

ENTREPRENEURIAL BIOCHEMISTRY EDUCATION FOR SUSTAINABLE YOUTH EMPOWERMENT, A CHALLENGE TO THE BIOLOGY TEACHER

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Abstract

This paper has examined the chemistry related areas in biology curriculum which should be emphasized in the schools toward entrepreneurship. When the students are well equipped with knowledge, skills and attitudes in these areas of biology curriculum they can be able to become self reliant. The paper has also identified the challenges posed to the biology teachers. Recommendations were given and the paper concluded by highlighting the importance of including the right knowledge, skills and attitudes for sustainable youth empowerment.

In Nigeria today, the struggle to completely remove citizens from the effects of educational system is not over. There are various levels of success in the evolution of Nigerian education system which are considered to be more relevant to the Nigerian situation, especially when science and technology education is the focus of discussion. The question to ask is how we can go in the new yet necessary direction dictated by issues of development, relevance to life and the general world economic stress. Efforts should be made to make course curriculum more relevant to the Nigerian situation in order to satisfy the needs of students who may or may not be prospective scientists.

This paper is written based on the new National Policy on Education (FGN, 2004) which stresses the teaching/learning curricula towards entrepreneurship in order to meet the survival needs of the Nigeria's ever-increasing population. Therefore, basic education for all is a necessary and should be seen as a stepping-stone to higher capabilities and capacities (Emenyonu and Okoro, 2012). Education all over the world has been recognized as a veritable and an indispensable instrument of development (Etesike, 2012). It is a tool for the development of all human potentials which is the most powerful level for shaping the future (Etesike, 2012). Education has now gone beyond the mere acquisition of the ability to read and write or even to ensure a job but to

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develop skill set and mind set individuals who looks for the ability to use innovations both adaptive and projective for problem solving (Emenyonu and Okoro, 2012).

Entrepreneurship Education

Education is a process of inculcating the right and acceptable societal behaviours into the citizens. It is one of the greatest processes that can be used by any society to bring about reforms, transformation and development (Akani 2014). According to Akani (2014) education is a process used in transmitting culture and worthwhile values in terms of continuity and growth and disseminating knowledge either to ensure societal, economical or political control or to guarantee regional progressive developmental stride in science and technology. Therefore, Entrepreneurship Education is the process of equipping the students with the capabilities of anticipating and responding to societal changes, training to develop and use their creativity to take initiative responsibility and risks, to also develop the creative mind, skill of positive thinking and reflective mind. Oharisi (2007) Stated that entrepreneurship education is an aspect of education that is aimed at developing, in Students, Skills, Ideas and managerial abilities necessary for personal development. Entrepreneurial skills, according to Alkamn and Longkuk (2010) in Nnoli (2015) are the skills acquired through training that emphasize the acquisition and development of appropriate knowledge and skills which enable an individual to maximize the resources around him within the limits of his capacity to run an enterprise successfully. Nnoli (2015) stated that the current emphasis is on weath creation, poverty reduction and youth's self-employment, there should be provision of enabling environment that will promote entrepreneurship through teaching and learning. Igboanugo (2015) stated that the present system of education in Nigeria is expected to equip the students, on graduation with skills capable of making them entrepreneurs rather than job seekers. Therefore, the exploration of our local environment to get essential products through the application of science knowledge has become imperative, because this will add value to our locally available resources and generate job opportunities (Igboanugo, 2015). Oharisi (2007) outlined some imperative steps for developing tasks in entrepreneurship education as follows:

- Identification of potentials and selection of career preference for self- employment.
- Development of entrepreneurial qualities such as innovative ability, risk taking, desire to achieve and goal- oriented leadership.
- Managerial understanding office and marketing management.
- Budget and Forecasting
- Business financing and organization

Biochemistry Education

Butani (2006) defines biochemistry as the chemistry of living beings. Since chemistry is the scientific study of the structure of substances, how they react when combined or in contact with one another, and how they behave under different conditions (Hornby, 2005), then biochemistry is the scientific study of the chemical structure and behavior of the chemical components of living things. The chemical nature of all living materials depends on an element called carbon, denoted with a symbol “C” in combination with other elements such as hydrogen (H), oxygen (O) and nitrogen (N) to form many compounds. There are seven types of compounds which make up the living components. They are carbohydrates, proteins, lipids, minerals, vitamins, water and nucleic acids. These make up the chemical composition of all living cells (STAN, 1990). Studies on the chemical composition of living cells led to the development of industries for organic chemistry in which extracts from living cells are used for medicinal, fashion, laboratory and many other purposes. Glucose, organic starch, motor grease, many vitamins and hormones are examples of such living extracts well known in our markets today. For example;

Fertilizers are now made locally by mixing ordinary pond clay and extract of potassium, calcium sold in the market and animals dungs.

Moringa Oleifera Plant well known to contain potassium; magnesium, calcium, sodium is now squeezed in water and sold for the cure and prevention of many diseases such as heart failure, muscle paralysis and hypertension/stress.

Lettuce, Spinach and cassava are now known to contain roughage which are the digestive material consisting largely of cellulose useful in the stimulation of muscular movement known as peristalsis to prevent constipation. The fibre also absorb potential harmful chemicals in the food.

Flower Petals of hibiscus, flamboyant and many other plants are now squeezed and prepared for laboratory chemicals such as Sudan III used in biochemical food tests and methyl Orange used as universal indicator. Others include paint and dye production.

Glues are adhesive prepared from animal and plant’s proteins such as animal glue, casein glue, soya bean glue etc. (Igboanugo, 2015). That the animal glues are made from the hydrolysis of collagen, which is the major protein constituent of animal hides and bones. These are marketed for construction trades such as decorative laminates, packaging, laminated boards and bottle labels.

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However, if proper biochemistry education is given to students it is expected that they will acquire necessary skills and ideas of positive thinking and reflective mind to develop the capabilities of using their creativity to take initiative responsibility and risks. The students should be able to utilize biochemical concepts, skills and managerial abilities necessary for their own development. They should be able to manifest entrepreneurial qualities such as innovative ability, risk taking, desire to achieve and goal-oriented leadership. These can be achieved by providing physical resources that are arranged in a variety of ways to enable students to work individually, in small groups or in a whole class setting (Akani, 2014).

Thus, by the end of his/her school year, the student could be empowered to become self-employed and self-manager in a business which may sustain him/her for life.

Sustainable Youth Empowerment

Empowerment is the process of giving an individual the power or authority to do something by giving him more control over his own life or the situation he is in (Hornby, 2005). Therefore, youth empowerment can be seen as an activity toward establishing entrepreneurial freedom to the Nigerian youth. In this case secondary school students are given special training to learn scientific concepts, skills and attitudes with the hope that they can use the experience gained to other situations in order to sustain and maintain their lives after they might have left the school. With the increasing population which puts more pressure on the social services provided by the government, now people are compelled to use experience and apply their creative energy to the transformation of the local, biological and socio-cultural environment (Nnoli, 2002). Thus, the new National policy on education (FME, 2014) stressed activity based teaching/learning process toward entrepreneurship.

To achieve a sustainable youth empowerment, the students should be adequately developed through increased skills and capacity, greater freedom, creativity, felt discipline, responsibility and material well being (Nwachukwu, 2009). With the apparent failure of regional and internal governments, multinational corporations and even humanitarian organizations to achieve the goals of effort to reduce hunger, disease, unemployment and general poverty, there is a resort to an inward looking tendency of self-help as a way out (Jimbo, 2009). Furthermore, Jimbo (2009) opined that science, Technology and mathematics education should prepare individuals for self-reliance. The youth can be empowered to become self-reliant by delivering science lessons practically

in such a way that it enable the students acquire necessary and vital knowledge, skills and attitudes for self-employment.

Challenge to the Biology Teachers

It should be noted that alleviating poverty and resuscitating youth empowerment which is a prelude to self-sufficiency and employment generation can best be achieved in Nigeria when science education is taught as hands-on and minds-on practical activities in our schools.

Even though there is an over whelming number of activities demanded by the biology curriculum, scarcity of practical/ laboratory materials and time frame for practical, the biology teacher should put on his best to make his lessons activity-base and give more emphasis to topics that discusses about plant and animal physiology such as structure and functions of transport systems in living things. The biology teacher should direct his teaching towards learners' acquisition of knowledge and skills for entrepreneurship.

However, Nwachukwu (2009) has enumerated some of the problems confronting science, technology and mathematics education in Nigeria as follows:

- Lack of enough funds to purchase teaching/learning equipment and materials.
- Lack of adequate textbooks
- Overcrowded classrooms and laboratories
- Poor time tables
- Lack of cooperation from administrators
- Lack of monitoring and feedback mechanism.
- Poor preparations of teachers and lack of motivation among teachers.
- Rapid rate of teachers transfer from one school to another
- Use of archaic traditional teaching methods which hinders internalization of learned materials.

Recommendations

- Teachers should make lesson activity-based, inquiry and discovery oriented.
- Stakeholders should cooperated with teachers in the provision of equipment/materials for laboratory practicals.
- Teachers should restructure their lessons for skill acquisition and attitude formulation.

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- Biology curriculum should be geared towards infusing entrepreneurial skills in students which will empower them with skills and ideas for developing their business dreams.

Conclusion

Entrepreneurship has been recognized to be a key driver to economic self-sufficiency all over the world. Therefore, there is the need to infuse and inculcate the acquisition of knowledge, skills and attitudes necessary for entrepreneurship into our curriculum. If the Nigerian youth are equipped with these knowledge, skills, attitude through biology education, ultimately it will lead to a sustainable youth empowerment.

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