

DEVELOPING ENTREPRENEURSHIP MINDSET IN SENIOR SECONDARY SCHOOL CHEMISTRY.

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Abstract

This paper discusses the process of developing Entrepreneurship mind set in senior secondary chemistry. Science, Technology and Mathematics (STM) education has not achieved its aim of producing secondary school graduates who are self reliant. Graduates of secondary education cannot effectively manage their own personal businesses. Entrepreneurship education in senior secondary chemistry should be introduced. This paper explains Entrepreneurship chemistry skills and outlines the advantages. It gave an insight of what the Chemistry Entrepreneurship Education will look like when it is introduced. The envisaged problems and prospects were also highlighted.

Keywords: *Developing, Entrepreneurship, Mindset, Secondary School and Chemistry.*

Introduction

It is a known fact that the system of education we inherited from our colonial masters is directly responsible for our quest for white collar jobs as soon as a secondary school student graduates or a degree student graduate is produced. Unfortunately our selfish and corruptive tendencies complemented job positions to become saturated everywhere in Nigeria. Many educationists as well as Okeke (2007) defined education as the process where individuals undergo through schools for the acquisition of knowledge, skills, abilities and attitudes that are necessary for effective living in the society. It then, follows that education has not prepared the young graduates for this enterprise (effective living in their environments). Regrettably this has not been so for a long time now. In Nigeria today, the above named definition of education is farfetched and has not even existed before. The only areas of exceptions are graduates in some professional courses like Medicine, Law, Engineering and etc who may after graduation be on their own and finally become self reliant. Single courses like chemistry and others of four year programs in a university are the most affected,

their curricular contents are not entrepreneurship mindset structured. Who is an entrepreneur? According to Nickel in Uzoka (2005) it is a clear manifestation of effective manipulation of human intelligence as demonstrated in creative performance. Igbo (1998) viewed entrepreneurship as that involving risk, financial, material, and human resources in a new way in the course of creating a new business concept or opportunity within an existing firm. Similarly NBTE (2007) defined entrepreneurship as the art of becoming an entrepreneur. An entrepreneur is a person who habitually creates and innovates to build something of recognizable value around perceived opportunities. The problem therefore is how do we build entrepreneurship mind set in senior secondary chemistry students?

Chemistry

Chemistry as science is a branch of study that is concerned with facts, principles and methods. It is the knowledge acquired by careful observation, by deduction of real life experiments. Chemistry as a physical science is the study of material substances that are available on the earth and somewhere else in the universe. According to Holman (1995) it is concerned with the utilization of natural substances and the creation of artificial ones by chemical or physical changes (reactions). Chemistry involves process skills which are mental tools used in the discovering and acquiring of scientific knowledge (creative/entrepreneurial).

Entrepreneurship skills in Chemistry

Sometimes entrepreneurship skills come naturally. Sometimes it is acquired over a period of time as a result of long training or it may come spontaneous as a result of long frustration or long determined mindset of an individual. In all, it is an ability to do some things new and well. Entrepreneurship skills are occupational survival skills (Nelson and Leach, 1981). These skills are sometimes called science (chemistry) process skills. According to Nigeria Teachers Institute, NTI (2006).The process skills in chemistry are the ways and strategies followed by the scientists in order to arrive at product of science. The process skills are (1) observation (2) classification (3) measurement (4) counting fiscal inference (10) experimentation (11) research (12) interpretation (13) control of variables (14) generalization (15) conclusion.

Similarly Asiriwa (2005) stated that the development of these process skills will lead to acquisition of the skills that successful entrepreneurs tend to use to start their ventures. Some of the entrepreneurial skills are (1) creative thinking (2) planning and research (3) decision making (4) organization (5) communication (6) team building (7) marketing (8) financial management (9) record keeping (10) goal setting (11) business management. Also Olalekan (1998) outlined the following as part of entrepreneurial skills. They are (1) observation (2) determination (3) interpretation of market (4) exhibition of knowledge (5) mastery of skills (6) ability to communicate and etc. All these skills are encompassed in the process skills as well as entrepreneurship.

Advantages of Entrepreneurship Chemistry Education

According to Bolarinwa in Ezeudu (2008), Entrepreneurship education has the following advantages. It will help students to form a knowledge base of the functions and operations of a business. It develops some level of familiarity and comfort with business environment such as technological change and micro enterprise and etc. It will play a complimentary role in developing the occupational knowledge, job skills and work experience.

It offers opportunities to students for job experience and for earning, saving, and investing money at earlier stage of life than their peers. It contributes to their belief in their abilities and to a sense of self worth. There will be great reduction in the high rate of unemployment in our society.

Also self employment and business ownership will become viable and appealing for today's students. Our STM education has failed in its responsibilities of fostering scientific skills and attitudes as the graduates roam the streets with no jobs and no skills and no mindset to start their own business. Then, there is a serious need to restructure our STM education for entrepreneurship. There is also the need to introduce into our curriculum entrepreneurship education for the acquisition of right habits, attitudes, and skills as a means of surviving in the face of unemployment in our society. In fact there should be a total overhaul of STM education. A new curriculum for Problems of Entrepreneurship of STM Education should be developed. Various sectors like the Nigerian Business Educators Association, The Nigerian Chamber of Commerce and Industries, Manufacturers Associations of Nigeria and others should be included in the formation of the new curriculum. The society, the

schools, the students, the trade unions and Associations, clubs and business owners should be included in the construction of Chemistry course contents. The course contents should reflect the local labor markets and student's need. The students' needs should include in its objectives:

1. To take up employment in industries and factories requiring their area of specialization.
2. To provide employment for self and others.
3. To become computer literate, service and maintain computers.

STM education classroom should reflect business sessions. Electrical appliances like locally made torch lights could be constructed for sale. Detergents, soaps, pomade and etc could be made for sale to make money (Iloputaife, 2005).

Dyes, colorings, spices could be produced by students for sell. There should be a shop in each institution to sell students' products. Seminars, workshops on starting a business, small business management, profit utilizations, personnel administration etc. can be organized for both teachers and students. There should be a way of rewarding the students and the teachers from the yields realized from the ventures. This will increase their enthusiasm and develop their interest. At least they will experience profit making. Students should be imparted with open mindedness, intellectual honesty, love of God and love of their neighbors'. Most products to be made and sold should come from our local environment, which differ from school to school. The various levels of Government should fund STM education to ensure a successful, fruitful and result-oriented STM education. STM education should also inculcate values such as punctuality and regularity at work, reward for merit. Insight into the Kernel of the issue using Chemistry as example

Curriculum designed for Chemistry education in tertiary institutions should include courses in entrepreneurship education. According to Ezeudu (2008) the entrepreneurship curriculum for the secondary school chemistry the following should be included:

For SS1:

- Meaning of entrepreneurship
- Basic elements of entrepreneurship
- Characteristics of entrepreneurship
- Key steps to entrepreneurship
- Causes and remedies of entrepreneurship failure

For SS2:

- Laws and procedures relating to registering a small business
- Sources of fund for financing small scale business
- Small business management-principles and application
- Profit utilization, credit and debit management
- Computer/Information processing and international business.

For SS3:

- Seminars and Workshops
- Management of the school shop
- Production and selling of items produced during practical

The SS3 students can produce the following items during practical sessions

- Production of Ethanoic acid for preserving food-flavouring food and dyes.
- Production of Esters used in making perfumes
- Production of Butter and margarine
- Production of Soap and detergents
- Production of Pomades
- Production of Glucose used in making sweets and jams
- Production of Breads and Biscuits
- Production of Cassava flours
- Production of Acids for charging batteries
- Production of Shoe polishes, palm kernel oil, vegetable oils etc.
- Production of Insecticides, antiseptics and disinfectants

Problems of Entrepreneurial STM Education

- **Inconsistency in policies implementation:** STM education policies may not be implemented, supervised and evaluated and evaluated by the relevant government officials.
- **Poor laboratories and facilities:** Unqualified instructors and teachers and inadequate instructional equipment and materials and lack of equipped laboratories may hinder the progress of entrepreneurial STM education.
- **Inadequate fund:** there may not be enough funds to provide the necessary materials needed for the program. This may be as a result of poor allocation of fund given to education sector. No payment of teachers' salary or science teachers' allowances or even promotion of teachers can result to low morale on the part of the teachers who may not like to take up extra job resulting from entrepreneurship.

Solution to the problems militating against entrepreneurial STM education

- (1) STM policies as specified in the National policy on education must be implemented, supervised and evaluated by those concerned about STM education. The development of intellectual, manipulative, social and other skills that will ensure self fulfilled and self-reliant citizens should be the watchword.
- (2) Good equipped laboratories: Well-equipped laboratories must be provided in schools. These laboratories should have enough equipment, materials and even improvised materials. Laboratory technologists, technicians and laboratory assistances should be provided and re-trained in improvisation.
- (3) Adequate fund: Adequate fund should be allocated to education especially to STM education. Teacher's salaries and science allowances should be paid on time. Some of the money generated from the sales of the products should be given to the students and the teachers to sustain their interest.

Conclusion

STM education should be diversified and made functional than presently and should be geared towards solving the problems of our contemporary society. To this end STM education should be re-structured to include entrepreneurship.

STM classroom should be business like to ensure education for work, and employment and education for self-reliance.

Recommendations

STM education should be diversified, made more functional and geared towards solving the problems of our contemporary society. To this end, it should be restructured to reflect entrepreneurship so that the graduates should be self – reliant and self employed. Hence STM education should be priority in Nigerian educational system to ensure a successful, fruitful and result oriented entrepreneurship. Teachers in service workshops and seminars should be organized.

Values such as punctuality, regularity at work, honesty in sales, reward for merit and other attitudes that will enhance productivity and promote orderly societal growth should be enforced. STM laboratories that will produce the products to be sold should be stocked with equipment and materials. STM practical lessons should be geared towards production of materials for sell to the college communities and outside the college environment. There should be advertisement units to advertise the products to the public. If these suggestions and recommendations are made and implemented, STM education will surely transform the society and ensure rapid development of the nation.

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