

# ENTREPRENEURIAL AND FUNCTIONAL BASIC SCIENCE EDUCATION AS A TOOL FOR ACHIEVING VISION 20:2020

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## **Abstract**

*For many students who may be dropping out of school after the 9-year basic education to join the world of works, the highest form of science learning they may encounter is Basic Science. This paper examines the role of functional Basic Science curriculum in developing entrepreneurial skills as a means of achieving the national objectives of vision 20:2020 in Nigeria. A historical interconnectivity of functional Basic Science and Nigeria's educational goals in the context of NEEDS and vision 20:2020 is discussed. The present status of Basic Science curriculum is highlighted to bring about implementation gaps that needed to be filled. The challenges and strategies for a functional Basic Science education curriculum are highlighted as well as how Basic Science curriculum can be used to impart entrepreneurial skills into learners. Recommendations have been made with the view to equipping students with life coping strategies that will position them to be gainfully self-reliant and self-employed.*

## **Introduction**

A major curriculum reform in science teaching at the Junior Secondary School is the re-structuring and re-alignment of the then existing Integrated Science curriculum to what is now known as Basic Science. In presenting the revised curriculum to Nigerians, then minister of education, Mrs. Oby Ezekwesili declared that the curriculum is intended to meeting the targets of the 9-year Basic Education in the context of National Economic Empowerment and Development Strategy (NEEDS) and the Millennium Development Goals, MDGs (Nigerian Educational Research Development Council, (NERDC), 2007). The curriculum as the minister stressed, is for the use of our children now and in the future.

The need to restructure Basic Science curriculum became imperative in pursuance of the millennium Development Goals by 2015 and, by extension, the need to

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implement the NEEDS, which can be summarized as: Value – reorientation, poverty eradication, job creation, wealth generation using education to empower the people.

As the country looks beyond the 2015 target date for the attainment of MDGs the NEEDS framework mid-wifed what is now known as Vision 20:2020, Nigeria's vision which has been approved by the country's decision-making Federal Executive Council in 2009 is an economic transformation blueprint. It seeks to position Nigeria within the twenty largest economies in the World by the year 2020 with a Gross Domestic Product (GDP) of not less than \$900billion and a per capita income of \$4000. According to the National Planning Commission (NPC), the blue print which lays out a the path for sustainable growth of the country's economy represents an intention to achieve a transformation of the Nigeria state across social, cultural and political dimensions.

The vision is for Nigeria to have a large, strong, diversified, competitive and, technologically enabled economy that effectively harnesses the talents and energies of its people and responsibly exploits its national endowments to guarantee a high standard of living and quality of life for its citizens. The blueprint contains propositions and projections designed to place the economy on a robust, double digit growth trajectory from 2010 to 2020 (National Planning Commission, 2009).

It is in the context and pursuance of these national propositions and projections that the country's curricula in various disciplines are being reviewed with the objective to achieving the country's developmental agenda.

### **The Basic Science Curriculum**

Among the important national educational goals are: the inculcation of the right type of values and attitudes for the survival of the individual and the Nigerian society, and the acquisition of appropriate skills and the development of mental, physical and social abilities and competencies as equipment for the individual to live in and contribute to the development of the society. As a consequence the curricula of various subjects in Nigeria are developed with a view to inculcating the acquisition of skill and competencies for self-reliance (FRN, 2004).

In specific terms, the Basic Science curriculum aims broadly at developing life-copying skills such as problem solving, communication, critical thinking and rational reasoning, to enable learners prepare for work place and self-sustainability in the world economy, (NERDC, 2007).

The Basic Science curriculum is the production of a realignment and restructuring of the revised curricula for Junior Secondary School. In selecting the contents, three major issues shaping the development of national worldwide; and influencing the world of knowledge today were identified. These are globalization, information/communication technology and entrepreneurship education (NERDC, 2007). The desire of Nigeria to be identified with the contemporary development worldwide, called for the infusion of relevant innovations in the area of. Environmental education; Drug Abuse education; population and family life education; and sexually transmitted infections.

The stated objectives of the Basic Science curriculum are to enable learners to:

1. Develop interest in science and technology
2. Acquire basic knowledge and skills in science and technology
3. Apply their scientific and technological knowledge and skills to meet societal needs.
4. Take advantage of the numerous career opportunities offered by science and technology
5. Become prepared for further studies in science and technology

The curriculum prescribes the use of guided inquiry method of teaching and learning in order to promote learning by doing and skills development. In addition, a new theme “Science and development” was added to expose learners to developments in science and technology alongside skills that will enable them to take challenges, make informed decisions, develop survival strategies, and learn to live effectively within the global community. These changes are in response to research findings including those of Ogunleye (1999) and Adejoh (2006),

### **The Concept of Functional Education**

The essence of any curriculum is to make it responsive to the needs and happenings in the society. As Utulu (2007) argued, the societal needs is a significant criteria used in drawing up the curium. This is because education should enable the child to not only understand the community but trained to be able to contribute and participate effectively in his society. The essence is to relate curriculum offerings more to the future undertakings of students. This is the concept of functional education. Ivowi (1999) emphasized three things which appear to be crucial in our bid to educate for functionality. These are:

- Provide adequate and suitable facilities (in particular, instructional material resources) to enable teachers perform as expected and as desired by them;
- Motivate teachers through various welfare packages, incentives and professional development under the aegis of Teachers Registration Council so that they can take teaching as a move serious and interesting business;
- Ensure that teachers motivate students to be interested in their learning to enable them acquire functional experiences as they infract with curriculum materials in schools.

In the view of Odunusi (1999), any educational system that could establish a curriculum specially designed, developed and implemented towards producing a man that could function well in his immediate and extended environment (this includes the high technological environment) is definitely providing a functional education. He further defined the ideas and realities of functional education to include:

1. Education for life;
2. Education for self – realization;
3. Education for human relationship
4. Education for self and national economic efficiency
5. Education for effective citizenship
6. Education for productivity and civil responsibility

7. Education for scientific and technological awareness and literacy
8. Education for democracy and national unity
9. Education for social and political progress;
10. Education for intellectual, moral and cultural values.

Co-incidentally, these are the dreams and visions of our national philosophy on education and NEEDS. But the question is: how functional is the Basic Science curriculum? From the personal experience of the authors, teaching and learning situation in schools are far from being functional because teaching and learning are examination driven.

### **Developing Entrepreneurial Skills through Basic Science Education**

The National Planning Commission (2004) has noted that Nigeria's future prosperity depends on producing youths that are adequately prepared to take their place in tomorrow's global society. Entrepreneurship according to Nwokolo (2007) is acquisition of skills, ideas and managerial abilities necessary for personal self – reliance. Okoli and Onwuachu (2009) also saw entrepreneurship as the willingness to seek out investment opportunities in an environment and be able to establish, take risk, and run an enterprise successfully based on identified opportunities. Through entrepreneurship education, students can be exposed to a wide range of business skills and managerial competencies.

The Basic Science curriculum lays emphasis on acquisition of scientific knowledge, process skills and attitudes. The knowledge is necessary in helping the student acquire skills of problem-solving and creativity which are necessary for success in business. Also, the teaching of Basic Science aims at helping learners acquire such process skills as recording, observing, predicting experimenting, hypothesizing, classifying and drawing conclusion, among others. Besides, the teaching of Basic Science is to help develop in learners such acceptable scientific attitudes as open-mindedness, curiosity, skepticism, honesty, and objectivity. Through practical activities, the student could acquire these process and attitudinal skills which are for self – reliance.

Regrettably, science teaching in most Nigerian schools emphasizes mostly the theory aspect while the practical aspect which should help the students acquire appropriate scientific, technological and entrepreneurial skills are neglected (Okoli & Onwuachu, 2009). This is so because the teaching of science as practiced today is such that emphasis on passing examinations which negates the ideals of functionality. Beyond understanding concepts for examination purposes science education is expected to equip learners with life coping skills. As Ivowi (1999) prescribed, science education should provide learners with opportunities to develop their skills in decision making by giving them chance for acquiring, questioning an discussing potential solutions to problems which are essential ingredients for entrepreneurial development.

In Basic Science, a number of curricula provisions lend themselves to entrepreneurial skills development. One of it is the identification and use of a local resource person in teaching some aspects of Basic Science. For instance, the use of a blacksmith in teaching properties of metals; the use of a Nurse in teaching drug abuse;

the use of an electrician in teaching electrical circuit etc. Using these local resource persons helps to reinforce the business spirit in students as well as help them learn attitudes in the work place.

Another aspect is the area of school-industry link through excursion visits. The field trip is an important teaching method in Basic Science where teachers are expected to take students outside the classroom so that they can learn science and technology concepts as they occur in natural settings. The pupils usually have a firsthand experience in the workplace setting. During field trips, opportunities are given to students to observe and ask questions of scientific and entrepreneurial value (NTI, 2008).

### **Strategies for Achieving Vision 20:2020 through Entrepreneurial and Functional Basic Science Education**

Wealth and job creation in the United State of America, Japan and other big capitalist states are in the hands of entrepreneurs who own the economy. Functional Basic science education has the potential for developing entrepreneurs for driving the country's wealth and job creation agenda. The principle of the strategy is: to make Basic Science education a priority for economic and social development, speed up the translation of scientific and technological advances into practical productive forces, enhance the scientific quality of thinking of the citizens to aid economic construction. China's scientific and technological advancement committee in 1995 recommended a speeding up of science and technology and encouraged the individual creative abilities. It is a vital lesson for Nigeria to emulate if vision 20:2020 is to be attained. Here are some suggested strategies of how entrepreneurial and functional Basic Science education can be used to achieve vision 20:2020.

- **Creating a Positive Attitude towards Entrepreneurship**  
Encouraging the enterprise spirit in young people is essential for achieving progress in small and medium scale industries as a precursor for generating employment and industrial growth. The point is that entrepreneurship should be seen as a general attitude that can be usefully applied in all working activities and everyday life. When this becomes the focus of education, it will nurture in young people, those personal attributes that form the basis of entrepreneurship such as creativity, spirit of initiatives, responsibility, capacity of confronting risks and independence.
- **Seminars and Workshop**  
Seminars/Workshops on entrepreneurship skills and attributes which are needed by entrepreneurs to succeed in business should be organized for students and pupils. Here, successful entrepreneurs and experts could be invited to deliver lectures on entrepreneurship to broaden students minds and help them know more about the entrepreneurship from their experiences.

- **Internship Programme for students**

Through the intern programme students are given the opportunity to be interned to a small business organization where they can practice the skills they have learned. Participating youths may be given opportunity to apply for paid long holiday internship with local entrepreneurs. Through this programme, entrepreneurial awareness among the young people is promoted, and a stronger bridge between the educational system and the business world will be further strengthened.
- **Use of Competent and Qualified Teachers**

The teacher employed to teach entrepreneurship education should be competent and qualified in terms of practical skills and knowledge of business opportunities available after graduation. The teacher is expected to know both the methodology and the content of the subject so that he can teach the students effectively. Okwori (2006) citing Jacob (1999) disclosed that qualified, competent, and dedicated teachers who have the interest of their students at heart should be employed in our schools to ensure qualitative education at all levels.
- **Teaching Strategies**

Teachers should use appropriate teaching methods (such as demonstration and field trip) in teaching entrepreneurship education so that students can understand the lessons. Entrepreneurship education should be properly taught so that when students graduate, they can make use of the knowledge acquired and establish their own businesses instead of waiting for government employment. Entrepreneurship village or centre should be made available by each institution so that students can be exposed to the real practical business management in a chosen entrepreneur or business.
- **Counseling**

The entrepreneurial teacher needs to counsel the students on entrepreneurship education because some of the students are still very young so that they will know the importance of entrepreneurship education. These teachers will guide the students properly towards establishing their own business instead of folding their hands and waiting for government only.
- **Visitation to Entrepreneurs in the Community**

On once in a while basis, entrepreneurial education teachers should organize visits to local entrepreneurs for their students. Students should undertake case studies of successful businesses. Through such visitations, teachers can expose students to successful small business to provide opportunities for students to practice their skills, enable students to become familiar with entrepreneurial and management tasks, and introduce students to contacts that they can draw upon to pursue their entrepreneurial dreams (Uwameiye & Aduwa – Ogiegbaen, 2006).

### **Challenges to Entrepreneurial and Functional Basic Science Education**

Efforts to making Basic Science education functional is met with a number of challenges. Some of these are:

1. **Large Classes.** Large class size has been identified as a major constraint to functionalizing Basic Science Education. In many schools, the class size is 60 students or even more. Under such circumstances, it is difficult to use learner-Centred and activity – based participatory teaching approaches. The consequence is that the intended desired process skills are not acquired. The national policy recommended pupil to teacher ratio of 40:1. This is hardly implemented.
2. **Teacher Factors.** It is the classroom teacher that implements the curriculum. An effective teacher is a well trained, motivated and well equipped to do his job. But the situation is that the teacher is not motivated in term of remuneration, working tools, welfare packages, working environment and social esteem.
3. **Assessment Procedures.** The system of assessment in the country is dysfunctional. It is expected that teachers should give projects to students as part of assessment and students could then use those projects to learn the skills – this is hardly done. Science practicals are not usually organized. This explains why students in most schools enter the science laboratory for the first time when list of requirements for practical examinations are released by WAEC. The JSCE in Basic Science does not even incorporate practical aspect in its examination. What is required for a functional Basic Science is performance based assessment.
4. **Poor Funding.** Education in Nigeria and Science education in particular has suffered severe under funding. The UNESCO's recommendation for a minimum of 26% of the budgetary allocation to education is yet to see the light of the day. The effect is that classrooms are lacking instructional materials.

### **Conclusion**

Entrepreneurial and Basic Science Education has the potential of equipping individuals with life – coping skills of entrepreneurialship and self – reliance as a pathway to achieving vision 20:2020. An individual who is properly schooled in Basic Science should be creative in his thinking and would be able to see opportunities where others have over looked. Such an individual will possess the attitudes and skills to be able to be self – reliant.

Therefore, in order for Nigeria to make one of the twenty great world economies by 2020, Basic Science curriculum should be made to be functional in terms of teaching resources, enough teachers in quantity and quality who are well motivated, good learning environment and integrated science laboratories. If this is done, there are high hopes that those who are exposed to Basic Science programme would have been equipped to re-direct our country's small scale enterprise coalition necessary to propel the nation's economy.

## **Recommendations**

In order that the Basic Science Education curriculum is made functional for effective enhancement of entrepreneurial education, the following recommendations are made.

- Regular workshops, seminars and conferences should be organized for teachers of Basic Science to build their capacities for integrating entrepreneurial skills in their teachings. The Science Teachers Association of Nigeria, (STAN) and such similar organizations could be of help in this regard.
- Assessment methods and processes should emphasize performance based assessment so as to ascertain the acquisition of the right type of skills.
- More teachers should be employed so as to reduce the student – teacher ratio to acceptable level. Those already employed should be motivated
- Basic Science laboratories should be provided and equipped to foster activity based learning

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