

Entrepreneurship in Science Education as Panacea to Nigeria's Development in the 21st Century

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ABSTRACT

This paper discusses entrepreneurship in Science education as a panacea to Nigeria's development in the 21st century. Entrepreneurship in Science education deals with acquisition of skills and self dependence of students who pass through such programmes. This paper opens various avenues that are far reaching to the opportunities available in science education. Some of the recommendations are that an entrepreneurship clubs (horticulture, floriculture, and aquaculture) should be organized and encouraged in science education departments so as to popularize entrepreneurship education; students should be taken out for field trips to various industries, factories, companies and related areas of interests. This will offer them opportunity to see and observe things which they did not have in their school's workshops and laboratories.

Keywords: Entrepreneurship, Science Education, Nigeria's Development

INTRODUCTION

In today's world where the economy fortunes of nations are dependent on its production strength, education is becoming redefined at both the national and international level. Gone are the days of white collar jobs as a major priority, where people go to school with the hope of graduating into the waiting arms of white collar jobs, both in the public or private sector. Nations are now more concerned about the quality of education that will provide opportunities for employment and generate income to both the individual and the nation at large. And not the type of education that tends to produce 'consumers'. Entrepreneurs rule the world now. Take for instance, in the present economic situation of Nigeria; we need more entrepreneurs to be able

to strengthen the nation. In countries like Brazil, Russia, India, China – impressive growth has been driven by a veritable entrepreneurial revolution. Since Nigeria is craving for development, entrepreneurship education becomes imperative. Entrepreneurship education remains the only antidote to unravel the mystery of development and also bring to an end the problem of unemployment in our society, considering the spate of growing number of graduates that flood the streets. The entrepreneur is widely regarded as an integral player in the business culture of any nation and particularly as an engine for job creation and economic growth.

Science education contributes to the realization of the ultimate goals of education. This is dependent on how it is taught. When it is properly taught using activity based instructions such as inquiry method, it stands to contribute immensely to the general development of students. To achieve this, both teachers in higher institution and secondary schools should do everything humanly possible to produce students devoid of parasitizing the nation's economy. This can be achieved by guiding the students to realize that it is hundred percent better to be innovative, creative, self-reliant, entrepreneurial and productive than being dependent on government for employment and other essentials of life. But science education has not actually achieved this due to the way it is being presented to the students. Thus, this paper is intended to dwell on the issues of entrepreneurship in science education a key to Nigeria's development.

The Concept of Entrepreneurship in Science Education

An entrepreneur is someone who has the ability to develop a new venture in business in order to make money; often in a way that involves financial risks, an entrepreneur is defined as the owner of a business who is responsible for the initiation and organization of the enterprise out of a desire to maximize profits. An entrepreneur is therefore a person that has developed certain skills, attitudes and behavior that enables the person to establish a business, thereby creating jobs for him and others. Entrepreneurship is a key driver of our economy; wealth and a high majority of jobs are created by small business started by entrepreneurially-minded individuals, many of whom go on to create big businesses. Entrepreneurship is key factor in the economic development process of this country. Its role is particularly important for industrialization of the economy. Studies of economic development, history

have shown in developed countries that, the present status of their development lies in the active role of the entrepreneurs. The role of entrepreneurs is perceiving business opportunities, bringing together inputs of production to produce the desired service, taking risks, decision making technology transfer and adaptation to overcome obstacles, response to change and transforming innovative activities into reality is indeed great (Rahman & Mujahidul, 2014).

Objectives of Entrepreneurship Education

Entrepreneurship education is oriented towards different ways of realizing opportunities. This is what makes entrepreneurship education distinctive in its focus on realization of opportunity, focus and on where management education is the best way to operate on the existing hierarchies. Entrepreneurship education seeks to provide students with knowledge, skills and motivation to encourage entrepreneurship success in a variety of settings. Entrepreneurship education according to Ojeifo (2013) is structure to achieve the following objectives:

- 1) To offer functional education for the youth that will enable them to be self-employed and self-oriented.
- 2) Provide young graduates with adequate training that will enable them to be creative and innovative in identifying novel business opportunities where necessary.
- 3) To serve as a catalyst for economic growth and development.
- 4) Offer tertiary institution graduates adequate training in risks management, to make input in communities they live in.
- 5) To reduce high rate of poverty amongst the graduates
- 6) Create employment opportunities from one generation to another.
- 7) Reduction in-rural urban migration
- 8) Provide the young graduates with enough training and support that will enable them to establish a career in small and medium scale business.
- 9) To inculcate the spirit of perseverance in the youths and adults this will enable them to establish a career in small and medium scale business.
- 10) Create smooth transition from traditional to modern industrial economy in their respective communities.

The entrepreneurship in Science education is a useful tool for provision of knowledge and information as well as facilitating globalization with human development in the same vein, strengthening national governance, acting as a vessel of common heritage to promote both National and International cooperation and solidarity (Truman 2015). Entrepreneurship education in junior secondary school Basic Science is essential for wealth. A key component of social integration, poverty eradication for sustainable development of Africa Nation (Rahman & Mujahidul, 2014) For instance a student that graduates with entrepreneurship in any science related field of the studies i.e in fishery, packaging of food, water items, meet retailing, plant air production, restaurant Services, regaining labour squads, operating nursery for children, charcoal making, raising of seedlings and seeds, raising flowers, tooth picks / cocktail snacks, taxi driving, production of conference bags, photography, car washing, keeping the surroundings of buildings clean, renting out canopies and chairs, electrical installation, GSM business: selling Recharge cards and phone accessories, distilling and boiling water for laboratories and petrol stations etc. through vision, change and creation. It requires an application of energy and passion towards the creation and implementation of new ideas and creative solutions. Essential ingredients include the willingness to take calculated risks in terms of time, equity or career, the ability to formulate an effective venture of team, the creative skills to Marshall needed resources and fundamental skills of building solid business plan, and finally, the vision to recognize opportunity where others are class contraction and confession (Kurarko, 2003 & Ezeaghasi, 2015).

There is more creative freedom for people who are exposed to entrepreneurship. It is the believe of many experienced business people, political leaders, economists and educators that fostering a robust entrepreneurial culture will maximize individual and collective economic and social success on a local, national, and global scale. It is with this in mind that the National Standards for Entrepreneurship Education were developed – to prepare youth and adults to succeed in an entrepreneurial economy. Entrepreneurs are innovators who are capable of developing new technologies new products and services, adapting existing technologies to new use. In the words of entrepreneurship raise the level of productivity in the economy by harnessing and utilizing resources efficiently. Entrepreneurship Education is education that provides training experience and skills that are suitable for

entrepreneurial behavior. Entrepreneurship is a process of providing individuals with the ability to recognize commercial opportunities and the insight, self-esteem, knowledge and skills to act on them. Entrepreneurship education entails teaching students, learners and would-be business men the essential skills required to build viable enterprises, equipping the trainees with skills needed for taking responsibility and developing initiatives of prospective training. Entrepreneurship education is an aspect of education which equips an individual and create in the person the mind set to undertake the risk of venturing into something new by applying the knowledge and skills acquired in school this creates the willingness and ability in a person to seek out investment opportunities in the society and be able to establish and run an enterprise successfully based on the identified opportunities. Hence, the overall purpose of entrepreneurship education is to develop expertise as an entrepreneur. Entrepreneurship entails the philosophy of self-reliance such as creating a new cultural and productive environment, promoting new sets of attitudes and culture for the attainment of future challenges (Ogundele, Akingbade and Akinlabi, 2012). Entrepreneurship education hence, prepares graduates with entrepreneurial knowledge and inculcates in them skills that are socially usable. It produces self-reliant graduates who can utilize the skills they have acquired to establish personal business. This means education for production of useful and marketable skills necessary for employment generation, wealth creation and productivity.

Bolariwa in Ezeudu (2008) listed the following as advantages of entrepreneurship education:

- i) It will help the students to form a base of knowledge about information and operation of business and develop some level of familiarity and comfort with the business environment such as technological change, micro enterprise.
- ii) Entrepreneurship creates job opportunities for others: Just as the saying goes, "no man is an island". Such statement also applies in entrepreneurship. When an entrepreneur starts a business using his financial assets, he must hire people to work with him. Hence, as time passes, there may be a reason for expansion; he starts a huge business, hence creating more job opportunities for people.
- iii) Cause economic growth: By creating job opportunities for people, an entrepreneur provides wealth to the people. There is every tendency

that they may also divide to start their own business with innovation like providing the best quality product within low price so that people can save their money and get the best product. This strengthens the economy of a country. For this purpose Government also welcome entrepreneur to start their business.

- iv) Entrepreneurship provides strength to small business: Most of the time, entrepreneurs prefer to invest their money in small business. Such activities of the entrepreneurs provide strength to the small business. So the niche market flourishes providing strength to the economy of the country. So entrepreneurship can be categorized as investment and it is very important for a country to flourish its economy. Thus, entrepreneurship may spur economic development if appropriate supported and taken as a national issue.
- v) It plays a complimentary role in developing the occupational acknowledgement, job skills and work experiences.
- vi) It offers opportunities to students for job experience and earning, saving and investing money at an earlier stage of living than their peers, contributing to their abilities and their sense of self worth.
- vii) There would be great reduction in the rate of unemployment and business ownership will become viable and appealing goals for today's students (pp 96).

To achieve this science education curriculum should be made adaptable, stimulating and relevant to the needs of the students and the society at large.

Objectives of Entrepreneurship Education

Entrepreneurship education is oriented towards different ways of realizing opportunities. This is what makes entrepreneurship education distinctive in its focus on realization of opportunity, whereas management education is focused on the best. For Ojifor (2013) it is structured to achieve the following objectives.

- i) To offer functional educational for the youth that will enable them to be self-employed and self-reliant.
- ii) Provide young graduates with adequate training that will enable them to be creative and innovative in identifying novel business opportunities.
- iii) To serve as a catalyst for economic growth and development.
- iv) To reduce high rate of poverty.

- vi) Create employment generation
- vii) Reduction in rural-urban migration
- viii) Provide young graduates with training and support that will enable them to establish a career in small and medium sized business.
- ix) To inculcate the spirit of perseverance in the youths and adults which will enable them to persist in any business venture they embark on.
- x) Create smooth transition from traditional to modern industrial economy.

Science Education as a Means for National Development

Science education is very important to the development of any nation in many areas. A graduate of physics education can be self employed. Many of the physics graduates have some knowledge of electronics that is enough for them to be able to have a little period of training as apprentices and then stand alone as electronic technician. For instant, Semiconductor is very important in the modern technology that if properly learnt it is enough for one to stand upon for a living; semiconductor physics is part of what any graduate in physics will learn and should learn. In semiconductor, is very important in a growing economy like ours in Nigeria; it is useful in ceramic industry and a well trained physics education graduate can be well established in ceramic industry. Without science education Information and Communication Technology would be impossible. Science and technology will not be possible without science education; for instance engineering, medicine, architecture will not be possible if there is no one to teach the students the core subjects needed for these courses.

Biology education is very important to any growing economy like Nigeria. Many graduates of biology education are self employed and employers of labour; many owned schools for themselves where people works and earn their living while some are in to fish business.

There are colleges of education where students of chemistry department are taught how to make dye and chalk; graduates of these departments can establish their own chalk business as soon as they graduate. If supported with fund many schools do not need to buy chalk outside anymore and they can equally produce for other schools. The growth of any nation is a measure of its level of science education. That was why Orukotan (2007) stated that science education has brought about a paradigm shift in our world today. Achievement in science education will go a long way in reducing illiteracy and poverty,

which are impediments to national development. Science education has contributed to the quality of life in different facets, particularly in aspects of health, nutrition, agriculture, transportation, material and energy production, industrial development and quality of life. Therefore, science education should be given prominence in Nigerian schools.

Unemployment is one of the problems plaguing the Nigeria society. Every year, a large number of graduates are produced from secondary and tertiary institutions in Nigeria. Unemployment arises where able bodied and willing persons who are qualified and capable for a job at a given wage does not find the employment opportunity to do the job (Iwuamadi & Ofoegbu. 2011). Employment is therefore when an able bodied individual has gained wage able job either employed by self or government.

In order to solve the problem of graduate unemployment using knowledge of science education there is need to key into the new dynamics of education through lifelong learning of science education.

Science education as an applied field of study built upon many discipline (Chemistry, Biology, Physics, Geography and related sciences) for the purpose of achieving and maintaining the well being of individuals in an ever changing society. Science education curriculum aims at developing life skills such as recording, measuring, communicating, observing, predicting, hypothesizing, inferring among others. These skills when acquired are useful for success in business and for problem solving and adaptation for national and individual development. Thus, the inculcation of these skills into the students will enable them, on graduation, to become self reliant and productive citizens, without waiting for governments, for employment. The teaching of biology also helps to develop in the learner, scientific attitude such as open mindedness, patience, curiosity, honesty and objectivity.

Furthermore, science education offers a lot of opportunities in various fields or courses which can be taught for entrepreneurship ability among students. These courses will depend on the geographical location and their biodiversity for the obvious reason that a student living far away from the sea need not be taught sea weed farming.

These topics and course according to Nayak (2002) include:

- i) Agriculture or Bee keeping; It includes the preparation of an artificial hive to attract the honey bee and once they colonize the honey it be extracted as at when required; the other product include bee wax.

- ii) Aqua culture; this includes composition of fish farming prawn farming and crab culture.
- iii) Sea weed culture; this includes intensive sea weed farming. Products include Agar, Agarose, and Machines thickening agents.
- iv) Floriculture; growing flowers for ornamental values and for export as well as for domestic market.
- v) Horticulture; growing fruits and vegetables. The products can be exported as well as can be used for domestically.
- vi) Geography and Ecotourism; this is mostly a developing field where the students will be able to guide tourists, both foreign and domestic to the biodiversity.
- vii) Aquarium; the fish used in the aquarium can be reared and students can be taught to maintain aquaria. This is again in lucrative business with export market.
- viii) Mushroom culture; it is a source of protein and has good export market value.
- ix) Preservation of soil fertility and prevention of spreading of the desert; Biological method are having advantage over others.
- x) Water conservation; it is a must in many nations of Africa for agriculture and drinking.
- xi) Poultry, rearing birds used for human consumption.
- xii) Insect pest and their control; to increase agricultural yield.

These fields among others when properly practiced can increased the economic rate of Nigeria because of the export market potential thereby creating employment. This will also improve the life of those who cannot go for higher education. However, it is the duty of science education teachers to teach these entrepreneurial topics properly, for the science education teacher to inculcate entrepreneurship skills in students' demands that he/she in addition to being the subject master will be able to spur the students interest in the subject through his/her method teaching attitude to the subject. According to Ukeje in Ezema (2000), a good teacher is one who in addition to transmitting knowledge and effective manner is also able to inspire the students to greater heights of achievement by guiding them to the full realization of their potentials.

Since, unemployment is on the increase, there is need for reorientation of the youths to pay attention to skill oriented courses like science education. This will help the students to acquire the competences required for employment and productivity. Thus, the science education teacher should employ child-centered or activity method in teaching for acquisition of entrepreneurial skills so that the students' will be able to stand on their own upon graduation.

ENTREPRENEURSHIP EDUCATION AND NIGERIAN DEVELOPMENT IN 21ST CENTURY

Development is a process of becoming and unfolding maturity process. Development means getting the correct environment and putting healthy people into such environment and exposing them to situations of learning to actively strive towards unfolding inner endowments in such a manner that fully realization and fruition is realized (Ebigbo, 2010). Nigeria is a signatory to many international resolutions aimed at improving the entrepreneurial skills of the populace. One of such is the Assembly of the United Nations on the Millennium Development Goals (2002). As nations advance into the 21st century, governments are shrinking and shedding the toga of major employers of labour. However, the rate of reduction varies from country to country but dictated by what is perceived as political and social consequences. This partly explains why in most developing countries the government is the major employer of labour. The NEEDS document (2004) states that "Human development will definitely be grossly undermined and impaired without employment". Awogbene and Iwuamadi (2010) argued that the problems of mass unemployment, low productivity, high inflation and poverty will depend on how speedily it is able to develop the millions of its labour force into a knowledgeable and skilled people needed for the required change.

Skills acquisition as a veritable vehicle to promote employment generation has been a part of the policy thrust of past Nigerian governments. However, most intervention programs have been poorly coordinated and in some cases either overlap or contradict one another. Beginning with the Directorate of Food, Road and Rural Infrastructure (DFRRI), National Directorate of Employment (NDE), Family Support Program (FSP) and now the National Economic Empowerment Development Strategies (NEEDS), SEEDS and even establishment of People's Bank of Nigeria (PBN) are some of the intervention programs that were intended to promote employment generation.

Most of the past intervention programs were implemented as adhoc poorly coordinated and marred by corruption and inefficiency. Consequently, rather than reduce unemployment, the reverse seems to be the case. The Nigerian living Standard Survey (NLSS, 2006) estimated the poverty level at 45%, implying that approximately 75 million Nigerians were unemployed. This figure is expected to be higher when lay-offs and outright closure due to the global economic meltdown since 2008 are considered. Government efforts at promoting skills acquisition through the establishment of vocational training institutions have also not yielded the desired result, even though Osunde (2004) noted that more vocational skills training institutions are being established yet the youths are not been motivated with vocational education due to some of the above reasons.

STRATEGIES REQUIRED FOR PROMOTING ENTREPRENEURSHIP IN SCIENCE EDUCATION

The following strategies will assist in promoting entrepreneurship in science education.

- i) Employment of qualified and competent science education teachers should be competent and qualified in terms of professional and practical skills and knowledge of business opportunities available in Science education. The teacher is expected to know both the methodology and the content of the subject matter in order to boost effective teaching and learning.
- ii) Teaching pedagogy, teachers should use appropriate teaching strategy (such as field trip, demonstration and enquiry) in teaching entrepreneurship education so that students will understand the lesson.
- iii) Establish an entrepreneurship club and Exhibition; entrepreneurship club should be established
- iv) Seminars and Workshops; seminars and workshops on entrepreneurship in science education are needed by the entrepreneur to succeed in business. Seminars and workshops should be organized for students at least once each academic session. The successful entrepreneurs and experts in biology are to be invited to deliver lectures on entrepreneurship to broaden the students' minds so as to learn more about entrepreneurship.

CONCLUSION

Entrepreneurship in science education has the potentials of equipping individuals with acceptable skills for creating and generating gainful employment. Individuals who are trained properly in science education should be creative in thinking and able to observe job opportunities where others have over looked and be to make investment. Such a person should acquire the attitude and skills to be self employed and productive. In order to quench the unemployment issue in Nigeria, there is need for biology teachers to teach students to acquire the requisite skills for employment, Productivity and self-reliance. The development of entrepreneurship education will go a long way in creating employment, give the youths the opportunity to develop their entrepreneurial skills, empowering the youths to be job creators rather than job seekers and by proving them with the necessary skills and knowledge to raise their output, income and wealth. This policy decision was based on government awareness of the critical role of entrepreneurship education and training in fostering employment generation among the teaming youths, economic growth and wealth creation.

RECOMMENDATION

The following recommendations are paramount in order to meet up with the challenges facing entrepreneurship in science education.

- i) An entrepreneurship club (horticulture, poultry keeping, animal husbandry, floriculture, and aquaculture) should be organized and encouraged in science education department so as to popularize entrepreneurship.
- ii) Students should be taken out for an excursion and field trips to various industries, companies, factories and areas of interest. This will offer them opportunity to see and observe array of equipments and apparatus that are not in the school workshops and laboratories.
- iii) Qualified and competent teachers of science education should be recruited and the existing ones should attend retainers' courses, seminars, workshops and conferences.
- iv) Entrepreneurship in science education and training should be recognized as an important component of human resource development policy in Nigeria.

- v) In order to create awareness on the subject entrepreneurship, entrepreneurial courses should be introduced in the curriculum at different level of educational system in all disciplines more especially science education.
- vi) Short term training courses should be designed and organized for different target groups and offered by trained motivators and trained trainers. While designing the training programmes, specific needs of the target groups are required to be identified by appropriate means. Needless to say that training program should be supported by appropriate government and donor agencies' assistance.
- vii) Each institution where entrepreneurship education is offered should have a well equipped and functional model office where all latest equipment/machines such as computer, fax, cellular, telex, internet accessories, email and conferencing technologies would be provided for students' effective exposure.
- viii) Government should ensure that every institution offering entrepreneurship education be adequately equipped with computer and current software on the basis of one-to-one student to computer.
- ix) The private and Non-governmental Organizations (NGOs) should be encouraged to participate in entrepreneurship education through funding or contributing in kind as part of their corporate social responsibility to the nation.

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