

Science, Technology And Mathematics (STM) Education For Human Security And Sustainable Development

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Abstract: *Human beings are in constant search for self-actualization, recognition, protection from risks and satisfaction of their needs in order to live in peace and harmony. This can only be achieved when all threats to security are removed. Science, Technology and Mathematics (STM) Education is concerned with the development of human resource which has significant impact on the development of social harmony and building a culture of peace. This is with the view to ensuring physical survival of individuals and groups and protection from threats like disease, hunger, unemployment, political oppression and environment degradation as indices of human insecurity. The paper, Science, Technology and Mathematics (STM) Education for human security and sustainable development looks at Human and Social Security, examines human security as it relates to physical and psychological well-being of individuals, it discusses security situation in Nigeria and the need to enhance human security for sustainable development of the society. It recommends among others honesty in the implementation of policies and issues that have to do with human security.*

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I. Introduction

Concern for the wellbeing of human beings has remained the major goal of every society. This is because it is human beings that exploit natural resources, build social, economic and political organizations and also carry forward national development. Development entails social harmony, economic growth and the ability to unify people within the society to remain socially, politically and economically viable. The Nigerian nation was founded on the principles of democracy, equity, social justice, freedom and unity. Constitutionally the security and welfare of the citizens remains the primary purpose of government at all levels. In the last few years, however, Nigeria has faced several issues and challenges which continued to stand on the way to national development. Corruption and fraud, ethnic and religious crisis, robbery (armed and unarmed), financial embezzlement, looting of resources entrusted to government officials, kidnapping, human trafficking and human right abuses, Militancy, insurgencies (Boko Haram, pipeline vandalization etc). These and other social ills have led to several forms of inequalities in wealth, status and power sharing. The result is that a handful individual siphons the nation's wealth while the larger populace are wallowing in poverty, squalor, disease, hunger and prospects for early death. When people cannot meet their basic needs of life, the resultant effect is conflict, intolerance and violence. This indicates a state of social strain and stress. With these there will be breakdown of law and order, destruction of human and natural resources. Challenges and threats of contemporary Nigerian society requires a corresponding change in the way and manner in which people operates. This underscores the need to put on ground mechanisms that ensures economic growth and social reconstruction. Education works for the development of the individual and the society. It is a prerequisite for economic regeneration and social well beings. It is the means of advancing peaceful co-existence among various tribes because it enables Nigerians to respect and value themselves and others, appreciate the independence of others, know their rights and social responsibilities. Youth are the potential source of national stability and sustainable development in any society. This however depends on how adequately they are prepared through the education process to take their rightful place in the society. Nigerian youth can be empowered through Science, Technology and Mathematics (STM) Education. This is because STM provides individual with the opportunity to acquire functional knowledge to become functional members of the society. Functional knowledge promotes manpower development because it provides competent and skillful people who can apply scientific knowledge to solve societal problems. Since in every human society, the expectation is that people should engage in productive work to generate income with which to meet personal needs and fulfill social obligations, there is the need for Nigerian youth to acquire skills and competence in Science, Technology and Mathematics.

Science, Technology and Mathematics provides entrepreneurial skills which opens global job market considering the diminishing opportunities for wage employment in Nigeria. However, a lot of Nigerian youth are not interested in the study of science, technology and mathematics. A lot of them are found in the arts and humanities. As a result of this, Nigerian youth are said to be knowledge-rich but skill-poor (Isaac, 2007). This calls for a re-orientation of Nigerian youth towards functional science technology and mathematics education. It was in this light that this paper looks at human and social security, it discusses security situation in Nigeria, relevance of STM education to human and social security and the need to enhance human security for sustainable development of the Nigerian society.

II. Human Security

The process of safeguarding the life and prosperity of citizens against threats is referred to as security. Aselebe, (2013) defined security as the protection of persons and property against a range of hazards including crimes, fire and attendant risks such as explosion, accidents, disasters, sabotage, subversion, civil disturbance, bombing etc. Human security is therefore, a concern for human life. It entails freedom from fear and want and the protection of human beings from threats and risks for peace and harmony to prevail. Bette and Ude, (2011) sees human security as liberating humans from physical and artificial hindrance such as war, poverty or political oppression which prevent people from choosing freely and acting freely on what they have chosen. United Nations Development programme (UNDP) defined security as safety from chronic threats such as hunger, disease and repression, protection from sudden and hurtful disruption in the pattern of daily life whether in jobs, in homes or in the community. A society which guarantees human security is a society in which individual human rights and social justice are respected (Bette & Ude, 2011). Bette et'al also reported that lack of access to reliable food supplies, safe drinking water, adequate health care and modern energy supplies constitutes the most immediate forms of insecurity. Over the years the Nigerian society witnessed and is still witnessing various threats of insecurity as a result of activities such as militancy, Boko-haramiasm, farmers and cattle owners clashes and banditry etc. to have an objective STM that could lead to objective development, human security must be guaranteed and sustain.

2.1 Social Security

Social security is the protection that the society provides for its people against economic and social distress. It is the protection of citizens from social and economic policies and situations that impacts negatively on them. It involves social regulations which are designed by the society to ensure physical survival of individuals and groups. It is freedom from want, freedom from fear and freedom to live in dignity. Social security is a means of attaining human security. Attah and Kyari, (2014) reported that a social security system serves as a major to ensure human security. The 1999 constitution of the Federal Republic of Nigeria in section 14 (b) stipulated the responsibilities of the government to its citizens to include among others political, economic, educational and social responsibilities. Under the social responsibilities, government is to ensure that citizen have equal rights, obligations and opportunities before the law. Government is also responsible for maintaining the sanctity of human dignity, the independence, integrity and impartiality in the court of law. It is also to ensure conducive human working conditions, equal employment opportunities without discrimination, adequate medical health and leisure facilities. All these could achieved through a well define and design STM curriculum. Hence, the need to improve, guaranteed and sustain both human and social securities.

2.3 Security Situation in Nigeria

To understand contemporary time, it is always good to go back to historical perspectives Nigeria is peopled by individuals who were previously separated by ethnic, religious and cultural difference. Each of these differentiated groups has its own different environment and cultural practices that marks it out as a unique entity with each striving for survival and prosperity with little or no regards for its impact on others. These diverse groups were forced to come together as a nation by British colonial masters when they amalgamated the Northern and Southern protectorates of Nigeria in 1914. The different groups looks at each other suspiciously with each afraid of being dominated by the other. This has led to intense competition among them for resources, assets, power and other advantages. The resultant effect of this is mistrust, tension, hatred and hostilities which have brought disunity, instability and insecurity. Economic security provides a durable foundation for peace and stability. Nigeria economy is in a state of depression. Despite the nations position as the sixth world largest producer of oil and the possession of abundant and vast reserves of human and natural resource, the nation is operating below her economic potentials. As a result of this, the nation has been identified as a country that is rich but whose citizens are living below poverty line. This portrays a mixed blessing of potentialities, where there are economic possibilities on one hand and challenges that threatens the very existence as a corporate entity on the other hand (Bagudo, 2015). Today, there are many social ills plaguing the Nigeria society. These include ethnic and religious crisis, food crisis, unemployment, cultism, examination malpractice, human

trafficking and other forms of human right abuses. Nigeria's rating on the global corruption index has remained high, corruption has remained the strongest social ill that has made the political, economic, educational and social systems of the county dysfunctional. The socio-economic system had strived on inequalities, exploitation, inflation of contracts, looting of government treasures, physical and psychological abuses etc. Instead of building a just and egalitarian society as stated in its constitution, Nigerian citizens are living under a cloud of insecurity. Nigerian youth who are the hope of the country are experiencing a lot of social and personal challenges. They are experiencing a lot of worries, anxieties and frustrations as a result of poverty, discrimination and deprivation. These are serious threats to their sociological and psychological dispositions, because human mind is the determinant of human conduct. Many Nigerian youth are now engaged in social vices due to their disturbed state of mind. Nigerian streets are now populated with school drop-outs, drug addicts, half-baked, unemployable youth who constitutes a social menace and security threat to national unity. To reduce all these to the barest minimum, Nigerian youth need STM Education that could stabilize human security as sustains development

2.4 Need for Human Security

Human security is an all-inclusive term. It involves all aspect of security ranging from physical, security, protection of basic human rights, economic needs and interests. A nation's most valuable asset is its human resources. This makes issues that relates to human security critical and vital. Such issues must be faced realistically and systematically. Wherever, there is human insecurity, human lives are at risk, people cannot freely go about their normal activities. Under such conditions, the economy of the nation would suffer and basic human needs would not be met, business would be jeopardized, investors would not venture into business, foreign earnings of the country that should be used for the development of the nation would be channeled towards mobilizing security agents to ensure security. Human insecurity also has economical, sociological and psychological effects on individuals within the society. It leaves victims in perpetual fear and anxiety. To ensure social and national security, the constitution and laws of Nigeria stipulated certain agencies and alliances concerned with protection of person's private life and effective protection of the sovereignty and territorial integrity of the nation. These include the police, the army, and the state security service (SSS) etc. All these are necessary to regulate the relations, actions and conducts of members of the Nigerian society for peace and stability to prevail. Though the Nigerian security agents are trying in maintaining peace and security, but it is an evidence that they are unequipped as funds meant for equipping them are being siphoned by few individuals.

2.5 STM Education for Human Security and Sustainable Development

Science, technology and mathematics are human enterprise; that are concerned with life and the harmonious relationship between man and his environment. They are closely related to the physical, social and economic life of the society. They ensure survival and protection of individuals and groups from such threats as disease, hunger, unemployment, political oppression and environmental degradation. The nation must provide qualitative STM Education to its teaming youths who constitute more than 50% of the country's population (see census figures). According to Wasagu (2009) science is a field of study that acquaint recipients with certain basic knowledge, skills, competences and attitudes that are essential for successful living within the society. Akpan (2010) also opined that science contributes to quality of life in so many areas. These include health, nutrition, agriculture, transportation, and material and energy production. He further stressed that science ensures that the air we breathe, and the water we drink are life sustaining not vectors of disease and decay.

STM education is that aspect of education that is concerned with the production of scientifically literate individuals. It is concerned with production of scientists, technologist, engineers, medical doctors and other professionals that are critical elements needed in running the affairs of the nation for sustainable development. Development involves advances economically, socially, morally and intellectually. It means improving the total circumstances of man on earth. It includes satisfying man's spiritual and material needs and granting him mastery of the environment (Aminu, 1986). Sustainable development according to Nabueze and Ozioko, (2015) is that development that leads to fulfillment of societal ideals. It encompasses development in all aspects of the life of citizens including social, economic and political lives. The factors that influence development are human ability to explore, invent and utilize knowledge to solve problems. Man's ability to do this is based on the quantum of skills acquired through the educative process. This is because skills are not necessarily inherent they are acquired disposition that can be taught and learned.

STM Education provides individuals with the opportunity to acquire functional knowledge and skills that can be used practically for functional living. Functional knowledge promotes man power development. It provides skills appropriate for taking up different jobs. This underscores the need to focus attention on man-power development which is done through the development of resourceful human beings that can exploit and develop material resources for national development. Science education is concerned with human resources development which determines the character and pace of economic and social development. Human resource

development involves the development of knowledge and skills of human beings and the utilization of these effectively for the development of the society. This is because human capital development improves the quality and productivity of labour which in turn results to economic growth. Thus human capital derives economic growth and prosperity of the nation. The education system of any nation should provide the citizens with sufficient and appropriate level of knowledge that could be applied to solve personal and societal problems. It should also enable the citizens to acquire the type of attitude that enables them to interact meaningfully and purposefully with other members of the society for the overall benefit and improvements of the society. In line with this the education system in Nigeria is aimed at acquisition of appropriate skills and competence as equipment for the individual to live in and contribute to the development of the Nigerian society. That is, the emphasis is on relevance, functionality and the application of knowledge to solve problems.

Science, Technology and Mathematics (STM) education is that aspect of general education that provides individuals with the opportunity to acquire knowledge and skills that could be used practically to resolve personal and societal problems because it promotes skill acquisition and development of dexterity in manipulating objects and managing events. In STM learners acquire critical thinking skills, logical reasoning and problem solving skills, it instill in the learners important behaviours that prepares them to reason and perform in a group, they acquire attitudes and good social values that shapes their views and perspectives. As a result of this therefore, Nigeria's numerous challenges could be tackled when STM education is adequately pressed. This is because science has the ability to provide life essentials such as food, water, shelter, clothing etc. It is also a means of improving health care and sanitation. All these would improve general standard of living, reduce poverty and ensure human security. The social ills in Nigeria cannot be divorced from lack of proper education. Youth are the agents of change and development, be it social, economic, political, spiritual etc, a lot of Nigeria youth however are said to be miseducated. Miseducation happens when the education system continues to graduate individuals who lack skills for self reliance thus completely irrelevant to the society. Self-reliance thrives on knowledge which is functional. Self reliance is a situation in which individuals are equipped with the intellectual resources and vocational skills with which to achieve self-fulfillment without necessarily depending on others. Adewale in (Opeyemi, 2012).

Unemployment is a major social ill in Nigeria. Unemployment leads to poverty and poverty is a deprivation, it is a social exclusion which leads to emotional, social and political powerlessness. The high rate of unemployment in the country could be attributed to lack of skills and competence required in the world of work. Lack of skill is a handicap to employment in worthwhile occupations. Only people with considerable knowledge, skills and capacity to adapt to changing needs of the society could get into global job market. The resultant effect of miseducation is that there is a surplus of man power in some disciplines while there is shortage in some. For instance there is scarcity of high and middle level manpower in science and technology related fields while there is surplus in arts and humanities. Farming used to be the predominant occupation in Nigeria, however a lot of Nigerian youth now feeling "too educated" to go back to agriculture and rural occupations even though the formal sector cannot generate enough employment opportunities to absorb all of them. The outcome of this is mass migration of youth to towns and cities in search of modern patterns of living which is not available since the demand of the economy is that of people with particular education, training and experiences. It is these youth that constitute social menace. STM education provides saleable skills with which to survive in the face of unemployment. It provides skills that are career-oriented and connected to life outside the school. With diminishing opportunities for wage employment, STM education could provide individual with the necessary training for establishing small and medium size businesses for self-employment and employment of others. With this income is generated and wealth is created for meeting personal needs and fulfillment of social obligations. Among the tenants of sustainable development in any society is food security. Food security involves the cultivation and production of enough food to ensure self-sufficiency. STM provides scientific and technological knowledge for food abundance. Through intensive mechanization of agriculture, irrigation farming, large scale livestock farming etc. potential arable land could be increased, improved varieties of high yielding crops could be produced and cross-breeding of animals could lead to abundance of food and good nutrition level in the country. All these could be possible only where there is a science and technology literate society. With a well-articulated science and technology education local farmers could be taught fundamentals of basic science and technology as they relate to agricultural practice, agricultural extension workers and food technologists have an important role to play in this direction. With improvement in agriculture rural-urban migration could be reduced thereby increasing the number of food producers rather than food consumers because over consumption of resources can seriously impair the economy and the living condition of people.

The economic wealth of any nation depends on the well-being of its citizens. People must be physically and mentally fit to carry out economic development activities. STM education produces competent medical and other health-related professionals for good health and national development. The nation's economy depends on crude oil production; however there is scarcity of high and middle level manpower in the field of petroleum technology. A well-articulated STM education would provide the required manpower because it turns out

graduates with the required intellectual skills, social and interpersonal skills needed to function as engineers, technologists and other professions in the petroleum industry. STM education also provides scientific and technological knowledge required in solving environmental problems such as erosion, flooding, pollution, human population dynamics, management of natural resources, oil spillage, indiscriminate dumping of refuse, bush burning etc. That means STM has solution to all human problems. Thus the problem of low level economic development and the resultant human insecurity could be solved when Nigerian youth are prepared and empowered by giving prominence to science, technology and mathematics education.

III. Conclusion

The paper concludes that a functional Science, Technology and Mathematics Education would promote human security and enhance sustainable development of the society. This is because a strong and functional STM Education has the potentials for income generation and wealth creation with which unemployment and poverty could be eradicated.

IV. Recommendations

4.1 To improve human security and ensure sustainable development of the society, the following recommendations are put forward.

1. Society functions in peace. When people are not able to satisfy their urges, cravings, desires and needs, tension is created in their minds. Government should promote the welfare of its citizens through adequate measures that guarantees access to sufficient resources and promotion of health and well-being of the citizens.
2. Peace guarantees security for all. For peace to prevail there must be mutual understanding and respect based on the ability to see from the perspectives of other people, respect and valuing others and an appreciation of the independence of other people within the society. Nigerians should understanding the need for unity in diversity and the need for peaceful co-existence.
3. For Human security to exist, basic social protection must be provided. At present social services are not functioning well in Nigeria government should put on ground a strong mechanism that discourage insurgences and tackle the causes of such insurgences.
4. Education system should provide individuals with opportunity to acquire skills and expertise with which to operate in the complex culture of modern world. In the globalized world of today science has become a social factor. It is a fulcrum which every other activity revolves around. Resolution of societal problems is not possible without a strong STM education programme.
5. Education is an investment that pay dividend in economic growth and sustainable development. The writers are of the view that Nigerian government should invest adequately in STM education. This is because through application of STM natural resources of the nation could be transformed into goods and services for better quality of life of all citizens and enhanced human security.
6. As Nigerian government struggles to overcome corruption and other social vices, there is need to make STM education strong and viable Nigerian youth could be empowered through a strong and viable STM education. Through an enriched STM curriculum skills for agriculture, biotechnology, vulcanization, rubber and skin tanning, soap making etc. problems of unemployment and poverty could be curtailed.

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