AN ASSESSMENT OF TEACHERS' AND STUDENTS' PERCEPTION OF THE INTEGRATION OF ENVIRONMENTAL EDUCATION INTO THE NEW SENIOR SECONDARY SCHOOL CHEMISTRY CURRICULUM IN NIGERIA

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Abstract

This study examined students' and teachers' perceptions of and the benefits derivable from the integration of environmental education (EE) into new Senior Secondary School Chemistry curriculum. The study adopted a cross-sectional survey design. 200 Senior Secondary Chemistry Students and 50 Chemistry teachers were randomly selected across ten (10) Senior Secondary Schools in Kosofe and Ikorodu Local Government areas of Lagos State. Four research questions and hypotheses were raised and formulated. Sampled teachers and students responded to a 25-items researcher-made questionnaire. The result collected was analyzed using simple percentage, Chi-Square and descriptive statistics at 0.05 level of significance. The result of the analysis shows that there is a significance relationship between the students' benefit, teachers' perception and improvement on the quality of the environment. It was established from the present study that environmental education (EE) increases environmental sanitation practice and reduces natural disasters in the society. Based on the findings, it was recommended that teachers, who are the implementers of formative curriculum, should be given the opportunities to undergo refresher courses, seminars and workshops that will expose them to new innovations in the curriculum and environmental Education (EE) should be explicitly introduced into the Nigerian Curriculum at all levels of our Education system and it was suggested that teachers should give more attention to the prescribed units of the text books.

Keywords:Environmental Education, Integration, Hypotheses and Environmental Education.

Introduction

The interaction and interdependence between man and his environment is mutually beneficial, because, as man influences his environment, the environment does same. Wagner, (1975) subdivided man's environment into four interlocking systems: Atmosphere, Hydrosphere, Lithosphere and Biosphere. According to him the Atmosphere is a thin layer that covers the crust, the hydrosphere are the world oceans, lakes and rivers; the lithosphere is the solid earth itself while the biosphere is a veneer of life that has resulted from the interaction of other spheres.

Man has demonstrated interaction with the environment through his quest for industrial development. Increase in agricultural products, construction of roads, houses and social amenities, fishing for food, mining, and excavation all of which have led to a serious environmental impact. On a daily basis, environmental degradation, resulting from environmental abuse is constantly experienced. Although, it was asserted that abuse of the environment has global implications (Osuntokun, 1998), the poorly managed urban and rural wastes, indiscriminate and unplanned construction of houses, refuse and bush burning, industrial pollution in the air, land and water, all affect not only the physical environment but also have deleterious effect on socio-political life (Osuntokun, 1998). Some other acts that constitute major threat in our environment include deforestation and desertification, oil spillage, gas burning, and damage to fisheries and agriculture.

Environmental education is a cross curriculum topic promoting global awareness, sustainable living and active citizenship. It involves a structured and planned process that seeks the implementation of environmental curriculum in educational institutions at different levels (primary, secondary and tertiary). Cross-cutting subjects that are integrated in a global perspective but that can be learned and applied locally should implement this curriculum. Based on this principle of cross cutting subjects, it might be asserted that Environmental Education should be multilevel and continuous. A first educational level should target special programs for non-formal adult and community-based audiences. The second level focuses on secondary school. It involves teaching the main disciplines within an environmental context. The third level focuses on obtaining environment based professional skills within the different professional disciplines (Green Cross International 2004).

However, mankind is yet to have the knowledge of the total environment (Jekayinfa and Yusuf, 2008). The recent discovery of hole in the ozone layer which prevents mankind from the danger of intense ultra violet rays of the sun demonstrates

increasing hazards of environmental deterioration inflicted on mankind as a result of abuse of the environment. There have been series of environmental protection measures introduced in Nigeria. Some of these include the abatement measure, environmental awareness campaign, environmental legislations, environmental policies, afforestation and land reclamation. According to Anthony, (2006), a great deal of effort has been invested by the Nigerian Educational Research Development Council (NERDC) to incorporate the environmental concept into many subjects in the Junior and Senior Secondary School Curricula,

The global and local concern about growing environmental degradation has called for the need to help people to transform their attitude and practices. Completely, education has been recognized as one of the important tools for conserving the environment among the people. The initiative for introducing/integrating environmental education into the school curriculum should be acknowledged by the Nigeria government. This is due to the fact that Nigeria economy is dependent on the country's environment and natural resources. But natural and human-made environmental issues and problems, like drought, floods, poor sanitation, lack of clean and safe drinking water, land degradation due to poor agriculture practices, unsustainable ways of harvesting natural resources like mining, forest and fishing, environmental pollution and loss of biodiversity are threatening the life support of the environment. These problems are results of various factors like population pressure, poor agriculture practices and high rate of urbanization (Johnen, Pynn and Johnson 2005; Shendan, 2004). Therefore, education for awareness raising and finding solution for these issues and problems is considered necessary. However, there is the need to instill the knowledge of the use of environment to Students right from Secondary School. Hence, the incorporation of Environmental Education into the Senior Secondary School Chemistry Curriculum in Nigeria is a way of enhancing the people's awareness of the dangers of environmental degradation. It is also believed that by incorporating environmental education throughout the total curriculum at every grade, a more comprehensive treatment of environmental issues and concerns can be accomplished (Simmons, 1989). The purpose of this research therefore, was to find out the perceptions of teachers (the implementers of the curriculum), and students (the receiver of the Education) on the integration of Environmental Education in the Nigerian Secondary School chemistry curriculum.

Research Methodology

Research Design

This study adopted a cross-sectional survey research design (the expo facto type)

Population

The target population composed ten (10) Senior Secondary School Students in Kosofe and Ikorodu Local Government area of Lagos State and 50 Chemistry teachers which was selected across the two Local Government area of Lagos State (Kosofe and Ikorodu).

Sample and sampling technique

The population for this research was 200 students and 50 Senior Secondary School Chemistry teachers within the 10 randomly selected Senior Secondary Schools in Kosofe and Ikorodu Local government areas of Lagos State, Southwest Nigeria. Hundred (100) Senior Secondary School Chemistry Students and twenty five (25) Chemistry teachers were randomly selected from five schools in each of the two local government areas in Lagos State.

Research Instrument

The instrument used for this study was the Inventory-Type Questionnaire. The questionnaire was divided into two sections, which are section A and B. Section A was designed to elicit information about the personal information of the respondents. Section B consisted of twenty (20) items based on the possible responses of strongly agree (SA), Agree (A), Disagree (DA) and Strongly Disagree (SD). A four point Likert scale was used, eliminating the midpoint scale of undecided based on the reason given by Denga and Ali (1983) "that when a person is undecided, he or she gives almost no useful information". The questionnaire was administered to the students and the teachers in the selected schools with the assistance of the Chemistry teachers.

Validity of the Instrument

Three graduate chemistry teachers currently teaching chemistry at senior secondary school level were asked to check the construct validity of the instrument (questionnaire). The chemistry teachers were asked to check the content relevant,

sentence structure and adequacy of the whole instrument and made some suggestions and correction which improve the quality of the questionnaire before administration.

Reliability of the Instrument

The instrument was subjected to item analysis (test difficulty level, disseminating index and analysis of response option and the reliability of the instrument was established to be 0.83 using Cronbach's alpha). This was then compared with the tabulated coefficient of reliability which according to Cramer and Bryman (2001) is acceptable at 0.8. Thus, the internal consistency (reliability) of the instrument was calculated.

Administration of the Instrument

The principal of each school was met for permission and the chemistry teacher was asked to assist the researcher in setting up the class. The SSS III chemistry students were given the questionnaire for completion and the chemistry teachers were given Inventory-Type Questionnaire for completion. The students were monitored for forty minutes and the scripts /questionnaires were collected for analysis, including the questionnaires that were given to the chemistry teachers.

Procedure of Data Analysis

Data obtained was analyzed using different statistical instrument appropriate for the purpose of the research work and each hypothesis formulated. Chi-Square analysis was carried out on all the hypotheses at 0.05 level of significance.

Results and Findings

Testing for Research Hypotheses

Hypothesis One

HO_1: There is no statistical significant difference between the perception of teachers on the integration of environmental education and education for sustainable development into Senior Secondary School Chemistry Curriculum.

Table 1: Chi-square table expressing the statistical difference between the perception of teachers on the integration of environmental education and education for sustainable development into Senior Secondary School Chemistry Curriculum.

	Value	**Df**	**Asymp. Sig. (2-Sided)**
Pearson Chi-Square	7.587[a]	3	0.033
Likelihood Ratio	4.595	3	0.104
Linear-By-Linear Association	0.421	1	0.664
N of Valid Cases	250		

Source: Field Survey 2015

Result in Table 1 above shows the P-value of 0.033 associated with the chi-square statistics of 7.587 is less than significant threshold of 0.05, we reject the null hypothesis (H_0) and conclude that, there is significant relationship between the teachers' perception on the integration environmental education and education for sustainable development into Senior Secondary School Chemistry curriculum.

Hypothesis Two

HO_2: There is no statistical significant difference between the introduction of environmental education in the Senior Secondary School curriculum and the improvement of quality of the environment.

Table 2: Chi-square table testing the statistical difference between the introduction of environmental education in the Senior Secondary School curriculum and the improvement of quality of the environment.

	Value	**Df**	**Asymp. Sig. (2-Sided)**
Pearson Chi-Square	11.780	6	0.017
Likelihood Ratio	7.362	6	0.089
Linear-By-Linear Association	1.733	1	0.188
N of Valid Cases	250		

Source: Field Survey 2015

Table 2 above reveals that P-value of 0.017 associated with the chi-square of 11.780 is lesser than the critical value of 0.05. We hereby reject the null hypothesis

that there is no significant relationship between the introduction of environmental education in the Senior Secondary School curriculum and the improvement of quality of the environment and concluded that there is significant relationship between the introduction of environmental education in the Senior Secondary School curriculum and the improvement of quality of the environment.

Hypothesis Three

HO_3: There is no significant statistical difference about teachers' perception that environmental education will improve people awareness about their environment.

Table 3: Table testing for statistical significant differences between teachers perception that environmental education will improve people awareness about their environment.

	Value	**Df**	**Asymp. Sig. (2-Sided)**
Pearson Chi-Square	1.657	3	0.020
Likelihood Ratio	1.159	3	0.019
Linear-By-Linear	0.330	1	0.245
Association	250		
N of Valid Cases			

Source: Field Survey 2015

Table 3 above reveals that P-value of 0.020 associated with the chi-square of 1.657 is lesser than the critical value of 0.05. We hereby reject the null hypothesis that there is no significant statistical difference about teachers' perception that environmental education will improve people awareness about their environment and concluded that there is significant relationship between environmental education and people awareness about their environment.

Hypothesis Four

H_{O4}: There is no significant statistical difference on the students' perception that they will derive maximum benefit from incorporating environmental education into the Senior Secondary School Chemistry Curriculum.

Table 4: Chi-square table testing for the significant statistical difference in students' perception on the derivable optimal benefit of incorporating environmental education into the Senior Secondary School Chemistry Curriculum.

	Value	**Df**	**Asymp. Sig. (2-Sided)**
Pearson Chi-Square	5.196	3	0.008
Likelihood Ratio	3.187	3	0.010
Linear-By-Linear Association	1.437	1	0.347
N of Valid Cases	250		

Source:Field Survey 2015

From table 4 above, the P-value associated with chi-square (5.196) is 0.008 which is less than the critical value of 0.05. We therefore reject the null hypothesis and conclude that there is significant relationship between the students' benefit and the integration of environmental education in Senior Secondary Schools.

Discussion

Findings from the study revealed (Table 1) that there is significant relationship between teachers' perception on the integration of environmental education in Secondary School Chemistry curriculum for sustainable development with the P-value of 0.033 associated with the chi-square of 7.587 which is less than the significant threshold (0.05). This result is in line with similar findings by Fememe and Sherman (2003), Grambs (2004), Smith and Anyaoku (2006), Onyeka (2006), Babatunde et al. (2008) and Nasir (2009) in which they all observed that in nearly all cases reported, there were teachers' influences on the integration of environmental education in Secondary School curriculum for sustainable development. The finding of this study may be due to the fact that the positive attitude of teachers towards the teaching of environmental studies will have a greater influence on the integration of environmental education in Secondary Schools Chemistry curriculum for sustainable development.

Results in Table 2 also showed that there is significant relationship between the introduction of environmental education in the Senior Secondary School curriculum and the improvement of quality of the environment. This is justified with the P-value of 0.017 which is less than the critical value 0.05. Though this result is supported by Simmelkjaer (2007), Friedman (2001), Benson (2002) and Akinlalu

(2005) who reported that the introduction of environmental education in the Senior Secondary School Chemistry curriculum will bring about improvement in the quality of the environment, findings from this is contrary to those of Ogunlade (2006), Lawin (2008), Obot (2011) and Anwana (2010) which annotated that sustainability and maintenance exercise has greater influence than the introduction of environmental education. Their reasons were that the introduction of environmental education will only create a notable effect in the long run while the effect of environmental quality will be quicken by good maintenance and sustainability of the environment in the shortest period of time.

Findings from Table 3 showed that there is significant relationship between the environmental studies and environmental awareness and sustainability. Comparing the hypothetical critical level of the significant threshold (0.05) with the P-value (0.020) associated with the chi-square (1.657) indicated that environmental studies have significant effect on the environmental awareness and sustainability. This result is in agreement with Linn (2002), Anderson (2005) and Akpan (2007) who reported that a curriculum study of environment has greater effect on the creation of environmental awareness and how to sustain it. This is to say that the environmental studies have an effective relationship with the environmental awareness and sustainability. Result in Table 4 showed that there is little or no benefit which students will derive from the integration of environmental education rather than the awareness and sustainable use of the environment which the findings in Table 3 affirmed. Therefore students stand to gain more knowledge on the awareness on the sustainable use of the environment and nothing more.

Conclusion

In this study, emphasis has been on teachers and students perception on the integration of Environmental Education (EE) into the New Senior Secondary Chemistry Curriculum. This study has established that teachers are instruments through which EE can be taught for its objectives to be realized as contained in the National Policy on Environment (Federal Republic of Nigeria, 1989), and National Policy on Education, (Federal Republic of Nigeria, 2004). Environmental education has not been integrated into Nigeria secondary schools. This may be predicted based on the perception of both the teachers and the students on the integration of environment education in the new senior secondary school chemistry curriculum. This has therefore caused environmental illiteracy in the community, thereby impacting negatively on (which affected) the students and the society. It was even

found from the study that there is significant relationship on student's benefit and the integration of environmental education in secondary school chemistry curriculum. This study therefore concludes that the non-teaching of environmental education in Nigerian Senior Secondary Schools, especially as a segmented or whole topic in chemistry curriculum had seriously affected the students, the teachers and the society awareness about the environment, and also that environmental knowledge is not impacted on the students and the people for them to know how to live and participate in environmental protection programs of the federal and state government and this had resulted in their inability to understand their environment better.

Recommendation

The following recommendation was hereby made based on the findings of the study:

Environmental education should be integrated into secondary school curriculum properly and should be integrated into the curriculum as a subject on its own, in other to foster environmental awareness in the school and outside the school.

Furthermore, stakeholders in education such as school administrators, examination bodies, educational bodies and the ministry of education both at the state and federal levels should create environmental education awareness program that will facilitate the learning of environmental education in schools through the provision of facilities and incentives.

Teachers should be encouraged to go for environmental education courses possibly sponsored by schools or the Teaching Service Commission, as this will enhance teachers' knowledge in the environmental education.

There must be deliberate planned programme of action for teachers in order to meet the challenges in teaching process of environmental education.

Environmental education should not be based on theories in the classroom; students should be exposed to field work and practical and the concept of environmental education should not be limited to classroom only. Mass media, seminar and workshop should be regularly organized for teachers to enhance their knowledge on the environmental education.

There should be strict adherence to the implementation of the education policy that emphasizes provision of material resources for teaching environmental education if integrated.

Government should formulate policies that will boost the standard of education and the environment. The local, state and federal Governments should ensure that more researches should be carried out on environmental education integration in school.

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