# PROBLEMS MILITATING AGAINST EFFECTIVE TEACHING AND LEARNING OF CHEMISTRY IN SECONDARY SCHOOLS IN NIGERIA.

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**Abstract**

Chemistry has been recognized as an important subject and as such was made a core subject among the natural sciences in Nigeria education system. The process skill needed in teaching chemistry can help the student to develop entrepreneurial skills. This paper looked at some factors that militate against the effective teaching and learning of chemistry. Among these factors are poor methods of instruction, teacher's attitude, laboratory inadequacy and poor science background. It was therefore necessary that teacher's be encouraged to go for workshop training in their area of specialization so that they can have ideas of current innovations that have taken place in the educational field. It was recommended that teachers teaching chemistry in the secondary schools should be qualified/professional teachers who are specialized in chemistry education.

One of the goals of education in Nigeria is the acquisition of appropriate skills, the development of mental, physical competencies as equipment for individual to live in and contribute to the development of the society (Federal Government of Nigeria 2014). Asiriuwa (2005) regarded education in science and technology as centrally and necessarily concerned with teaching individuals in order to acquire systematic skills, knowledge and attitude and application of these to the society. There is no gain saying that science and technology play prominent role in the development of nations.

According to Okeke (2007), Science and Technology serve as the key to modernizing and developed nations in the world today, have achieved greatness due to the special attention given to science and technology, one of the strategies for enhancing the growth of science and technology in a nation is by paying attention to the training of children at the foundation stage (Jacobson, 2010). This implies that there should be more focus on science and technology at the primary and secondary levels of our educational system.

Chemistry as a science is the study of material substances that occurs on earth and elsewhere in the universe. It is concerned with the utilization of natural substances and the creation of artificial ones (Holman, 1995). Within the contact of science education, chemistry has been identified as a very important school subject and its importance in scientific and technological development of any nation has been widely reported (Adesoji and Olatunbosun, 2008). It was as a result of the recognition given to chemistry in the development of the individual and the nation that it was made a core subject among the natural sciences and other science related courses in the Nigerian educational system

Chemistry is an artistic enterprise which offers a lot of occupational opportunities in areas like:

- Manufacturing of goods such as pharmaceuticals, food stuffs, packaging, detergents, soaps, flavours, fragrance, paints, candles, metals, textiles, agricultural products e.t.c
- Sales of goods

- Analytical and consultancy services
- Researching
- Consumer education

The acquisition of professional qualification in chemistry equips an individual with skills to be self employed because chemistry involves the use of process skills which are the paths for ways and strategies followed by the chemist in order to arrive at the products of science. These process skills are:

1. Observation
2. Classification
3. Measurement
4. Counting numbers
5. Recording
6. Communication
7. Prediction
8. Hypothesis
9. Inference
10. Experimentation
11. Research
12. Interpretation of data
13. Controlling variables
14. Generalization.

Some of the entrepreneurial skills are:

1. Creative thinking
2. Planning and research
3. Decision making
4. Organization
5. Communication
6. Team building
7. Marketing
8. Financial management
9. Record keeping
10. Goal setting
11. Business management (Jacobson,2010)

Jacobson, (2010) outlined the following as parts of entrepreneurial skills, observation, determination and interpretation of market exhibition and mastery of skills, ability to communicate and so on. All these shills are encompassed in the process skills.

The realization of the goals of chemistry to some extent has been impeded because the achievement of students in the subject remains low in Nigeria (Adesoji and Olatunbosun 2008).
Among the factors that have been identified as leading to poor performance in chemistry are poor method of instruction (Osuafor,1999) teachers attitude (Aghadiuno, 1999), Laboratory inadequacy (Okegbile 1996, Rainu,1998, Bajeh, 1997 and Adeyegbe,2005), poor science background (Oshokoya,1998 and Adesji,1999) and non chemistry teachers teaching chemistry.

**Poor Methods of Instruction.**

The subject chemistry appears abstract to many students. To make it real and close to the students, the methods used in teaching it matters. The teaching and learning of chemistry should be activity- based so that students will be actively involved. By this, the subject becomes real to majority of teachers teaching chemistry are not current with the many methods of teaching chemistry. The majority of teachers who have been employed in the past decades have been doing the same thing the same way all along. They have no knowledge of the current ideas and innovations that have taken place in the educational field in the recent past. There are many active learning strategies that can be used in the chemistry classroom. They include, discussion, game playing, project demonstration, discovery, brainstorming, problem solving method and process based approach. These develop in students critical thinking skills, creativity, open mindedness, intellectual honesty e.t.c. another factor that lead poor method of instruction is the employement of non professional qualified teachers that is teacher who teaches chemistry but has no teaching qualification. Such teachers may not be

knowledgeable in teaching methods suitable to learn chemistry effectively not to talk of being abreast with the use of instructional material to teach chemistry.

**Teachers Attitudes.**

Teachers attitudes plays a great role in the effective teaching of chemistry to students. Some teaching of chemistry to students. Some teachers impede the implementation of the chemistry curriculum by their attitudes in the following ways:

- Skipping unfamiliar content areas
- Inability to meaningfully interpret performance objectives
- Inability to recognize activities for children
- Skipping activities where material are not readily
- Inability to identify sources of instructional material.
- Rushing the pupils to finish the scheme of work.

All these in most cases, as a result of non-chalant and lack of dedication of the teacher to his/her job.

**Laboratory In-adequacy**

One of the activities in chemistry is experimentation. It provides a forum for practicing the theoretical knowledge gained and for demonstrating the psychomotor skills of teachers and learners. It is believed that learners can achieve more if given the opportunity to practicalise what they have been taught in the classroom. Farounbi (1998) argued that students tend to understand and recall what they hear as a result of using laboratories in the teaching and learning of science in general and chemistry in particular. Experimentation in chemistry is however dependent on the availability of science equipment (Ugwu, 2008). Many authors have reported the issue of inadequate science equipment in educational institution. (Ogunmade, 2006 Ugwu 2008) Nwagbe, 2008 Bajah, 1982, Osobonye,2002). It has been reported that non availability of science equipment and non-exposure to practical serve as barrier to effective science teaching (Adeyemi,1990, Rami,2002 and Adeyegbe 2005) reported that laboratory inadequacies affect the performance of students in chemistry. The issue of inadequate funding of education sector is also a contributing factor to the inadequacy of science equipment in educational institutions. Over the years, financial allocation to the education sector thus making it impossible to procure adequate equipment for teaching and learning.

**Poor Science Background.**

The achievement of students in chemistry is reported to be casually influenced by the previous experience of students in integrated Science. A student cannot learn chemistry effectively without going through some experience in integrated science (Shokoya,1998, and Adesoji,1999).

**Conclusion**

Chemistry education emphasizes application or transferability of knowledge to immediate environment. When a student undergoes training in chemistry, he/she acquires appropriate skills and development of his society. Consequently, chemistry aims at equipping an individual to be self-reliant. The attainment of the goal of chemistry education in Nigeria is not to some extent realized because of some factors which militate against it among which are poor methods of instruction, teacher's attitude, laboratory in-adequacy and poor science background.

**Recommendations**

Based on the conclusion drawn it is recommended that:

1. Teachers should be encouraged to go for workshop training in their area of specialization so that they can have knowledge of current ideas and innovations that have taken place in the educational field. Especially in their area of specialization.
2. Teachers teaching chemistry in the secondary schools should be qualified/professional teachers who specialize in chemistry education.
3. When chemistry teachers are faced with unfamiliar content areas, inability to meaningfully interpret the performance objectives, inability to organize activities for pupils and inability to organize activities for pupils and inability to organize activities for pupils and inability identifying sources of teaching aids, they should do a lot of reading to become familiar with the content areas or seek the assistance of more experienced teachers.
4. When chemistry teachers are faced with the problem of non-availability of materials/equipment for practical purposes, they should improvise.
5. To avoid rushing students to finish the chemistry science of work, teachers should be dedicated to their work and by so doing they can plan their lessons thoroughly and start on time.

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