

# A SURVEY OF SCIENCE TEACHING METHODS IN EDO STATE

*Asiriwa Olutoyin D.*

## **Abstract**

This study identified methods that are being used in teaching science in secondary schools in Edo State. The research design adopted for the work was survey. Questionnaire and personal interview were used for data collection. The data collected were analyzed using frequency count and percentage. Results revealed that most science teachers employ lecture method of teaching. They agreed with the items that will help to improve their teaching and learning of science. They also agreed that some of the teaching methods are new to them. It was thus, recommended that the teachers should attend seminars, conferences and workshops. Also, more funds should be released into science education.

## **Introduction**

Macmillan English Dictionary Learners (2002), defined science as the study and knowledge of the physical world and its behaviour that is based on experiments and acts that can be proved, and is organized into a system. Science involved knowledge, information, communication, observation, and classification, etc. It implies everyday activities in man's life. The significance of science in the society cannot be overemphasized. Recognizing the importance of science, the Federal Republic of Nigeria (2004), stated in its National policy on Education Science education shall emphasis the teaching and learning of science process and principles. This will lead to fundamental and applied research in the sciences at all levels of education. Also, the goals of science education as stated in the national policy of education (2004), are to:

- i. Cultivate inquiry, knowing and rational mind for the conduct a good life and democracy; ii. Produce scientists for national development;
- iii. Service students in technology and the causes of technological development, and iv. Provide knowledge and understanding of the complexity of the physical world, the forms and the conduct of life.

In an effort to achieve the stated goals of science education the Federal government and indeed some state governments have done much in providing laboratories, workshops, audio-visual aids, etc for the teaching of science. Also, there has been review of science curriculum by various commissions and boards set-up by the Federal government bodies (for example science Teacher Association of Nigerians, Nigerian Integrated Science Project. The Nigeria Secondary School Science Project, etc) to monitor/supervise the science education.

In spite of all these efforts, the poor performance and lack of interest in science among Nigerian students are on the increase. Aghadinumo (1987), Okolo (1988), Azikewe (1997), Ezeokeke (1995) and Sheii and Olatunji (2001), affirmed the poor enrolment and performance in science subject, Physics, Chemistry', Biology in both external and internal examinations. These lack of interest and poor performance have been attributed to the method of teaching science.

## **Statement of Problem**

The extent to which a learner learns depends on, among other things, the methods of teaching employed by the teacher. The methods of teaching science are the means through which contents and processes of science are learning and objectives of sciences are achieved. There are different methods of teaching science. These methods include lecture, project, field (rip, inquiry, demonstration, etc.

Mbata, in Jackden (2006), opined that the extent to which a teacher has succeeded in impacting knowledge to learners depends partly on, the extent to which his learners have actively participated during and after the lesson and partly on how the teacher himself has been able to transfer the knowledge to the learners. It then means that for meaningful and effectively learning of science to take place, appropriate teaching methods have to be used.

Science is an activity-oriented subject. The way it is taught is important in helping the

learners to acquire basic scientific knowledge, skills and attitude to so solve different day-to-day problems. The learners should be activity involved in science learning. Thus, the study focus on method(s) employed by science teachers and way of improving science teaching and learning.

### Research Questions

This study was guided by the following research questions: i. What is/are the teaching method (s) employed by science Teachers? ii. What are the strategies of improving the teaching and learning of science in our schools?

### Methods

The study population consisted of all the 954 science teachers in Edo State (Teachers Registration Council of Nigeria, 2007). Proportional stratified random sampling techniques was used to select 12 government schools from the three (3) senatorial districts in Edo State. The sample is made up of 120 teachers, both male and female teaching the a basic science-chemistry, biology and physics.

The instrument for data collection was questionnaire prepared by the researcher. Some of the teachers were also interviewed. The instrument was structured and has three sections. Section A elicited information on the science teacher's personal data, section B sought information on the methods of teaching and section C elicited information on their agreement or disagreement with strategies for improving science teaching. The instrument was validated by three experts in measurement and evaluation from College of Education, Ekiadolor. Their suggestions were used in modifying the instrument. The reliability coefficient of internal consistency of 0.83 was found using Cronbach Alpha after analyzing data collected from twenty (20) non-participating teachers.

The instrument was personally distributed and collected by the researcher. The data obtained were analyzed in line with research questions using frequency count and percentages. The data are presented in tables.

### Results

Personal data of the teacher **Table**

**1: Teacher Qualifications**

Category	No of Teachers	Percentage of Teachers
NCE	9	7.50
B.SC	10	8.30
B.SC ED	75	62.48
HND	10	8.33
BSC with PGDE	16	13.32
Total	120	100

Data in table 1, indicate that most teachers had pre-service teacher education at NCB level or degree. 16.63% have no pre-service teaching qualification (i.e 8.3% B.Sc and 8.33% of HND), Though 13.32% later had training in education.

**Table 2 : Response of Teachers to Method Employed in Teaching**

Method of Teaching	Always		Sometimes		Not at all	
	No	%	No	%	No	1%
Lecture	90	75	30	25	-	hy-
Laboratory	20	17	90	75	10	8
Inquiry	-	0	-	py	120	100
Demonstration	-	0	90	75	30	25
Discovery		0	-	0	120	100
Discussion	1	0	20	17	100	83
Assignment	30	25	80	67	20	8
Field Trip	-	0	30	25	90	75
Project	-	0	10	8	110	92

Cooperative	-	0	-	0	120	100
Game	-	0	-	0	120	100
Computer Assisted Instruction	-	0	-	0	T20~T100	

Data in table 2, indicate that most science teachers employ lecture method in teaching, 75% sometimes use demonstration and laboratory methods. No teacher ever uses inquiry, discovery, cooperative learning, games and computer assisted instrument.

**Table 3: Strategies for Improving Science Teaching and Learning**

S/N		Strongly Agreed (SA)	Agreed (A) %	Disagreed (D) %	Strongly Disagreed (SD)
1	Teaching aid should be made available.	67	56	13	2
2	Functional laboratories should provided time allotted for science	67	41	8	4
3	Classes should be reviewed upward	93	13	13	1
4	More funds should be at the disposal of science teachers as to enable them to improvise	75	29	12	4
5	Seminars and workshop should organized to expose teachers to methods of teaching science.	95	17	4	4
6	There should be mass retraining orientation of science teachers.	89	16	9	6
7	Science class should not be too large	67	38	13	2

Data in table 3, revealed that most science teachers are of the opinion that if they are exposed to the above items and necessary provision is made the teaching and learning of science will improve greatly.

#### **Other Findings from Interview with Some Science Teachers**

- i. Most of the teacher indicated that some of the teaching methods in the questionnaires are new to them
- ii. Most of the school do not have functional laboratory and other teaching materials
- iii. Most teachers are not computer literate

#### **Discussion**

The study investigated methods of teaching science and strategies for improvement.

The findings of the study showed, that most science teachers use the conventional methods of teaching-lecture (Chalk and Talk) method, according to them, this method enables them to cover the science syllabus in time. This conform with reports of Oyedeji (1992), Betiku (2002), Oriafio (2002), Fideiis Ferdinard Koko (2005) and Asiriwuwa (2007).

The use of assignment as a method of teaching science is also generally practiced by the science teachers. These methods are not effective in science teaching and learning. However, improvement could be made by combining it with other more effective methods that are activity-based. The study revealed that the science teachers need retraining and orientation in order to teach effectively. Modern methods of science teaching are illusion to them. Jaryum (2005), stated that science teachers are not skilled in soretatic questioning. They are not skilled in inductive

methodology. They are preoccupied with presenting "good science" getting through overcrowded syllabus and meeting the demands of external examinations.

### **Recommendation**

In order to improve the teaching and learning of science in our schools, the following recommendations should be considered:

#### **Suggestion to Science Teacher**

Before selecting method of teaching, what to be taught (i.e the topic/concept) and why it should be taught must be considered first before how it should be taught. The learner (Students) should be taken into cognizance. The students should be actively involved by providing them with hands-on activities.

In selecting methods of teaching, the science teachers should give preference to teaching methods that allow students to;

- i. Make connection between prior knowledge and new concepts; ii. Evaluate themselves;
- iii. Show interest by asking questions;
- iv. Use inquiry to explore or investigate concepts;
- v. Form prediction and hypotheses;
- vi. Formulate experiments with alternatives;
- vii. Record ideas and observations;
- viii. Use various resources to seek explanation

Remember that those methods that are activity-based yield better quality learning, while those methods in which the child is passive lead to rote learning. Methods like inquiry, discovery, field-trip, project are highly recommended as they give room to active participation of the learners.

It is also recommended that science teacher should use a variety of instructional materials because science is an activity-based subject. Where there is lack of material, the science teacher should improvise.

The teachers should update their knowledge and improve their professional competence by attending science workshops, seminars, conferences and in-service training. They should also join professional science associations and read science journals, magazines and bulletins.

#### **To the School Authority**

The school authority should encourage activity-base science learning by providing adequate instruction materials. Where such materials are not available, allowance for improvisation should be given to the science teachers. Also, time allocated for science classes should be increased on the school's timetable so as to given enough time for practical/band-on activities.

#### **To the Government**

The Federal and State government can improve science teaching method by organizing workshops for science teachers. At these workshops, different and new approached to science teaching should be highlighted.

Provision of functional laboratories and other instructional materials by the government will also improve the teaching and learning of science.

Equipment of professional teacher will also go a long way to improving science and teaching learning.

### **Conclusion**

Science is a body of knowledge developed through the process of investigating that is combined with thoughtful reflections and guided critical thinking skills. It is an activity-oriented subject and should be taught thus, lecture method used by most science teachers is the oldest method and has the advantages of saving the teacher's time and efforts. It's use in science class should be with caution since it tends to make the students inactive. It should be noted that there is no one method that is perfect. Bert and Miller (1991), ascertained that no one method will work in every situation for each students. The teachers must use their professional judgment in matching methods with numerous other variables such as students' needs and available resources. But any method(s) selected should help the

students promote development of knowledge, skills and process through active participation of the students.

## References

- Aghadinum M.C.K. (1987). Analysis of the enrolment and performance in the hard science in WASC in the 1960s and 1980s. *Journals of Science Teachers Association of Nigeria* 28<sup>E</sup> Annual conference proceeding 25.
- Asiriwuwa O.D. (2007). Insight into science. A focus on the teaching of chemistry in Nigeria. *Knowledge Review* 14(9), 116-119.
- Azubike U. (1992). Female participation in science technology and mathematics (STM) education. Implication on manpower development *Journal of Vocational/Technical Education and Manpower Development* 85
- Barts & Miller (1991). <http://education.Cortland.edu/teach/ppt/methodppt/pitrane.htm>
- Betiku O.F. (2002). Cognitive styles and mathematics attainment of SS II students in :Lagos State. *The Nigerian Teacher Today* 10 (1 & 2) 37-52
- Ezeokeke J.C. (1995). Students aversion to learning science causes and possible remedies. *Journal of Technical Education Research and Development* 1 (I) 185-190,
- Federal Republic of Nigeria (2004). *National policy on education* 4<sup>th</sup> edition NERDC, Lagos
- Fidelis E.B.; Ferdinard A.M & Koko (2005),. Fostering science and technology for qualitative education in Nigeria *Journal of Research in Education* 2 (2) 38-40
- H. Macmillian English Dictionary (2007). 2<sup>nd</sup> edition
- Jackden H.N. (2006). Effectiveness of method used in teaching technical drawing in federal college of education Dankshin Nigeria, *International Journal of Research in Education* 3(2) 103-106
- Jaryum K.H. (2005). Enhancing professional STM teacher's role in lifting education in science. Technology and mathematics education and professionalism 46<sup>th</sup> Stan Annual Proceeding 105-106
- Okolo C (1989). Investigation into poor enrolment in physics in secondary and selected tertiary institutions, causes and possible remedies. *Journals of Science and Science Education* 1(1), 65
- Oriafo S.O. (2002). Refocusing STM education in Nigeria. *Refocusing education in Nigeria*. Dasylyva influence Nigeria 50-61
- Oyedeji O.A. (1997). Area of difficulties in primary mathematics curriculum as perceived in service mathematics teachers *Journals of STAN* 27(2), 66-70
- Sheu P. & Olatunji R. (2001). Women in science, technology and mathematics (STM) in Nigeria a view of gender representation in college of education.
- Teacher Registration Council of Nigeria (2007). Talk of teachers in core subject area in secondary schools nationwide (2006/07, 2007/08). *Statistical Digest on Teachers in Nigeria* 2005/2006 and 2006/2007, 1(3), 21.