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Integrating Peace Education into Senior Secondary School Science and Technological Curriculum for Sustainable National Unity and Development

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Abstract

The paper presents an overview of peace education and the need for its integration into the senior secondary science and technology curriculum for sustainable national unity and development. It argues that many changes in the society coupled with the increasing scientific and technological innovations have brought a lot of unimaginable challenges such as intergroup tensions, civil unrest, ethnic agitations, insecurity, cultism, kidnapping, arm robbery, cybercrimes, banditry, child trafficking etc. all of which have greatly threatened the corporate existence of our nation Nigeria. The paper therefore posits that integration of Peace Education into the secondary school science and technology curriculum could help senior secondary school students gain effective and relevant skills required the resolution of non-violent conflicts. These skills are also expected to be reinforced to facilitate the growth and development of peaceful values in the society.

Keywords: Peace Education, Science and Technology Curriculum, National Unity, National Development

1. Introduction

Science and Technology have been described as the primary drivers of progress of nations and have constituted veritable tools for global competitiveness. Both disciplines have transformed people's lives, socially, economically, morally and politically. Social development throughout history at all levels of society is tremendously influenced by Science and Technology. According to Akpan (2015) nations who have spearheaded modern development across the globe are those who have invested both human and material resources towards the advancement of developmental project in science and technology education. Therefore, when a country showcases great tendencies in the institutionalization of new technological frameworks towards the production and good and services, these indices will invariably reflect in the quality of schools established in such environment (Akpan, 2015).

Hammond (2017) argues that within a more specified framework of analysis, a qualitative institutionalization of science and technological education in any society establishes a strong cognitive capacity for members of such societies. Invariably, this means that there will be room for advanced reasoning, establishment of critical thinking, and problem solving skills that are required for basic interactions and public policy decision making. Similarly, Rees (2014) has pointed that science and technology education helps to:

i) Promote a culture of scientific and technological thinking and also institutionalizes the ability of individuals to adopt features of evidence based reasoning strategies during the decision making process.

ii) Establishes a society of people with high level of confidence, technical knowhow, and basic skills that will enable them actively engage in scientific revolutions cutting across the globe.

iii) Train and equip individuals with the capacity of developing relevant problem solving, innovative, and analytical skills that will enable them become self-reliant individuals in the society.

iv) Establish and promote and environment that encourages innovations that promotes peaceful coexistence amongst individuals and nation states.

v) Encourage the participation of citizens in debates, discussions and conversations that promotes science and technological innovations. This will further improve their interests in the policy process, thereby encouraging active participation of citizens in the decision making processes in the society.

According to Akpan, (2015), science and technological developments and discoveries have been widely applied to the benefit of mankind yet some mundane problems have either been caused by the abuse and misuse of the inventions of science and technology with resultant negative consequences on the peace and tranquility of the society. As science and technology affect society by advancing socio-cultural changes and developing economic, political and educational aspiration, society in turn use the knowledge of science and technology to create

unimaginable havoc in form of misinformation and misuse, leading to violence, insecurity, intergroup tension, political uncertainty, banditry, kidnapping, arm robbery, cybercrimes, ethnic agitations all of which have threatened the corporate existence of many African nation including Nigeria.

Akpan (2015) further noted that science and technology have affected human society and it's surrounding in a number of ways including developing advance economies, information management, leisure, health and communication yet the same science and technology have created some serious problems that have many negative or undesirable effects on the life of man and his environment. Hence, not all science and technological products have been used for peaceful purposes. The development of weapons and firearms of increasing destructive power has progressed through history, from boomerang, spears, bows and arrows to nuclear weapons and these are still alarmingly on the increase. Fortunate or unfortunately every nation, country or community acquires or store weapons in readiness for an eventual attack from hostile, enemy country or community which by implication is that advancement in science and technology has enabled man to develop and equip himself with dangerous weapons of various degree and capacities for his own destruction and insecurity.

This explains why Williams (2017) lamented that incidence of crimes have been on the increase in the society since science and technology have made it possible for the production of devices and gadgets which have greatly assisted political leaders to rig and falsity election results, fraudsters to steal from their victims, communities to go into war with each other and humanity to engage in ethnic agitations, banditry, kidnapping, thuggery and violence leading to insecurity and political uncertainty in many countries of the world including Nigeria.

This paper therefore examines the components of science and technology curriculum and the need for integration of peace education into it at the secondary school level in Nigeria as a means of helping students to acquire non-violence skills, better orientation and understanding of science and technological products and processes vis-à-vis the underlying implications for national unity, human security, moral values, attitudes, social cohesion and democratic culture in Nigeria.

2. Science and Technology Curriculum in Nigeria

Curriculum generally is viewed from many different perspectives and has as many definitions as individuals perceive it or its implications. The whole of Education (science and non-science) is largely concerned with curriculum either its development or implementation. In whatever way curriculum is defined or described or explained, experts have agreed that it has three key components namely teaching, learning and governance. For Offorma (2005) curriculum is conceived as an access route through which qualitative education can be actualized. This definition by Offorma (2005) is limited in scope because it attributes curriculum to the specific teaching contents specified by examiners to teachers during the exercise of their teaching obligations. This means that in any subject, teachers are only expected to emphasize on specific topics as specified by the examiners. For instance, in

Nigeria, the West African Senior Secondary School Certificate Examination (WASSSCE) or the Joint Admission and Matriculation Board (JAMB) syllabus is a specific contents which stipulates the exact topics a senior secondary school student should be equipped with at the end of their secondary education. Irrespective of this limited definition of curriculum, a broader analysis sees curriculum as a continuous and engaging process that introduces relevant ideas that serves the needs of every society. This invariably means that curriculum is not static, but rather a continuous process that evolves with time and the changing dynamics of the society (Obanya, 2004). Therefore, curriculum as a whole is expected to encompass total and comprehensive activities a school undertakes in response to the demands and needs of the society. Curriculum is expected to cut beyond the contents of a specific subject or learning experiences of specific individuals. Rather, curriculum as a whole is a comprehensive formulation, implementation and evaluation of learning and teaching experiences provided by schools to its learners for the purpose of actualizing the educational, social, scientific, and technological goals of any society. In collaborating this view, Obanya and Fadoju (2008) maintain that:

> "*A process that involves translating the nation's broad educational goals into down-to-earth realities and of making informed choices on how the realities can be implemented to ensure that the ultimate goals of education derived from the nation's overall developmental goals are attained through the concrete activities of the schools and the entire educational system".*

Based on the above views presented by scholars, Godwin (1981) has categorized the structural definition and conceptualization of curriculum into elements of teaching, learning and governance. In the area of teaching, curriculum places emphasis on the contents of the various subjects taught to students at schools. In this context, curriculum is viewed as the instruments or materials utilized by the teacher in impacting knowledge or stimulating learning to students in schools. The second contextual meaning of curriculum which places emphases on learning, is rather a more popular conception held by many individuals in the school system. For this view, curriculum is conceived as a sum total of all the experiences a learner gains within the contextual supervision of a school system. It is important to note that these type of experiences has a large impact on the behavioral and attitudinal formation of the learner. Thus, these could be experiences undergone by a learner in school, the contents of the learning experiences expected from a child, or the programs institutionalized by the school for learners.

The third conceptualization views curriculum as the sum total of all the experiences a child is expected to attain as specified by the school. This invariably means that whatever experiences a child gains, is solely the responsibility of the school. Based on this context, this definition assumes that

- It is the sole authority of the school to guide the educational experiences of the child

- It is also the right and responsibility of the school to organize, formulate, design, and implement the chain of academic events that will shape the learning outcome of the students.

These conceptions invariably shapes the structuring and institutionalization of extra-curricular or co-curricular activities in schools. These activities are authorized by schools to build and strengthen the cognitive and learning experiences of the child. Based on these claims, the specific role of science and technology is to aid the development and training of children in basic scientific and technological skills. These skills are expected to be used by the children to learn and understand the basic physical and biological operations of the world. Therefore, the basic objectives of science and technology curriculum as outlined by Nzewi (2014) is to achieve the following outcomes:

i) Help students to develop and build interest in science and technological values.

ii) Enable students to acquire basic science and technological knowledge or skills that will enable them meet up with global best practices.

iii) Help students to effectively apply basic technological and scientific knowledge in the actualization of societal demands.

iv) Equip students with the basic science and technological skills that will help them leverage on the various career advancement opportunities offered by science and technology.

Furthermore, in order to develop the science and technology curriculum, it was observed that the curriculum also included the thematic approaches required for the selection of contents. Based on this context, certain themes which are assumed to be scientifically responsible for helping students acquire relevant knowledge in science and technology are:

i. The contextualization of the “YOU” and “Environment” concept.

ii. The concept of Living and non-living things

iii. The contextualization of the idea of “You and technology”

iv. The contextualization of the “You and energy” concepts.

The science and technology curriculum cuts across the junior secondary and the senior secondary school levels. At the junior secondary level, the themes are sequenced in a way that the students are introduced to the topics all through the nine (9) years at various degrees of complexity. The curriculum is arranged in such a way that it is easy for the teacher to implement. The topics have been broken down into implementable units in a table that has the following headings; topics, performance objectives, content, activities, teaching and non-teaching materials and evaluation guide. Implicit in the activities provided is the use of guided inquiry as major instructional strategy.

At the senior secondary level, the science and technology curriculum as approved by the national council on education is structured as senior secondary schools (science and

mathematics) and senior secondary school (technology) with relevant subjects for each stream. The science subjects listed at secondary level are biology, chemistry and physics.

Each subject has its curriculum with well-defined objectives to enable a smooth facilitation of science and technology techniques, as well as ensuring that children are provided basic knowledge of science and technology through an effective contents and sequence selections. The spiral approach to content organization was adopted such that learners are introduced to concepts in increasing order of difficulty throughout the three-year course. Also emerging issues which covered value orientation, peace and dialogue, human rights education, family life, HIV/AIDs education and entrepreneurial skills were infused into the relevant contents of the senior secondary school curriculum but unfortunately these components have not been seriously emphasized at the implementation stage of the curriculum.

3. Conceptual View of Peace Education

Peace education is conceived as a process where people acquire values, knowledge attitudes, skills and behavior, to enable them exist in harmony in relation to their environment. The primary focus of peace education according to Johnson and Johnson (2012) is to help students acquire basic knowledge that will help them resolve conflicts in a non-violent way through the promotion of peaceful values in the society. According to Desh (2008) peace education aims at shaping secondary school students in becoming goal driven individuals who respect divergent opinions and opposing views. These category of students are also expected to develop values that gives room for empathy and solidarity to individuals across national boundaries. In addition to these characteristics, people with good peace education are also expected to have the capacity to become ambassadors of peaceful values by deconstructing every element of violent coexistence amongst members of the society. Generally, peace education is conceived as an important tool for reducing and controlling conflicts in any society. Furthermore, peace education establishes conscious efforts among individuals to be sensitive to threats of conflict and violence.

According to Akudolu (2010), the major focus of peace education in any society is to help learners build confidence as advocates of peace. Therefore as peace advocates, irrespective of whether formally or informally educated, these persons are expected to have the capacity to live in harmony with themselves and with other members of the society. They are also expected to promote peaceful coexistence with man's natural environment, promote the respect of human rights, as well as institutionalize democracy and good governance in every aspects of the society they find themselves. The goal of peace education is generally derived from the resolutions of the United Nations and the noble peace prize laureates' manifesto (2010) which are stated thus:

i) Respect all life – that is, respecting the rights and dignity of each human being.

ii) Non-violence – rejection of violence, obtaining justice by convincing and understanding.

iii) Sharing – developing attitudes and skills for living together in harmony, putting an end to exclusion and oppression.

iv) Listening to understand: giving one a chance to learn and share through the free flow of information.

v) Preservation of the planet – making sure that progress and development are good for everyone and the environment

vi) Tolerance and solidarity – appreciating that people are different and that everyone has something to contribute to the community.

vii) Equality of man and woman – ensuring an equal place for men and women in building society.

viii) Democracy – making decisions by having a say and give others theirs

In addition to the specifications outlined by the United Nations, Harris (2004) has also distinguished five types of peace education namely: conflict resolution, human rights education, development education, global education and environmental education. Based on this idea, peace education generally represents all ethical values, respect and tolerance an individual has when analyzing his or her interactions with other members of the society. Possessing these values is a yardstick for promotion the principles of peaceful coexistence, attitudinal values, and national unity in any country. Peace education also instills the moral values of self-respect, insights and other non-violence skills which are helpful for analyzing global issues and problems and also educate about alternative security systems. Overall, practicing peace education serves as a fulcrum through which students that advocate for justice, better welfare schemes, equity and fairness in any school environment. Inculcating peace education into curriculum of schools therefore serves as a social responsibility for both the teachers and students in any senior secondary school.

4. Peace Education at Tool for National Unity and Development

It is an undisputable fact that Nigeria has over the year's experienced high degree of insecurity and is unarguably in search of peaceful society. It is also not unreasonable to conclude that one searches for only what one lacks and so for Nigeria, it is peace. We all need peace and desire peace which has been painfully and destructively lacking in our country for years. As Nigerians, ours is a tired, distracted and distressed society for now. The national dailies, radio and television all sound one daunting ever recurring note; Nigeria is at its lowest ebb. Nigeria is now a slaughter ground for all forms of interethnic strife and herdsmen-farmers struggle as well as religious crises. In other words, Nigeria is in chaos, confusion and violence walk the streets, the specters of Boko haram attacks, herdsmen-farmers attack are haunting. There are inter-tribal clashes, herdsmen-farmer's bloody clashes in different parts of the country most especially the northern part and these have become the order of the day (Abdul-Wahab, 2018).

According to Abdul-wahab (2018), Nigerians are in constant fear of what the next hour might bring. The catalogue of factors for insecurity in the country is disturbingly endless. Thus, it is at least certain that we can say that peace is Nigeria's direst need today for unity and meaningful development. The need for peace education has grown exponentially as the incidence of conflicts has become more dramatic and prevalent in all its various dimensions in Nigeria. Peace education is an inter-disciplinary area of education whose goal is non-institutionalized teaching about peace and for peace. It is a socialization aimed at inculcating virtues of tolerance, co-operation patience, and good interpersonal and other values of integrity, honesty, hard work humanness and brotherhood of mankind (Maiwada, 2008).

Peace education also includes conflict resolution, equality, respect for individual and societal differences and social justice. According to Abdulahi (2006) peace education in school is to assist students acquire skills for non-violence conflicts resolution and to reinforce these skills for the promotion of the value of peace for national unity and development. Peace and justice can be achieved by creating opportunities for interaction among people of different culture, race, languages and social interaction for the purpose of achieving national unity and national development. Unity refers to the state of being one, harmony of opinion, interest or feeling. By implication, it is only when there is peace and unity that stability can emerge. The concept of unity states that unity, not conflict is the central governing law of life and that once unity is established, and conflicts are often prevented or easily resolved.

According to Danesh and Danesh (2012), unity is a conscious and purposeful condition of convergence of two or more unique entities in a state of harmony, integration and co-operation to create a new evolving entity usually of same or higher level of integration and complexity. The animating force of unity is love, which is expressed variably in different conditions of co-existence. National unity according to Abdulahi (2006) is a situation where people of diverse culture, religion or language, political, social, economic systems are brought together to have common goal. The people have a mutual understanding, love, co-operation and trust among themselves. They are united, tolerant and have faith in their fatherland. The significance of national unity in national development is very obvious. It makes the arrival of a national consensus much easier and much faster which in turn accelerate the rate of national development.

Nwafor (2012) explained that national unity allows political leaders to harvest citizen' commitment and contribution in nation-building and national development. Through national unity, citizens are given an equal opportunity to explore social, cultural and economic development. This implies that national unity generally promotes national development. National development in this context explains a comprehensive transformation of a nation in all spheres of its national life, including political, economic, social, religions and scientific spaces. Generally, based on these indices, the national development of a nation will be measured based on the ability of its citizens to have an enhanced standard of living with little or no poverty and inequality. Similarly, Tolu and Abe (2017) are of the opinion that a country can only exercise pride in the international community when its development indicators portrays a society where citizens have a natural, and not forced attachment to the process of

governance.

It is however pertinent to note that in order for a nation to attain a substantial level of development, there has to be some basic prerequisites such as socio-political and economic stability, peaceful co-existence and non-violence environment (Tolu and Abe, 2017). Based on this view, national development can therefore be conceived as a collective and overall advancement of a country. These type of advancements are best achieved through conscious and deliberate development plans institutionalized by the government and also a conscious efforts by the government to effectively implement these development plans. Government development plan cannot strive successfully in a chaotic environment except in a place where people are at peace and live in peace. Therefore, sustainable national unity and development can meaningfully be achieved only when there is peace and harmony. Hence, the need for integration of peace education into the senior secondary school science and technology curriculum.

5. Strategies for Integrating Peace Education into the Senior Secondary School Science and Technology Subjects

Curriculum integration is a term which describes a strategic process of integrating or combining the contents of two or more subjects when teaching a particular topic to students. It involves integrating the subject concepts, subject content and subject competencies developed in a topic. According to McPhail (2019), curriculum integration is anchored on the assumption that students learn more about real life events when various subjects are contextually presented as inter-relational themes to explain a phenomenon. Therefore, Barnes (2015) have suggested that in cognitive science, research shows that there exists a strong relationship between conceptually structured knowledge and human cognition development. This means that human cognition is best developed when students are taught subjects with inter-related concepts, ideas, and theories. This assertion supports the idea that in order for the conceptual contents and structures of a subject to be retained, curriculum integration needs to be embedded into the structuring of subject curriculum. This will enhance learning mechanisms and also ensure that learning moves beyond the boundaries of everyday learning to deep learning.

According to Barnes (2015) the principles in cognitive science maintains that subject concepts have the power to initiates a student's capacity to independently bring up abstract ideas and logical thoughts. Therefore, the major benefit of curriculum integration is that it allows students to pursue learning in a holistic way without the restriction often imposed by subject boundaries.

5.1 Designing a Topic in Science and Technology Subject Using Curriculum Integration

Designing a topic using curriculum integration approach requires the following steps:

i) Creating a concept map for the separate subjects in relation to the topic and see if there are areas of overlap or enrichment.

ii) Identifying any science or technology subjects' competencies associated with the key subject concepts.

iii) Considering the major contents through which the students will learn about the subject concepts and develop subject competencies

iv) Considering the order in which the content will be shared with students. This will involve setting a roadmap on how the students will be provided with access to the knowledge in number 1-3 above, how the key subject concepts relate to each piece of content, and the types of learning activities you will use to explore the subject concepts and content such as reading direct instruction and guided instruction.

v) Considering how you will assess the topic to identify how bringing together the subjects has deepened the learning or provided a cognitive advantage.

5.2 Principles for Consideration in Using Curriculum Integration Approach

i) Consider what is it that students will learn that they would not otherwise learn by bringing two or more subjects together. Only bring subject together where there are clear areas of subject conceptual overlap.

ii) Use curriculum integration only in selected part of the curriculum and carefully assess its effectiveness.

iii) Plan for curriculum integration at the subject concept level once a topic has been chosen. This ensures learning aims and objectives go beyond every day common-sense knowledge or key competencies to subject concepts and competencies.

iv) Use curriculum integration to deepen learning that has already occurred in a single subject setting.

v) Introduce subject concepts in a planned, sequential and logical pattern and revisit them in a spiral fashion. Critical thinking emerges when students knowingly use subject concepts to think with.

vi) Ensure that sufficient time and subject expertise are available when planning for curriculum integration

5.3 Challenges of Implementing an Integrating Curriculum Approach

There are some few challenges that comes with integrated teaching among which are;

i) The task of ensuring that the cognitive advancement is clearly as a result of bringing the two subject together. For example, drawing concepts from peace education curriculum and some from any of the science and technology subjects. (Biology, Chemistry and Physics)

ii) Difficulty on the part of the teacher to develop a common understanding among the learners of the learning task

iii) Challenges of establishing lines of connection between integrated disciplines as well as the lack of coherence that is often associated with integrated teaching.

iv) One or the other learning area could be trivialized. Science and technology is often the subject that suffers particularly if it is simply a matter of trying to incorporate it with a broad topic.

5.4 Overcoming the Challenges of Implementing Integrated Curriculum

There are number of strategies and actions teachers could adopt to facilitate a smooth transition to integrated learning opportunities. They are as follow;

i) Teachers must endeavor to become sufficiently knowledgeable by ensuring that they read all the related materials and topics to be covered from the integrated subjects. Teachers could also engage in collaborative discussions with colleagues in related disciplines about concepts to be taught jointly in the classroom. This will instill confidence and a clear understanding of the fundamental ideas.

ii) Teachers should start their integrated lesson with topics in which they are highly familiar and knowledgeable and how other disciplines address the issue and have a clear sense of how to synthesize and integrate them.

iii) Always begin the integration with the notion that every discipline in isolation would offer and identify the potential gains from the synthesis and integration and then clarify the options to foster integration.

iv) Encourage students to be creative and to take risk as the wrestle with the challenges of being more inclusive thinkers.

v) Convince students that inter-disciplinary teaching is worthwhile. Let the students identify insights they would have missed if they had engaged in a subject specific teaching of the topic.

vi) Incorporate insights from other disciplines that the teacher believes are well suited to enrich students understanding of the topic

6. Conclusion

Peace exists in any society when people are able to resolve their conflicts without violence. This feature can best be achieved through the inculcation of peace education into our educational system. The practice of peace education is an opportunity to promote the total welfare of students, advocate for their justices, and equitable treatment of young adults and promote individual and social responsibility for both educators and learners. Introducing peace education into a nation's curriculum will prevent the emergence of conflict and create conditions for sustainable peace in the world. Peace education activities are generally expected to promote conflict resolution strategies that encourages peaceful coexistence and respect for human rights. Curriculum integration of peace education and science-technology

will provide opportunity for acquisition of non-violence skills, moral values and thus facilitating national unity and development. This paper therefore concludes that the integration of peace education into the curriculum of any society should include instructional practices that respects developmental, intellectual, cognitive and social capacities of both educators and learners.

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