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Review Article

Science education for entrepreneurship and sustainable development: A call for overhaul of government agencies and institutions in Nigeria

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ABSTRACT: Nigeria has a good number of Government Parastatals in the Ministry of Science and Technology, Industrial Development Centers, Federal and States Universities of Science and Technology, and Polytechnics, which are capable of promoting entrepreneurial activities as well as providing entrepreneurship education. Yet much is left to be desired; the epileptic power supply, unprofessionalism in government sectors, corruption by government officials, and the well-celebrated practice of substituting merit for a quota system. The paper discusses the need to overhaul Government Agencies and Institutions in Nigeria to meet the desired Entrepreneurship Education for Sustainable Development. Since skill acquisition is central to entrepreneurship, the paper highlighted the need for qualitative education as means for the attainment of appropriate skills for achieving sustainable development. Four skills relevant to different levels of education were identified. Challenges of entrepreneurship education for sustainable development as well as strategies for achieving entrepreneurship education for sustainable development were discussed. The paper recommends that Government Agencies and Institutions saddled with the responsibility of providing entrepreneurship training in the country should be overhauled.

Keywords: Entrepreneurship, science education, sustainable development.

INTRODUCTION

Education, in whatever form is meant to satisfy certain basic needs of man. No doubt that the early man went into it straight on his own with the unseen master teacher – experience, this is probably because no one is born fully-formed: it is through self-experience in the world that we become what we are (Freire, 2014). Though slow and painful, it was effective because it aided man in meeting three of his basic needs: Food, Clothing, and Shelter. A man by his initiatives, creative thinking, hard work and careful observations had applied himself so tenaciously to "his education" to attain the standard. In other words, the attainment of a certain standard depends to a very large extent on the standard and quality of science education acquired or provided to the learner.

Science Education has been defined differently by different scholars. In this paper, however, the writers see science education as that act of careful but articulate construction and re-construction of practical knowledge and experiences to meet human needs. These needs can only be met when science education is geared towards skills acquisition for the purpose of production of goods and services that would satisfy human needs and consequently leads to a corresponding sustainable development. To achieve this, there is the need to revisit our education sector for quality delivery, which is the driving force towards meaningful sustainable development. UNICEF (2000) discusses five dimensions of quality education, "healthy learners; conducive environments; relevant curricula; child-friendly pedagogy; and useful outcomes" (p. 4). All these elements contribute

to building a quality education in a system, thereby enabling an indispensable right to students for effective learning. It is against these backgrounds that our educational system should be made to be:

- Qualitative and purposeful
- Aggressive and technological
- Academic and creative
- Formidable and satisfying
- Work oriented and poverty eradication
- Entrepreneurial and economic driven

A study by Adebayo (2013) revealed that Nigeria has as of 2013 seventeen parastatals in the Ministry of Science and Technology and twenty-two Industrial Development Centers, which are capable of promoting entrepreneurial activity in the country. Additionally, institutions such as the Universities of Science and Technology, Polytechnics, National Directorate of Employment (NDE), Bank of Industry (BOI) and a host of others are saddled with the mandate of making direct contributions to the promotion of entrepreneurship education in the country (Adebayo and Kolawole, 2013).

The problem

In spite of the growing number of Government Agencies and Institutions that were given mandates to make direct contributions to the promotion of entrepreneurship education in the country, much is left to be desired. For instance, the poor state of the nation's energy sector is a major hindrance to entrepreneurship activity, which has led to the closure of some of these entrepreneurial activity centres and industries. Institutions providing entrepreneurship education are grossly underfunded. Lawal (2019) reported that the United Nations Educational, Scientific and Cultural Organization (UNESCO) has warned that the 2030 target for achieving the Sustainable Development Goals (SDGs) may be unrealistic unless countries improve their funding of the education sector. This is evident in the low budgetary allocation to Nigeria's education sector over the years (Table 1). In 2017, ASUU Earned Academic Allowances statistics from 2013 – 2016 were put at 124 billion and accumulated areas were 495 billion. On the whole, ASUU expected 619 billion, but the entire budgetary allocation for education then was 540.01 billion (Adesulu, 2017), which is far below the budgetary allocation for that year. The saying that you cannot give what you do not have, reveals quite clearly the ugly trends in the admission of students into higher education across the country. It is saddening to note that the JAMB cut-off points requirement for admission into faculties of education is among the least. Ironically, it is the faculty which produces the required manpower for the training of persons who will turn around the economic machinery of the nation. When the very foundation stage of education is faulty, it affects quality education delivery and the end would appear to be pathetic, unproductive and sustainable development becomes unrealistic.

Table 1 and the 2019 budget of 8.83trn with 620.5bn allocated to education, shows clearly that Nigeria has not met the 26% minimum budgetary allocation recommended by UNESCO for the education sector. This trend will no doubt affect the provision of quality education in the country, thereby limiting entrepreneurial activities geared towards sustainable development. Others observed problems include unprofessionalism in government sectors and corruption. The paper discusses the need to overhaul Government Agencies and Institutions in Nigeria to meet the desired Entrepreneurship Education for Sustainable Development. Since skill acquisition provided by quality education is central to entrepreneurship.

ENTREPRENEURSHIP EDUCATION

Entrepreneurship according to Nwokolo (1997) cited in Okoli and Onwuachu (2009) is the acquisition of skills, ideas and managerial abilities necessary for personal self-reliance. Entrepreneurship education on the other hand is a carefully planned process leading to the acquisition of entrepreneurship skills for efficient and effective living (Elechi, 2009). For entrepreneurship education to be effective in developing the competencies of learners, the capacity of schools to create supportive and stimulating learning environments is as important as the personal competencies and motivation of science educators. This is evident by the fact that such education cannot take place in isolation from the world outside of the school. It may require working in partnership with external organizations in order to facilitate learning in other ways.

Entrepreneurship education prepares students to be responsible and enterprising individuals. It helps them develop the skills, knowledge, and attitudes necessary to achieve the goals they set out for themselves and become self-employed and sometimes employers of labour. Entrepreneurship education has the mandate to equip the youth with functional knowledge and skill to build up their character, attitude and vision (Gautam and Singh, 2015). Graduates who acquire entrepreneurship education are more likely to set up their own business enterprises, which will eventually metamorphosis into companies. This is achievable when students are exposed to apprenticeship programmes capable of providing the needed skills for entrepreneurial activity while in school. Every graduate has the potential of becoming a businessman but not everyone has the potential of becoming a successful businessman because to be successful in business, one must be ready and willing to develop:

- Conduct research on areas of need of the community and people.
- Positive interest and business spirit.
- Shock absorbers of patience and ability to absorb business risks.

Table 1. Federal Government Budgetary Allocation to Education (2009 – 2018).

Year	Budget (Trillion)	Allocation to Education (Billion)	% of Budget Allotted
2018	8.612	605.8	7.03
2017	7.444	550.0	7.38
2016	6.061	369.6	6.10
2015	5.068	392.2	7.74
2014	4.962	493.0	9.94
2013	4.987	426.53	8.55
2012	4.877	400.15	8.20
2011	4.972	306.3	6.16
2010	5.160	249.09	4.83
2009	3.049	221.19	7.25
Total	55.19trn	3.9trn	7.07%

Source: Ndujihe (2018).

- Have the will power to succeed.
- Broad base marketing strategies.
- Readiness to explore all available avenues.

Business opportunities abound in science education because it is the driving force of entrepreneurial skills. An entrepreneur, on the other hand, is a person who applies his acquired skills to an enterprise for the production of goods and services, job creation, and economic and national development. Though entrepreneurship education may be important for promoting entrepreneurship, Mani (2015) puts it right when he asserts that, there is a need to carry out more research on the way of providing entrepreneurship education. This is owing to the fact that formal entrepreneurship education can instil confidence in the students to start venture into business.

Entrepreneurial skills

It includes the skills of creativity (imagination, critical reflection, problem-solving), communication, mobilizing resources (people and things), and coping with uncertainty, ambiguity and risk. Entrepreneurial skills are relevant skills and competencies that will enable an individual to seek and run an enterprise successfully (Ifeakor and Enemuo, 2009).

In science education for instance, four very important entrepreneurial skills stand out at all levels of learning:

1. Basic science process skills – Primary education.
2. Integrated science process skills – Secondary education.
3. Reasoning skills – Undergraduate education.
4. Critical thinking skills – Post graduate education.

The first two were developed by the American Association for the Advancement of Science (AAAS, 1967) and the curriculum which drives in these skills is known as Science a Process Approach (SAPA). Basic Science Process Skills (BSPS) are functional skills designed for primary school pupils and are vital for science learning and concept formation at primary and junior secondary schools (Akinbobola and Afolabi, 2010). Integrated science process skills are important skills for solving problems or doing science (Mutlu and Temiz, 2013 as cited in Aydogdu, 2015). Science Reasoning Skills help children make sense of information they gather by fostering an open mind, curiosity, logic and data-based approach to understanding the world (Valentino, 2000). According to Ibe (2010), critical thinking involves the ability to identify a problem, raise questions about it, seek information, analyze them and make inferences logically.

Whereas Basic and Integrated Science process skills provide bases for gathering information on concept formation and working behaviour of Scientists, reasoning and critical thinking skills make sense of the information acquired and apply them to new situations for the purpose of solving problems that could lead to gainful employment, decent jobs, entrepreneurship and sustainable life-styles, which are basic sustainable development in nature for civil life in the modern world. Through science process approach instruction, these skills can adequately be acquired for the purpose of entrepreneurial activity, as it affords learners the opportunity to interact with the environment through rich and stimulating activities (Shaibu and Mari, 2003).

SUSTAINABLE DEVELOPMENT

The concept of sustainable development was described by the 1987 Bruntland Commission Report as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UNESCO, 2012). In other words, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are

made consistent with the future as well as present needs (Cyril and Orji, 2017). Achieving sustainable development hinges on a number of principles of sustainable development, which gravitate towards the economy, environment and society (Mensah, 2019). Whereas sustainability is thought of as a long-term goal, sustainable development refers to the many processes and pathways to achieve the goals. The International Union for Conservation of Nature (IUCN, 2017), describes sustainable development as a means of adopting lifestyles and development paths that respect and work within nature's limits. One of the processes of achieving a sustainable future according to UNESCO (2012) is education and training because education is seen to be an essential ingredient for a more sustainable future, characterized by national development.

National development has been described (Abimbola and Adesote, 2012) as the ability of a county or countries to improve the social welfare of the people such as providing social amenities like quality education, potable water, infrastructural facilities, medical care, and so on. Quality education is the promoter of progress and human development. Over the decades, Nigeria's education quality has come under severe challenge and condemnation. This is partly because Nigeria has continued to rank below her contemporaries (Malaysia, China, India, etc.) from the very dawn of independence in the area of infrastructural and human capital development.

Human capital development provides professionalism in driving the country's resources. However, the bases for achieving professionalism have been scuttled at the very entry levels. For instance, merit has been substituted for quota system, catchment area and educationally less advantaged persons in the admission processes of our institutions of higher learning where supposedly, quality education is to be offered. UNICEF (2000) defined quality education as one that empowers students to think critically about their reality, by being creative and developing ownership of their learning experience, they learn through creativity and problem solving which helps them to develop critical consciousness about current realities they leave in. From the above definition, one would infer quite quickly to the fact that skills necessary for entrepreneurial activities could be attained through quality education. Additionally, research which is equally central to its acquisition must characterize our institutions of higher learning. No doubt, therefore, that an eminent scholar, Professor Peter Okebukola was reported (Lawal, 2019) to have identified reasons why African Universities are poorly ranked among global league institutions. Some of the reasons he identified include:

1. Low investment in research.
2. System inefficiency.
3. Low ICT use in promoting visibility.
4. Sharp practices in research works.
5. Failure to attract international students.

Furthermore, about 60 years after independence, the Nigerian State is still grappling with the popular phrase "educationally less advantage" and so on, in a country where every state has Federal University not to mention States owned Universities and those privately owned. In the management of government resources as well, the "national character" syndrome has equally substituted professionalism. Corruption and nepotism are already endemic. No thanks to the selective approach to the anticorruption fight of successive governments. In spite of the huge budgetary allocations to power by successive governments, energy which is central in driving entrepreneurial activities for economic growth and national development has remained a myth. Though thanks to the present administration for the recent signing of a power deal with Siemens for the production of 25,000 megawatts of electricity by 2025 (Ameh, 2019). All these put together culminated in the observable rot and collapse of the nation's resources, thereby hindering sustainable development.

In a similar development, polytechnic education in Nigeria is among the institutions saddled with the promotion of entrepreneurial activities. This is clearly provided in the objectives of polytechnic education:

1. Promotion of technical and vocational education and training.
2. Technology transfer.
3. Skills development to enhance the socio-economic advancement of the country.

These objectives are clear indications of the fact that polytechnic education provides a vital role in the human resources development of Nigeria by creating skilled manpower, enhancing industrial productivity and improving the quality of life. Unfortunately, so many odds stand against quality polytechnic education delivery (Lawal and Atueyi, 2017). Some of which include: the obsolete nature of the Polytechnic Act, the disparity between university graduates and their polytechnic counterparts, the non-implementation of the NEEDS assessment report of 2014, salary shortfalls and low funding.

Challenges of entrepreneurship education for sustainable development

Entrepreneurship education provides youths with the needed entrepreneurial skills for entrepreneurship, job creation, employment of labour and development. However, so many factors militated against their commencement and successes. Among these challenges are:

1. Decay in the education sector due to poor funding provided by acute budgetary allocation to the education sector.
2. Un-professionalism in government agencies and institutions that should promote the needed skills for

entrepreneurial activities to flourish.
3. Unstable power, which is the driving force behind the gear of industrial machines that produce goods and services for money generation and development.
4. Corruption

Strategies for achieving entrepreneurship education for sustainable development

For developing countries such as Nigeria to successfully catch up with her counterpart nations such as China, India, Singapore, etc, it must be ready and ever determined to move out of the current mono economy status. This can only be achieved if we embrace quality education for sustainable development. Hence the paper recommends the following:

1. Government institutions and agencies saddled with the promotion of entrepreneurship education need to be overhauled to meet the required results.
2. There should be adequate funding for the education sector to meet the UNESCO recommended minimum standard for developing countries.
3. The issue of unprofessionalism in government establishments should be adequately addressed because unprofessionalism affects productivity and national development.
4. Power should be made stable to achieve the production capacity of industries and enterprises that provide goods and services to the nation.
5. Educational institutions should rise above board to provide quality education that is entrepreneurship driven.
6. The fight against corruption should not be targeted at oppositions but should be all embracing regardless of one's status in society.

CONCLUSION

Entrepreneurship education has become imperative if only Nigeria is willing and ready to make a bold stride towards achieving sustainable national development. Though it is clear that so many odds are against this effort in promoting entrepreneurial activities, however, with quality science education in place we can attain our maximum potential. It is therefore mandatory for the government to provide the needed budgetary requirement for education and imbibe the culture of professionalism in agencies and institutions of government in other to maximize productivity for sustainable growth and national development.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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