Pyrex Journal of African Studies and Development

Vol 5 (1) pp. 1-7 June, 2019

http://www.pyrexjournals.org/pjasd

ISSN: 2985-8763

Full Length Research Paper

Implications of Biology Exclusion on Nigerian Non-Science Senior Secondary School Students' Capacity Building in Education

Akingbemisilu Afolabi Abiola* and Ayegbo Ruth Temidayo

Science Education Department, Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria.

Accepted 15th June, 2019

Abstract

The importance of biology studies in the life of individuals cannot be underrated. Recently, in Nigeria Biology that was previously a compulsory subject for all senior secondary school students has been made non compulsory especially for non-sciences students. This development comes with some worries for science educators, especially as it concerns the capacity building and application of the subject in the life of all. This study therefore, investigated the exclusion of biology from non-science senior secondary School students and it implications on capacity building in education. A descriptive survey type was adopted for the study. The instrument used for the study was questionnaire that sought information from teachers. The population for the study consists of all teachers in Akoko Area, out of which a sample of 237 teachers from twelve Schools were randomly Selected. The data collected were analyzed using simple percentage, and chi-square statistics. The study reveals that the exclusion of biology teaching from non-science student's curriculum has significant relevance on student's career prospect in tertiary institution. This was also found to have negative impact on the progressive development of non- science students. Based on the findings of this study, that the application of Biology teaching in Senior Secondary Schools has helped students in the time past in handling issues relating to health and hormonal changes during adolescence, as well as for lifelong education which has direct positive implication on Education diversity and knowledge versatility in its application, it therefore means that non- Science Students' would be deprived of these benefits. It is therefore recommended that an important subject like Biology that has high link with Capacity building of students' life and their health status should be considered for all.

Keywords: Biology exclusion, capacity building, curriculum, and senior secondary school students.

INTRODUCTION

One of the main objectives of education in any country like Nigeria is to ensure the continued expression of knowledge in all aspects of life. In the 21st century, improving the quality of Education throughout the world remains an elusive dream and this can only be achieved through capacity building. This is widely recognized as an important component of all research for developmental activities that spurns a very wide field in academics. Capacity is the ability of individuals, organizations, or systems to perform appropriate functions effectively, efficiently and sustainably. While capacity building is the process by which individuals, institutions, organizations, and the societies at large increase their abilities to perform core function; solve problems, define and achieve objectives, understand and deal with their development needs in a broad context and in a (UNDP, 1998; UNESCO, 2005). Capacity building emphasizes the continuing process of strengthening of abilities to perform core function, solve problems, define and achieve objectives and deal with development needs. Capacity building in education has to do with expanding knowledge base of the students beyond what they have presently and the results are always in the form of new knowledge, skills and management capabilities. To achieve this, the students must not be restricted but must be allowed to be versatile by entrenching a robust curriculum that will make them to be functional and productive. The main focus of capacity building in education is to increase knowledge base and educational versatility.

Biology curriculum is designed to give secondary school students basic knowledge of the living world around them, to integrate courses that maintain scientific rigor, while providing a broad education, NPE, (1997), Lisonbee and Fullerton, (1964) and Flynn and Munro, (1970) opined that Biology curriculum was designed to give all secondary school students a basic knowledge of the living world around them. They emphasize the relationship of Biology to Agriculture, Human Nutrition, Health, Medical problems such as family planning and National Economy which leads to ultimate development of students and since capacity building in education has to do with expanding knowledge base of the students beyond what they have presently and the results are always in the form of new knowledge, skills and management capabilities. With the exclusion of this important subject non-science students will definitely be narrow minded and increasing knowledge base and educational versatility which is the core of capacity building will be minimal.

Furthermore, the teaching of biology has contributed immensely to the lives of students generally in senior secondary school, it is seen that through the teaching of biology students are able to employ the processes of science in their investigations and explore the diversity of life and the inter-relationship between organisms and their environment. Students develops understanding and knowledge of the unit of life – the cell- whose structures and processes are shared by all living organisms and, in so doing, gain an insight into the uniqueness, function and role of organism including themselves (National Science Foundation, 2003). According to National Policy on Education (2004), the broad aims and objectives of Secondary Education in Nigeria is the preparation for useful living within the society, preparation for higher education. The development of the individual into a sound and effective citizen and the full integration of the individual in to the community (NERDC 2003). Education in Nigeria has to be geared towards self-realization, better human relationship individual and national efficiency.

Recently, non- science students in Nigeria were excluded from learning biology in order to introduce entrepreneur related subjects forgetting that the study of biology contributes to the achievement of the overall aims of education. Biology is an applied science founded upon many disciplines for the sole aim of attaining and maintaining the wellbeing of individuals.

The teaching of biology can help to offer a lot of opportunity in various fields of the subjects which can be taught for entrepreneurship ability among the students. These topics and fields according to Nayah (2002) include;

1). Agriculture or Bee keeping: it includes the preparation of an artificial hire to attract the honey bee and once they colonize the honey can be extracted as when required the other products include bee wax.
2). Aqua Culture; this includes composition fish farming. Prawn farming and crab culture
3). Sea Weed Culture; this includes intensive sea weed farming. Products include Agar, Agarose, machines, thickening agents.
4). Floriculture; growing flowers for ornamental values and for export as well as for domestic market.
5). Horticulture; growing fruits and vegetable. The products can be exported as well as can be used for domestic market.

Corresponding author: akingbemisilua@yahoo.com

6). Ecotourism; this is the most developing field where the students will be able to guide the tourist both foreign and domestic to show the bio-diversity.
7). Aquarium; the fish used in the aquarium can be reared and the students can be taught to maintain aquariums. This is again a lucrative business with export market.
8). Mushroom Culture; it is a source of protein and has good export market value.
9). Water Conservation; it is a must in many nations of Africa for agriculture and drinking.
10). Preservation of soil fertility and prevention of spreading of the desert; Biological methods are having advantage over the others.
11). Poultry; rearing birds used for human consumption.
12). Insect pest and their control; to increase agricultural yield.

These fields among others are all embedded in biology when properly practiced can help to increase the economic growth of the country and also helping the students build their capacity and thereby attaining the overall aim of education which is increasing knowledge base and educational versatility.

Statement of the Problem

Biology, which previously served as a general subject for all Senior Secondary Student is now restricted to only science classes, while non-science students are now deprived from the learning of the subject which could have given them basic or general knowledge on their body anatomy, personal hygiene, health, and help their general understanding of basic functionalities of the body system among other benefits.
Notably, considering capacity building as one of the central objectives of Education, the exclusion of Biology tends to delimit the goal and exclusion of Educational diversity and knowledge versatility. It is on this basis that this study intends to investigate the implications that the exclusion of Biology for non-science students might likely have on the pursuit for capacity building in education.

Research Questions

The following questions were addressed in this study:

1). Would the teaching of biology have any restriction on the career prospects of non-science secondary school students' in tertiary institution?
2). Would there be any progressive development on capacity building of non-science student in senior secondary school with the exclusion of Biology in their curriculum?

Research Hypothesis

The One null hypotheses that was put forward for this study are;

1). There is no significant difference in the progressive development on capacity building of non-science students with the exclusion of biology in their curriculum.

METHODOLOGY

The Study adopted descriptive survey research design. The population of the study comprises all the teachers in secondary schools of Akoko area. Selection of Schools was by simple random sampling, the study was conducted in twelve secondary schools randomly from the four local government areas of Akoko in Ondo State, Participants were randomly selected from twelve schools including male and female. A total of 237 samples were involved in the study. Structured questionnaire made up of 10- items developed from the two research questions was the instrument used for data collection. The instrument was constructed by the researcher and the questionnaire was given face and content validity by three experts in Biology Education from Adekunle Ajasin University, they made necessary scrutiny and correction before the questionnaire was used for the study. It was then administered to 20 teachers that were not part of the sample. Their responses were analyzed using Cronbach Alpha to test for the reliability of the instrument. The value obtained was 0.82, this shows that the instrument was reliable. Out of the 240 respondents only, 237 responses were able to be retrieved for data Analysis. The data collected were answered descriptively using simple percentage, and inferentially using chi-square.

RESULTS

Research Question 1:

What is the relevance of biology teaching on career prospects of non-science secondary school students' in tertiary institution?

Table 1: Frequency counts and percentage scores on the relevance of biology teaching on career prospects of non-science secondary school students in tertiary institution.

S/N	ITEMS	FREQ A	%	D	%	N
1	The teaching of biology prepares non-science students for further studies in some subject area in tertiary institution.	158	66,7	79	33.3	237
2	Some non-science course (e.g psychology, Health Education, Home Economics) has some biological foundation that biology teaching can affirm basis for the learners	210	88.6	27	11.4	237
3	The teaching of biology provides the students with the knowledge, skills and understanding that may be needed to pursue further education, training and employment.	204	86.1	33	13.9	237
4	The teaching of Biology in non-science secondary school gives opportunity to non-science students in studying health related courses, environmental health, Psychology, Health Education.	208	87.8	29	29.12	237
5	The knowledge of biology helps the students in tertiary institutions to cope with biology related fields and responds to the need of the economy and contributes to sustainable economic development	219	92,4	18	7.6	237

Table 1, item one shows that 158(66.7%) of the respondents said that the teaching of biology prepares students for further studies in some subject area in tertiary institution while 79(33.3%) were of the contrary view. In item two, 210(88.6%) of the respondents agreed that some non-science courses (e.g. psychology, Health Education) has some biological foundation that biology teaching can affirm basis for the learners while 27(11.4%) were of the contrary view. In item three, 204(86.1%) of the respondents agreed that the teaching if biology provides the students with the knowledge, skills and understanding that may be needed to pursue further education, training and employment while 33(13.9%) were of the contrary view. In item four, 208(87.8%) of the respondents opined that the teaching of biology in non-science secondary school gives opportunity to non-science students in studying health related courses, environmental health e.g. Psychology, Health Education while 29(12.2%) were of the contrary view. In item five, 219(92.4%) of the respondents said that the knowledge of biology helps the students in tertiary institutions to cope with biology related fields and responds to the need of the economy as contribute to sustainable economic development while 29(12.2%) were of the contrary view.

In the final analysis, the mean percentage from the questions raised above shows that 200(84.32%) of the respondents agreed that Biology teaching has effects on the career prospects of non-science secondary while 37(15.68%) are of divergent opinion, therefore the teaching of biology in senior secondary school would have effect on career prospects of non-science secondary students.

Research Question 2: Would there be any progressive development on capacity building of non-science senior secondary school student with the exclusion of biology in their curriculum?

Table 2, item one reveals that 226 (95.4 %) of the respondents agreed that the teaching of biology helps to create notable awareness about genetic issues in students while 11 (4.6 %) were of the contrary view. In item two, 210 (88.6 %) of the respondents agreed that Biology teaching prepares the students for further education, for adult working life and lifelong learning while 27 (11.4 %) were of the contrary view. In item three 227 (95.8 %) of the respondents opined that biology teaching helps the students to reflect the changing need in their growth and development while 10 (4.2 %) were of the contrary view.

In item four, 211 (89.0 %) of the respondents said that the teaching of biology has helped to promote 21st century skills which includes knowledge of inquiry, critical thinking and creativity in students while 26 (11.0 %) were of the contrary view. In item five, 217(91.6%) of the respondents said that Students of biology become aware about the application of knowledge in social, economic, environmental, industrial, agricultural, medical, waste management and other technological contexts while 21(8.4%) were of the contrary view.

In the final analysis, the mean percentage from the questions used above shows that 218(92.08%) of the respondents agreed that there would be progressive development in non- senior secondary school students with the inclusion of biology in non-science secondary.

Table 2: progressive development on capacity building of non-science senior secondary students with the inclusion of biology their curriculum.

S/N	ITEMS	FREQ A	%	D	%	N
1	The teaching of biology helps to create notable awareness about genetic issues in students	226	95.5	11	4.6	237
2	Biology teaching in non-science senior school develops in Students the ability to make informed evaluation about contemporary biological issues, and also enhance student's ability to cope with trends during adolescence.	210	66.6	27	11.4	237
3	Biology Teaching helps the students to reflect the changing need in their growth and development and also help in promoting hygienic qualities in learners	227	95.8	10	4.2	237
4	The teaching of Biology in Secondary School has helped to promote 21st century skills which include knowledge of inquiry, critical thinking and creativity	211	89.0	26	11.0	237
5	Students of biology become aware about the knowledge in social, environmental, industrial, agricultural, Health and medical, waste management and other technological contexts.	217	91.6	21	8.4	237

school curriculum while 19(7.92%) are of divergent opinion. Chi-square with a formula of $x^2 = (O-E)^2/E$ at a significant level of 0.05 used to analyze the hypothesis

Hypothesis 1: There is no significant difference in the progressive development on capacity building of non-science senior secondary students with the exclusion of Biology in their curriculum.

The results presented in Table 3, shows that the computed (X^2cal) value 88.716 IS greater that the (X^2 tab) value 19.68. This implies that the stated null hypothesis is rejected hence there is a significance difference in the progressive development on non-science senior secondary school student capacity building with the inclusion of biology in their curriculum non-science Students.

DISCUSSION

The result of hypothesis 1 shows that null hypothesis H_{01}) was rejected. This indicates that, there is significant difference in the progressive development in senior-secondary school with the exclusion of Biology in non-science secondary school curriculum, this is in accordance with Fry, (2009) who stated the response of students when participating in vision and change activities. During the focus groups, organizers presented, followed by representative student responses drawn directly from the NSF/AAAS report of national conversations (Fry, 2009). Innovation in other fields often depends on biology. Everyone needs some knowledge of biology in order to make informed decisions as Adults-about health, nutrition, the environment, conservation, "green" living, etc. Biology can help make connections between self and society. Biology presents a good way to communicate about science, because many biology topics are immediately relevant and relatable to anyone's life. Moreso,A New Biology for the 21st century (2009), who stated that Innovation in life science will be a major driver of meeting four major societal challenges; challenges of food, challenges of climate, challenges of energy challenges of health and this can be effectively achieved when all students are made to have the fundamental knowledge of it. Furthermore, National Curriculum for Biology X1-X11, (2006) which stated that Biology teaching in secondary school enable all students to develop their capacities as successful learners, confident individuals, responsible citizens and effective contributory to society and this can be achieve when all secondary school student are given equal opportunity to learn biology and thereby becoming an effective contributor in the society. An understanding of biology can make people feel more engaged with Earth and its environment and more inclined to take steps to protect it. Good biology education is needed for global competitiveness. Biology education is needed to provide solutions for diminishing resources/sustainability issues.

Table 3: Chi-square table showing the progressive development on non-science Students' capacity building with the inclusion of biology in their curriculum.

S/N	ITEMS	FREQ SA	A	SD	D	RT	DF	X^2CAL	X^{2TAB}
1	The teaching of biology helps to create notable awareness about genetic issues in students	128 E_1 109.8	98 E_2 108.4	7 E_3 10.2	4 E_4 8.6	237			
2	Biology teaching in non-science senior school develops in Students the ability to make informed evaluation about contemporary biological issues, and also enhance student's ability to cope with trends during adolescence.	99 E_5 109.8	111 E_6 108.4	12 E_7 10.2	15 E_8 8.6	237			
3	Biology Teaching helps the students to reflect the changing need in their growth and development and also helps in promoting hygienic qualities in learners	117 E_9 109.8	110 E_{10} 108.4	9 E_{11} 10.2	1 E_{12} 8.6	237			
4	Students of biology become aware about the knowledge in social, environmental, industrial, agricultural, medical, waste management and other technological contexts.	95 E_{13} 109.8	116 E_{14}108 .4	10 E_{15}10.2	16 E_{16}8.6	237	12	84.856	19.68
5	The teaching of Biology in Secondary School has helped to promote 21st century skills which include knowledge of inquiry, critical thinking and creativity	95 E_{17} 109.8	116 E_{18} 108.4	10 E_{19} 10.2	16 E_{20} 8.6	237			
	CT	549	542	51	43	GT=1185			

CONCLUSION

Based on the findings of this study, the following conclusions were made; the teaching of Biology in secondary schools has helped in preparing the students for further studies, for adult working life as well as providing lifelong Education, this also enhance Education diversity and knowledge versatility in its application. More so, it has assisted the students in making connections between themselves and the society, which is the goal of NPE, in making the students functional for themselves and also for the society.

RECOMMENDATIONS

From the findings of this study, the following recommendations are made: Curriculum planners, Policy makers Educational administrators should see the continuous changes witnessed in curriculum of Educational system in Nigeria specifically in primary and secondary levels as an issue of concern as this is fast reducing the complementary relevance of some subjects like Biology in the attainment of the Tertiary Education. Curriculum planners should always look critically in to the concept of capacity building which is the central objective of Education for them to be able to balance up the curriculum from primary to Tertiary level if at all changes is needed and not just concerned with a single area e.g (Exclusion of some very important subjects for the inclusion of vocational subjects) The Exclusion of Biology from non-science curriculum tends to delimit the goal of enhancing Educational diversity and knowledge versatility. Educational administrators should always monitor the effective implementation of curriculum by the teachers and ensure that their teaching is not only

theoretical but making every necessary equipment available. Specialist should be employed in the teaching of some sensitive subjects like Biology.

REFERENCES

Dike, V.E. (2009). Technical and Vocational Education: Key to Nigeria's Development, (http://www.nigeriavillagesquare.com/articles/victor-dike/technical-andvocational education key to-nigerias-development.html. Educational Research and Development council (NERDC) at the Sensitization and Advocacy Workshop organized for civil society organizations and the media, Lagos. Education in Nigeria: A case study of Ilorin, Kwara State, Education, 6(1), 10-15. Education, Kano, Nigeria.

Fafunwa, A.B. (2002). Abuja: 2nd edition, Federal republic of Nigeria, 2004, National policy Federal Republic of Nigeria, (1981), National Policy on Education.

Fry, (2009). Vision and Change in under graduate biology education: preliminary reports of conversations American Association for the Advancement of Science, Washington, DC.

Heller, K. A. (2007). Scientific Ability and Creativity. Creativity Journal. Vol. 18, issue 2 for science, Areas, 1, 10-11.

Howard Hughes Medical Institute, (2005). The eye of the fly: HHMI Professor and 138 undergraduate identify essential genes that function in eye formation. HHMI Research News, February 15.

International Council for Scientific Union, (2002). Science Education and capacity Building for Goals, Ibadan; University press http://www.literature.org/Works/Charles-Darwin/origin/Developing Areas, 1, 10-11.

Igwe, R.O. (2000). The Fundamentals of Curriculum Instruction. Lagos: Hiwitts press Ltd. In Developing Areas, 1, 10-11 in Nigeria, International Journal of Educational Studies, Vol 7 No1, pp149-156 Internatoinal Journal of Science Education, 24(4) 389-403.

Madu, B.C., and Iyiola F.B. (2013). Needs assessment of Nigerian senior secondary school science teachers for improvement of science instruction in Taraba state in Nigeria. Department of Science Education, University of Nigeria, Nsukka. Manauals on University of Ilorin.

National Policy on Education, Abuja (2003). Federal Government Press International Council Nigerian Educational Research and Development Council (NERDC) at the Sensitization and Advocacy Workshop organized for civil society organizations and the media, Lagos, March 9-11.

Nayak, R. (2003). Teaching Commercial, Aspect of biology.43rd proceedings of cetSTAN. HEBN. 209-201

Obioma, G. (2009). The new 9-year Basic Education Curriculum and the newly approved Senior of Ilorin

Offarma, G.C. (2005). Curriculum for wealth creation.

Philip, A., Sharp, M.I.T., Cochai, (National Research Council) NRC Committee; A New Biology for the 21st century

Tanner, D., Tanner N. (1980). Curriculum Development training instruction. Development Education, Education Technology, University Trentham Books.

UNDP (1998), Capacity Assessment and development in a system and strategic management context, Technical advisory paper 3

UNDP (1997), Capacity Development resources book. New York: UNDP.

UNESCO (2005). UNESCO thesaurus Retrieved in August 2005 from: http://databases. Unesco.org/thesaurus/