
Developing Entrepreneurial Skills Through Functional Science and Technology Education in Nigeria

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Abstract

This paper discusses the relevance of entrepreneurship in Science and Technology Education. It is an undisputable fact that the major strategy for social progress if well utilized is functional education which in turn heavily lies on the impact of Science and Technology programme. It therefore requires that teachers must be adequately and effectively prepared with professional and entrepreneurial skills to reduce high level of poverty in the society and enhance socio-economic, political and technological development of the Nigerian society. The paper concluded with recommendations demanding the government to replace outdated equipment at various tertiary institutions as that would enhance the growth of entrepreneurial acquisition through Science and Technology Education programme in Nigeria.

Introduction

The latter half of the 21st century will be remembered as the beginning of the information age. It is also the era of phenomenal explosion of interest in entrepreneurship. Entrepreneurship is the force that drives and fuels the Information Technology (IT) revolution. Entrepreneurship has become a global phenomenon. All across the globe, in rich and poor countries, governments are integrating entrepreneurship and small enterprise development into their economic strategies.

The new educational reforms in Nigeria (2000) encourage science education with the view of equipping graduates with marketable skills to enable them set up their own businesses and employ others. Science and Technology is a skill oriented course that can help equip individuals with needed for self reliance. According to Njoku and Anyakoha (1997), if students are equipped with skills, but have no entrepreneurial education they will not be able to market the products they produce and will still not be self reliant. Therefore, there is need to educate them to successfully set up their businesses.

Baiden (1994) observed that there is growing rate of unemployment among the educated in the formal education sector because growths in job openings have not kept pace with the number of new entrants into the labour market for the educated. Science appears to deal with some aspects of entrepreneurship education. Entrepreneurship Education is the teaching of entrepreneurial skills like competitiveness, risk taking and self confidence. Even with science and technology, the amount of time and energy devoted to entrepreneurship education is very limited. It is always at the discretion of the individual teacher.

Aluwong (2004) posits that the integration of entrepreneurship education into science and technology curriculum will prepare students to enter the labour market in the small-business sector or even to inspire, these burgeoning entrepreneurs to start their own business. Othman (2003), state that, Malaysia recognizes youth as the agents of change who are supposed to be receptive to grow new ideas, adoption of technologies and are willing to make changes, to harness the potential of the younger generation.

Even though there is government policy on medium and small enterprises to promote activities of entrepreneurship, there is little evidence that the average science student would have adequate preparation in entrepreneurship education so that they can successfully market the practical skills acquired to make a living. One way of creating an effective entrepreneurship education programme is to allot the task of starting up the development to one specific disciplinary area.

Entrepreneurship: Conception View

The term entrepreneurship can be defined according to Olosun (1987) cited in Tijjani (2009), as a task taking, innovative individual who establishes and manages a business for the purpose of profit and growth. In the view of Oshagbemi (1983) also cited in Tijjani, entrepreneurship is seen as the willingness and ability of an individual to seek investment opportunities, establish and run an enterprise successfully. Emeka, (2004) identified an entrepreneur as a man or woman who creates ventures from raw materials of their own ideas and hard work. The entrepreneur therefore bears all the risk and direct all human and material resources involved in the business. The entrepreneur

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has some expected functions in the running of the business. These have been summarized by Ehad and Kazeem (2006) as follows:

- 1) He is the initiator of the idea of a business.
- 2) Determines consumer need and want.
- 3) Organizes the resources (human and materials).
- 4) Bears all the risks.
- 5) Makes all decisions relative to profit, cost benefit and size of the business.

If the entrepreneur is acquainted with the above functions, he will be successful in his business organization. From the foregoing, entrepreneurship is perceived as a process of managing business either in small or large scale. The aim of entrepreneurship is profit making in any business decision he or she takes.

Science: there are lots of misconceptions on the body of knowledge called science. From its linguistic origin, “science” is derived from the Latin word “scientia” which means “knowledge” Eneh, (2000) in the simplest term, defined Science as the knowledge of the world of nature.

Mapaderun (1998) on the other hand defined science from its sociological point of view as an intellectual activity through which man seeks to understand nature. Ogunniyi (2003) sees science as an attempt to understand by human beings to organize their experiences about nature into meaningful systems of explanations.

Abdullahi (2004) defined it as activities culminating into a testable, falsifiable and verifiable body of knowledge. However, selecting anyone of these definitions of science would be inadequate and misleading; therefore we can look at science as an enterprise participated in by human beings, concerned with the study and parsimonious explanation of the materials and forces of nature. Science employs a variety of techniques, is motivated by a desire to know, assumes orderliness in nature, is governed by understandable and acceptable ethical principles and terminates incredible concepts in the form of descriptive, comparative and quantitative concepts.

Technology: can be defined according to Oxford Advanced Learner’s Dictionary as scientific knowledge used in practical ways in small scale industry, for example in designing new machines.

Oguniye, (1999) in the same vein defined technology as the application of scientific knowledge and research to solve problems of life in the society, thereby making life more comfortable to human beings. Technology is not a body of theoretical related laws and principles. It is characterized by techniques, devices, procedures, processes and materials. It is more of a collection of practical information that can be used to do something. It affords man to interact more effectively with the environment and become self reliant in the society.

International Journal of Research & Development

In spite of the seeming differences between science and technology, they are ultimately linked or symbiotic. This is because technology will be crippled and blinded if not for the new knowledge which science provides it. Science on the other hand, will not progress much, if technology does not supply it with new instruments, new techniques and new powers. The driving force in science is curiosity while that of technology is know-how.

Impact of Science and Technology in the Society

In the last three decades or so, tremendous achievements have been recorded in the area of science and technology development in the world. Modern inventions and discoveries have cumulatively helped to improve man's progress in health, happiness and productivity (Eneh, 2000).

Science and technology have gone a long way in turning deserts into arable lands. Wheat and barley, which hitherto were foreign to us, now thrive in northern part of Nigeria, crude oil, which used to be refined abroad, is now being refined in the country. In the realms of biological science, there has been increase in food production, antibiotics and other pain relieving drugs to treat various diseases and ailments.

Space science has gone a long way in reducing the distance between the earth and other planets. Man has successfully transported himself against the force of gravity to other planets and he has also landed on the moon. Communication between a state capital and the remotest village in Nigeria can be achieved within seconds. Through satellites, one is given the opportunity to see and hear reports of events while a single transmission or broadcast can reach a whole hemisphere of the earth. Computers of various brands and sizes can be used to process large amount of information within few seconds.

Electricity helps to illuminate our environment, cook food and drive our ploughing machines; tractors and harvesters have tremendously increased crop yields in recent time. Genetic engineering, development of hybrids has increased agricultural productivity through development of new breeds of crops and animals. All these and many more are examples of the product of technology.

It is interesting to note that before each of these products were developed; a significant scientific discovery had been made. Each of these examples demonstrates a symbolic relationship between science and technology (Popper, 2003).

Objectives of Science and Technology Education in Nigeria

Nwala (2001), submits that science and technology education is a field of study concerned with producing a scientifically literate society. Also, it lays the foundation for future work in science and science related fields by acquainting the students with certain basic knowledge, skills and attitudes.

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Science education is the bedrock upon which scientific and technological development depends. It is believed by most educators that the giant strides made by the developed countries such as Japan, United States (US), Germany and Britain are not unconnected with the type of science education available in these countries. Nigeria as a late starter in science education may not have achieved like some of the developed nations of the world. Nigeria's entry into scientific and technological pursuit is not an accident but as a result of a well planned science education programme. The policies that shaped Nigerian science and technology curriculum point to a well thought science education objectives. These are:-

- 1) Observe and explore the environment.
- 2) Develop basic science process skills, including observing, manipulating, classifying, communicating, inferring, hypothesizing, interpreting data and formulating models.
- 3) Develop functional knowledge of science concepts and principles.
- 4) Explain simple and complex natural phenomena.
- 5) Develop a scientific attitude including curiosity, critical reflection and objectivity.
- 6) Apply the skills and knowledge aimed through science to solving everyday problems.
- 7) Develop self confidence and self-reliance through problem solving activities in science.
- 8) Develop a functional awareness of and sensitivity to the orderliness and beauty in nature.

Entrepreneurship in Science and Technology Education in Nigeria

Having clarified the conceptual frame work of entrepreneurship and science and technology education, it is worthy of understanding that entrepreneurship has multi-dimensional approach to science and technology education. It is the provision of both entrepreneurial skills and professional skills to make the would-be-scientists create jobs in the event of scarcity of public jobs. Entrepreneurship education is limited to only practical oriented disciplines like Technology, Home Economics, Fine Arts, and others. It is applicable to other fields of studies in science education programme. Therefore, entrepreneurship curriculum should be introduced as a general course in Colleges of Education and other teacher training institutions. The curriculum should possess sufficient contents, methodologies, instructional materials and evaluative techniques. This approach, without any doubt, would give the students opportunities to master certain skills that would make them self-employed after graduation. Since metal work, building, wood work, automobile, electrical and electronics are taught in technical departments of various Colleges of Education and Polytechnics, the rudiments skills needed for self-employment in these fields should be inculcated into the students. This is achievable through exposing students to sufficient and effective practical works. This would help in no small way in poverty reduction and overdependence on government for job creation. Practical knowledge in food and nutrition, clothing, tie and dying should be taught effectively to the students of Home Economics department.

~~This would make them active contributors to socio-economic growth of Nigeria as a democratic nation. To achieve this therefore, government must show genuine support to education financially and materially.~~

Professional skills as a form of entrepreneurship refers to the acquisition of worth-while knowledge, skills, attitudes, and values needed to become successful professional scientists who are adequately prepared with the principles and practices of science education. This therefore, may lead to the establishment of schools to satisfy the aspirations of their immediate communities thereby contributing to the technological development of the areas instead of allowing the untrained, unprofessional and quack individuals to dominate the industry. Moreover, the idea or rationale behind entrepreneurship in science and technology education programme stemmed essentially from the under-listed considerations;

- 1) The need to meet the societal demands for technological advancement.
- 2) The need for economic empowerment and poverty reduction.
- 3) The need for accelerated national growth and development.

Commenting on the failure of higher education system to produce enterprising graduates, Ayodele (2007) lamented that “the system is accepted to be dysfunctional. If it were to be functional, graduates would be adequately prepared with right attitudes; sufficient knowledge and skills to create jobs when they could not get public employment”.

Therefore, entrepreneurship in science and technology education will lead to the production of quality, skilful oriented citizens who can withstand the challenges of a modern world. In a nutshell, effective entrepreneurship in science and technology education in Nigeria would ensure the following;

- 1) Preparation of the skilful and oriented person to be a responsible citizen.
- 2) Through entrepreneurship education, teaching-learning process would emphasize development of favourable skills and competencies useful in real life situations.
- 3) Inculcation of creativity and critical thinking into the students. This will help them on a daily basis as they struggle for economic survival.
- 4) It would not only create job opportunities for scientist in training but also, for other members of their immediate communities.

Conclusion

In view of the importance of entrepreneurship through functional science and technology education programme, it is imperative for government to be committed and give adequate value re-orientation to science and technology education preparation. Thus, the incorporation of entrepreneurship would make science and technology education programme more valuable to be used as a veritable instrument for socio-economic and political development. This would give Nigeria opportunities to cope with the challenges of globalization.

Recommendations

The following recommendations are put forward for consideration:-

- 1) Adequate funding of the educational sector and science and technology education programme in particular is highly needed in these noble tasks. Therefore, Nigerian government should comply with the UNESCO declaration of 26% of budgetary allocation to educational sector.
- 2) Provisions of loan facilities to the graduate of science and technology education to enable them establish business ventures of their choices. This will assist them immensely to reduce the level of poverty in the society.
- 3) Adequate and well equipped infrastructure at the various institutions of higher learning.
- 4) Replacement of out-dated equipment at the various technical and science departments of the Colleges of Education as well as in the Universities and Polytechnics respectively.

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