

RELEVANCE OF THE BIOLOGY EDUCATION PROGRAMME OF UNIVERSITIES TO SENIOR SECONDARY SCHOOL BIOLOGY CURRICULUM IN SOUTH-EASTERN NIGERIA

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Introduction

Curriculum is usually regarded as a guiding programme for effective teaching and learning. It is intended to effectively bring some positive changes in the behavior of the learner. The curriculum is usually considered as a programme of education targeted as a guide to the teacher and learner in terms of procedure, content and context of the course of study.

Universities are mostly research institutions that are empowered to teach, develop high manpower and equip the learners with the necessary skills for successful living (Nnachi, 2009). The goals of the curriculum for University Education can be achieved, through:

- a. Intensifying and diversifying its programmes for the development of high level manpower within the context of the needs of the nation;
- b. Making professional course contents to reflect our national requirements;
- c. Making all students, as part of a general programme of all round improvement in University education
- d. Making all students, as part of a general programme of all round improvement in university education, to offer general courses such as history of ideas, philosophy of knowledge and nationalism.

The curriculum goals of educational institutions including faculties of education include, among others, the following:

- a. Production of highly motivated, conscientious and efficient classroom teachers for all levels of our educational system
- b. Provision of the teachers with the intellectual and professional background adequate for their assignment as well as making them adaptable to changing situations (FRN, 2013).

Biology, a life science, according to Odubunmi (2005) stands at the centre of science and technology. Being a life science it has contributed

greatly towards improving the quality of human life by providing drugs for curing and preventing human diseases. In addition, the course is also a gateway to noble professions like Medicine, Pharmacy, Dentistry, Nursing, Agriculture, among others. The objectives of the biology curriculum at the secondary school level as derived from the National Policy on Education (2013) are to:

1. prepare students to acquire adequate laboratory and field skills in Biology;
2. meaningful and relevant knowledge in Biology;
3. the ability to apply scientific knowledge to everyday life in matters of personal and community health and agriculture;
4. reasonable and functional scientific attitudes.

The curriculum covers the major themes of:

- 1: Organization of life
- 2: Organisms at work
- 3: The organisms and its environment
- 4: Continuity of life

The new Biology curriculum is planned using the spiral approach where concepts are arranged in such a way that they run throughout the three-year post basic course, with the concepts being discussed in greater depth as the course progresses. The implementation of Biology programme has been a matter of serious concern to Biology educators. This concern arises from the fact that Biology occupies a central position in the scientific and technological development of any Nation (Maduabum, 1992).

The Biology curriculum just like any other science is activity oriented and student-centered. Therefore emphasis is laid more on teaching and learning of Biology as a process rather than as a body of knowledge. However, studies like Nwachukwu and Nwosu (2007) found that science teachers are poorly trained in content and pedagogy. Some vital questions that need to be raised in construction of a curriculum to attain certain educational goals include what the educational objectives that the curriculum should achieve be and what should constitute the content of the subject matter as well as what should constitute the learning experiences in order to meet the objectives and make the curriculum relevant to the learner.

The Biology teacher occupies a strategic position as the quality of teachers in any educational system determines to a large extent the quality of the system itself (FRN, 2013). In spite of the strategic position of Biology teachers to the successful implementation of Biology programme, research

evidence by (Nwachukwu & Nwosu, 2007; Dangbin, 2008) show that most schools in Nigeria lack qualified science (Biology) teachers.

As stipulated in the National Universities Commission Benchmark in 2007, the Biology education programme in universities is a teacher education programme meant to produce senior secondary school and college teachers who are knowledgeable in the subject matter areas and methodology of the subject. The objectives of the Biology education programme are to:

1. Enable students to acquire the various concepts, principles, theories, laws and conceptual schemes of Biology;
2. Enable students to acquire necessary teaching and practical skills and other aspects of methodology of teaching Biology;
3. Help students to become effective classroom teachers;
4. Expose students to industrial application of Biology
5. Acquire the ethics of teaching as a profession;
6. Become professional science teachers;
7. Disseminate information in science to the society;
8. Develop necessary laboratory skills and
9. Develop positive values and attitudes for efficient discharge of their duty as teachers

It is very important that the Biology education undergraduates, who are potential secondary school Biology teachers, are properly trained since 'no educational system can rise above the quality of its teachers (FRN, 2013). This study thus set out to achieve the major objective of investigating the relevance, with regards to topics coverage, of the Biology education programme to the senior secondary school Biology curriculum.

The study was guided by the following research questions;

1. What is the mean student's rating on coverage of listed topics in the SSS Biology curriculum, by the Biology Education Programme.
2. To what extent does the Biology education programme enable the students achieve the listed objectives of the programme as prescribed by the National Universities Commission (NUC).

Method

Cross-sectional survey design was utilized. Cross-sections of graduating students of Biology Education from three states of the South-East geopolitical zone were sampled. The states sampled are Enugu, Ebonyi and Abia States. Simple random sampling was used to sample the states and also a government owned university from each of these states. The graduating

students were chosen for the study as they would have completed their course work leading to the award of Bachelors degree as at the time of the study.

Twenty graduating students were randomly sampled for the study from each of the three Universities sampled from the states. Thus a total of 60 graduating students made up the sample size.

The instrument used for data collection was questionnaire. The questionnaire has three sections. Section A sought to obtain general information about the respondent. Section B is designed to obtain information on whether the listed topics in the senior secondary school Biology curriculum were covered by the students during the 4-years programme of study of Biology Education in their Universities. Section C is designed to find out the extent the Biology Education programme enables the student achieve the listed objectives of the Biology Education programme according to the NUC. A four-point rating scale of Very high extent, High extent, Low extent and Very low extent was utilized for section C.

The questionnaire copies were administered to the students and also collected through the help of lecturers in science education Department of the sampled Universities. Data collected were analysed in two ways; data collected in respect of Section B was analysed using simple frequency and percentages. In this study, the researchers decided to accept only responses that scored 70% and above in terms of coverage of curriculum topic. Data collected in respect of section C were analysed using the mean ratings. Only mean ratings of 2.50 and above are accepted as Agree. .

Results

Table 1: Undergraduate Students' Responses on Relevance of Biology Education Curriculum to topics in SSS Biology Curriculum

S/N	Topics	Covered(f)	Percentage	Decision
1	Living things, classification of animals	59	98.30%	Agree
2	The cell	59	98.30%	Agree
3	The cell and its environment	60	100%	Agree
4	Tissues and supporting systems	54	90%	Agree
5	Nutrition in animals	59	98.30%	Agree
6	Basic ecological concepts	60	100%	Agree
7	Functioning ecosystem	55	91.70%	Agree
8	Energy transformation	53	88.33%	Agree
9	Relevance of biology to agriculture	55	96.67%	Agree
10	Microorganisms around us	56	91.70%	Agree
11	Towards better health	50	83.33%	Agree
12	Aquatic habitat	58	96.67%	Agree

13	Terrestrial habitat	55	91.70%	Agree
14	Unicellular organisms and invertebrates	59	98.30%	Agree
15	Classification of plants	59	98.30%	Agree
16	Digestive systems	59	98.30%	Agree
17	Transport system	58	96.67%	Agree
18	Respiratory system	58	96.67%	Agree
19	Excretory system	58	96.67%	Agree
20	Nutrient cycling in nature	55	91.70%	Agree
21	Ecological management	58	96.67%	Agree
22	Conservation of natural resources	49	81.67%	Agree
23	Pests and diseases of crops	51	85%	Agree
24	Reproductive systems in vertebrates	56	93.33%	Agree
25	Pollination in plants	55	91.67%	Agree
26	Regulation of internal environment	56	93.33%	Agree
27	Nervous coordination	54	90%	Agree
28	Sense organs	52	86.67%	Agree
29	Ecology of population	54	90%	Agree
30	Balance in nature	44	73.30%	Agree
31	Reproductive system and reproduction in humans	56	93.33%	Agree
32	Development of new seeds	52	86.67%	Agree
33	Fruits	58	96.67%	Agree
34	Reproductive behaviours	59	98.30%	Agree
35	Genetics	58	96.67%	Agree
36	Variation	57	95%	Agree
37	Evolution	57	95%	Agree

Results on Table 1 show that all the listed topics from the senior secondary school Biology curriculum are being covered by Nigerian Universities as they teach the Biology education students based on the NUC Biology Curriculum.

Table 2: Responses of Students on the Extent of Achievement of Objectives of the Programme

S/N	Objectives	Mean	Decision
1	Enable student to acquire various concepts, principles in Biology	3.88	Agree
2	Acquire necessary teaching and	3.92	Agree

	practical skills and other aspects of methodology of teaching Biology		
3	Helps students to become effective classroom teachers	3.97	Agree
4	Expose students to industrial application of their subjects (Biology)	1.33	Disagree
5	Acquire the ethics of teaching as a profession	3.77	Agree
6	Become professional science teachers	3.97	Agree
7	Disseminate information in science (Biology)	3.40	Agree
8	Develop necessary laboratory skills	3.82	Agree
9	Develop positive values and attitude for efficient discharge of their duty as teachers	3.37	Agree

Results on Table 2 show that the Biology Education programme enables the students achieve all the stated objectives except the objective of exposing them to industrial application of their subject (Biology).

Discussion

The results of this study as shown on Table 1 show that the Biology education Programme of Universities covers the identified topics in the senior secondary school Biology curriculum. This is an indication of the relevance of the programme to the Biology curriculum at the secondary school level. The finding of this study is contrary to the observations of Obiaga (1997), who reported that bulk of what is taught in Nigerian schools is imported from other developed countries implying their irrelevance. Similarly Adeyegbe (2004) is of the view that some of the contents of the science curriculum are of little relevance to the general education of the intended level.

Table 2 shows that the Biology education programme enables the graduates become; effective teacher, professional science teachers, acquire necessary teaching and practical skills and other aspects of methodology of teaching Biology. Other objectives being achieved by the Biology education programme include; enabling graduating students to acquire various concepts and principles in Biology, developing necessary laboratory skills in the students, enabling the graduating students acquire the ethics of teaching as a

profession, enabling graduating students disseminate information in science/biology to the society and developing in the graduating students the positive values and attitude for efficient discharge of their duties as teachers. On the contrary, the objective of exposing the graduating students to industrial application of their subject is not being achieved. This finding corroborates the study of Ndirika (2016) who reported that biology education undergraduates in the University studied lacks entrepreneurial competence and needs appropriate skills in Bee keeping, Aquaculture, sea weed culture, mushroom culture, Floriculture, Water conservation and Insect Pest control. It could be that the biology course taught the undergraduates did not incorporate skills in those areas where they lack competence. The findings of this study are also in conformity with the findings of Olaitan, Alaribe and Okeme (2009) that discovered that agricultural science teachers needed improvement in 9 competency items in implementing school farm activities.

Conclusion

This study has shown that the Biology education programme of universities is relevant to senior secondary school Biology curriculum with respect to coverage of topics in the senior secondary curriculum by the programme. The study also reveals that the NUC prescribed objective of the programme are being achieved except the objective of exposing the graduating students to industrial application of their subject is not being achieved. There is need to address this aspect of the programme.

Recommendations

Based on the findings of this study, the following recommendations are made

1. Curriculum regulatory bodies for teacher education in Nigeria need to include industrial application of Biology in the curriculum.
2. Teacher educators should ensure that the teaching of industrial aspects of the Biology Education course includes practical as much as possible.

References

- Adeyegbe, S.O.(2004): Research into STM curriculum and schools examination in Nigeria: The state of the art. *Proceedings of Science Teachers Association of Nigeria 45th Annual Conference*, 70-79
- Dangbin J. P. (2008). Methods and instructional materials in teaching STM education in F.C.E Pankshin, in: N. A. Udofia (Ed.), *Proceedings of Science Teachers Association of Nigeria 4th Annual Conference* 40–45.
- Federal Republic of Nigeria (2013). *The National policy on Education*, Lagos. NERDC.

- Maduabum M. A. (1992). The role of the biologist in Nigeria development. *Journal of STAN*, 27 (2), 18–24.
- Ndirika, M.C. (2016). Investigation of competencies in biology-based entrepreneurial opportunities among biology education students. *International Journal of Educational Studies (INJEDS)*. 1(2), 68-71.
- Nnachi, (2009). Curriculum Implementation at the tertiary level of Nigerian Education. *Curriculum Theory and Practice*. A publication of the Curriculum Organization of Nigeria. 186-195.
- Nwuchukwu J. and Nwosu A. A. (2007). Effects of demonstration method on different levels of students cognitive achievement in senior secondary biology, *Journal of STAN*, 42,(12), 50-59.
- Obiaga, T.I (1997). Nigerian University Education and Improvement of Indigenous Technology. Problems and Prospects. In Ejiogu A & K. Ajayi. Emergent issues in Nigerian Education.
- Odubunmi E. O. (2005). Practical approach to the teaching and learning of genetic concepts, paper presented at *The Biology Panel Workshop of STAN*, Benue State University, Makurdi.
- Olaitan, S.O., Alaribe, M.O. & Okeme, I. (2009). Quality assurance of lecturers of soil Fertility management in developing evidence-based test for measuring productive learning by student of agricultural education in colleges of education, South-Eastern Nigeria. A Paper presented at the Faculty of Education, University of Nigeria, Nsukka.