Entrepreneurial Potential of Science Education Curriculum: A Panacea For Graduate Self-Employment in Nigeria

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Abstract

This paper focused on the potential of science education curriculum as a panacea for graduate self-employment in Nigeria. Entrepreneurship Education (EE) has emerged and been included into Nigerian Universities Curriculum as potent instrument for economic growth as experienced in other parts of the world. There are however, entrepreneurial skills inherent in the science education curriculum which this paper seeks to highlight that have lots of prospects for self-employment. While it cannot be argued that the introduction of entrepreneurship education can help students' acquire skills for developing small business ventures, science education students can conveniently develop entrepreneurship from the effective coverage of science curricula. Even though there are critical challenges that could mitigate the actualization of such entrepreneurs, there are however a lot of prospects in the science education curricula. This paper recommends amongst others that: the teaching of science education should be more practically oriented than emphasizing theoretical constructs that students memorize and cannot be turned into business enterprises for poverty alleviation and economic development of Nigeria.

Keywords: Entrepreneurship Education; Science Education Curriculum; Graduate; Self-employment

Introduction

The aspiration of almost every Nigerian University graduate is to earn a white collar job after completion of his or her study and one year compulsory National Youth Service Corp (NYSC). This mind-set of obtaining a white collar job is deeply rooted in the colonial education system bequeathed to this nation by the British colonial masters (Mustapha, 2013). The National Policy on Education (FGN, 1976; 1981 & 2004) emphasizes that; every individual should be self reliant amongst other objectives. It is hoped that, a graduate who has passed through all the levels of education should have acquired skills and competencies necessary to be self reliant. Akindutire (2004) lamented that the problem of graduate unemployment is a reality in Nigeria where graduates had to wait for upwards of five years to get a job in the public service. It has become usual for graduates to be subjected to competitive examination before appointment in a formal sector. However, the reality is that, Nigerian education system produces graduates that are more theoretical and academic in orientation with little or no skill for vocational or entrepreneurial relevance (Olorundare & Kayode, 2012).

The goal of any nation is for her citizenry to have economic empowerment. The way to actualize this dream is for her graduates to have entrepreneurial competencies derived from knowledge gained from areas of specializations to create small business enterprises or gain alternative employment opportunities. Gone is the era where graduates remain unemployed for several years with no knowledge of available alternatives (Ifedili & Ofoegbu, 2011). In an effort to equip these individuals, government introduced Entrepreneurship Education (EE) which is infused into University curriculum as a core and compulsory course. Mustapha (2013) highlighted the different perspectives to entrepreneurship education as identified by Obioma (2011) as;

a) Entrepreneurship as a general course: to raise the level of awareness of students to self-employment opportunities and entrepreneurial attitudes
b) Entrepreneurship as academic discipline: as the realm of real business in order to explore the potentials within a specific area of specialty
c) Entrepreneurship training: as a means to creating business plans. This are basically business designs, management skills, funding and resource management
d) Entrepreneurship as practical hands-on: learning by doing or practice which involves training through practical beyond theory.

The rate of unemployment in Nigeria is presently at 27.3% which is growing by 16% annually. Globally, unemployment rate is projected at 12.7% in 2012. Government had to promote entrepreneurship education as viable alternative for acquisition of productive skills for world of work. It is this view that encouraged Nigerian government to accept the National Economic Empowerment Development Strategy (NEEDS) in May 2004 which has the following goals; wealth creation; poverty reduction, employment generation and value re-orientation. Tertiary institutions were mandated to incorporate entrepreneurship education into its curriculum of study. This should be seen as laudable efforts towards producing innovative and creative individuals who will become entrepreneurs taking advantage of the areas of specializations to develop micro-economic centres and small scale business entities that will become the hub of economic activities, wealth creation and value re-orientation.

The Concept of Entrepreneurship Education

Entrepreneurship education when viewed from the typical Nigerian cultural setting refers to education and teaching given both in school and in the surrounding society. Using this framework, students, youths and artisans will progressively acquire educational experiences that will enable them develop insight needed to discover and create entrepreneurial opportunities.

Izedonmi and Okafor (2010) have defined entrepreneurship education as developing youths with the passion and multiple skills. According to Nwagwu (2007), entrepreneurship education is willingness and ability of an individual to seek out investment opportunities in an environment and be able to establish and run an enterprise successfully based on the identified opportunities. Therefore, EE focuses on helping graduates transform ideas into reality by inculcating competences knowledge, skills and values needed to recognize business opportunities, design and organize and start-off new venture. It seeks to provide students with knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings (Maria, 2010) in Akpan; Effiong and Ele, (2012).

From the foregoing definitions of the concept of entrepreneurship education, it is clear that the essence of it is to produce graduates/individuals who will not depend on others for job and wealth creation but rather that the lead in generating self-employment opportunities for a greater economic development. Adamu (2005) has aptly summed-up the concept of EE as, learning to know; learning to do; learning to live together and learning to be. These could be realized through formal and informal educational setting.

Who is an Entrepreneur?

The word entrepreneur is a verb phrase 'entrepredre' from the French origin which means to 'undertake' a venture. Longman Dictionary of English Language and Culture defines an entrepreneur: as a person who starts a company or arranges for piece of work to be done, and takes business risks in the hope of making profit. Wushishi (2013) describe an entrepreneur as a person who evaluates business opportunities, gather necessary resources and initiate appropriate actions to ensure success. Thus; a typical entrepreneur is somebody who faces uncertainty, risk taker, devoted to his work, coordinator of factors of production,

manager of resources and creator of business environment where none probably existed before it.

Objectives of Entrepreneurship Education

Entrepreneurship education according to Paul (2005) is designed to achieve the following objectives:

- ✓ To create self-employment opportunities to teaming graduates.
- ✓ To reduces the high rate of poverty by identifying business enterprises for young graduates.
- ✓ To create smooth transition from school to modern industrial economy.
- ✓ To serve as a catalyst economic growth that will raise Gross Domestic Productivity (GDP).
- ✓ To provide the young graduate with training and support to establish small and medium size enterprises.
- ✓ To equip the graduate with skills to incubate business ideas.
- ✓ To provide knowledge that enable graduates take up business in any environment thereby reducing rural urban drift.
- ✓ To offer young graduates turn theoretical concepts into functionality for self-employment and self-reliance.
- ✓ To make youths to be creative, innovative, industrious and positive-minded in ability to identify noble business opportunities.
- ✓ To offer tertiary institution graduates with adequate training skills and abilities in risk management.

Furthermore, it is worth noting that, the purpose of entrepreneurship education lies in its focus or orientation towards the realization of job opportunities and the elimination of unemployment amongst graduates. Thus, Howkins 2001 and Scott (2003) in Akpan et al (2013) have corroborated that, what makes entrepreneurship education distinctive is its focus and orientation towards the realization of opportunities.

Entrepreneurial Nature of Science Education Curriculum and the Prospects for Self-Employment Opportunities

Science has been defined as a body of knowledge, a method of investigation and a method of reasoning in the pursuit of the understanding of nature (Mustapha, 2009). Thus, science is a process of inquiry into natures' endowment and the influence of discoveries on other forms of life. Kneller (1971) delineated the field of science into three:

I. Pure or basic science: this group includes natural sciences like; biology, chemistry, physics and mathematics. They are fundamental tools for the understanding of the universe.

II. Fundamental applied science: this group is made of fields such as; biochemistry, microbiology and medicine. They are scientific fields that combine natural sciences into a whole and put it into practical use.

III. Applied science: this involves the use of scientific knowledge to find solutions to technical problems. Some examples of applied sciences are; engineering and technology disciplines, computer science and vocational technical education.

Science education curriculum essentially encompasses all the natural science fields applied to solving human needs, thus promoting economic development. The entrepreneurial nature of science education curriculum exposes the contents of science discipline to development of business orientation. The utilization of scientific knowledge and skills for wealth generation, poverty reduction and economic empowerment underscores the importance of science to self-employment.

The essence of science education curriculum is to produce graduates that are entrepreneurially inclined to stimulate the growth of business enterprises that puts scientific processes to practical usage in creating job opportunities. Nevertheless, Arikpo (2000) argued that, the science curricula content do not contain what is required to produce graduates who would be job creators and not job seekers.

There are several content areas of the natural sciences curricular; biology, chemistry, physics, mathematics etc that have potentials for economic value and can be inclined towards job creation and self-employment. In this wise, the following content areas of sciences are so identified:

Table 1:
Thematic areas in science curriculum and entrepreneurial opportunities

Thematic/Content Area	Entrepreneurial skills and Job opportunities
Horticulture/Identification/classification of plants	Botanical garden for production of natural herbs/drugs for cure of diseases. Nursing of flowers/hedges for aesthetics purposes Mushroom production for human consumption Vegetable gardening
Vegetative Propagation Grafting/Layering and budding	Production of hybrid plants through combination of two or more quality attributes of similar plants e.g. sugar content and draught or disease resistance
Laboratory Techniques Microscopic slide materials	Vertical dissection of herbaceous plants to produce to thin-layers of plants/animals materials of; Euglena, Spirogyra, Amoeba etc for practical appreciation of plants and animal anatomy.
Animal husbandry/Poultry Keeping	Rearing of birds for meat (broilers) and egg production. Fish farming, piggery and rabbits
Zoological Gardening/Tourism/students escort ion	Rearing of wild breeds of animals like; lion, monkey, snakes, elephant, crocodile etc
Landscaping	Planting of various species of grasses, flowers, hedges and trees in homes and offices for; aesthetic purposes, creation of siren environment, supply of clean air/oxygen, production of vegetation cover against desertification
Industrial chemistry (Saponification) Colours	Making soap, liquid detergents, liquid soaps/medicated soaps, creams/cosmetics production. Paint making, dying of textile and prints
Polymer chemistry	Preparing of adhesive/gum from natural plant materials. Preparation of colours for dying of clothing materials
Analytical chemistry/Quality control	To determine quality of substances manufacture
Electronics	Undertaken of repairs electronic gadgets like; radio, television etc; Electrical wiring of households and offices
Solid State Physics	Production/manufacture of battery cells for solar energy storage
Metal and Alloys	Using metals for fabrication of doors, windows etc
Computer science	Using computer applications, software manufacture, computer engineering and supply of accessories

From the table above, it is evident that the science education curriculum has an endless list of possibilities for entrepreneurship. Therefore, science education graduates have greater

chances of been self-employed where there is an enabling environment and even become employers of labour.

Challenges to Realization of Entrepreneurship Science Education

The Nigerian education sector at all levels is faced with almost similar constraints that hamper effective teaching and implementation of science curriculum thus equally affect entrepreneurship skill development from knowledge that is supposed to be learnt. Mustapha (2013) enumerated some of the following challenges;

- ✓ **The nature of science curriculum:** that our science curricula to a greater extent are devoid of economic or rather commercial values. Therefore, teachers concentrate on the bookish (theoretical) content forgetting to incorporate scientific process skills that could entrench deeper understanding and perhaps lead to higher cognitive levels of synthesizing and application of knowledge to day-to-day life activities.
- ✓ **Inadequate time for practical work:** Laboratory/field works are supposed to reinforce and be linked to classroom theories. However, because there are no adequate time for practical works teachers either deliberately skip those periods or are mostly unable to orient students to link/relate school to industry thereby, limiting the growth of economic ventures from school science
- ✓ **Examination focused education:** Nigerian education system is focused towards passing examination. There is so much emphasis on examination and thus teachers tend to concentrate on learning outcomes that can be examined rather than acquiring knowledge, process skills/principles and competencies that are relevant to economic and industry growth.
- ✓ **Lack of endowment funds:** If Nigerian industries will grow and continue to develop then it must tie endowment funds to scientific breakthroughs in colleges and Universities. Research grants obtainable from companies will provide bases and direction for research that can see to the evolution of small and medium enterprises in Nigeria.
- ✓ **Poor funding of education:** It is a common saying among people that 'no nation grows above the quality of its education'. Public education institutions in Nigeria are collapsing due to inadequate funding and provision of instructional materials and other facilities for teaching and learning. Longe Commission of 1991 observed that the percentage of budgetary allocation to education has never exceeded 10%. Hence, Potential scientists and entrepreneurs are seeking greener pastures outside the shores of Nigeria.
- ✓ **Lack of entrepreneurship education:** most lecturers lack initiatives, resourcefulness and interest of promoting scientific knowledge for entrepreneurship that will bring economic benefits. This may be due to lack of skills of linking scientific concepts to business ventures which requires special methodologies to accomplish.
- ✓ **Objective oriented curriculum:** the stating of specific objectives at the beginning of a learning task has tended to make teachers/lecturers difficult to measure knowledge. This motive has often skewed lecturers to teaching aspects of science that can be examined quantitatively.

Conclusion and Recommendations

This paper has attempted to clarify the nature of science education curriculum as having inherent entrepreneurial skills capable of making science students self-employed. This is capable of reducing unemployment while making our graduates employers of labour, thereby improving the overall economic development of the nation. Thus, there is established correlation between science education and entrepreneurship and between entrepreneurship and economic growth and overall economic development of the nation (Wasagu, 2007). In

order to entrench and expose entrepreneurial skills amongst science education graduates, the following recommendations are made;

1. Teaching should be made practical-oriented; more emphasis should be placed on laboratory practical exercises than learning theoretical constructs that students memorize and hardly experiment.
2. Science lecturers must imbibe entrepreneurial attitudes and orientations to be able to translate scientific knowledge to creating small business entities for socio-economic development.
3. Students industrial work experience (SIWES) must be accorded greater prominence to actually expose them to world-of-work outside the school for greater motivation and exposure to practicals.
4. Government should progressively increase annual budgetary allocation to education to UNESCO recommended 26% of the total budget of the nation allocated to education.
5. Lecturers should be properly motivated to acquire competencies through workshops and conferences to appreciate emerging trends of research and pedagogical approaches that promote effective learning of science curriculum.
6. National Universities Commission (NUC) should review its science education curriculum and inject more practical and discovery approaches that will explicitly indicate and evolve entrepreneurial abilities and competencies.
7. Government should encourage industrialist to form partnership with Universities and tertiary institutions to encourage research outputs that are marketable. Similarly, students research projects can be patented where found to be innovative.
8. Industrialists and entrepreneurs should be occasionally invited to give career talks that will stimulate students' interest in entrepreneurship.

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