



Science Teachers Association of Nigeria

STEM EDUCATION AND GLOBAL ECONOMIC CRISIS



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Nsikak-Abasi Udofia
Editor

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PAPER 19

SCIENCE TECHNOLOGY AND MATHEMATICS EDUCATION: THE PANACEA FOR ECONOMIC MELTDOWN IN NIGERIA

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Abstract

The introduction of Science, Technology and Mathematics Education was to inculcate scientific literacy and skill for social, political and economic development. The present global problem of financial crisis calls for radical teaching/learning of Science, Technology and Mathematics education. This paper discusses the causes of economic meltdown in Nigeria and the possible steps to be taken using science technology and mathematics education as a potent tool.

Introduction

Science, Technology and Mathematics Education is the cornerstone of the development of any country. Science is the basis of technology and mathematics which promote skills and creativity to solve various problems. According to Eshiet (1993), the beginning of STM education could be as old as the beginning of human race arising from the need of man to solve problems threatening his survival. Scientific literacy is defined as the recognition, understanding and application of scientific principles and concepts to real life situation both at personal and societal level (Dass, 1999).

Consequently, Science, Technology and Mathematics Education play a critical role in providing knowledge, skills and technology advancement for social and economic development. It is very certain that meaningful teaching and learning of science courses will reduce poverty, promote productivity and increase economy of a nation. Accel-Team (2008) define productivity as the ratio of how well an individual convert input resources such as time, skills, materials and knowledge into goods and services. Hence, STM can be used to develop students' capacity, critical thinking, inquiry and reflective skills that will enable them to understand and practically apply the knowledge to solving problems such as economic recession.

The impacts of Science, Technology and Mathematics Education to national development is felt in several ways as it provides humanity with knowledge about the environment; attitudes and values for social living, knowledge and skills to explore and transform resources; change in quality of life and improvement in economy. Therefore, this paper examines the causes of economic meltdown in Nigeria and the role of STEM in solving this problem.

Objectives of Science, Technology and Mathematics Education

The overall objectives of Science, Technology and Mathematics Education at the basic level aim at providing knowledge, skills and capacity building for self reliance. The goals for Nigerian tertiary education as stated in national Policy (2006) include to

- a. Develop the intellectual capability of individuals to understand and appreciate their local and external environment.

- b. Acquire both physical and intellectual skills which will enable individuals to be self reliant and useful members of the society.
- c. Contribute to national development through high level and relevant manpower training.

These objectives if committed and appropriately implemented will result in

- a. Increase productivity through exploitation and exploration of resources
- b. Reduce poverty rate through production of improved products and services.
- c. Improve skills for farming and trading through the use of modern technology.
- d. Increase high level national manpower that will enhance economic growth.
- e. Develop skills and knowledge and application of acquired knowledge.
- f. Increase integrity and social value that will result in stable environment for business to thrive.

More so, when the youths are provided with knowledge, positive attitude and skills through quality basic and higher STM education, the learners become intellectually empowered and technologically driven to create the right environment for revenue generation and manage effectively the available resources for economic growth.

STEM and Economic Meltdown

Importantly, challenging changes had taken place in the world which makes it imperative that science education be proactively taught to the teeming youths in Nigeria. One of such changes is economic meltdown which became headline news in Nigerian dailies in the past one year. This global problem of financial crisis has seriously threatened the financial system of nations including the world power such as United States of America. Though the crisis might happen in a very short time, the recovery period of economic expansion is usually very slow.

Foster (2000) define economic meltdown as a failed system which increasingly exhibits a fatal contradiction between reality and reason as it threatens human welfare and other forms of life. Similarly, economic meltdown is a down turn in a nation's economic expansion. It is a depression in finance with great outflow but low inflow of money into the system (<http://wikianswers.com/causes of economic meltdown in Nigeria>). Nigeria total dependent on oil for internal and external revenue is a well known fact.

According to Akpan (2008), Nigeria total dependent on oil sector accounts for 95 percent of foreign exchange earnings and about 80 percent of budgetary revenue. Corroborating the above statement, the former Governor of CBN, Professor Soludo, on 18th March, 2009 while addressing a special briefing of Federal Executive Council said "Nigeria depends on more than 95 percent of its foreign exchange on oil and the price has crashed to the extent that from July, 2008, the outflow of foreign exchange outstripped the inflows" (<http://wikianswer.com/causes of economic meltdown in Nigeria>).

The implications of this crisis are that there is shortage of money flowing into the government and individual account for use in development. The poverty rate has risen and many industries close down due to high tariff on importation of machines. Many banks went bankrupt resulting in many people being sent back to the labour market. Thus, there is general set back in development with increased fear for the future.

Since education is meant for empowerment and development, it implies that science, technology and mathematics education are closely linked to economic development of any nation. Akpan (2008) opined that science education is a key driver of economic development of any country and maintained that the ability to harness the potentialities of scientific and technical knowledge is a major source of competitive advantage, wealth creation and improvement in quality of life.

Succinctly, Iriajen (2004) said the wealth of a nation is no longer a function of its natural resource endowments, but the strength and quality of its workforce. This means that capacity building to produce quality human resources who will turn out as future planners and managers of nation's economy can be achieved through effective teaching and learning of science. It would be right, therefore, to say that science, technology and mathematics education has a crucial role to play in empowering and sustaining skills development to cope with challenges such as global economic recession. It also means that different levels of education especially secondary and tertiary institutions, as a matter of absolute necessity, have to equip the learners with appropriate and sustained knowledge, skills and competency to manage available resources as well as generate revenue.

Causes of Economic Meltdown

The understanding of the causes of this present economic recession is very relevant in order to plan towards effective economic recovery. This makes it more peculiar in the case of Nigeria as a developing country. In Nigeria, the causes considered in this study are

1. **Mismanagement of Resources:** Nigeria has in abundant both material and human resources. Unfortunately, the resources are not channel to productivity due to high level of corruption. Omodi (2008) reported that financial mismanagement and lack of accountability by officials led to diversion of substantial resources from educational institutions to other areas. This is evidence in poor state of science facilities and low quality manpower sent out from the system. Invariably, this has resulted in low productivity and economic breakdown.
2. **Growing Population:** The society is ever changing with the population growing very rapidly. Unlike the developed countries that have a rolling plan for their nation growth, Nigeria has no serious plan for the ever growing population to take care of emergence changes such as economic recession. The high rate of poverty, poor health care services, dilapidated school facilities and unemployment resulting in social vices such as kidnapping and militancy is attest to this fact.
3. **Stakeholders are greedy:** The economy of a nation is driven from many sectors which include industrial, commercial and service providers. Unfortunately, many of these companies such as oil producing companies make billions and completely devastated the environment of the host community without adequate compensation and payment of taxes to the government. The devastation of arable land and pollution of water causes reduction in farming, increase cost of living and reduce revenue generation. This outright corporate greed exhibited by these companies contributes to the economic situation in the country.
4. **Indebtedness:** Nigeria is very rich with mineral resources and vast hectare of arable land for agriculture. Aside from that, Nigeria generate a lot of revenue from oil and gas which if well managed, should be enough to provide essential needs to the masses. Unfortunately, Nigerian government both at Federal and State level are fond of getting loans from World Bank even in the midst of excess crude oil revenue accruing to the country. Sadly too, these loans are not use to build industries that can generate employment and reduce poverty. This weakens the economic base that results in economic depression.
5. **Overdependence on oil:** Nigeria depends greatly on oil revenue for her development. According to the former CBN Governor, Prof. Soludo, Nigeria depends on more than 95percent of its foreign exchange on oil. The almost total dependence on oil has a compounding effect on the financial system especially with the high rate of Niger-Delta militant activities of kidnapping and damaging of oil pipes. This

affects oil production and invariably reduces revenue accrued from oil that eventually results in economic depression.

6. Loss of Human Dignity: The Nigerian moral value has been thrown to the dust with outright greed exhibited by the elites who contribute to the economic depression in the country. The basic facilities like water, light, road, hospital are lacking due to poor leadership. This lack of respect for human dignity does not promote peace, respect and integrity that will promote productivity and growth in economy.

7. Rich-Poor Divide: Nigeria is a capitalist country with the rich people growing richer at the expense of the poor masses and the nation at large. The growing gap between the rich and poor in Nigeria is a serious challenge to economic growth. Experience has shown that the elite class of this country amasses wealth and some are richer than Nigeria as a nation. Most of these wealth acquired are stock away in foreign countries rather than using them to establish industries that will provide employment, reduce importation of goods and poverty rate. It is this elite group especially those in the service of the States that siphon government money meant for the development. While the elite groups are sending their children to world class institutions to acquire knowledge and skills, the poor are having it difficult to feed. This contributes to wider socio economic development of the society and thus affects the nation's economic growth.

The Panacea

The global challenges and economic crisis facing the nation can be overcome if the school leavers from secondary and tertiary institutions are empowered with knowledge, creative and problem solving skills for self reliance. Self reliance involves optimal utilization of local resources with well coordinated development of talents in production for sustainable development (Etiubon & Udofia, 2009).

Given the functions of science education in building and sustaining a strong economic growth, effective and committed implementation of STEM programmes can make an intrinsic growth in nation's economy. Economic recovery can be achieved if potent strategies are taken as follows

- 1. Effective and consistent implementation of the science curriculum:** Science teaching should focus more on practical acquisition of entrepreneurial skills that will enhance wealth creation, poverty alleviation and employment. This will surely reduce the capital flight incurred on importation of goods. Effective teaching and learning of science will promote productivity, create employment and eradicate poverty and promote rapid economic growth.
- 2. Utilization of Resources:** Science and technology by its nature has to do with utilization of both human and material resources for sustainable development. Nigeria is blessed with a lot of mineral resources and arable farmland. Though Nigerians have great passion for imported goods, however, science should produce creative and skilled individuals who should be able to transform the available raw materials into new and improved goods for domestic use as well as for export.
- 3. Make Science Teaching more proactive:** A radical change in teaching/learning science to match with the present condition should be the focus. There are several teaching strategies such as inquiry, laboratory, project or activity and problem solving which promote hands-on-minds on activities. Teachers are catalysts that accelerate or retard the progress and achievement of educational goal. Hence, teachers should aim at integrating thinking, creative and practical application of scientific knowledge to boost productivity and revenue generation.
- 4. Use of Advance Technology:** The utilization of modern technology and ICT facilities in teaching brings about successful development of entrepreneurial skills. The modern science teaching

demands that modern machines be used in teaching science to enhance skill acquisition for self reliance. Prices of food commodities are increasing on daily basis because the output has been on the decline mostly due to increase in cost of production. Many farmers should be sensitized scientifically to use modern production and processing technologies in farming for improved and increased production of goods. The effective teaching and learning of science using modern technology will not only provide more food but also improve economic growth as performance in agriculture is a strong predictor of economic stability.

- 5. Promote Peaceful Co-existence:** The STM education should be used to promote peaceful coexistence and respect for human rights for social and economic development. The modern science teacher should inculcate right values for peaceful coexistence among learners and increase opportunities for learner-learner and teacher-learner interaction with some real life problems. Link school science activities to community problems with explicit and appropriate reference to how to solve social, political and economic crisis.

Conclusion

The role of Science, Technology and Mathematics Education in the growth and development of any nation cannot be over emphasized. The problem of economic recession in Nigeria demands that STEM become increasingly involved in capacity building of individuals to effectively cope with the challenges. This implies that STM education be effectively taught with greater focus on utilization of available raw materials especially in the agricultural sector to produce quality goods for local consumption and export to generate revenue, effective management of resources, development of techniques and knowledge for solving problems. STEM can be used to build attitude, value, respect for life and justice. Since the society is ever changing, teaching STEM to students has a huge potential in enhancing economic development as well as coping with the present economic meltdown.

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