Full Length Research Paper

Teacher's Perception of Factors Affecting Effective Implementation of Biology Curriculum in Secondary Schools in Nigeria: The Way Forward for Sustainable National Development

Ayeni Margaret F., Omotayo Kehinde A. and *Adedayo Julius O.

Department of Science Education, Faculty of Education, Ekiti State University, Ado-Ekiti, Nigeria.

Abstract
This paper examined the teachers' perception of the factors affecting effective implementation of biology curriculum for sustainable development. Two null hypotheses were generated and tested at 0.05 level of significance. The study adopted a descriptive design of the survey type. The sample consisted of 60 biology teachers randomly selected from Senior Secondary Schools in Ekiti State of Nigeria. A questionnaire was used in collecting data for the study. Mean and standard deviation were used to analyze the research question while t-test was used to test the hypotheses generated. The study found out that lack of competent biology teachers, poor science allowance, lack of separate biology laboratory, inadequate instructional materials and ineffective maintenance of laboratory were among the factors affecting effective implementation of biology curriculum in the secondary school. The result also revealed that gender and location of the teachers have no significant influence on the factors affecting the implementation of biology curriculum. Recommendations were made in order to improve the implementation of biology curriculum as a way forward for sustainable development of educational sector in Ekiti State of Nigeria.

Keywords: Perception, implementation, curriculum, teachers, development

Introduction
Biology as a science subject in the secondary school programme occupies a unique position. The policy for the secondary school (among other things) stated that "all students must compulsorily offer one science subject which may be physics, chemistry or biology" (National Policy on Education, NPE 2004). Biology is a science subject offered in all senior secondary schools (SSS) in Nigeria which attracts the greatest patronage of both science-oriented and non-science based students (Nwosu, 2006). There is, however, a consensus that biological knowledge is of central importance in developing policies for the management of earth's resources and the conservation of its environment to achieve a "sustainable development" (Federal Ministry of Education, FME 2002). According to Adeyegbe (2004), curriculum is the hub of the activities in any educational endeavour since it dictates what is to be taught, as what level, by whom, with what equipment and for what purpose and assessed by what means. Adedayo (2016) also viewed curriculum as the sum total of all the tasks and activities which learners are exposed to in the school setting.

According to the National Policy on Education of the Federal Republic of Nigeria (NPE, 2004) and the National Curriculum for Senior Secondary Schools produced by Federal Ministry of Education (1985), effective biology teaching in Secondary School should develop essential scientific skills in the learners so as to prepare them for technological applications. The bid is to promote their knowledge of the world around them, enhance creativity in them and self sustainability in the world economy. Despite the introduction of Biology Curriculum to Nigerian secondary schools many decades back, the country still lack the technology that could make her environment more comfortable and life more interesting. One could therefore presume that the implementation of the curriculum is deficient since the objectives are not being achieved. Ibe & Nwosu (2003) and Ogunleye (2007) noted that poor achievement in science is as a result of poor implementation of science curriculum.

One will also want to agree with the surveys from schools (Akpan,1996; Alio,1998; Ajayi,2000; Ajayi,2007) that students do not achieve as well as they ought to in science because of the problems relating to teaching and learning processes and absence of good instructional materials/equipment and laboratory facilities. Ugwu (2008) summarizes the constraint in four major problems: poor remuneration of biology teachers, voluminous curriculum content, and lack of specimen/equipment and poor preparation of biology teacher. In the same vein, (Ezike, 1986; Ajayi 2000; Ajayi 2007) believed that laboratories with necessary facilities also have a vital role to play in implementation of physics curriculum. Lack of specimen/equipment for practical activities is responsible for a situation where by the teacher will strive to make available the little equipment to prepare the students just for their certificate examinations conducted by both West African Examinations Council and National Examinations Council, probably for the first time. This situation

will automatically have adverse effect on the academic performance of the students. Every school must have a separate well-equipped standard laboratory for Integrated Science, Biology, Agricultural Science, Chemistry and Physics (Federal Ministry of Education, 2002). The situation in schools is contrary. Several schools have a general laboratory for all the science subjects, especially in the rural areas. This single laboratory is used for all the science subjects. Such a situation where a single ill equipped room is being used as the laboratory for all science subjects would definitely be highly inadequate and improper for effective learning since each science subject has its own peculiarities. This calls for proper investigation for implementation of science curriculum, biology in particular. Development sustainability is a phrase which means development that meets the needs of today without compromising the ability of future generation to meet their needs. The aim of development sustainability is to create a particular awareness to sustainable development and improve quality of life for all its citizens and also for economic competitiveness in our globalizing word.

Statement of the Problem
Biology is a biological science involving series of activities, which deals with the study of life. The researchers observed the deterioration in the academic achievement of students in science subjects at the secondary schools, most especially biology, on yearly basis. One of the major factors that could be responsible for this occurrence is the curriculum implementation. The teachers are pivotal to the implementation of the curriculum. Based on this premise, the study attempted to answer the question below:
What is teachers' perception of the factors affecting the effective implementation of biology curriculum in Senior Secondary Schools in Ekiti State of Nigeria?

Purpose of the Study
This study focused on the teachers' perception of the factors affecting the effective implementation of biology curriculum in Secondary Schools in Ekiti State of Nigeria for development sustainability. It also unveiled the effect of teachers gender and location on effective implementation of biology curriculum in the secondary schools in Ekiti state.

Research Hypotheses
        The following hypotheses stated in null form were generated for the purpose of the study:
1. There is no significant difference in the mean scores of biology teachers' perception of factors affecting the implementation of secondary school Biology curriculum in urban and rural locations.
2. There is no significant difference in the mean scores of male and female biology teachers' perception of factors affecting the implementation of secondary school Biology Curriculum.

Materials and Methods
The study adopted a descriptive type of survey design. The population for the study consisted of all biology teachers in Senior Secondary Schools, Ekiti State of Nigeria. They were made up of male and female teachers from both urban and rural locations. The sample for the study was 60 biology teachers selected using multi stage random sampling technique. The first stage involves the random selection of four local government areas from each of the three senatorial districts of the state. The next stage involves the selection of five schools from each of the twelve local government areas chosen through simple random sampling technique. All the SSS III biology teachers in the sampled schools were used. A total of 25 male and 35 female teachers formed the sample.

The instrument used for collecting data for the study was a researchers' designed questionnaire which consisted of two parts (A & B). Part A sought for information on the bio data of the respondents while part B gave room for the subjects to respond to 14-items on the factors affecting effective implementation of biology curriculum in the secondary schools. Each question was rated on a four-type rating scale of strongly disagree(1), disagree(2), agree(3) and strongly agree(4). The validity of the instrument was ensured by four experts in Science education, who were consulted and requested to judge the relevance and usability of the items for the purpose of the study. Their suggestions were considered in preparing the final draft of the instrument. The reliability of the instrument was ascertained through test re-test method where the instrument was given to SSS III biology teachers outside the coverage of the sampled schools for this study. Two weeks later, the same instrument was re-administered to the same respondents and the results were compared using Pearson's Products Moment Correlation statistics. The result showed the reliability co-efficient of 0.72, a value considered high enough to adjudge the instrument as being reliable.

The researchers personally visited the sampled schools and administered the instrument to only SSS III Biology teachers in the sampled schools. The administration of the instrument took the researchers two weeks to move round the sampled schools. All the copies of the questionnaire distributed were retrieved immediately by the researchers while the data collected were analysed using mean and standard deviation to answer the research questions and t-test to test the hypotheses at 0.05 level of significance.

Results
Descriptive Analysis

Question 1: What is the perception of Biology teachers of the factors affecting effective implementation of secondary school biology in Ekiti State.

Table 1: Mean Rating and Standard Deviations of Biology Teachers' Perception of Factors Affecting the Curriculum Implementation.

S/N	Items	X	SD	Decision
1	Lack of competent biology teachers	3.01	0.78	Agree
2	Lack of competent laboratory attendant	2.55	0.95	Disagree
3	Poor science allowance for biology teacher	3.28	0.80	Agree
4	Lack of separate biology laboratory	3.17	0.81	Agree
5	Controversial examination for teachers in the state.	2.57	1.00	Disagree
6	Inadequate of instructional materials	3.23	0.65	Agree
7	Ineffective maintenance of laboratory	3.17	0.67	Agree
8	Inability to reject traditional method of teaching	2.62	0.96	Disagree
9	Large number of students in the class	3.08	0.77	Agree
10	Late teaching of biology practical	3.03	0.84	Agree
11	The volume of biology curriculum	3.08	0.65	Agree
12	Lack of specimen/equipment in the laboratory	3.28	0.64	Agree
13	Lack of fund	3.35	0.73	Agree
14	Lack of specimen biology text book	3.07	0.71	Agree
	Grand mean (x) & Standard deviation (SD)	**3.04**	**0.78**	**AGREE**

Table 1 above showed that the rating means of all the items except 2, 5 and 8 were above the criterion mean value of 3.0. This means that the respondents agreed that the items in 2, 5 and 8 contain factors that do not affect the effective implementation of secondary school biology curriculum in Ekiti State. In effect, other items contain factors affecting the effective implementation of secondary school biology curriculum in Ekiti State. The grand mean 3.04 is greater than the criterion mean value of 3.0. Hence, the respondents on the average agreed that items listed contain factors affecting the effective implementation of secondary school biology curriculum in Ekiti State.

Testing the Hypotheses

H_01:   There is no significant difference in the mean scores of biology teachers' perception of
         factors affecting the implementation of secondary school Biology curriculum in urban and rural locations.

Table 2: t-test of the mean responses of Urban and Rural teachers of Biology on the factor affecting the effective implementation of biology curriculum in Ekiti State.

Location	N	X	SD	Df	t - cal	t - tab
Urban	35	3.06	0.429	58	1.568	2.021
Rural	25	2.87	0.512			

P > 0.05

From the table (2) above, t-cal (1.568) is less than t-tab (2.021), the null hypothesis is therefore upheld. This means that there is no significant difference in the mean perception of biology teachers in rural and urban locations on factor affecting the effective implementation of secondary school biology curriculum in Ekiti State.

H_02: There is no significant difference in the mean scores of male and female biology teachers' perception of factors affecting the implementation of secondary school Biology Curriculum.

Table 3: T- test of the mean responses of male and female teachers of biology on the factor affecting the effective implementation of biology curriculum in Ekiti State.

Gender	N	X	SD	Df	t - cal	t – tab
Male	25	3.05	0.509	58	0.955	2.021
Female	35	2.93	0.441			

P > 0.05

Table 3 showed that t-cal (0.955) is less than t-tab (2.021), thus the null hypothesis is not rejected. Hence, these is no significant difference in the mean perception of male and female biology teachers on factor affecting effective implementation of secondary school biology curriculum in Ekiti State.

Discussion

The result of the analysis showed that majority of the biology teachers agreed that almost all the factors contained in the items of table I really affect the implementation of secondary school biology curriculum except lack of competent laboratory attendant, controversial examination for teachers and inability to reject traditional method of teaching. The other factors which the teachers agreed to affect the implementation of biology curriculum in the secondary school was in agreement with Ajayi (2007) that students do not achieve as well as they ought to in science because of the problem related to teaching learning processes of science and absence of good instructional materials, equipment and laboratory facilities. The result also showed that voluminous biology curriculum contents contribute to its ineffective implementation. This is in agreement with Adeyegbe quoted by Eqbunonu and Ugbaja (2011) that science

curriculum is overloaded with contents much of which are not only of little relevance to the general education for which secondary schools is meant; but cannot be covered within the time limit.

The result revealed as well that there is no significant difference in the mean scores of rural and urban schools teachers' perceptions of factors affecting the implementation of secondary school biology curriculum. This is however contrary to the earlier submission on this paper that situation of laboratory in urban is different from the rural schools. Also, there is no significant difference between male and female teachers' perceptions of the factors affecting the implementations of secondary school biology curriculum in Ekiti state.

Conclusion
Based on the findings of the study, it can be concluded that:
- *The factors affecting the implementation of secondary school biology curriculum in Ekiti State include lack of competent biology teachers, poor science allowance for biology teachers, lack of separate biology laboratory, inadequate instructional materials, ineffective maintenance of laboratory, large number of students in the class, late teaching of biology practical, voluminous biology curriculum contents, lack of specimen/equipment in the laboratory, lack of fund and lack of specimen biology text book.*
- *There is no significant difference in the secondary schools teachers' perceptions of factors affecting the implementation of secondary school biology curriculum in Ekiti State irrespective of their school location and gender.*

Recommendations
With the above findings, it is therefore recommended that:
- *Seminars/workshops should be organized by the government for secondary school biology teachers in order to boost their level of competency.*
- *Separate laboratory should be put in place for science subjects for effective implementation of the curriculum.*
- *Government should try to review upward the science allowance for secondary school teachers.*
- *Curriculum planners should review the contents of secondary school biology curriculum considering the relevance and time limit for study.*
- *Schools should be provided with adequate and appropriate instructional materials.*

References
Adedayo, J.O. (2017). *Physics methods.* Ado-Ekiti: Greenline

Adeyegbe, S.O. (2004). Research into STM curriculum and school examinations in Nigeria: The state of the Art. *STAN proceeding of 45th Annual Conference*, 70-79.

Ajayi, P.O. (2000). Effectiveness of practical and theoretical methods on students' performance in physics in Akure, Ondo State. An M. Ed. Thesis, University of Ado- Ekiti, Nigeria.

Ajayi, P.O. (2008). Evaluation of the implementation of senior secondary school physics practical activities in Nigeria. *Research in Curriculum Studies,* 5(1).

Akpan, B.B. (1996). Towards a reduction in the contents of our primary and secondary science curricula. Journal *of Science Teachers' Association of Nigeria*, 31(1&2), 1-6.

Ali, A. (1998). *Issues and trends in science education in Africa*. Akwa: Cape Publishers.

Egbunonu, R.N. and Ugbaja, J.N. (2011). Biology teachers' perception on the factors affecting the effective implementation of biology curriculum. *STAN Proceeding of 52nd Annual Conference*, 239.

Federal Ministry of Education (2002). Guidelines on minimum standard in schools nationwide. Abuja: Federal Inspectorate Service.

Federal Republic of Nigeria (2004). *National Policy on Education* (revised). Lagos: NERDC.

Ibe, E. and Nwosu, A.A. (2003). Effect of guiding inquiry and demonstration on science precess skills acquisition among secondary school biology students. *Journal of Science Teachers' Association of Nigeria*, 38 (1&2), 56-63.

Nwosu, A.A. (2006). Biology education for new millennium. In E.A.C Okeke (ed) *Educational Reforms in Nigeria for the new Millennium*

Ogunleye, A.O. (2006). An investigation into the availability and extent of use of resources in the teaching of physics in some lagos public and private schools. *47th Annual Conference Proceedings of STAN,* 283-290.

Ugwu, A.N. (2005). Towards improving the status of STM teachers' in higher institutions of learning science in Enugu state. *STAN Proceeding of 46th Annual Conference*, 18-22.

Ugwu, A.N. (2008). Current issues on implementation of senior secondary school science curriculum in Nigeria. *STAN Proceeding of the 49th Annual Conference.*