



CURRICULUM INNOVATION IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) THROUGH MILLENNIUM DEVELOPMENT GOALS (MDGS) PROGRAMME IN NIGERIA

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ABSTRACT

Curriculum innovation contents of STEM for MDGS in education offering have never been certain in Nigeria. as a result, innovation in instructional delivery in this enviable STEM has always been mixed up with contents of general education in a greater proportion. These happen because, Nigerian professional in STEM education appear not to know what they want and what STEM education should offer for human empowerment and economic development. The objective of this paper is to determine the specific curriculum innovation and content in STEM through MDGS programme. The modest suitable system studies for the realization of curriculum content of STEM through MDGS programme are also proffered. Some issues that might implicate curriculum innovation reform in STEM through MDGS education are pertinently raised.

KEYWORDS: curriculum, Development goal, Programme, Innovation, Science and Technology.

INTRODUCTION

Advancement in Science, Technology, Engineering and Mathematics (STEM) has played indispensable roles in shaping the economic realities of the society in Nigeria. Past individual and government failed attempts at solving global socio-economic problems perhaps led to the worldwide collaborative efforts aimed at tackling human problems, through the millennium development goals (MDGS) programme. After the analysis of the massive disappointments, failures and colossal wastes of nations past attempts at ameliorating global socio-economic woes and decadence, it perhaps, obviously, became clear, to the international community that more effective meaningful, and sustainable results would only come from well articulated curriculum content in STEM. In fact, synergistic approach, rather than the hitherto individualistic and factionalized method in curriculum contents is both cost effective as well as more productive.

Curriculum

Odunsui (1999) and Iji (2008), opined that the quality of education in any system and at any level is dependent on the quality of curriculum. Curriculum is defined as a planned and guided learning experiences and intended learning outcomes formulated through the systematic reconstruction of knowledge and experiences under the auspices of the institution for the learners continuous and wistful growth in personal and social competence (Onwuka, 1981). Curriculums in education are not to be handled with levity. It serves as a point on which challenges such as economic, political, social and educational development of a nation hinge.

Science, Technology, Engineering and Mathematics curriculum in high institution including what is taught at post-graduate education classes may have become static,

and the teaching and learning of STEM in classrooms are lacking in contents which are benefited to generality of the student population and the immediate community. Afe (2006) in Orukotan (2007) was of the view that curriculum enrichment is a daunting task that needs radical approaches to the development of desired inputs for a qualitative education programme specially innovation in the areas of improving teaching and learning, curriculum content, organization, material, development, teacher community linkages and diversification of educational opportunities.

Innovation

Innovation means a new way of doing something. It is incremental, radical and revolutionary changes in thinking, products and processes. Innovation is the successful introduction of something new and useful. lueck and katz, (2003), defined innovation as introducing new methods, techniques or practices or new or altered products and services. Innovation in STEM is any change to accosted practice in learning and teaching whether in objectives, content or methods. To eradicate unemployment rate and lack of skills development in our youths, there is need to infuse the following innovations into high institutions STEM curriculum for entrepreneurship. Agbem (1997) noted that curriculum is dynamic because it demands changes in the light of the changing societal needs. This makes innovation an inevitable factor in STEM curriculum to keep it functional. Students are expected to acquire from the high institutions, appropriate skills and abilities to make them self-reliant after graduation and to contribute to development of the society. One of the objectives of STEM education is that the recipients should become self-reliant after graduation. It is obvious that

young school leavers are faced with unemployment because no specific skills are developed at this level.

A contributing factor to the worsening unemployment crisis is in the present curriculum of STEM which turns out graduates from all the levels of the school system without requisite skills for self-employment. The need for innovation and entrepreneurial studies in STEM curriculum is highly appropriate. The goal of innovation is a positive change geared towards making something better; i.e. it has to do with improvement upon what has been existing previously.

In this paper, innovation in STEM education deals with the introduction of knowledge, acquisition of skills and capabilities that will lead into self sustaining ventures (entrepreneurship).

Entrepreneurship in STEM

Developing Entrepreneurial skills through science, Technology, Engineering, Mathematics Education, Information and communication Technology (ICT), leads to graduates employability, thinkers who have the technological skills, ability, capacity and necessary tools, starting with electronics Micro scale, through medium scale to a large scale industrial enterprises are the goals of innovation in STEM education curriculum. The Authors are of the opinion that the following programmes such as vocational Agriculture, Agro- technology, Building, Woodwork technology, Computer technology, Electrical technology, Electronics technology, Mechanical technology are expected to be 60% practical and 40% theoretical. The engineering aspect of the programmes should be 50% practical and 50% theoretical.

The greater proportion, of practical activities requires the high-quality skills for one to demonstrate competence in ones area of specialization. Hence, greater emphasis should be placed on competence and employable skills that are related to the demands of the labour market. Mayer (2000), noted that when people acquire skills, in the above programme, it will make them more adaptable to the society. This implies that without skills acquired by Nigerian youths, the country would continue to be trailing along the periphery of technological know-how without efficiency.

Thus, a well organized education system in STEM programme that can produce skilled labour force can help to attract global, financial capital to this country Nigeria. UNESCO (2003), recommended that activities in the laboratory or workshop should be linked to mathematical and scientific foundations and conversely technological theory as well as the mathematics and science underling the theory should be illustrated through their practical applications.

International labour organization (ILO) (2004) admitted that skills development should be a coherent and integrated part of comprehensive economic, social policies and programmes that promote economic and employability growth. In this awareness, it will be of great advantages to the country's economic growth, if most of the education courses currently forming the greater proportion in curriculum innovation in STEM education are modified to suit the objectives of STEM for employability, self-reliant and self-employments. Since

technology is also understood to be a means of preparing for occupational field and for effective participation in the world of work, it is then pertinent that programmes in STEM education should be based on curriculum innovation designed around core knowledge, competencies and skills as well as on the economics aspects of the occupational fields as a whole.

STEM Through Millennium Development Goals

The Millennium Development Goals (MDGS) cannot, from all indications be an aftermath of after-thought; somewhat the need would have arisen following some critical global self examination. After the analysis of the massive disappointments, failures and colossal wastes of nation's past attempts at ameliorating global socio-economic woes and decadence, it perhaps obviously become clear to the international community that more effective, meaningful and sustainable results would only come from concerted, dedicated and in fact synergistic approach, rather than the hitherto individualistic and meaningless efforts.

There is therefore no better platform through which such comprehensive and laudable STEM programmes can be pursued than through the Millennium Development Goals (MDGS) programme.

The MDGS a global policy initiative is aimed at aggressively tackling a wide range of Socio-economic issues and problems, enhancing human capacity and increasing environmental sustainability. Information and communication technology is defined as hardware, software, networks, media for collection, storage, processing, transmission and presentation of information.

Nwabueze (2005:1) echoes this view: information and Communication is indispensable in any human activity, the mass Media are very vital to the Mobilization of a large, heterogeneous people for any Activity of interest to them and the society at large. Application of ICT to the MDGS has been widely established that the economic development of a Nation can be accelerated by improvements in a country's ICT infrastructure. ICT can therefore provide the veritable platform for development across economic and other sectors if well harnessed (the united Nations Declaration 2000)

Consequently, the need for the full realization of the targets of the STEM aspects of the MDGS, raises the challenges of well-planned, designed, focused, effectively and strategically packaged curriculum as a vehicle for communication approved and signed by member countries of the UN. The STEM related embodiments of the MDGS programme are expected to be achieved between a period of 15 years (1990-2015), so as to combat the serious socio-economic matters particularly social issues and problems facing the globe. According to Nwosu and Nkeamnebe (2006), NPC (2004: and EBSPC 2006), the entire MDGS packages are translated into NEEDS, SEEDS and LEEDS. NEEDS, SEEDS and LEEDS extend the implementation of the MDGS to the grassroots, alleviate poverty, generate employment and wealth and ensure good governance. There are revolutionary targets whose achievement is bound to globally among others, combat ignorance, superstition, poverty, diseases and inequality.

The media contribute to development everywhere. However, the expectation of their roles to the development of the emerging world seems to be more pronounced, seemingly due to the peculiar situation obtainable. The theory, a generic of the Normatic model, which postulates that the government and the media jointly champion the cause of development through partnership, explains the scenario most noticeable in Africa, Asia, Latin America and Eastern Europe..

In the words of Baran (1999), this theory postulates that the government and the media jointly champion the cause of development through partnership.

Development is seen as a collective responsibility between the two, and media content must “meet specific cultural and societal needs.... “Thereby satisfying the development aspirations of the people, in the areas of STEM such as is the focus here, agriculture, education, economy, politics, science and technology, military to name but a few.

STEM Aspects of the Millennium Development Goals is a crucial agenda in a developing nation like Nigeria.

A number of factors have placed the world on serious STEM risks requiring collective attention. Some of these factors and challenges include:

1. The increasing high level of poverty and leanness of resources in most countries as substantial percentage (about 70%) of global wealth is in the hand of few rich, industrialized and developed nation, to the detriment of the majority.
2. The individual tackling of some of these STEM problems amount to wastage and dissipation of energy and scarce resource. The answer therefore is collective approach.
3. The failure of past attempt to individually manage these problems which amounted to fiasco and disappointment.
4. The ever interdependentness of the global community making imperative the closeness and synergistic collaboration of all nations, if these common problems can be effectively and conveniently resolved.
5. The sudden realization by the industrialized and developed nations that in their quest to handle certain global threats, they cannot go it alone, but somewhat must covert the partnership of smaller countries. The global onslaught on terrorism and the global united approach against it is a case in point.
6. The recent and seemingly uncontrollable and heightened environmental hazards occasioned by sudden climatic changes resulting from global warming. Part of the aftermaths is upsurge in diseases and natural disasters. No nation can fight these alone.

The result is the Millennium Development Goals (MDGS). Set to be achieved between 1990 and 2015, this has received the approval of the UN General Assembly and the subsequent of member nation, (UNDP, 2000)

CONCLUSION AND RECOMMENDATIONS

The aim of every Nigerian who goes to school is to participate effectively in the society after graduation. This dream may not be realistic if the needed skills for full and effective participation are lacking.

STEM programme provides the opportunities for enabling individuals to develop and improve on their skills necessary for entrepreneurial expressions which permit them to participate fully in the scheme of affairs in their society. However, education in STEM is capital intensive. The Millennium Development Goals generally have been widely accepted as perhaps, the first ever most serious global commitment to achieving the sustainable well being of the majority of people in the world. It is a strong instrument for an attempted effort to evenly redistribute global wealth, thereby narrowing the gulf between the haves and the have-nots

In the area of STEM the policy initiative is an unequalled and innovative measure to compel governments to muster the courage and political will to give due attention to this critical sector- such gingered commitment shifts from governments to this vital sphere.

With the Millennium Development Goals and the STEM related aspects direct effects future global socio-economic fortunes, the world is assured as a habitable place for mankind.

A professional process which partly involves the application of diverse and dynamic skills, techniques, strategies and communication is the most essential tool for the effective harnessing of the vital interest groups that must ensure the attainment of the targets contained in the STEM-related aspects of the Millennium Development Goals.

Achieving these goals go a great extent, relies on the effective marketing of the entire programme, arousing the commitment of all the partners at all levels and mobilizing the essential resources.

Integration of innovation in STEM Programme curriculum background will enhance professional diversification because, students and STEM providers alike will have avenue to be exposed more in the science and mathematics which lead to improvement in technology and engineering principles needed for specialization. Therefore, the education sources that are not related to technology and engineering principles and application necessary for effective participation in the world of work should not form part of curriculum offerings for technology and engineering programmes contents.

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