

**REVITALIZING INTEGRATED SCIENCE EDUCATION FOR
SUSTAINABLE SECURITY AND ECONOMIC DEVELOPMENT IN
NIGERIA.**

By

S.U. OZIOKO, (Ph.D)

*Department of Integrated Science, Alvan Ikoku Federal
College of Education, Owerri,
Imo State.*

E.U.C. NWAEZE

*Department of integrated science,
Alvan Ikoku Federal College of Education,
owerri, Imo State.*

E.N. AZUBUIKE

*Department of integrated science,
Alvan Ikoku Federal College of Education,
Owerri, Imo State*

&

I.O. NNAMDI

*Department of Integrated science,
Alvan Ikoku Federal College of Education,
Owerri, Imo State*

Abstract.

For the past decades, integrated science education in Nigeria had been dwindling due to factors like non-specialist teachers, pedagogical pattern, shabby instructional materials and insufficient attention and sponsorship by various stakeholders in education. At the inception of the course in Nigeria, teachers were drawn from single subject specialist such as biology, chemistry, physics, health and earth science. These categories of teachers end up teaching the areas they have competent, leaving the areas they do not have competent in. Integrated science is a unified course which should be taught holistically by trained teachers in integrated science. However, the recruitment of some specialist teachers in the area in recent time, globalization of science, adoption of computer assisted instruction (CAI) and curriculum review had contributed immensely to rapid revitalization of integrated science education in Nigeria. This paper further examined other ways of revitalizing integrated science education in Nigeria. The impact of revitalizing integrated science education on the sustainable security in Nigeria. The impact of revitalizing integrated science education on the economic development in Nigeria. The challenges of

revitalizing integrated science education for sustainable security and economic development in Nigeria. Recommendations were made on how to revitalize integrated science education in Nigeria.

Keywords: Revitalizing integrated science education, sustainable security and economic development in Nigeria.

Introduction

Since the introduction of integrated science education into the school curriculum in 1970, factors like poor teaching resulting from recruitment of incompetent teachers, lack of instructional materials and lack of interest by students have been hampering the development of integrated science education in Nigeria (Uduma & Ihie, 2017). These problems demand for revitalization of integrated science education in Nigeria through proper planning and implementation. Revitalization is the processes of making something grow, develop, and impart new ideology to already existing education (Cambridge English Dictionary, 2021).

Qualified teachers must revitalize their approach to science in the classroom in order to effectively educate and inspire future generation scientists (Shepherd, 2005). In addition, she outlined other approaches of revitalizing integrated science education as involving students in hands-on activities, research and globalization of science education through social network media. Many teachers shy away from these approaches because they are unprepared to teach science and secondly they lack the knowledge in that area (Shepherd, 2005). According to Brown (2016) revitalization equally involve moving from political solongs to the realities in developing science education, re-organizing teacher training programme to prepare teachers for their new roles and functions in school and recommending science textbooks to enhance class discussion among students. Another crucial way of revitalizing integrated science education is through making teachers' welfare a priority. Teacher's effectiveness is one of the factors that promote revitalization of integrated science education. Proper training and re-training of teachers through workshop and seminars are imperative for better standard and teaching. Equipping teachers with modern teaching and learning facilities such as computers and android phones is very crucial for effective revitalization of integrated science education. Enhancing better academic standard also account for revitalization of integrated science education in Nigeria. The policies and programme in integrated science education should be well structured and developed to aim higher academic standard. Improvement in academic standard is achieved

through curriculum review which is occasionally done to accommodate innovative teaching and learning strategies.

Furthermore, Students are the major stakeholder in education and their needs are enormous. The primary aim of attending school is to acquire scientific literacy which can only be achieved through the use of ICT for teaching and learning. On this note, public and private institutions should establish functional ICT centers and library where students can study and do their assignments. Institutions should also build enough classrooms for lectures and examination halls for various examinations, Parents should also pay school fees; provide learning facilities such as computer, android phone and finance to avoid students' embarrassment in their respective schools.

Periodic assessments of students are the major channel of maintaining standard in various institutions. Programme evaluation could be done by federal and state ministry of education to boost academic achievement. The standardization of examination and tests, and their administration are the major means of assessing students' performance in schools. The outcomes (results) lead to overhauling of academic system for better achievement.

Parent involvement in education: The role of parents in revitalizing science education cannot be over emphasized. Parents' play a key role in paying school fees, buying required facilities to promote learning and equally monitoring the students' performance.

The Impact of Revitalizing Integrated Science Education for Sustainable Security in Nigeria

Revitalization is the act of putting back to new life program, concept or object that has depreciated. Education system, courses, subject and concept can also be revitalized through adapting new teaching. The use of information and communication technology (ICT) in teaching and learning has actually revitalized education sector in Nigeria. In fact, one of the giant strides in teaching of science education is the presence and utilization of information and communication technology (ICT) facilities in teaching and learning process. In the past, the progress in educational system including integrated science education was retarded because of lack of ICT facilities such as computers, radio, internet, television and telephone (Ozioko, 2019). According to national policy on education (2014), the introduction of ICT into science education and education in general is to:

- (i) Effectively develop access and improve educational program.
- (ii) Make learning more meaningful for students.
- (iii) Reduce educational cost.

- (iv) Promote in-service training program such as workshop and seminar with the help of power point.
- (v) Develop and promote effective innovative teaching technique.

Integrated science is taught primarily for the purpose of acquiring scientific knowledge, sustainable security and economic development. The scientific inquiry lays much emphasis on cognitive, affective, and psychomotor skills which promote sustainable and economic development. The cognitive aspect involves formulating hypothesis, gathering data, analyzing and interpreting results. The psychomotor skill involves the hands-on activities that are done in the laboratory for the purpose of acquiring entrepreneurial skills which lead sustainable development.

Sustainable development is the organized tenets targeted toward meeting human development goals and at the same time sustaining the power of natural resources and ecosystem services in which the society and economy depend (Imam-tamin, 2012). Sustainable development is the ability of satisfying the present demand of the nation's population without endangering the future benefits of the future population to benefit from the natural resources. It expands to embrace people having affordable education, good jobs, adequate food, and freedom of speech, military protection and well structured economy.

The basic goals of sustainable development are anchored on the following:

- (i) To minimize the destruction of natural resources while trying to satisfy human needs.
- (ii) To create development that can be maintained and sustained without causing harm to the environment.
- (iii) To promote methods of sustaining existing development to make them environmentally friendly (Wikipedia, 2015)

However food and water security is the offshoot of sustainable development. Sustainable security is the articulated thought of nations' security in terms of food, water, military and development (www.americanprogress.org >2009/08>pdf. Food is one of the basic physiological needs of man that sustain his life. Man needs adequate foods to boost his immunity against the attack dangerous diseases and equally obtain energy to live longer. It should be noted that there is chronic food shortage in Nigeria due to ethnic crisis, Boko Haram attacks and nomadic attacks too. The food supply to cities, towns and villages had drastically dropped due to insurgency. The four pillars of food security are the ability of food to be available, accessible, utilizable and stable. The four key words are virtually absent in Nigeria. Nigeria cannot meet up with their food security because of ban in importation of food by Nigeria government,

The federal ministry of water recourses takes the responsibility of providing adequate water to Nigerian citizen. This trust of providing adequate and clean water has not been adequately solved in Nigeria for a very long time. The most vulnerable to contaminated water are rural dwellers. The major sources of water supply to the rural communities are well, rivers, lake and stream. These bodies of water are being contaminated by pollutants such as chemicals, decayed matters, urine and other domestic wastes. These pollutants have poisoned the water causing various degree of water borne disease such as: cholera and typhoid.

Sustainable security is the ability of any nation to organize well structured security in terms of food, water, diplomacy, defense and development. Integrated science education has been identified as instrument per excellent for archiving food and water security in Nigeria. Integrated science is holistically taught for the purpose of acquiring scientific literacy, entrepreneurial skill, and good health and environmental controlled as well as food and water security. Food security exists when all people whether poor or rich at all time have access to sufficient, safe and nutritious food for an active and healthy life (world food summit, 2000). Retrieved from www.fao.org/pdf-food-security-concept-note.

Science and technology education have contributed colossally in production of agriculture equipment and agro-based chemical needed for food. Scientific literacy help scientist to produce hybrid animals and crops. Modern varieties of crops and animal have contributed in increasing nutritive value of food and greater resistance to diseases. The various agro-based chemical for controlling weeds and fertilizers are based on the knowledge of science and technology education (Ezugwu, 2013). The knowledge of science education has also contributed to production of pure water used for occasion in rural and urban areas. The knowledge of distillation in our various laboratories is acquired through science education.

Challenges of Revitalizing Integrated Science Education for Sustainable Security and Economic Development.

Revitalizing education especially science education is a challenging task which stakeholders in education should consider as a serious business. Perhaps, the non-challant attitudes of the stakeholders had led to dwindling academic standard of science education in Nigeria. However, the following challenges have been outlined as the major challenges of revitalizing integrated science education in Nigeria.

- 1) **Lack of specialist teachers:** Integrated science is unified course which suppose to be taught holistically by specialists in the area (graduate

teachers of integrated science). Many institutions such as tertiary and secondary schools employ single subject specialists from biology, chemistry, physics, agriculture and geology to teach integrated science in their respective schools.

- 2) **Lack of curriculum review:** curriculum review is a crucial exercise that should be taken seriously in Nigeria. It is the function of NERDC to review and develop curriculum for effective teaching such as the online teaching.
- 3) **Poor funding:** Government and private sectors as the major stakeholder of science education in a country are expected to fund science education adequately. In Nigeria, the budget allocation to the education sector is usually unsatisfactory
- 4) **Epileptic power supply by power holding company of Nigeria (PHCN).** The power supply in this country has become the major threat to the advancement of science education in Nigeria. Constant power supply is needed to empower electronic gadgets used for teaching and learning.
- 5) **Poor services by the service providers:** One of the factors that hinder the revitalizing of integrated education is poor services by the service providers such as MTN, GLO and AIRTEL. Browsing, downloading of materials and teaching are seriously affected by the poor services. The most striking problem is lack of service in the rural area where some educational institutions are located.
- 6) **Lack of instructional materials:** Teachers' efficiency and effectiveness solely depend on the instructional materials available; computers and projectors are instructional materials that contribute colossally to the revitalization of integrated science education. The presence and utilization of the aforementioned facilities arouse three domains of education, such as cognitive, affective and psychomotor domains. The laboratory instructional materials include modern microscope, autoclave, chemicals and slides which are effectively used for teaching.

Recommendations:

It is pertinent at this juncture to recommend that:

- (1) Specialist teachers who graduated as integrated science teachers should be recruited by the government to teach the course at various levels educational institutions. The single subject specialist can only teach the area they are competent in.

- (2) Another crucial factor to be considered in revitalization is the review of curriculum by National Education Research and Development Council (NERDC). Curriculum review should be done at stipulated time so as to integrate new instructional materials for teaching activities. This should be done to revitalize integrated science.
- (3) Funding: the stakeholder in education sector (public and private) should adequately fund their institutions. Adequate fund is required to buy ICT facilities and instructional materials for teaching and learning. Computers, android phones, photocopier and scanners are ICT facilities required for revitalization of integrated science. The budget allocation to science education should be increased.
- (4) Epileptic power supply: the PHCN should provide adequate power supply to both rural and urban area to sustain academic activities. Electricity is required to operate equipment in laboratory and offices.
- (5) Poor services by service providers such as MTN, GLO and AIRTEL has also jeopardize the progress of revitalization science education
- (6) Adequate instructional materials also from the bases of effective teaching in our school. Consequently, government should provide adequate fund to buy enough instructional materials for effective teaching.

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