

EXTENT OF APPLICATION OF INNOVATIVE TECHNIQUES IN IMPLIMENTATION OF BIOLOGY CURRICULUM AMONG SECONDARY SCHOOLS IN ENUGU STATE, NIGERIA

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Abstract: *The study examined the extent of Application of innovative techniques in the implementation of Biology Curriculum among Secondary Schools in Enugu State. Two research questions and two null hypotheses guided the study. The two hypotheses Formulated were tested at 0.05 level of significance. The sample of the study comprised of two hundred and forty-four (244) Senior Secondary School two (SSII) Biology teachers in both rural and urban secondary schools in Enugu State Nigeria. There was no sample and sampling in the population as they were small and manageable. The Biology curriculum implementation Questionnaire (BCIQ) was used for data collection. The instrument was validated by three experts from Godfrey Okoye University Enugu. A reliability coefficient of 0.82 was obtained for the instrument using Cronbach's Alpha Formula. Means and standard deviation were used to answer the research questions. The findings of the study among others included that Biology teachers in both rural and urban Secondary Schools do utilize innovative techniques to a High Extent (HE) in the implementation of Biology Curriculum. There are also many challenges confronting the use of innovative techniques in the implementation of Biology Curriculum such as over reliance on the use of teacher-centered methods in teaching of Biology. It was recommended among others that Biology teachers should be made to regularly undergo training and retraining in form of seminars and workshop on innovative approaches to teaching and learning processes individuals and philanthropists should be made to help in supply of innovative instructional resources to schools both in rural and urban schools.*

Keywords: *Innovative Techniques, Instructional delivery, Curriculum Implementation.*

How To Cite

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Introduction

The Nigeria Education System no doubt has witnessed a kind of paradigm shift with the improvements and inclusion in Information and Communication Techniques (ICT) in teaching-learning processes which had positively affected all facets of human life including Biology curriculum. Biology education has to do with acquisition of knowledge skills, attitude and competences that would enhance National development.

Biology Education, which forms part of Biologicalsciences requires innovative techniques and methods in the delivery of knowledge and skills so as to be in tune with the demands of the 21st century. The focus use of conventional in Biology education must shift from use of conventional "Talk and chalk" methods to incorporating pragmatic and stimulating learning environments in order to create in-depth learning?(Ovansa, 2017). Globally, the aim of education is not only to make learners literate but also to

ensure acquisition of rational thinking and problem solving skills for self-sufficiency (United Nation Education Scientific and Cultural Organization (UNESCO, 2013)

In the same vane the study of Biology is geared towards achieving National development according the Nigerian Educational Research and Development Council (NERDC) listed the objectives of secondary school Biology curriculum in Nigeria as Follows: Adequate laboratory and relevant knowledge in Biology; ability to apply Scientific Knowledge to everyday life in matters of personal and community healthy and agriculture as well as reasonable and functional scientific attitude giving the inadequate provision of teaching, resources for teaching and learning of Biology there is obvious divide in the extent of curriculum implementation based on rural and urban lines. UNESCO (2013) equally observed rural deprivations or neglect including educational services. Then, to this end Ovansa (2017) also opined that most rural Schools Lack adequate Facilities for teaching and learning of Biology.

This by extension could lead to low academic performance of students in such external examinations as the West African Examination Council (WAEC) and the National Examination Council (NECO). It may be necessary to note that inability of Biology teachers to use innovative Methods techniques could bring about ineffective any curriculum implementation and of Biology Curriculum inclusive. Therefore, it technique used has to be Student-Centered and activity Oriented. It should be research-based instruction that allows maximum student-to student interaction for learning purposes.

Statement of the Problem

Since the quality of education content is critical to a giving nation's national development, it is imperative to investigate a number of techniques being utilized for instructional delivery/Implementation of Secondary School Biology Curriculum. The application of innovative teaching techniques is critical if we are to motivate and engender a spirit of learning as well as enthusiasm on the part of students learning. The problem of this study is therefore to find out the extent to which teachers in both rural and urban schools utilize innovative techniques in teaching Biology topics.

Purpose of the Study

The main Purpose of this study is to determine the extent teachers utilize the innovative techniques in implementation of Biology Curriculum in Secondary Schools in Enugu State. Specifically, the study sought to:

1. Determine the extent teachers in rural and urban secondary schools Utilize innovative techniques in implementation of Biology curriculum in Enugu State
2. Find out challenges of utilizing of innovative techniques in the implementation of Biology Curriculum in Enugu State.

Research Questions

- i. To what extent do biology teachers in rural and urban Secondary Schools Utilize innovative techniques in the implementation of Biology Curriculum in Enugu State?
- ii. What are the challenges of Biology teachers utilizing innovative techniques in the implementation of Biology Curriculum in Secondary School in Enugu State?

Hypotheses

The following null hypotheses formulated guided the Study and were tested at 0.05 level of significance

- Ho₁: There is no significant difference between the mean ratings of Biology teachers in rural and urban Secondary Schools on the extent of utilization of innovative teaching techniques in implementation of Biology Curriculum.
- Ho₂: There is no significant difference between the mean ratings of teachers in rural and urban Secondary Schools on the challenges of utilization of innovative teaching techniques in implementation of Biology Curriculum.

Methodology

The study adopted a descriptive survey design. A descriptive survey design is most appropriate for the study because the study elicited the opinions of Biology teachers in both rural and urban secondary schools on the utilization of innovative techniques in the implementation of Biology curriculum in Enugu State. The Population consisted of one hundred (100) SS2 Biology teachers in rural secondary schools and one hundred and forty four (144) SS2 Biology teacher in urban Secondary Schools making a total of two hundred and forty four (244) SS2 Biology teachers among public secondary schools in Enugu state (Source Statistical

Post Primary Schools Management Board (PPSMB) Head Quarters Enugu April 2021). All the population was used. Therefore, there was no sample and sampling techniques. The instruments for data collection was a questionnaire structured on a four (4)- point Likert rating scale of very High Extent (VHE) High Extent (HE), Low Extent (LE) and Very Low Extent (VLE) Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) with the values of 4, 3, 2, 1, respectively. The instrument for data collection was face validate by three specialists two from the area of curriculum and instruction and one in Measurement and Evaluation all Faculty of Education Godfrey Okoye University Enugu. The reliability of the instrument was established using the Cronbach Alpha formula. The reliability coefficient value yielded 0.82 on the average which was considered high enough and reliable for the study. The instrument was administrated personally by the researcher with the help of three briefed Research

Assistants. A total of 244 copies of questionnaire were dually collected back after completion by the respondents. The data collected were analyzed using mean scores and standard deviation for the research questions, and the hypotheses were tested at 0.05 level of significance.

Any mean score from 2.50 and above was regarded as agreed while any one less than 2.50 regarded as disagreed to the items. Then respect to the hypotheses, if the T-calculated values are less than critical t-values null hypotheses will be accepted but if the t-calculated values are more than critical t-value, null hypotheses will be rejected.

Results

The results of the data analyses were shown hypotheses formulated for the study.

Research Question One

To what extent do Biology teachers in rural and urban Secondary Schools Utilize innovative techniques in the implementation of Biology Curriculum in Enugu State?

Table 1: Mean ratings on the extent Biology Teachers in rural and urban Secondary Schools Utilize innovative techniques in the implementation of Biology Curriculum in Enugu State.

S/N	Items	Rural teachers			Urban teachers		
		\bar{X}	SD	Rem	\bar{X}	SD	Rem
1	Always use creative thinking in teaching Biology Topics	3.19	0.04	VHE	2.11	0.06	HE
2	Constantly Utilize Practical demonstration Method in teaching Biology	3.94	0.47	VHE	3.05	0.64	VHE
3	Always Utilize animation tools techniques in learning Biology topics	3.21	0.30	VHE	3.45	0.11	VHE
4	Use Social media techniques in teaching Biology topics	3.37	0.22	VHE	3.20	0.08	VHE
5	Constantly apply child-centred techniques in learning Biology topics	3.24	0.36	VHE	3.29	0.17	VHE

\bar{X} =Mean, SD=Standard Deviation, Rem=Remark.

The result in Table 1 shows that the mean ratings of teachers in rural and urban Secondary Schools in Enugu State for item 1 to 5 are 3.19, 3.94, 3.21, 3.37 and 3.24 with standard deviation of 0.04, 0.47, 0.30, 0.22 and 0.36 respectively. Then, the mean ratings for teachers in urban Secondary Schools of the State are 2.19, 3.05, 3.45, 3.20 and 3.29 with the standard deviation of 0.06, 0.64, 0.11, 0.08 and 0.17 respectively. Therefore, the result from this table shows that Biology teachers in both rural and urban

area of Enugu State Utilize innovative techniques to a High Extent (HE) in implementation of Biology curriculum.

HO₁: There is no significant difference between the mean ratings of Biology teachers in rural and urban secondary schools on the extent of utilization of innovative techniques in implementation of Biology Curriculum in Enugu State.

Table 2:t-test of the extent of utilization of innovative techniques

S/N	Group	No	Mean	SD	Df	t-Cal	t-value	Dec
	Rural	44	3.19	0.28	242	1.68	1.96	
	Urban	200	3.18	0.21				

In the above table the t-calculated value of each item was obtained; the degree of freedom of all items was 242, while the critical t-table of 1.96 was obtained at 0.05 level of significance. Thus, this shows that the t- calculated values for all items were less than critical t-value. Therefore, there is no significant difference between the mean ratings of teachers in rural and urban secondary schools in Enugu State on the extent of utilization of

innovative techniques in the implementation of Biology Curriculum.

Research Question Two

What are the challenges of Biology teachers in rural and urban Secondary Schools on challenges of utilization of innovative techniques in implementation of Biology Curriculum?

Table 3: Mean ratings on the challenges of Biology teachers in rural and urban Secondary Schools on challenges of utilization of innovative techniques in implementation of Biology Curriculum.

S/N	Items	Rural Teacher			Urban Teacher		
		\bar{X}	SD	Rem	\bar{X}	SD	Rem
1	Over reliance on teachers centered technique	3.40	0.14	VHE	3.34	0.10	SA
2	Inadequate support from individual and community in supply of lack of adequate	3.13	0.50	VHE	3.33	0.07	SA
3	Inadequacy of available innovative learning resources in schools.	3.10	0.15	VHE	2.80	0.17	A
4	Inadequateworkshop/seminars for Biology teachers lack of technical Know-how	3.40	0.15	VHE	3.20	0.13	SA
5	Inadequate Students technical know-how to actively participate in innovative teaching process	3.36	0.20	VHE	3.21	0.09	SA

Key: \bar{X} =mean, SD=Standard Deviation, Rem= Remark

The result in Table 3 shows that the mean ratings of Rural Biology teachers for items 1-5 are 3.40, 3.13, 3.10, 3.40, and 3.36 with the corresponding standard deviation of 0.14, 0.56, 0.15, 0.16 and 0.20 respectively. Thenthe mean ratings of urban teachers on the items above are 3.34, 3.30, 2.80, 3.20 and 3.21 respectively with the corresponding standard deviation of 0.10, 0.08, 0.18, 0.14, and 0.08 respectively.

The result from the table above shows that there are many challenges facing Biology teachers in both rural and urban on the utilization of innovative techniques in implementation of Biology Curriculum.

HO₂: There is no significant difference between the mean ratings of rural and urban teachers on the challenges of utilization of innovative techniques.

Table 4: t-test of the two groups on the challenges of utilization of innovative techniques in implementation of Biology Curriculum

S/N	Group	No	Mean	SD	DF	t-Cal	t-Value
1	Rural Teachers	44	3.38	0.25	242	1.78	1.96
2	Urban Teachers	200	3.26	0.11			

In the above table the t-calculated value of each item was obtained. The degree of freedom of all items was 242, while the critical t-table of 1.96 was obtained at 0.05 level

of significance. Then, from above table it can be seen that the t-calculated values for all items were less than critical t-value Hence, no significant difference between the mean

ratings of rural and urban Biology teachers on the challenges of utilization of innovative techniques in implementation was accepted.

Discussion of Findings

The findings of the study with regard to research question one (1) and hypotheses, one shows that such innovative techniques like using of creative thinking peer to peer method Audio and video tools use of media tools and application of context are being utilized in implementation of Biology Curriculum. The findings were in line with Samuel (2019) that different social media platforms can be used wisely to teach science to make the science classrooms more interesting and engaging.

Then, findings with respect to research question two and hypotheses two show that Biology teachers in both rural and urban share the same view on the challenges of using innovative techniques and methods in implementation of Biology Curriculum. They all strongly agreed (SA) that the above listed challenges militate against using innovative techniques in the implementation of Biology Curriculum. The findings is in line with the findings of made by Arnold (2016) that the over reliance on traditional method the teacher centered technique, lack of inadequate support from Individual, School and Community, inadequacy of available innovative learning resources,

Conclusion

Education is an aspect of societal dynamics which continues to change with time hence, the need to adept some innovative techniques and methods in implementation of Biology Curriculum. The findings of the study showed that there are challenges in the utilization of innovative techniques in implementation of Biology Curriculum as evidenced in responses of teachers in both rural and urban schools.

Recommendations

The study therefore recommends that government at all levels should encourage philanthropists and corporate bodies to donate innovative tools to schools in both rural and urban areas. Secondly, well-spirited individuals groups and Non-Governmental Organizations (NGOs) are to sponsor Biology teachers on regular basis to educative workshops and seminars, to improve on teacher's acquisition of knowledge and skills on teaching and learning Biology.

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