



Biology Education amidst National Challenges: Implication to Teaching and Learning

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ABSTRACT

The impacts of National challenges on Biology education cannot be undermine as schools and other learning centers are usually affected in the midst of challenges. School closure which is a way of keeping students and teachers at home safe from some highly disturbing challenges can further deteriorate teaching and learning of biology. Biology is an essential subject for many fields of learning that contributes greatly to the technological growth of a nation, this fields of learning are medicine, nursing science, pharmacy, physiology among others and other entrepreneurship careers such as poultry farming, fisheries and snail farming, house care givers, sex educators etc. The paper explains biology, it also explains the role of biology education in national development. Based on the paper, National challenges are problems or difficulties face or experience by a country or nation, these challenges are corruptions, unemployment, armed conflict insurgency etc which could hinder or affects biology teaching and learning and education as a whole. The paper concludes that due to the impact of the recent national challenge (COVID-19 Pandemic) which led to closure of schools and other learning centers, a new teaching and learning platform was discover which Virtual learning platform is. The paper suggested that more teaching and learning platforms should be implemented and adopted for use in teaching and learning of biology to avoid lack of learning in times of any challenges.

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INTRODUCTION

The impact of National challenges on Education cannot be underestimated. Schools and other learning centers are usually affected in the midst of challenges. School closures, which are a way of keeping students and teachers at home and safe from some highly disturbing challenges, can further deteriorate learning and learning of biology

Biology education is a core subject in senior secondary school (NPE, 2014), it is a natural science that deals with the living world; how the world is structured, how it functions and what these functions are, how it develops, how living things come into existence, and their react to one another and with the environment (Umar in Amosa, Akawo, Gana and Ughovwa, 2014). Biology is an essential subject for many fields of learning that contributes greatly to the technological growth of a nation (Ahmad, in

Amosa, Gana and Ughovwa, 2014). These fields of learning are Medicine, Nursing, Pharmacy, Physiology, Physiotherapy, Agriculture and other entrepreneurship careers like poultry farming, fisheries and snail farming, house care giver, sex educators etc despite the importance of biology, it is still challenging at some point

Cimer (2011), explained that every concept in biology is challenging at some point hence, Benjamine and Emmanuel (2017) agreed that many biology concepts including water transport in plant, protein synthesis, respiration and photosynthesis, gaseous exchange, energy, cell biology, mitosis and meiosis, organ, nervous system, Mendelian genetics etc can be perceived as difficult to learn by secondary school students. Therefore, in view of these assertions by these researchers there is a need for biology subject to be taught

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in school where the student will have contact with the teacher and other practical procedure for better understanding and assimilation of concept rather than to be taught abstractly and or online where student interest and attention is not captured, and the role of biology education in a nation is misinterpreted.

ROLE OF BIOLOGY EDUCATION IN NATIONAL DEVELOPMENT

The belief that biology education is a subject that is meant to enable learner pass examination and meet requirement for further studies in tertiary institutions have led to learners' negative attitude to the subject. Biology education plays important roles in national development through the following ways (Jegede, 1997; Miller, 2000; Idodo-Umeh, 2005; Nwido and Okoruje, 2008; Obi, 2011; Othuke, 2019).

1. Promotion of good health practices: Biology helps to promote good personal and community health practices, students are made to acquire knowledge of the causes, mode of transmission, symptoms and controls of many diseases such as water borne and air borne diseases. Biology education stressed the effective of personal and clean environment in preventing diseases in it content thereby enabling student to acquire knowledge of how to control the breeding site of mosquito which is a vector of malaria parasites. The effects of sexually transmitted diseases including human immunodeficiency virus and acquire immune deficiency syndrome can be reduced through sex education which is found in biology education.
2. Promotion of good nutritional practices: biology education explains nutritional value of most food items consumed in Nigeria, the requirement and the amount needed by the body (a topic found in biology SS1 syllables called Balanced diet). This topic explains the importance of eating right in order to prevent nutrition deficiency diseases such as scurvy, kwashiorkor, beriberi etc by eating rightly, this eating rightly will ensure a healthy population who will

contributes to the national development of a country.

3. Overcoming misconception and myths: Biology education will help fight against misconceptions and myths like Female genital mutilation, the killing of twins and albinos, not wanting to take vaccine etc. all this myths and misconceptions can be dealt with through biology teachings.
4. Promotion of family planning: Over population is the one of the major problems of developing countries like Nigeria, this contributes to unemployment, food shortage, congestions in urban areas, lack of quality health care system and education among others. Knowledge gotten from biology education such as the use of various contraceptive methods will help many couples plan their family to avoid over population and under population.

Despite the important role played by biology education on national building and development, it is face with a lot of problem militating against it effective teaching and learning.

Problems of Biology Education in Nigeria:

The problems militating against biology education according to Asun (1997); Jegede (1997); Ajayi (2004); Neboh(2011) and Othuke (2019) are

1. Biology is taught as a subject to meet the requirement for admission into tertiary institutions, emphasis is placed on student performance in both external and internal examination rather than the scientific knowledge gained by the individual and for personal development.
2. Biology education is taught abstractly, where the teacher does the talking and the student do the listening or take notes, students are meant to visit the biology laboratory if at all week or two to examination.
3. Lack of well-equipped biology laboratories in the school affect the effective teaching and learning of biology, it promotes negative attitude of the student towards the subject

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4. Shortage of experience and dedicated man power; this field has been affected by people who came into the educational system or teaching because of lack of jobs. Biology education needs expert, people who love to impacts lives not people who were forced into teaching because they were stranded.

Irrespective of the challenges impeding on the effective teaching and learning of biology in Nigeria schools, the researcher explains some solutions to the above challenges

Solution to the Challenges of Effective Teaching and Learning of Biology

1. Biology education should not be seen as a recommendation for passing examination into tertiary institutions alone but, as a measure of impacting scientific ideas and knowledge into an individual student that will create an enabling environment and be career oriented even without going into tertiary institutions. This impact will make the learner know more about their body system and the environment where they lived in, thereby making them healthy, responsible, and productive citizens of a nation.
2. Biology teachers should be employ based on their expertise, interest in teaching (impacting lives), qualification and knowledge; these will help to lift the standard of biology teaching and learning there making biology teaching fun not just as duty.
3. Appropriate biology environment should be provided to enable positive attitude, interest and effectiveness performance of student.
4. Biology teachers should be knowledgeable in different methods of teaching so as to understand which method best suit each concept to be taught putting the learner into consideration.
5. Biology educators should be sponsored to conferences, seminars, and workshop at the appropriate time to encourage and motivate them.
6. A well-equipped biology laboratory should be provided to all Government secondary schools, this will help in controlling some of the challenges encountered.

National Challenges

National is an adjective that refers to something or someone that belong to a nation or country (Vocabulary.com, 2011). A nation is a community of people formed on the basis of a common language, history ethnicity, a common culture and in many cases a shared territory (Garner, 2014). No country or nation exited without challenges, challenges can also be seen as a way of building a strong nation. Challenges are difficult or hard task or problem. It can also be described as something that needs great mental or physical effort in order to be done successfully, or situation of facing this kind of effort (Cambridge Dictionary, 2021).

National challenges can be defined operationally as a problem or difficulties found in a country or nation, it can also be seen as a problem that affect a community of people that share common language, history, ethnicity, culture, and in many cases a territory. National challenges can be described as difficulties or problem facing a country or nation. National challenges have been classified and categorized by different Arthurs and researchers in Nigeria but for the purpose of this paper the researcher explain the following as national challenges which includes among others:

1. Corruption
2. Unemployment
3. Armed Conflict and Insurgency (Banditry and Kidnapping, Framers/Herdsman Conflict and Boko Haram Insurgence
4. COVID-19 Pandemic etc. these national challenges affect teaching and learning of biology in Nigeria schools

Biology Education amidst National Challenges

The role of biology education in national development cannot be over stated despites this importance it is being affected by some national challenges which impede on the effective teaching and learning in Nigeria. Below



are some of the challenges and how it affects Biology education.

Biology Education amidst Corruption

Corruption according to Madaki (2019), universally plagues societies and its impact has disastrous effects on national development; according to Madaki the impact of corruption globally on educational sector undermines the national advancement of any country. Corruption in education as a whole causes 'impediment in biology education as such biology teachers or educators are appointed in schools based on God fatherism or favoritism instead of expertise, experience and qualification, in the same vain those in charge of biology department tends to siphoned resources sent to the department for use to their own personal use, practical equipment and others are also diverted for individual use. This is even worsening due to the fact that the international funding from multinational organizations that is attracted by this sector is misappropriated by those in charge (Ololube, 2016).

This further impacts on the advancement of the nation's educational sector (Madaki, 2019). Corruption in biology education has led to the department having poor equip laboratory and lack of efficient practical equipment which enables teaching and learning thereby making learning difficult for learners; it results in negative attitude of the student towards the subject and poor performances. According to the researcher, this corruption has led to examination malpractices for both internal and external examinations conducted within the school and outside the school. In view of this, Egbefo (2012); Madaki (2019) concluded that when corruption is practiced in the educational sector, biology education is affected and it becomes a 'double tragedy' because of the impact and role of biology education on national development. Corruption in biology education can breed unemployment in a way that those qualify as biology teachers will not be granted employment.

Implication to Teaching and Learning

Biology has numerous roles one of its roles is to create entrepreneurs, who are self sufficient and responsible citizen of a nation, and sex educators who can boldly teach and educate the nation's populaces on what sex is

all about and the implication of premarital and unsafe sex. This role of biology as a result of corruption sees individuals who are not qualified for position and professions placed in this role and this has implication on the society at large. Corruption in biology education drains it of quality teachers and hence teaching and learning of biology. This corruption in biology education impacts merit, quality, competence, professionalism as it becomes exclusive for those who can afford it (Nwaokugha and Ezeugo, 2017). In view of this assertion, the researcher concludes that corruption in biology education can lead to unemployment, which in turn leads to banditry and kidnapping and other vices in the nation.

Biology Education amidst Unemployment:

Unemployment is one of the national challenges that have continued to affect education in Nigeria. Unemployment is when a person is not working either in a paid job or self employed and constitute to redundancy (Sadoh and Sidi, 2021). Chappelow (2020) agrees that unemployment occurs when a person who is actively searching for employment is unable to find work, adding that unemployment is often used as a measure of health of the economy. Unemployment is a great challenge to education in Nigeria as it affects all aspects of teaching and learning including Biology subject, unemployed parent and guidance cannot send their wards to school for learning of biology, this poses high challenges on student biology academic achievement in a way that student's performances are affected. Parent or guidance employment status plays a major role in a learners schooling, unemployment status of the parents or guidance will affect payment of school fees which may result in the learner driven out of school for lack of payment of school fees. And when the learner is not present at the time of biology lessons, the learners' achievement and performance will be affected and may lead to drop out of school.

Discontinuous education due of unemployment which results to lack of fund to pay school fees will affect the learner's attitude to biology subject and education as a whole, this negative attitude is prompted many unemployed biology graduates combing the street of Nigeria. With this belief, the learner will prefer to quit schooling and engage in something else rather than education.

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Biology education amidst Armed Conflict Insurgency (banditry and kidnapping, book haram and farmers/herders' conflict)

Education is under attack, as incidents of violence against students, teachers, schools and other learning centers are on the rise worldwide and Nigeria in particular (Ugwumba and Udom, 2015). This deliberate attack and threat against students, academics, teachers and educational facilities create barrier to accessing quality biology education, this is because the schools where the student learn is affected, this also affect the teaching and learning of biology subject. The kidnapped of school children and teachers by bandit, kidnappers and book haram has forced parents to lose confidence in sending their children to school which in return will affect learning of biology (Peterside, 2021). Biology education cannot thrive efficiently and effectively in the midst of all these insurgencies because teachers who are supposed to teach are living their jobs or fleeing the area where these insurgencies are (Brenda, 2010).

Implication to Teaching and Learning

The implication of armed conflicts insurgencies is that it will lead to possible decline in biology education, and a decline in biology education will affect the nation. A nation that has not educated its citizens on biology foretells danger for the future, because a challenge that is supposed to be resolved as a result of knowledge gain in biology education will be taken to the hospital or health centers making the work of health practitioners cumbersome.

Biology Education amidst COVID-19 Pandemic

COVID-19 is a disease caused by a new strain of coronavirus. 'CO' stands for Corona, 'Vi' for Virus, and 'D' for disease. The disease is referred to as '2019 novel coronavirus' or '2019-nCoV'. The COVID-19 Virus linked to the same family of viruses as Severe Acute Respiratory Syndrome (SARS) and some types of common cold (Bender, 2020). COVID-19 affected the world in general and specifically in Nigeria. In Nigeria COVID-19 first cases were announced in February, 2020 in Lagos State. On March 19th, 2020 a circular was granted approval for the closure of all schools for a period of one month by the ministry of

Education (Nigeria Education in Emergency Group; NEEG, 2020). The closure of schools commenced on 23rd March 2020 so as to prevent the spread of the virus.

COVID-19 school closure and the reopening of schools amidst the pandemic affected learner's performance (i.e. Biology subject) in as much as during the lockdown most schools did not conduct teaching activities and some few that did, potential impact was less as most science subject (i.e. biology) needs contact hours with teacher and student in a school setting (classroom or laboratory).

COVID-19 was announced as a Pandemic on March 12, 2020 by the World Health Organization (WHO). (WHO, 2020). From thence it was called COVID-19 Pandemic. COVID-19 Pandemic has caused a lot of crises in all sectors of life, of which the Education sector is not left out. COVID-19 Pandemic has shifted the education system throughout the world (Ndzwayiba, 2020).

Before the advent of the COVID-19 Pandemic, the Nigeria education system has adopted purely, face to face approach to teaching and learning of Biological science subject at secondary school level; the students were not allowed to own any digital gadget or take any digital gadget to school such as phone or computer.

With the advent of this challenge, (COVID-19 Pandemic) which led to lockdown of schools for some period of months, both teachers and students were left stranded about how to continue the teaching and learning of biology in the face of the pandemic as biology cannot be taught abstractly like story books, novel or history. This challenge threatened education system in Nigeria given that education system has been working on sub standard platforms (Dan-Nwafor, 2020; Yinka and Adebayo, 2020; Eze, Sefotho, Onyishi and Eseadi, 2021). This platform was affected by school lockdown which impaired teaching and learning of Biology which in turn leads to loss of access to vital biology teaching and learning materials provided by the school and leaving more students behind, as most topics in biology require face to face teaching for easy comprehension, this impacts are likely to widen the gaps in the quality of knowledge acquired in biology subject following the school closures in the country.

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Biology learning within the home could also be a challenge or present challenges for learners, because learning within the home most likely to depend on parents' or guidance's educational attainment or knowledge and other commitment. The learner's parent or guidance may not be learned or and if learned may not have knowledge of biology education, this impact leaves a greater population of biology student behind. These problems constituted great concerns from all stakeholders in education (Crawford, Butler, Rudolph and Glowatz, 2020)

Implication to Teaching and Learning

COVID-10 Pandemic is a national challenge that affected the whole world and education sector was not left out, it is the era of worldwide closure of schools and other learning institution, the era that force both teachers and student away from school and teaching and learning of biology was brought to a halt yet, the era introduced a new teaching and learning platform which is Virtual learning platform.

CONCLUSION

The paper concluded that due to the impact of the recent national challenge (COVID-19 Pandemic) which led to closure of schools and other learning centers, a new teaching and learning platform was discover which is virtual learning platform, based on this conclusion the following recommendation was given

RECOMMENDATION

Teaching and learning of biology should not be stopped or shutdown in the midst of national challenges like armed conflict and insurgency and COVID-19 Pandemic rather a suitable system of learning should be developed and adopted like e-learning, digital learning, showing of simulations on TV, a learning platform that will showcase interactive teaching and learning so that the student won't miss much in the face of these challenges e.g. teaching and learning on webinar, Microsoft Team, ZOOM and etc should be permanent in education. Also, with the rising of more challenges in the nation, a teaching and learning method should be adopted that will help improve learning of biology irrespective of where the learner may be, how and when the learner want to learn. This will help to overcome haphazard, non- organize, unstructured and

lack of learning of biology subject in times of challenges. Petrie (2020) suggested that the use of suitable and relevant pedagogy for online teaching of biology subject may depend on the expertise and exposure to information and communication (ICT) for both biology educators and learners. According to Petrie, some of the online platforms used so far include unified communication and collaboration platforms such, as Microsoft Teams, Google classroom, Canvas and Blackboard. With the creation of such platforms, it will enable Biology teachers to create biological concepts, training and almost real-life programs that will make learning of biology on line suitable and fun. They include option of workplace chat, video meetings and file storage that keep classes organized, easy to work and for discussions on difficult concept if the student encountered any (Pokhrel and Chhetri, 2021).

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