

# Towards Enhancing the Entrepreneurial Skills of Primary School Pupils through Creative Teaching of Basic Science

## REVIEW ARTICLE

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## ABSTRACT

*This paper focuses on enhancing the entrepreneurial skills of primary school pupils through creative teaching and learning of basic science. Primary education in Nigeria, concept and importance of entrepreneurship, creative teaching and strategies for developing entrepreneurial skills of basic science pupils through creative teaching of basic science were also highlighted. Some of the strategies include the use of creative teaching methods, improvisation, extrinsic and intrinsic motivations of pupils. Problems related to science and entrepreneurship education were also captured. Some of these problems include: lack of conscious efforts towards achieving entrepreneurship education, insufficient skilled human and material resources, corruption, poor funding and motivation of teachers among others. Improving fund provision, use of trained and qualified science teachers to teach basic science at primary school level and involvement of pupils in improvisation of teaching and learning skills were among others recommended to enhance entrepreneurial skills of pupils at primary school level through creative teaching and learning of basic science.*

**Keywords:** Basic science, Teaching, Recessed economy.

## INTRODUCTION

Universal Basic Education (UBE) is 9-year school programme that spans through primary school and three years of Junior Secondary School in Nigeria. It was introduced in 1999 by Federal Government of Nigeria with intent of giving qualitative and functional education to the Nigerian child. The philosophy of the 9-year basic education as it relates to basic science is to ensure that learners exposed to the programme acquire appropriate level of numeracy, literacy, communicative and manipulative skills that are essential for reflective and scientific including life-long learning (NERDC, 2013). The objectives of the programme (NERDC, 2013) include enabling learners develop interest in science and technology, acquire basic skills and knowledge in science and technology and apply the scientific and technological knowledge and skills in meeting societal needs. Others include taking advantage of the varied vocational and career

opportunities accrued to science and technology and preparing the learners for subsequent studies in science education.

Education is the process through which individuals acquire knowledge, skills (including entrepreneurial skills), abilities and attitudes leading to a relatively permanent change in behaviour that is necessary for effective and functional living in the society (Okeke, 2007). This implies that, since education is intended to produce skilful and knowledgeable individuals, education is therefore, the essential tool for production of entrepreneurs. Entrepreneurs are catalysts for economic development, industrialization, self-reliance and wealth creation. Poverty analysts (Eriba, 2011) place Nigeria at the lower rungs of the indices of economic development and standard of living. According to the analysis, 70% of Nigerians are living below poverty line. Regrettably, in spite of the natural endowments, many Nigerians are still jobless and poor, young graduates from various levels of education are wondering why the education they obtained cannot earn them a living.

Arising from the increasing unemployment rate in Nigeria today, the need for Nigerians to seek avenues for self-employment and self-fulfilment is pertinent. It is observed that over 70% of secondary school leavers find it difficult to gain admission into higher institutions while over 60% of graduates are not able to get employment immediately after graduation because they are relatively unskilled and therefore unemployable (Olorukooba, Usman & Yero, 2009). Consequently, they attempt one entrepreneurial venture or another, but unfortunately fail because they have not been adequately prepared to face the challenges before embarking on entrepreneurial ventures. Fundamentally, this problem is partly due to the nature of the Nigerian education system which tends to produce "job seekers" instead of "job creators" due to lack of development of entrepreneurial skills in learners from the cradle.

In order to produce job creators instead of job seekers, there is need to infuse the culture of entrepreneurship in the teaching and learning of Basic Science and Technology right from the cradle. It is the exhibition of teachers' creative behaviours that may facilitate the development of entrepreneurial skills among pupils (Ayua&Jato, 2012). This is because in the education system, the classroom teacher to a large extent, is the determinant of the quality of the pupils' learning experiences and pupils' creative abilities is premised on teacher's creative competency in classroom teaching and learning (Ezeh& Ode, 2018). Though, entrepreneurship education is universally recognised as the brain behind individuals' and nation's economic and technological development, its cultivation in the classroom is paradoxically neglected in Nigeria. This suggests that creative skills have been stifled in so many pupils as a result of low exhibition of creativity by basic science teachers during classroom interaction in primary schools.

Nigeria accords priority to quality and creative teaching and learning of science at primary school level. Accordingly, in the National Policy on Education (FRN, 2012), government emphasized primary education and spelt out its goals which includes to develop in the child the ability to adapt to the child's changing environment, give the child opportunities to develop manipulative skills that will enable the child function effectively in the society within the limit of the child's capacity and provide the child with basic tools for further educational advancement - including preparation for trade and crafts of the society. As laudable as these goals sound, it may be difficult if not impossible to attain them if there is no development of entrepreneurial skills among primary school pupils. Mohammed and Funtua, (2009) maintained that in modern times, functional education has become key for the survival of individuals and for the development of the society. Unless a sound foundation is laid at the lower (primary) education level, education at higher levels may not be qualitative and appreciative.

Primary school is therefore, not only the foundation upon which the rest of education system is built but also the key to the success or failure of the whole system. It be noteworthy that what people learn in their formative years has lasting influence on the rest of their lives. The rate at which the products of our education system are roaming about as unemployed job-seekers and the scourge of

poverty prevalent in the society is a matter of utmost concern. This is contrary to the goals of Nigerian education (FRN, 2012) which aims at producing a self-reliant nation. This indicates that there is a disturbing gap between policies and practices in the school system on one hand and between education system and the employable skills required for the available jobs. Thus, school leavers or graduates lack some entrepreneurship experiences. Realizing the gross impact of this on the society, the Nigerian government established the Bureau of Unemployment which tries to train graduates on any trade they wish to go into after National Youth Service Corps (NYSC) instead of looking for white-collar jobs which have since become scarce since 1980s. Additionally, in 1999, the National Poverty Alleviation and Eradication Programme (NAPEP) was set up to reduce poverty and provide a means of livelihood for the less privileged Nigerians (Olajide & James, 2009).

Apart from these post-graduation efforts, there seems to be little attempt to train Nigerian students to acquire entrepreneurial skills while in school. This gap may be difficult to fill if the solid foundation for developing entrepreneurial skills is not laid at the primary school (cradle). Worse still, the issue of pensioners is another matter of serious concern. The practice is that when people are due to retire, they do not want to, due to lack of entrepreneurial skills to fall back on. They either try to change their age or begin to lobby for contract appointments after retirement. Those who cannot do either, go and start languishing at home waiting for gratuity and monthly pension which may or may never come. This indicates that there is a missing link between the education system and life after school. The society therefore, needs the type of education that can help people to discover their talents/skills at a very early age and also encourage them to develop and use them effectively as they grow into adults through entrepreneurship education.

## SOME BASICS IN ENTREPRENEURSHIP EDUCATION

Entrepreneurship education involves the production of individuals from various levels of the school system who are equipped with the appropriate knowledge and entrepreneurial skills for wealth creation and self-reliance (Asiriwuwa, 2009). Emmanuel (2010) submitted that Entrepreneurship is not colour, height, race, tribe, sex, or age based. Hence, there is the clarion call for entrepreneurship education at all levels of education beginning at the primary school. It is sad that even handicraft which provides primary school pupils with various craft skills for self-employment, wealth creation and self-reliance have gradually disappeared from Nigerian primary schools (Achor, 2011). Notwithstanding, with more people being educated, and the fact that the government could no longer employ most school leavers, economic programmes and strategies to encourage entrepreneurship and its education are being put in place. This include the Open Apprenticeship Scheme, People's Bank of Nigeria, Funds for Small and Medium Scale Industries, Co-operative Societies, National Poverty Alleviation and Eradication Programme (NAPEP) (started in 1999), Training of NYSC on entrepreneurship and granting them WAP (War Against Poverty) Loan (started 2009), introduction of entrepreneurial and vocational training for all tertiary institutions in Nigeria, as a mandatory course for students by the NUC. All these efforts beside many others are in furtherance of the need to drive the development of Nigeria through developing science on the platform of a culture of entrepreneurship in Nigerian Youths (Akinsola, Lawal & Oyedokun, 2009).

Entrenching entrepreneurship education at all levels of Nigerian education system including primary schools has a lot of benefits to offer. Bolarinwa (as cited in Ezeudu, 2008), submitted that it brings about entrepreneurial skills acquisition leading to reduction of unemployment among youths and will play a complementary role in developing the occupational knowledge, job skills and work experience among teachers and students. Other advantages include effective utilization of local resources, decentralization and diversification of business, promotion of science and technology, capital formation and promotion of the spirit and culture of entrepreneurship among Nigerian youths and children. Entrepreneurship education is the brain behind the economic development of individuals and nations. In fact, the development of entrepreneurial skills through creative teaching and learning of science among Nigerian youths beginning at the primary school level will not only serve as medicine to cure or vaccine to prevent unemployment and poverty but much more

importantly form the unshakable foundation, unbreakable cornerstone and formidable pillars to building a scientific, technological and self-reliant individuals and a self-reliant nation with a great and dynamic economy. According to Morris (as cited in Emmanuel, 2010), all humans have creative or entrepreneurial potentials at varying degrees but most of them do not know how to develop and unleash them and hence the need for entrepreneurship education. In order to do this effectively, pupils must be made to be interested in science and ES development. However, if the right atmosphere filled with materials and teacher creative behaviour are lacking, there may be little or no success. This suggests that, the essential factors for entrepreneurial success include: one's desire or interest to achieve something, ability and interest to assume personal responsibility, confidence in one's ability, energy and interest in pursuit of goals.

There are quite a number of entrepreneurial skills needed by every entrepreneur for entrepreneurial success. These skills could be developed in all humans (including primary school pupils) and unless a solid foundation is laid at the primary school, much of what happens at the other levels of education may not be successful enough. These skills include: creative thinking, planning/research, decision making, organizing, team building, marketing, financial management, record keeping, goal setting, business management, accounting, Information and Communication Technology (ICT), technical and personal skills among others (Ogbonnaya, 2011).

Looking at the national philosophy and goals of Nigerian education, one would expect this nation to have developed far beyond mental and economic neo-colonialism. According to Ezeudu (2008), political upheavals, economic depression, unemployment and poverty will continue to frustrate development in Nigeria except the problems confronting meaningful and functional education (particularly science and entrepreneurship) are addressed. Science education has a lot of problems challenging the fulfilment of its goals. These include: Lack of policy implementation guidelines, lack of human and material resources, teachers' attitude to work, administrative problems, poor funding and corruption. Piwuna and Osasebor (2009), stated that without adequate tools, even the best teacher is handicapped and thus creative science teaching is inhibited. This inhibition may in turn influence the development of ES among primary school pupils. Other problems related to entrepreneurship education in Nigeria as outlined by Odei (2010) include; lack of well-designed entrepreneurship curriculum, lack of dignity of labour, inadequate career guidance, paucity of appropriate teaching facilities and equipment, inadequate professional entrepreneurship educators in the system, and the problem of societal attitude towards entrepreneurship education as part of vocational and technical education.

### **Concept of Creative Teaching**

Creative teaching as an aspect of creative education, according to McFinn (2015), is based on individuals' needs and abilities, which need freedom in learning/teaching as an active mode that influences innovative personality development; it involves creating something unique and turning it into an entrepreneurial activity. It also involves teachers making learning more interesting and effective and using imaginative approaches or exhibiting creative teaching behaviours during science classroom interactions (Suhvan, 2014; Cremin, 2018). Creative education has to do with teaching creatively and teaching for creativity. Thus, on one hand, teaching creatively entails demonstrating how to think creatively and the ability to use diverse methodological approaches and resources. On the other hand, teaching for creativity involves inspiring students to think creatively, exposing them to critical instances for generating ideas, encouraging creative learning and identifying learners' creative strengths and fostering them. Creative teachers are change agents; they welcome new experiences and are not afraid to go off the main track or step into the unknown.

Creative teachers use imaginative approaches of engagement in classroom activities in order to develop children's manipulative abilities and actions in creative learning. Besides, they need to exert professional autonomy, learning to be flexible and responsive to different learners and

different learning contexts (McFinn, 2015). Creative teachers' pedagogical practice includes: helping learners find relevance in their work either by practical application or via emotional and personal connections; use open-ended questions and fostering persistence and resourcefulness including providing time for reflection. Thus, in both planning and teaching, creative teachers are alert to the potential mental connections between imagination and personal/professional experience and give high value to curiosity and risk taking, to ownership and autonomy and the development of imaginative and unusual ideas in both themselves and in learners.

Teachers have to attract the students' interest and attention in a new way. Consequently, development of creative approaches is imperative. Creative people are more likely to engage in entrepreneurial behaviour. As a result, the concept of creativity is one that is often discussed in relation with entrepreneurship for the reason that creative thinking is an essential element in the formulation of business ideas and is needed in every stage of business development and execution. Adams (2006) stated that creativity has three basic components: creative thinking skills, motivation or interest and expertise. Teaching and learning for a New Age require a new model of education. This according to Radovic-Markovic (2012) means an interactive and creative education based on individual needs and abilities. The 21st century education strategy requires freedom in learning and teaching; such that an active mode of learning engenders innovative personality development, which creates something unique and turns it into entrepreneurial activity. A synergy of business and education environment should be flexible, welcome a variety of ideas, empower freedom in learning/teaching and foster strong links among policies, principles and practices.

The key points about creative teachers and teaching according to Cremin (2018) are that: creative teachers are aware of and value the human attribute of creativity in them and seek to foster such a mind-set in the learner. Creative practice is multi-layered (encompassing personal qualities, pedagogy and ethos), in which each has a distinctly creative orientation. They personally and pedagogically in their classroom ethos, both display and develop learners' curiosity, connection making, autonomy, ownership and originality. They are also autonomous professionals, who actively model their own creative engagement in the classroom and seek to nurture this in their students. While all good teachers reward originality, the creative ones rely on it to enhance theirs and students' well-being; seeing the development of creativity and originality as the distinguishing mark of their teaching.

### **Creative Teaching of Basic Science: Educating for Creativity and Entrepreneurial Skills Development among Learners**

Following the economic challenges befalling Nigeria like other countries around the globe in the present generation, there is need for comprehensive review of our education system in order to make it more functional. Zhao (2013) observes that in the past, education was designed to sort students into roles. With the advent of the industrial age, there grew a need to be able to differentiate between students who were going into job vacancies in the society; digging ditches and manning the assembly lines, and those who would be managers of the workforce. Before the current wave of globalization, most people undertook jobs in their local economies that required very similar, basic skills. Only a small percentage of jobs required higher cognitive skills. The local economies were mostly insular and change at a very slow rate. So, it was not difficult to predict what skills were needed in the marketplace. Therefore, school curricula were simply designed to meet those needs. This to Zhao (2013) and Lesswing (2014) remained the dominant paradigm under which schools have been operating since the early 1900s. Thus, education has been about producing employees for the market place with similar skills, and similar values, thereby reducing human diversity into skilful creativity and entrepreneurship.

The development of creative potential as an educational goal is a clarion call today. Thus, educational psychologists such as Guilford and Vygotsky according to Beghetto (2010) stated that the entire future of humanity will be obtained through the creative imagination. In his presidential address to the American Psychological Association, Guilford (as cited in Lesswing, 2014) emphasized the need to encourage creative teaching for developing creative thinking among students in schools. Students need to be imaginative, flexible and tough-minded in order to succeed. However, basic science teachers seem to be reducing or undermining creativity instead of encouraging or developing it. This suggests that creative teaching is needed for equipping creative and entrepreneurial learners which could prepare them for individual and societal survival.

Entrepreneurial creativity deals with the relationship between creativity and entrepreneurship. It is about coming up with innovative ideas and turning them into value creating and profitable business activities. According to Kotelnikov (2017); creative thinking skills, cross-functional expertise, motivation and entrepreneurial actions are the key elements of entrepreneurial creativity as undermentioned.

**Creative Thinking Skills:** these include inventive thinking, thinking outside the box, lateral thinking, asking searching questions, creative problem solving and radical thinking.

**Cross-Functional Expertise:** This has to do with systemic thinking, entrepreneurial mind-set and skills, mastery of business synergic and systemic innovation.

**Motivation:** on one hand it refers to internal motivation like love, burning desire to make a difference, creative dissatisfaction with the status and fun-driven creativity. On the other hand, it means external motivation like creativity under the gun, problems, enemies and competitors.

**Entrepreneurial Actions:** deals with stretching oneself, being prepared to win, adopting a can-do attitude and jumping in, experimenting with new ideas, working smart and hard to conquer different enemies of innovation, attaining the seemingly impossible and turning your dreams into reality.

### Strategies for Developing Entrepreneurial Skills among Basic Science Pupils

The teacher is the key to any educational development and the influence of creative teaching behaviours on basic science pupils' life could be reasonable. This suggests that exhibition of creative teaching behaviours during classroom interactions for the development of entrepreneurial skills among students could be a right step in the right direction. According to Ikwuanusi (2011) the following strategies when used may help in the exhibition of creative teaching behaviours during classroom interactions:

**Teaching Method(s):** If teaching methods such as activity-based, child-centred, hands-on-minds-on, problem-solving, science-technology-society, excursion, demonstration and project are fully utilized, combination of all or a few of them may provide the necessary entrepreneurial skills among pupils.

**Motivation:** Here, achievement drive should be built in students during classroom interactions. They should be helped to develop the drive for success and expertise in new ventures through one's effort and skills. Motivation could be either intrinsic or extrinsic and once students developed interest in learning, it follows successfully.

**Encouragement:** To encourage development of entrepreneurial skills among pupils, teachers need provide child-friendly environment, display role-model behaviour, provide ample activities and materials, expose students to challenging opportunities, and provide time for exploration through excursions among others.

**Improvisation:** In life, it is not everything that one needs that is readily available. There are

situations where one has to look for an alternative means to meet one's need. Though these alternatives may not be as good and perfect as the original(s), they serve as substitutes and are better than nothing at all. This act of using any relevant-thing at any time there is lack of some specific first hand teaching aids is an act of creativity or creative behaviour which every science teacher needs. Improvisation could either be by role substitution or by role stimulation (construction). Including students in the improvisation processes may not only facilitate the development of Entrepreneurial skills but also creativity (Ikwuanusi, 2011).

**Quality Performance of Models:** Teaching of certain topics should be linked to the history of great entrepreneurs. Their experiences and exploits; how they started from the slum, waded through poverty and penury, employ their wit and resourcefulness to create, manage and control resources that ultimately brought them into fame.

Other strategies include: career education, training in management efficiency, research, innovations, technical skills and confidence. These could also facilitate the display of creative behaviour needed for the development of entrepreneurial skills and interest in basic science among pupils.

### Problems Related to Science and Entrepreneurship Education

Looking at the philosophy and goals of Nigerian education as stated in the National Policy on Education (FRN, 2013), one would expect this nation to have developed far beyond mental and economic neo-colonialism. Education ought to be a source of wealth of any individual or nation. However, the fact that Nigerian youths are facing unemployment and poverty due to lack of ES for self-reliance makes one to assume that all is not well with Nigerian education system. According to Ezeudu (2008), political upheavals, economic depression, unemployment and poverty will continue to frustrate development in Nigeria except the problems confronting meaningful and functional education (particularly science and entrepreneurship) are addressed. This indicates the urgent need to overhaul Nigerian education system to ensure that the goals of science and entrepreneurship education are not defeated. It is likely that only effective, meaningful and functional science and entrepreneurship education would help Nigerian school leavers and youths become confident and disposed to survive the harsh social and economic conditions of the 21st century. Entrepreneurial education has a lot of problems challenging the achievement of entrepreneurial education. These include:

**Lack of conscious implementation efforts:** This is to say that there are no corresponding steps actualize entrepreneurship education which has to do with well-trained and well-motivated teachers.

**Insufficient human and material resources:** Science teachers are inadequate in Nigerian schools and so are trained laboratory technologists and attendants(Adeogun and Osifila, 2012). Besides, most of the schools do not have laboratories and where they exist, they are not well equipped. The case becomes worse with the low level of improvisation among science teachers (Ayua, 2011).

**Poor motivation of teachers:** Nigerian teachers are not well motivated. Their salaries are irregularly paid. In most cases, this could give rise to poor teaching, truancy and negative attitude to work.

**Administrative problems:** These constitute hindrances to the progress of science education. Most policies are hardly implemented. Those in-charge of education are not always science oriented and so they show little or no interest in science matters.

**Poor funding of education:** Education budget in Nigeria is usually low and not much is given to science education. This has over the time negatively affected the teaching and learning of

science as well as research and laboratory activities.

**Problem of corruption:** This has to do with dishonesty, bribery, mismanaging, misappropriating, embezzling and looting public funds meant for science education.

Other problems related to entrepreneurship education in Nigeria as outlined by Otoyee *et al.*(2010) include; teachers lack of practical/psychomotor skills (Eze, 2008), lack of well-designed entrepreneurship curriculum, lack of dignity of labour, inadequate career guidance, paucity of appropriate teaching facilities and equipment, inadequate professional entrepreneurship educators in the system, and the problems of societal attitude towards entrepreneurship education as part of vocational and technical education. These enormous problems are prevailing in our educational institutions in the face of the need for inculcating entrepreneurial skills in pupils from the cradle stage particularly at basic level of education. So, where do we go from here?

## CONCLUSION

Entrepreneurial skills can be developed among pupils at the cradle. To do this effectively, exhibition of creative teaching and learning of basic science is necessary. However, the poor exhibition of creativity during basic science lessons cannot yield the expected result. Therefore, as far as development of entrepreneurial skills is concerned, the school pupils go to does not seem to matter. It is the teachers and the systemic problems in the school systems that hinder the development of these very important potentials among pupils. Hence, there is need for basic science teachers to consciously deploy creativity in the teaching and learning of basic science at primary school level to develop and inculcate in the pupils entrepreneurial skills and entrepreneurship culture.

### Recommendations

In view of the need for entrepreneurial skills development among pupils at primary school level, enabling environment is required for creative and innovative teaching and learning of basic science. It is therefore recommended that:

1. School proprietors should provide materials/funds needed for teaching Basic Science experimentally;
2. School heads and the Parents Teachers Association (PTA) should support teachers' efforts to improvise and explore resources for teaching Basic Science practically;
3. The use of non-science teachers to teach Basic Science at primary school level should be avoided; rather, there should refocus attention on quantitative and qualitative training/retraining and production of Basic Science teachers in order to address their shortage in schools;
4. Stakeholders in science education in conjunction with curriculum experts should improve basic science teachers training programmes with keen emphasis on skills acquisition needed for effective improvisation and entrepreneurship education;
5. The efforts of creative basic science teachers should be rewarded by their employers with motivational incentives or encouragement allowances; Basic science teachers should change their cold attitudes towards entrepreneurship as being part of vocational and technical education only;
6. Basic science teachers should improve their classroom interaction patterns with pupil as regards accepting, answering and managing pupils' unusual questions and ideas timely and wisely so as to sustain pupils' interest in learning science and thinking creatively.

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