the percentage of students that pass Chemistry at credit level in senior School Certificate Examination (SSCE) has never reached 40% in the recent past. Note that this percentage, less than 40, is the percentage of candidates who qualify for higher degree admission in science related courses, other things being equal.

The long-standing consistent poor achievement of secondary school students in Chemistry in Nigerian secondary schools, especially in secondary schools in Benue State is a threat to Nigerian economic, social, scientific and technological development. This ugly trend has been a worry to concerned Nigerians (educationists, scientists, policy makers and the like) [10]. Recent research reports show that the major factors leading to this poor achievement include lack of interest in the teaching and learning of Chemistry among the students, which emanates mainly from the monotonous and ineffective methods of instructions used by the teachers, lack of skilled professional teachers, intellectual demand of the subject, lack of instructional materials among others. Standing out among these factors is the issue of ineffective method of instruction used by teachers.

British Educational Research Association (BERA) [11] acknowledged widely that the most important factor influencing students' achievement is high quality teaching. High quality teaching is a product of skilled professional teachers among others [12]. It is the teacher who translates the curriculum into practice. Thus it was stated that teacher education should provide the teachers with the intellectual and professional background adequate to any changing situation, not only in the life of their country, but in the wider world [13].

ICT application in classroom delivery is a new approach for teaching and learning globally in which it is necessary to create more access to information and experience through global networks and pool of knowledge [1]. In the classroom usage ICT provides both learners and teachers up-to-date information in their field of study, brings to their doorsteps latest scientific discoveries and research reports from all over the world [2]. Since the use of ICT in classroom-delivery has the potential of increasing and sustaining the students' interest in the teaching – learning process, one can say that using ICT in teaching chemistry in secondary schools in Benue

State can improve the achievement of the students in the subject. However, Asongo [2] made it clear that for the teacher to effectively use ICT in teaching learning, the resources and facilities for ICT should be available in schools and the teachers should be proficient in using them often in classroom delivery. It becomes necessary therefore to find out whether secondary schools in Benue State have ICT resources and facilities and whether the Chemistry teachers in those secondary schools utilize these resources often in classroom delivery.

### **THE RESEARCH QUESTIONS, METHODS OF DATA COLLECTION AND ANALYSIS**

This study seeks to find answers to the following research questions:

1. What are the ICT resources and facilities available for teaching chemistry in secondary schools in Benue State?
2. How often do chemistry teachers in secondary school in Benue State utilize the available ICT resources in their classroom delivery?

The research employed a survey of the availability of the ICT resource in the secondary schools in Benue State and how often chemistry teachers make use of these resources. All the chemistry teachers in secondary schools in Benue State make up the population for the study. From this population, 36 chemistry teachers were randomly selected to serve as samples for this study.

A structured questionnaire was used to collect data for the study. The data was analyzed using means, standard deviations and percentages.

## FINDINGS AND DISCUSSIONS

*Research question 1: What are the ICT resources and facilities available for teaching chemistry in secondary schools in Benue State?*

*Table 1: ICT Resources and Facilities Available for Teaching Chemistry in the secondary schools*

S/n	Resources and facilities	Percentage(%) availabilities	Remarks
1	Computer	25	Not available
2	Printers	75	Available
3	Television	10	Not available
4	Video Cassette	0	Not available
5	Scanner	28	Not available
6	Storage disk	35	Not available
7	Internet facilities	15	Not available
8	Projector	0	Not available
9	Good Hand Sets	25	Not available
10	Radio	10	Not available
11	Steady electric light	5	Not available

Data in table 1 shows that all the ICT resources and facilities for teaching chemistry, except printers, were not available in the secondary schools used for this study. Looking at the table, only printer scores 75% in percentage availability showing that it was present in the schools used for the study. Other resources and facilities scored below 50% in percentage availability showing that they were not available in the schools used for the study. Asongo [2] found out that resources for internet accessibility were not available in most secondary schools in Nigeria. That this ugly situation has not changed is a thing of great concern. This is really a pathetic and worrisome situation. If ICT resources and facilities are not available in almost all Nigerian secondary schools, one wonders how the aims and objectives of teaching chemistry in secondary schools, which include:

- To equip students to live effectively in our modern age of science and technology.
- To enable students to develop reasonable level of competence in ICT application that will engender entrepreneurial skills, among others could be achieved.

*Research Question 2: How often do chemistry teachers in Secondary schools in Benue State utilize ICT resources in their classroom delivery?*

*TABLE 2: The Usability of ICT Resources and Facilities in Classroom Delivery*

S/N	Resources/facilities	Usability		Remarks
		Mean	SD	
1	Computer	2.75	0.02	Often used
2	Printers	2.75	1.19	Often used
3	Television	1.00	0.00	Not often used
4	Video Cassette	1.00	0.00	Not often used
5	Scanner	1.35	0.65	Not often used
6	Storage disk	1.62	1.01	Not often used
7	Internet facilities	1.22	0.56	Not often used
8	Projector	1.00	0.00	Not often used
9	Good Hand Sets	1.23	0.12	Not often used
10	Radio	1.87	0.78	Not often used
11	Steady electric light	0.85	0.14	Not often used
12	Modem	1.00	0.00	Not often used

An examination of data in table 2 shows that chemistry teachers in secondary schools in Benue State often used only computers and printers. This is so because their mean values are above 2.50, which is the criterion mean. All other ICT resources and facilities used for the study were not often used by the chemistry teachers as can be seen from their mean values that are below the criterion mean. This finding is similar to earlier findings [1, 2] who noted that the teachers did not use most of the ICT resources for classroom delivery. It is not, however, surprising that teachers were not using the ICT resources. Table 1 shows that these resources were not available in the schools by the criterion of 50% availability in this study. Therefore, teachers cannot use what is not available to teach. It is instructive to note that teachers not using the ICT resources in their classroom delivery may not be as a result of lack of interest. Ikemelu [1] noted that using ICT in teaching and learning increases and sustains the interest of teachers and learners.

This finding has implication in the teaching and learning of chemistry in secondary schools. The objective of teaching chemistry in secondary schools, which aims at enabling students to

develop interest in chemistry and develop reasonable level of competence in ICT applications, may not be achieved.

## **CONCLUSION AND RECOMMENDATIONS**

From the findings of the study, it can be concluded that most of the ICT resources and facilities for chemistry teaching and learning were not available in the secondary schools in Benue State. The study also reveals that chemistry teachers in secondary school in Benue State were not using ICT resources in their classroom delivery. Based on these conclusions, the following recommendations are made:

1. Effort should be made to provide ICT facilities and resources in all our secondary schools. This will be a joint effort of the governments, non-governmental organizations, parent teachers association, Philanthropist and so on.
2. Periodic training and re-training of chemistry teachers and other teachers on the usage of ICT facilities for classroom delivery should be embarked upon and sustained. These trainings need to emphasize the importance of ICT in the teaching and learning of every subject, especially science subjects. In addition, skills for effective usage of ICT resources in classroom delivery should be inculcated in the teachers.
3. Welfare packages for teachers such as science allowance, housing loan, medical allowance, prompt and regular payment of salaries and allowances should be made available for science teachers. This will make them to be happy on their profession and to devote time to acquire skills that will enable them to be effective on the job.

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