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# The Aims and Purposes of Science Education: Social-Scientific Issues in the Science Curriculum in Nigeria.

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**ABSTRACT:-** In this paper, I examine the purposes of education in Nigeria, major science curricula reforms, their justifications, and the role of the Science Teachers' Association of Nigeria (STAN), and other stakeholders in science curriculum reforms in Nigeria. The policy 'process cycle' (Bowe, Ball and Gold, 1992) has been adopted as a framework to examine how ideologies from government and public stakeholders are transmitted in terms of discourses, construction of policy texts and how class teachers, as end users of the policy documents translate this in practice. I argue that in Nigeria, there exists a gap between the 'planned' and 'received' curriculum (Kelly, 2009) in content and delivery, and that this is reasonably attributable to lack of wide consultation and composition of curriculum panels during the review process. The paper concludes with an evaluation of the science curriculum in terms of its international relevance and UNESCO's framework of the making of a 'quality curriculum' (Stabback, 2016).

## I. EDUCATION IN NIGERIAN CONTEXT

Nigeria is the most populous country in Africa with an estimated population of over One hundred and Ninety Million – 190,000,000 (CIA World Factbook, August 2018). Of this population, about 42.5% are aged 0-14 while 19.6% are between ages of 15 – 24 years. The population that falls between 15– 19 years within that group (15-24) is where most of the students in the senior secondary classes of the three - year secondary education in Nigeria are located. Nigeria was one of the British colonies in the West coast of Africa. Consequently, English Language is the official mode of instruction in the formal school system in the country from age six (6) when formal, basic and compulsory education begins.

Nigeria's Gross Domestic Product (GDP) and GDP per capita in 2016 were $405.1 billion and $2177.99 respectively (The World Bank, 2017). The country has 36 states with Abuja carved out as the Federal capital Territory (FCT). Nigeria is a former British colony and had its independence in 1960. The country is Africa's largest oil producer, with oil making about 70% of the government's revenue and contributing about 95% of foreign exchange income for the country. As a result, most international oil and gas industries are located in Nigeria, providing jobs for middle and high skilled professionals in science and engineering related fields. Most young people in secondary schools get highly motivated to study science with the aim of gaining highly paid employment in the many oil and gas related industries in the country.

Presently, Nigeria runs the 6-3-3-4 system of education with 6 years of primary education (ages 6-12), 3 years of junior secondary (ages 13-15), 3 years of senior secondary (ages 16-18) and 4 years of university education. However, engineering and medical related courses in the university take 5 or 6 years respectively. In Nigeria, the first 6 years of schooling at the primary level and the first 3 years of secondary make up the 9 years of basic, free and compulsory education referred to as the Universal Basic Education (FRN, 2013).It is important to note that in Nigeria, admission into schools is not strictly by age, so it is not unlikely to have a range of 5 years of age difference in any class cohort.

### Educational policy, administration and control in Nigeria

In Nigeria, policies on education are centrally created and monitored through government agencies that are supervised by the Federal Ministry of Education (FME). Generally, the Nigerian Educational Research and Development Council (NERDC) – a parastatal under the FME is saddled with the development and review of the National Policy on Education (NPE). The ministry formulates, administers and controls national policies on education with several other bodies or parastatals under its supervision for specific tiers of education. For

instance, the National Universities Commission for universities, the Universal Basic Education Commission for primary and junior secondary schools and the West African Examinations Council and National Examinations Council for the conduct of senior secondary school certificate examinations. However, each of the State Ministries of Education (SMoE) have responsibilities for provision of inspectorate services, policy and control over pre-primary, primary, secondary and tertiary institutions owned by states 'in accordance with the requirements of the National Policy on Education' (FRN 2013, p. 44). The Local Education Authorities (LEAs) have responsibilities for the payment of primary school teachers' salaries and allowances, pensions and gratuities and retraining of teachers within their local government areas.

## II. CLASS SIZE AND LABORATORIES FOR SCIENCE TEACHING AND LEARNING IN NIGERIA

The teacher-student ratio in Nigerian schools vary from 1:10 for Crèche (0-4 years), 1:25 for Kindergarten (5 years), 1:35 for primary and junior secondary (6-12 and 13-15 years) and 1:40 for senior secondary (16-18 years). However, according to the NPE, 'for effective participation of students in practical work, the teacher students' ratio shall be kept at 1:20' (FRN, 2013, p. 17). The implication is that teachers plan laboratory activities such that no more than 20 students get involved in lab work under the supervision of one teacher. Laboratory technicians who prepare equipment and resources, and set the laboratory for use usually assist Science teachers during lab activities. There are no separate laboratories for the teaching of science in most primary schools in Nigeria. Teachers would normally improvise and or obtain some funding from head teachers for demonstration classes in very few cases, especially in staff and demonstration schools that are run by institutions or companies. Generally, secondary schools have separate laboratory buildings. Some have a single integrated laboratory for all the sciences, while some have separate laboratories for biology, chemistry and physic that are generally ill equipped with poor infrastructure (Adolphus, 2016).

In Nigeria, science is taught and learnt as Basic Science and Technology from primary to junior secondary levels, and as biology, chemistry and physics for three years in the senior secondary (SS) classes (SS1-3). The government recognises the importance of science to the development of its young citizenry as demonstrated in the national policy and other curricula texts – 'in recognition of the fundamental importance and cost-intensive nature of science, technology and trade/entrepreneurship, Government shall provide adequate funds for science, technology and trade/entrepreneurship education' (FME 2013, p. 16). Also, that 'in order to stimulate creativity and develop process skills and correct attitudes in students, the course (physics) is student-activity oriented with emphasis on experimentation, questioning, discussion and problem-solving' (FME 2009c, p.iii). Similarly, the senior secondary school biology curriculum states that 'the contents and context of the curriculum places emphasis on field studies, guided discovery, laboratory techniques and skills…' (FME 2009a, p.iii). The foregoing from policy texts demonstrate the policy demand for adequate provision of science teaching and learning facilities including laboratories, lab equipment and facilities, online learning resources and simulations in all schools in Nigeria. However, research shows that most state schools in Nigeria, lack adequately equipped laboratories especially in the rural areas, and that pupils learn science more theoretically (Adolphus, 2016; Aladejana and Aderibigbe, 2007). This is also supported by the government's position that - 'unfortunately, the teaching and learning of physics has been fraught with challenges which prevent many students from performing well in external examinations' (FME 2009c, p.ii).

### Research Questions

The main research questions addressed by this paper are:

1. What are the purported aims of science education in Nigeria?
2. To what extent are socio-scientific issues (SSI) included in the science curriculum in Nigeria?
3. How are policy texts in Nigeria translated to practice in schools?

### The purposes of science education in Nigeria

The purposes of science education in Nigeria are generally drawn from the national goals and philosophy of education as contained in the National Policy on Education (NPE). For instance, the goals of education in Nigeria include:

> Development of the individual into a morally sound, patriotic and effective citizen; …and social abilities and competencies as equipment for the individual to live in and contribute to the development of the society (FRN 2013, p.2).

According to the national policy text, the goals of science education shall be to:

(i) Cultivate inquiring, knowing and rational mind for the conduct of a good life and democracy
(ii) Produce scientist for national development
(iii) Service studies in technology and the cause of technological development; and

(iv) Provide knowledge and understanding of the complexity of the physical world, the forms and the conduct of life. (FRN 2004, p.29).

These goals appear very lofty, but vague. For instance, what defines moral soundness when morality is itself 'indefinable' (Skorupski 1993, p.121), and is subject to social and cultural interpretations? In addition, what criteria are set to identify an 'effective citizen'? What is the parameter to measure one who has cultivated an 'inquiring, knowing and rational mind'? In addition, what does - 'for the conduct of a 'good life' and democracy' mean? These are clearly subject to different interpretations by the end users of the policy.

The science subject curricula also derived their specific objectives from the NPE national and science education goals. For instance, the objectives of the Basic Science and Technology (BST) curriculum for the first 9 years of school are to enable learners to:

> Develop interest in science and technology, acquire basic knowledge and skills in science and technology, apply their scientific and technological knowledge and skills to meet societal needs, take advantage of the numerous career opportunities offered by science and technology, become prepared for further studies in science and technology, avoid drug abuse and related vices, and be safety and security conscious (FME 2012, p. vii).

Similarly, the objectives of the biology curriculum for senior secondary schools are to prepare students to acquire:

> Adequate laboratory and field skills in biology, meaningful and relevant knowledge in biology, ability to apply scientific knowledge to everyday life in matters of personal and community health and agriculture, *and* reasonable and functional scientific attitude (FME 2009a, p.iii).

Some of the objectives of the chemistry curriculum are to enable students to:

> Develop interest in the subject of chemistry, in science, technology and mathematics, acquire basic theoretical and practical knowledge and skills, *and* develop reasonable level of competence in ICT applications that will engender entrepreneurial skills and apply skills to meet societal needs of creating employment and wealth (FME 2009b, p. iv).

While the general objectives of the physics curriculum is to:

> Provide basic literacy in physics for functional living in the society, *(enable learners to)* acquire basic concepts and principles of physics as a preparation for further studies, acquire essential scientific skills and attitudes as a preparation for technological application of physics, and *(to)* stimulate and enhance creativity (FME 2009c, p. ii).

Although the some of the specific science curricula objectives can be argued to be vague, just as the national goals of science education, it is nonetheless possible to align the subject curricula objectives with the national goals. These goals and objectives of science education demonstrate government's intention to equip young people with scientific knowledge and skills to participate productively and contribute to the growth of society and to occupy positions in science and technology related fields that drive the global economy. To produce a scientifically literate society, the Basic Science and Technology curriculum (for ages 6-15), for instance, had four curriculum innovations infused to appropriate contents. These are environmental education, drug abuse education, population and family education and sexually transmitted infection, including HIV/AIDS education. The government's rationale for these infusions was 'the desire of Nigeria to be identified with contemporary development worldwide' (FME 2012, p.viii). These 'infusions' were designed to address some socio-scientific issues (SSIs), for example, climate change, sex and relationship education, drug use and abuse.

**Socio-scientific issues in science curricula in Nigeria**

Socio-scientific issues (SSIs) are controversial social issues or problems, with some link to science. According to Sadler (2011), SSIs are open-ended problems with variety of solutions. Sadler also established the linked between socio-scientific issues and 'situated learning' where learners are situated in specific environments and contexts that 'shape the way in which participants engage in activities and ultimately afford and constrain what participants come to know and be able to do' (Sadler 2011, p.3). Similarly, SSI has been described as a pedagogical strategy (Zeidler, *et al*., 2005) where learners are presented with issues that are socially relevant, but complex with the aim of promoting scientific literacy that would support rational, evidence-based discussions and responsible citizenship. While some of the socio-scientific issues are global, for instance, global warming, cloning and applications of genetic engineering, some may be local such as air pollution from bush burning and illegal oil refining resulting to pollution of the air with 'black soot' as in Rivers State, Nigeria.

In Nigeria, the science curricula at various level includes SSIs. For instance, the Basic Science and Technology curriculum (for ages 6- 15) has themes and topics such as:

- drug abuse
- pollution of the environment from gas flaring
- population and family life
- Climate change
- environmental hazards
- ethical issues in science and development.

These contents occur in every class from Basic 1 to 9 (6-15 year olds) as the thematic approach was adopted in the development of the curriculum. To sustain the interest of learners, 'the topics under each theme were sequenced in a spiral form beginning with the simple to the complex across the 9 years of basic education (FME 2012, p. ix). Similarly, socio-scientific issues could been also be seen in Agricultural Science, Physics, Chemistry and Biology curricula (for ages 16-18) offered in the senior secondary classes. For Biology for instance, SSI's are addressed in Theme 3: the organism and its environment and Theme 4: Continuity of life. Table 1 below demonstrates how 'Climate Change', for instance is taught across the years in various classes and subjects in Nigeria.

**Table 1: Climate Change across the curriculum in Nigeria.**

| SSI | Grade/ Level/ Age | Unit and Topic Name | Connection to the Major Goals for this Science Curriculum | Link/ Evidence of a Progression from Prior or Future Topics | Relevant Examples or Applications (Local or Global) |
|---|---|---|---|---|---|
| **Climate Change** | Upper primary classes 4,5 and 6 (9-11years) | Theme: Learning about our environment- Topics: Changes in Nature, our weather, safety in our environment | "Provide knowledge and understanding of the complexity of the physical world, the forms and the conduct of life" | Concept of 'Climate change' in upper primary science is carried on in junior and senior secondary subjects like Agric. Science, Social Studies, Basic science, biology, chemistry and physics. | -Over population, resulting to the clearing of forests/lands for habitation<br>- burning of fossil fuels to increase $CO_2$ in the atmosphere<br>-desertification /land degradation |

**Policy influences and the curriculum process in Nigeria**

The influence on the curriculum process in Nigeria can be divided into three distinct eras.

- The first was when the early missionaries established and controlled education and schooling without government intervention (1859 -1882).
- Secondly, the period of colonial government interventions with missionary participation (1883 – 1930), and
- thirdly, the period of fuller government involvement (1931- date)

There were no clear science curricula for schools when the missionaries first introduced some rudiments of science, as their main aim was to train healthy catechists with some fair knowledge of the environment and hygiene to provide support for their work. Ogunleye (1999) argued that the rudiments of science taught at that time was 'nature study' and that the period was marked by 'lack of instructional objectives in science teaching' and 'any uniform curriculum in science' (p. 2,3). Similarly, Gbamanja (1999) maintained that the early missionaries and the colonial masters did not so much concern themselves with science teaching in schools. The 1920 Phelps-Stokes commission set up to investigate the needs of the African colonies reported its displeasure with the manner and content of science learning and teaching in Nigeria (Ogunleye, 1999). Gbamanja (1999) noted that:

> "The colonial masters in many parts of Africa, did not concern themselves much with the teaching of science in the schools. The main objective of the educational system in the British-oriented countries, for example, was to train catechists" (p. 32).

Ogunleye (1999) observed that science teaching and learning in Nigerian schools between 1859 and 1882 was characterized by the:

> "lack of science laboratories, lack of qualified science teachers, lack of interest or enthusiasm shown by the colonial government in Nigeria towards encouraging and supporting the efforts of the missionaries, lack of instructional objectives in science teaching, lack of funds to promote science education, lack of science textbooks, lack of any uniform curriculum in science" (p. 3).

That was the state of the foundation of science teaching and learning in secondary schools in Nigeria with the colonial government having no control of the curriculum and general educational standards for the mission schools.

It was not until 1882 when the colonial government took control and regulation of missions that were involved in education with the enactment of the first Education. With the provision of financial assistance by the government, many of the missions were able to procure some science laboratory equipment and open more secondary and teacher training colleges mostly in the southern part of the country which resulted to the spread of science teaching and learning in many schools in the country (Ogunleye, 1999, Gbamanja, 1999). Ogunleye(1999) noted that King's College, Lagos established in 1909 as King's School was the first government secondary school that had a chemistry laboratory and Taiwo (1975) as cited by Ogunleye (1999), reported that "King's School remained for many years the only school which consistently offered science to the standard of Cambridge University Senior Local Examination" (p. 3).

Despite the progress made in the teaching and learning of science with the involvement of the colonial government in education in Nigeria at the time, the yearnings and aspirations of the people was not satisfied. The educational system and science that was taught in schools as inherited from the missionaries and the colonial masters was not relevant to the needs of the indigenous society and the learners. The agitations of some nationalist on the irrelevance of the educational system led to the setting up of the Phelps-Stokes commission in 1920 with a mandate to investigate the needs and resources of African colonies with the aim of providing them with an education that was relevant to their needs. The commission's recommendation gave a further boost to science teaching and learning in Nigeria. The political independence gained by Nigeria in 1960 increased the awareness of national consciousness among the elites and nationalists, which led to the establishment of some commissions to investigate the educational priorities of Nigeria. Some of these commissions established in 1960 were The Banjo Commission of the Western region and The Ashby Commission of the Federal government (Ogunleye, 1999).

The Science Teachers Association of Nigeria (STAN) has been at the forefront of science curriculum review in Nigeria. From 1968 in response to the request made by the West African Examinations Council, WAEC, to review the existing curricula of the science subjects, STAN inaugurated committees to work on the Integrated Science, Biology, Chemistry and Physics curriculums. Okebukola (1997) cited in Ogunleye (1999) remarked that the STAN Committee report resulted in the production of the Nigerian Integrated Science Project (NISP) with pupils' workbook, pupils' textbook and teachers' guide published in 1971. After the launching of the National Policy on education in 1977, STAN reviewed its Nigerian Integrated Science Project and produced 3 separate books for the first 3 years of secondary education with their workbooks and teachers' guides in line with the national policy on education. The success of NISP motivated STAN to venture into aggressive development of science textbooks in Nigeria. Subjects panels composed of specialists were used by STAN for the writing of text books. Ogunleye (1999) remarked that

> "subject panels were also mandated to organise one week annual workshops on various strategies for teaching and learning science so as to make science more enjoyable and less difficult for both science teachers and student" (p. 80).

These subject panel workshops and the STAN annual conferences have regularly featured in Nigeria over the years. Currently in Nigeria, there are many volumes of STAN textbooks used in schools on all subjects of school science such as Integrated science, Chemistry, Biology, Physics, Primary science, Mathematics, Agricultural science and Further mathematics.

Apart from STAN, several bodies have influenced the curriculum process in Nigeria. Some of these organisations are the defunct Comparative Education Study and Adaptation Centre (CESAC) in Nigeria, defunct Nigerian Educational Research Council (NERC), The West African Examinations Council (WAEC), National Examinations Council (NECO), the Science Teachers Association of Nigeria (STAN), the Joint Consultative Committee on Education (JCCE), and the National Council on Education (NCE). In 1988, the CESAC, NERC, Nigerian Book Development Council (NBDC) and the Nigerian Language Centre (NLC) were merged for form the Nigerian Educational Research and Development Council (NERDC), with a mandate to develop curriculum for at all levels in Nigeria. The NERDC is a 24-member council with six members, including the Chairman and Executive Secretary appointed by government. The other 18 statutory positions include one representative of the

Federal ministry of education, Five from state ministries of education, four from universities, two from colleges of education, and one each representing the Association of principals, the teachers' union, the Academy of education, examination bodies, Book league and the Linguistic Association of Nigeria. The composition reveals that only two members from the primary and secondary schools constituency are statutory members of the council, and that students are not part of the curriculum development body. This kind of arrangement aligns with the linear, 'top-down' policy process described by Bowe, Ball and Gold (1992) with political advisers and bureaucrats 'disconnected' from school teachers as policy receivers (p. 7). Sam Egwu (then minister of Education) aptly presented this in his foreword to the 2009 science curricula:

> It is my fervent hope that the teachers and learners for whom these curricula are produced would demonstrate commitment and assiduity in using these curricula (FME 2009c, n.p).

This type of 'top-down' policy process could explain why in Nigeria, there exists a gap between the 'planned' and 'received' curriculum (Kelly, 2009) in content and delivery, and that this is reasonably attributable to lack of wide consultation and composition of curriculum panels during the review process. Also, the inadequate provision of science teaching and learning resources in Nigeria, coupled with the epileptic electricity supply (Adolphus, 2016; Aderonmu and Adolphus, 2012) especially in most rural schools could explain the gap between the 'planned' and 'received' curriculum. However, the curriculum development and review process in Nigeria involves series of consultations with stakeholders including curriculum experts, subject specialists, teachers, policy makers, parents and employers of labour (FRN, 2013). Although more teachers participate in, and are widely consulted in the process, there appears to be no place for learners in the process.

Following the government's desire to reform the secondary school science curriculum aimed at 'value-orientation, poverty eradication, job creation, wealth generation and using education to empower the people', a High Level Policy Committee on Curriculum Development (HLPC) composed of stake holders was mandated to review the curricula (FME 2009c, p. i). The HLPC after due consultations provided guidelines for the re-structuring of the curriculum. Generally, the process involves planning, writing, critique, editorial, and presentation to the JCCEand the NCE for approval. The physics review writing workshop, for instance, was composed of four participants – a renowned physicist and curriculum expert, two university physics lecturers and only one secondary physics teacher (from a Federal Government college). Considering the poor state of resources for the teaching and learning science in most schools in Nigeria, a review team with a wide spread of teachers' skills, knowledge and experience from rural, urban, state and private school settings, would have been more appropriate.

**Teacher Autonomy and the science curriculum in Nigeria**

The science curriculum in Nigeria is highly prescriptive as described by Bowe, Ball and Gold (1992). The contents of instruction, performance objectives, teacher and students' activities, teaching and learning materials and evaluation guides are clearly specified, giving very little or no space for teachers to demonstrate their skills and expertise in the classroom. This is not consistent with global trends of promoting teacher agency and professionalism where teachers are given their right place as "active developers of the curriculum" and not "implementers of others' decisions" (Priestly, Biesta, Philippou and Robinson 2015, p. 78, 79). The general structure of subject curriculum with topic, performance objectives, content, activities (teacher/student), teaching and learning materials, and evaluation guide is presented belowusing SS1 (Age 13) physics

Table 1: Extract from senior secondary class 1 physics curriculum – Theme I: Interaction of matter, space and time

| TOPIC | PERFORMANCE OBJECTIVES | CONTENT | ACTIVITIES | | TEACHING AND LEARNING MATERIALS | EVALUATION GUIDE |
|---|---|---|---|---|---|---|
| | | | TEACHER | STUDENT | | |
| **1. Fundamental and derived quantities and units** | Students should be able to:<br>1. distinguish between fundamental and derived quantities;<br>2. distinguish between fundamental and derived units | 1. Fundamental quantities: mass, length, time and electric charge.<br>2. Fundamental units: kg, m, | 1. Hold discussion on standard and units of measurements<br>2. Demonstrate the measurement of the | 1. Give examples of derived quantities and units<br>2. Should measure length and mass of objects in | * metre rule<br>*Tapes<br>*Spring balance<br>*Chemical balance<br>*Venier Callipers, etc | Students to distinguish fundamental quantities from derived quantities. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | s, etc<br>3. Derived quantities: force, speed, etc<br>4. Derived units: m/s, $m^2$, $m^3$, etc | fundamental quantities | their environment. | | |
| **2. Position, distance and displacement** | Students should be able to distinguish between distance and displacement in a translational motion | 1. Measurement of distance<br>2. Concept of deflection<br>3. Distinction between distance and displacement | Demonstrate how to use a size metre string to measure length of the field, classroom block, etc | Use the metre rule to measure the length and breadth of the classroom, etc. | * Metre rule, *Tapes<br>*A pair of compasses<br>*String and protractor | 1. Students to use different measuring instruments to measure<br>2. Students to distinguish between distance and displacement. |

The curriculum structure as shown in Fig. 1 indicates that teachers are prescribed what to teach, with specific performance objectives, content breadth, activities, evaluation, and assessment guidance. This kind of curriculum does not provide for the desired autonomy for teachers as professionals. However, teachers' experience and skill may come to bear where prescribed teaching and learning materialsare not readily available, in which case teachers may negotiate to either the advantage or disadvantage of the pupils to deliver the 'planned' curriculum or what the pupils actually experience as the 'received' curriculum (Kelly 2009, p. 11).

**International relevance of the science education curriculum in Nigeria**

In recent times, curriculum policies and development in many countries have been influenced, not only by local and national concerns, but also by international drivers. In the views of Thijis and van den Akker (2009), the curriculum operates at the 'supra' level when influenced by international and transnational ideas. In 2009, some expert in science education met in an international seminar to articulate some 'big ideas' and goals of science education with 'the aim of identifying the key ideas that students should encounter in their science education to enable them understand, enjoy and marvel at the natural world' (Harlen, *et al.*,p.iv).Recent curriculum innovations in Nigeria (2009 for the senior secondary school curriculum and 2013 for the Basic Science and Technology curriculum) attempted at producing curricula that demonstrates relevance to learners with general aims to equip learners with 21st century skills and knowledge of critical thinking, problem solving, creativity, digital literacy and collaboration, to meet societal needs and aspirations. For instance, one of the objectives of the senior secondary chemistry curriculum is to 'show chemistry and its links with industry, everyday life activities and hazards' (FME 2009b, p.iv). Similarly, for the topic 'Environmental hazards' in the Basic Science and Technology curriculum for the junior secondary class three (age 15), students are expected not only to learn in the classroom and read from books. Teachers are also to arrange and lead 'a visit to a nearby erosion site and guide students to suggest measures of control' (FME 2012. p. 33). Also, on 'fundamental and derived quantities and units' taught in senior secondary class 1 physics, students were not just required to memorise units and dimensions, but also, to 'measure length and mass of objects in their environment' (FME 2009c, p. 1). These activities and demonstrations carried on by students show the relevance of curriculum to the environment and society in which the learner lives, and provide opportunities for the acquisition of necessary critical thinking and problem solving skills for global and international relevance. Research evidence shows that students engage more with learning when classroom experiences connect to real life scenarios (Furrer and Skinner, 2003; Claxton, 2007), and that that positively affects performance (Shernof, Csikszentmihalyi, Schneider and Shernoff, 2003; Klem and Connell, 2004). It is hope that government provides the necessary infrastructure, right calibre of science teachers and training and retraining opportunities to enable the actualisation of set programme goals for science education in Nigeria.

## III. CONCLUDING REMARKS

In this paper, I have examined the purposes and aims of science education in Nigeria. There have been many global influences on national curriculum development, particularly in relation to science education with the aim of making the study of school science relevant to learners. The use of SSI as a pedagogical strategy have been argued as way of making young people make sense of concepts with social, cultural and ethical

implications in science classroom. SSIs such as climate change and gas flaring that are relevant to the Nigerian contexts in select science curriculum have been discussed. The various science curricula in Nigeria demonstrate international relevance, at least as evident in the curriculum documents. However, the lack of teacher autonomy, poorly equipped or lack of science laboratories, inadequate training and retraining opportunities for science teachers and the more involvement of science teachers in the curriculum making process are key areas of attention if the government aims to achieve the lofty purposes of science education in Nigeria.

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