THE ROLE OF SCIENCE ENTREPRENEURSHIP FOR SUSTAINABLE NATIONAL DEVELOPMENT

Okorieimoh Chibuisi, C¹*, Okorieimoh Ezinne. O²#

¹School of Electrical and Electronic Engineering, Technological University Dublin, Ireland.
²Jumiel International School, Owerri, Nigeria.

Abstract

Throughout the world, there has been a great concern on how to totally apply science to develop people’s capacity to manage and bring on innovations. In some African countries like Nigeria where economies are still at the developmental stages, there are high rates of infrastructural dilapidations, unemployment, devaluations of currency, lack of basic infrastructure/social amenities and incessant corrupt practices to mention but a few. In all these trending challenges, the need for the role of science entrepreneurship to balance up or cushion these effects cannot be over-emphasised. In a country where unemployment rates has escalated more than the global permissible rates, there should be speedy alternatives to bring on means of livelihoods. The speedy alternatives may be the application of science to learn vocational skills such as tailoring, cosmetology, cosmetic, production of paints, baking of doughs, agricultural practices etc., all these should be done through apprenticeship and mentorship processes, one may set up his or her own small business (i.e., small and medium enterprise scales, SMEs) and be self-employed and self-reliant as well as creating jobs to the teeming unemployed youths, therefore contributing to the growth of the economy. This is known as science entrepreneurship.

The best and preliminary way of achieving science entrepreneurship is through the ingraining of it from primary to tertiary curricula or syllabi as well as enforcement of more practical, trades and exhibitions that incorporate forty percentages (40%) of academic learnings at all levels.

Nevertheless, science entrepreneurial trainings should also be extended to graduate service programmes such as National Youths Service Corps (NYSC) where every graduates within the age brackets of serving his/her father land (Nigeria) for a period of one year and those who have been exempted or excluded from serving due to their above age limits are expected to learn at least one entrepreneurial trade right from the orientation camp straight to the community development service (CDS) centre. This should be through the extension of the already begun entrepreneurial trades right from their undergraduates’ programmes. Thereafter, Government should fund/support them at the end of these trainings to help them in establishing their own small scale businesses or companies which thus creates jobs to teeming unemployed youths and also reduce the activities of juvenile delinquencies as well as contributing to the growth of the economy.

To make this a reality, Government at all levels should include in her already existing ministerial or commissioning cabinets, the ministry of / or commissioner for science and entrepreneurial technology which shall oversees and monitors the progress of science entrepreneur at all levels of education.

Keywords: Science Entrepreneurship, Government, Sustainable National Development, Economy
Introduction

Poverty has been seen as a major setback towards national development and capacity-building as well as major impairments that have challenged the socio-economic growths and developments. A plan to mitigate this socio-economic constraint by the various elected and appointed leaders of the world especially in Nigeria is still in doubt.

Nigeria seen as the most populated black nations “Giant of Africa” have bennedictions to copious natural resources like crude oil, natural gas, tin, iron ore, coal, limestone, niobium, lead, and zinc. The country is not left out in agricultural practices owing to her possessions of arable lands that grown the following cash crops: Cocoa, Cassava, Oil palm, Groundnut, Maize, Yam, Cotton, Rubber, Soya-bean, Beans, Sesame, Melon Seed, Tobacco, Coffee, Rice, Kolanut, Carrot, Plantain and Banana, Sugarcane, Gum Arabic, Millet, Sorghum, Cashew, Tomatoes and Timber but still face with massive poverty, high rates of unemployment, inadequate basic infrastructure/social amenities and infrastructural dilapidations, devaluations of currency, incessant corrupt practices caused by failed polity.

Based on the statistics and data from the National Universities Commission (NUC, 2004), the estimated number of unemployed graduates in Nigeria have surpassed percentage when compared to the percentage of the gainfully employed graduates. These alarming unemployed rates are due to the disequilibrium that exists between the minimum requirements that were sought by the employers and the dearth of crucial qualities and skills that make job seekers employable (Dabalen et al., 2000). These qualities and skills that are seen dearth in the job seekers largely forestall the advancements of both the graduates, school levers and the country at large.

According to Oviawe (2010), Nigeria is densely populated by people living under the age of 30, therefore, Nigeria economy can be suggested to be a youth economy. Ariyo (2008) states that for Nigeria to attain its maximum, it needs to take up measures that will incorporate the youths with regards to socio-economic advancements in its adaptations and implementations. Although, Nigerian government through her Ministry of Education has incorporated entrepreneurial trades into secondary and tertiary education curricula to step up skills and acquisitions trainings which will hence play some major roles in job creations, alleviating the poor living conditions of her youths, reducing unemployment and juvenile delinquencies as well as contributing to the growth of her economy. Monitoring and supervision of this is very poor owing to a failed polity and lack of strict ethics and laws guiding the implementation of this into the secondary and tertiary education curricula.

Therefore, this paper seeks to address:

- the importance of science entrepreneur in the growth of national economy;
- science entrepreneur as a pillar for sustainable national development; and
- science entrepreneur as an alternative means of livelihoods.

Entrepreneurship has been seen as vision of progress, innovations, developmental pillar of nation’s capacity building and a key to a robust economy. On this view, many scholars and professionals have put together different meanings of Entrepreneurship and Entrepreneur (Igbo, 2006):

1. Adenipekun (2008) defines Entrepreneurship as that which referred to mental activities like creativity, originality and proactivity in enterprise education planned to prepare students for pursuing in self-directed economic future.
2. Arogundade (2011) states that Entrepreneurship in science training continuously encourages self-reliance because of the philosophy of creation of new cultural and attitudinal approaches for
responding to future challenges. This is an art for creating jobs, decline in importations, reduction in trade deficits and promoting economic growth (Ogundele, 2004; Osuagwu, 2002).


4. Onyebueke and Ochonogo (2002) in National Directorate of Employment (NDE) depicts entrepreneurship as the skill that consists of identifying prospective business openings, mustering and gathering assets and persevering so as to achieve a set of targets while exploiting the opportunity.

5. Gana (2001) describes entrepreneurship as the skill of seeking out investment prospects and establishing an enterprise from this recognised openings.

6. Oviawe (2010) says the ability to invent new ideas or make new approach to an old venture is one of the main purposes behind entrepreneurship.

7. Stancy (2006) defines Entrepreneurship as that which shows the skills to supervise or monitor the business environment, identify opportunities, assume economic risk and initiate change, based on recent realities.

In my own view, sees an entrepreneur as a person who creates a new business in the face of risk and certainly put together the necessary resources to capitalise on them.

Therefore, an entrepreneur is a self-reliant and sufficient person that is already prepared to fail or succeed with his/her business ideas. He/She tries to create his/her own business seeking for survival by inventing a source of revenue for his/her self.

Youth Employment

Akande (2014) posits the following as the major reasons for the youth unemployment:

- In 2013, the National Population Commission (NPoC, 2013) states that approximately half of the population of Nigeria is made up of youth which is defined as individuals between 15 and 34 years of age respectively and this made the population of Nigeria youth to be directly proportional to its unemployment rate, that is, as the population of the youth increases, their unemployment rates increased. In 2012, over 11 million youth in a population of 167 million people are unemployed and the majority of this population are females and those living in rural areas.
- The following factors may have led to this increase of youth unemployment in Nigeria:
  1. Increase in population growth rate;
  2. Inadequate school curricula and unprofessional teachers;
  3. Poor infrastructural development in the rural areas;
  4. Lack/non-availability of vivacious industry to absorb competent graduates;
  5. Failed polity and inconsistent public policies act on employment and job creation;
  6. Lack of adequate information for policy makers as a result of their greed or nonchalant attitudes;
  7. High rates of taxations on foreign companies and industries by the government may cease their existences;
  8. Government too much dependency on imported products may prevent the influx of indigenous companies or industries.
- Many targeted programs like National Directorate of Employment (NDE) and National Youths Service Corps Programme (NYSC) aimed at creating opportunities for youth employment have failed.
Some findings have shown that younger youth hunt for jobs even more than their elderly counterparts. Leastwise, two-thirds of unemployed youth are between 15 and 24 years of age. Considering the youth unemployment by gender perspective, available statistics show that a majority of unemployed youth are female (NISER, 2013). Table 1 show that women recorded for more than 50 percent of unemployed youth between 2008 and 2012.

**Table 1: Showing the Figures for the National Youth Unemployment by Gender and Geographical Location, From 2008-2012 (NISER, 2013).**

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage of Unemployed Youth that are Female</th>
<th>Percentage of Unemployed Youth that are in Rural Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>58.50</td>
<td>54.68</td>
</tr>
<tr>
<td>2009</td>
<td>57.82</td>
<td>50.77</td>
</tr>
<tr>
<td>2010</td>
<td>54.52</td>
<td>47.59</td>
</tr>
<tr>
<td>2011</td>
<td>50.85</td>
<td>59.95</td>
</tr>
<tr>
<td>2012</td>
<td>55.42</td>
<td>53.25</td>
</tr>
</tbody>
</table>

**Source:** NISER, 2013

Table 1 also shows that the analysis of youth unemployment is largely in rural areas and rapidly grows from 2010 to 2011 where unemployed youth in rural areas increased from 47.59 percent to 59.95 percent respectively. The population of unemployed youth in rural areas increased from 2.9 million in 2008 to approximately 5.9 million in 2012.

With respect to Education, from 2008 to 2012, more than 50% of unemployed youth only had primary Education (see Figure 1). The statistical graph in Figure 1 shows that 20% of Graduates of tertiary Education were also badly affected by unemployment too, hence indicating that they often remained unemployed for upward of five years after graduation (from 2008 to 2012) (NISER, 2013).
Some many policies have been approved by the past and present military and civilian administrations on a bid to combat the incessant rates of unemployment of youths. For instance, Operation Feed the Nation (OFN) was introduced in 1976 by the Federal Military Government to boost agricultural practices and make it more commercial practice than peasant practice. This made it possible for vast job creation and some many youths were employed but unfortunately, this programme never lasted for more than two years owing to bureaucratic policies of ministry of agriculture (Arua, 1982) and the appointments of these youths were terminated.

With the transition of power from Military rule to Civilian rule in 1999, Government have tried to modernise some of the old programmes of the military administrations to suit the interest of the teaming unemployed youths and millennium development goals (MDGs) (Uche et al., 2009). Most of these programmes are entrepreneurially inclined. Examples of these programmes are Subsidy Reinvestment and Empowerment Programme (SURE-P), the Youth Enterprise with Innovation in Nigeria (YOU-WIN) and the Osun State Youth Employment Scheme (O’YES) to mention but a few.

The SURE-P came into the limelight on February 2012 and its focus was on managing and investing the savings realised from the partial removal of the subsidy on petroleum products. The idea of this SURE-P was to create job opportunities to graduates of tertiary institutions. This SURE-P was an affiliates of some many intervention programmes such as the Graduate Internship Scheme (GIS), Community Services Scheme (CSS), Vocational Training Scheme (VTS), and Community Services, Women and Youth Empowerment (CSWYE), to mention but a few (Akande, 2004).

Among all these aforementioned affiliates of SURE-P, the most successful scheme is the GIS, which has offered the unemployed graduates the opportunities to do a one-year internship programme in firms, banks, ministries, government departments and agencies, get trained through the NDE as well as in small and medium enterprises (SMEs), pertinent to beneficiaries’ disciplines. Outside the trainings given by the various tertiary institutions, the aim of establishing the GIS is to assist the beneficiaries acquire the
requisite skills and the desired practical knowledge that will enable them to be more suitable for the job market (Akande, 2004). These programmes never succeeded in reducing the population of the teeming unemployed youths as only 50,000 graduates were selected for the first phase of the scheme out of 85,000 applicants. Also, out of 2000 firms that expressed their interests in hosting these graduate programme, only 293 firms were approved by the government (Akande, 2004).

Therefore, these programmes were discontinued by the next administration in 2016 and that gave birth to another social intervention programme known as N-Power. N-Power was introduced with the purpose of decreasing unemployment among Nigerian graduates and non-graduates between the ages of 18 and 35. This flagship programme is a component of the Federal Government's Social Investment Programme (SIP), where the volunteers from different different categories of the programme such as N-Teach, N-Tax, N-Health, N-Agro and N-Build receives thirty thousand Nigerian naira (30,000 NGN) monthly as a stipend for a maximum period of two years (Premium Times Online News, 2019).

In 2018, the estimated youth unemployment rate in Nigeria was approximately 20 percent as shown in Table 2 and Figure 2 (Plecher, 2019). According to World Bank, the data were estimates from the International Labour Organization (ILO), an agency of the United Nations that develops policies to set labour standards.

The youth unemployment rate simply means the percentage number of the unemployed within the age interval of 15 to 24 years incomparable to the total labour force. The youth unemployment rates are usually greater than the total unemployment rates. The total rate of unemployment was almost 6% in 2018. This is because many of the youth under the age of 24 were studying full-time and were unavailable for work.

Table 2: Showing Youth Unemployment Rates from 2008 to 2018 (Plecher, 2019)

<table>
<thead>
<tr>
<th>Year</th>
<th>Youth Unemployment Rates (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>8.66</td>
</tr>
<tr>
<td>2009</td>
<td>9.49</td>
</tr>
<tr>
<td>2010</td>
<td>9.65</td>
</tr>
<tr>
<td>2011</td>
<td>9.71</td>
</tr>
<tr>
<td>2012</td>
<td>9.75</td>
</tr>
<tr>
<td>2013</td>
<td>9.84</td>
</tr>
<tr>
<td>2014</td>
<td>12.62</td>
</tr>
<tr>
<td>2015</td>
<td>16.3</td>
</tr>
<tr>
<td>2016</td>
<td>20.67</td>
</tr>
<tr>
<td>2017</td>
<td>19.96</td>
</tr>
<tr>
<td>2018</td>
<td>19.68</td>
</tr>
</tbody>
</table>
Failed Entrepreneurial Training Programme

In the survey conducted by Nigerian Institute of Social and Economic Research (NISER), the outcome of the survey suggested that the youth unemployment programs have relied more on training than on other activities that actually provide opportunities for immediate employment in white-collar jobs or jobs in the small- and medium-scale industries (NISER, 2013). This entrepreneurial training programme has not produced the needed results because the training is often not accompanied by soft loans, which will enable the graduate trainees to establish their own businesses. It is quite hilarious to send someone for an apprenticeship in an automobile, after so many years of apprenticeship, the person end up being idol without having a place to practice. This is a waste of resources and time. Therefore, the failed entrepreneurial programme today is caused by lack of sponsorship and funding.

Nigeria Population

According to the latest United Nations estimates, the current population of Nigeria is 201,448,056 as of Saturday, August 10, 2019. The population of Nigeria is equivalent to 2.6% of the total world population ranking number 7 in the list of countries (and dependencies) by population. The Nigeria’s population density is 221 per Km² (571 people per mi²). Nigeria occupy the total land area of 910,770 Km² (351,650 sq. miles). 51.9% population of Nigeria (104,282,822) as of 2019 are urban dwellers while about 48.1% population (96,896,515) are rural dwellers. The median age in Nigeria is 17.9 years.
Youth Population

According to the national survey conducted by the National Bureau of Statistics (NBS, 2012), Nigeria, their report shows that youths within the age interval of 15 to 35 years of approximately 70 million persons in a population of 166 million of Nigerians, 54% of these youths are unemployed.

According to the united nation, a youth is someone who is between the ages of 15 and 24 (UN, 2011). Due to the incessant unemployment in Nigeria, the Nigeria youth is now defined as a group of persons between the ages of 18 and 35 which make up the residents of the Federal Republic of Nigeria (Anasi, 2010). Therefore, more than 70% of people within this age brackets are still unemployed.

Table 3: Showing yearly population of Nigeria from 2007 to 2019 (www.worldometers.info//)

<table>
<thead>
<tr>
<th>Years</th>
<th>Population (in Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>146.95</td>
</tr>
<tr>
<td>2008</td>
<td>150.66</td>
</tr>
<tr>
<td>2009</td>
<td>151.22</td>
</tr>
<tr>
<td>2010</td>
<td>159.2</td>
</tr>
<tr>
<td>2011</td>
<td>164.39</td>
</tr>
<tr>
<td>2012</td>
<td>166.21</td>
</tr>
<tr>
<td>2013</td>
<td>173.6</td>
</tr>
<tr>
<td>2014</td>
<td>178.52</td>
</tr>
<tr>
<td>2015</td>
<td>182.2</td>
</tr>
<tr>
<td>2016</td>
<td>186.6</td>
</tr>
<tr>
<td>2017</td>
<td>191.3</td>
</tr>
<tr>
<td>2018</td>
<td>196.2</td>
</tr>
<tr>
<td>2019</td>
<td>201.4</td>
</tr>
</tbody>
</table>
The Table 3 and Figure 3 above shows the yearly population of Nigeria from 2007 to 2019 as recorded by the worldometers. As seen in Figure 3, there is an increase in population from 2007 to 2019. This means that as the population increases, unemployment rates (especially that of the youths) also increases.

Science and Entrepreneurship

The word “science” is seen as the study of the world or universe based on examining, testing and proving of facts. It can also be described as intellectual and practical activities which encompasses the systematic study of the structure and behaviours of the physical and natural universe through experimentations and observations. Scientific ideas are unique collaborative platforms for innovations and economic developments support that will increase the competitive performances of science and technology-based companies. The purpose of scientific ideas is to help increase the performance of businesses by putting new ideas into practice.

This is being carried out through research and knowledge exchange activity centred on innovation, creativity, competitive performance and economic development (Ogundele, 2004; Osuagwu, 2002; and Arogundade, 2011). Possibly, thinking about to commence a new investment is not an uncommon activity, in fact, at any given point in time, over 4% of the working age population might be thinking of an idea for new investment.

Not amazingly, turning ideas into business investments is untrust; only about 10% of upcoming entrepreneurs have a new firm in place within 12-18 months, the other 90% either fail to define a sound business model that can drive their business idea forward to a new investment or realise their idea was flawed, the findings of Ukonu and Ehiabhi (2011) supported these theories. A key ingredient in successful entrepreneurship is self-knowledge. If entrepreneurs know their limitations and strengths, they may be able to avoid some common pitfalls in starting up their own business.
The opportunity-recognition is critical in new investment creation. This pattern in the entrepreneur’s perception of the relationship between the invention and financial product is refined into a business model that describes how the investment will make money or provide an appropriate return to the potential investors (Uche et al., 2009). Over the years, entrepreneurs have shown considerable creativity in inventing new business models to support life science investments. A new life science venture is started up in the United States where a scientist through initial government or foundation grants, discovers a pathway or mechanism in biology that is particularly interesting and appealing for disease intervention or treatment (http://newscienceventures.com/). The findings of this scientist is then send through the university’s office where discussions will commence with him/her and the technology transfer or licensing officer at the university about commercializing his/her discovery.

**Youth Empowerment**

Empowerment simply means the provision of power or authority to do something. Youth empowerments are acts of given mandates or authorities to persons within the youthful age intervals to enhance their abilities. The idea of youth empowerment is simply the attitudinal and organizational procedure where the youth have the ability and free will to take decisions that have significant implications on their wellbeing and people around them.

Many times, this seems as an important instrument towards civic engagement and national development. The idea of youth empowerment can come from home, community, church and government policies. In Nigeria, the youths constitutes the greater percentages of her population and majority of these youths are unemployed graduates. Every year, Nigerian tertiary institutions produces thousands of graduates from different fields of disciplines but Governments do not have the capacity to employ them. However, Nigerian streets are filled with young hawkers trying to earn a living.

According to some scholars, the rate at which unemployment is growing is becoming alarming and worrisome and as such could undermine the democratic experience as politicians could use these to achieve clandestine activities (Adepegba, 2011). Crimes such as smoking of Indian hemp, theft and murder are increasing daily in Nigeria.

A statistical report by NBS, Nigeria in 2012 has it that out of 46, 836 of young persons arrested by police for various crimes in Nigeria, smoking of Indian hemp has the largest percentage followed by theft which is 15.7% and murder which is 7.4%. For this to reduce almost to the nearest minimum, Nigerian government should organize an all-encompassing, integrated programme aimed at preparing, funding, training and researching in entrepreneurship in science for the young persons in the society that will make them self-dependable, self-reliant and enhance national development.

Government shelving her importation policies and invest wholesomely in her youths through science entrepreneurship will go a long way to create jobs to the teaming unemployed graduates, school levers and non-educated, reduce the activities of juvenile delinquencies, theft, or any forms of anti-social activities as well as boosting her economy.

**National Development**

National development is the process by which individuals, administrations, organisations and societies improve their capabilities to carry out significant roles, resolve problems, describe and accomplish objectives, understand and handle their advancement requirements in all-encompassing context and in a manner that is maintainable (Aremu and Oluwole, 2001).
This also means the ability of a nation to improve the lives of its citizens. These include materials such as an increase in gross domestic product (GDP), or social such as literacy rates and availability of healthcare. The aim of all national development is to upgrade the lives of her citizens in question within the context of a growing economy and an emphasis on the good of the community as a whole. Gboyega (2003) captures development as an idea that embodies all attempts to improve the conditions of human existence in all ramifications.

**Conclusion**

The role of science entrepreneurship for sustainable national development cannot be overemphasized in Nigeria. For this to be actualized, there is every need for incorporation of entrepreneurial trades from primary to tertiary education curricula. Science has a great significance for youth empowerment and production of man power needed in Nigeria labour market today. Science has been seen as an education instrument for rapid development, technological accomplishment and industrial expansion in the countries of the world. It provides crucial aid in choice of career, job placement and gainful employment.

The astonishing beauty of science is that it equips one with a set of necessary skills that are required by the entrepreneur to avoid future mistakes (Osuala, 2004). Science entrepreneurship for young people hence prepares them with necessary qualities and skills on making decisions, acquisition of new concepts, techniques of commencing and sustaining conversations and initiating business partnership. Through science entrepreneurship, operations and qualitative skills that ease computation and record keeping are further learnt. This begins with setting up of entrepreneurship programme aimed at developing and acquiring skills and competences for national development. Whatever that falls short of these will be using kid gloves to tackles the challenges in repositioning the Nigerian youths.

Therefore, science entrepreneurship provides the individuals with the quintessence of scientific ideas that involves searching and discovering that will enhance national development and guarantee the future of Nigeria.
Recommendations

Sequel to the aforementioned points that formed the major consequences of unemployment and science entrepreneurship, the following recommendations are therefore summarised below:

1. Government should supplement well targeted entrepreneurship training with loans/financial support;
2. Government should invest in transparent organizational structure and seamless strategy that will promote the skills of entrepreneurs;
3. Government should take a more comprehensive, less ad-hoc approach that not only targets the youth unemployment, but also look at their standard of education, labour market issues, etc.;
4. Government should as a matter of urgency address factors that limit the demand for labour, infrastructure and industrial expansion;
5. Government should provide social infrastructure such as good roads, electric power, hospitals, water, etc. so as to establish a sustainable place for business. This will encourage the entrepreneurs to undertake entrepreneurship projects that are innovative;
6. Government and Non-governmental agencies should engage in economic, mental, sociological and scientific training to prepare the young the entrepreneurs for the formative stage of their entrepreneurship;
7. Government should boost her monitoring and supervising teams and place serious sanctions on defaulters and violators of ethics and bylaws guiding the establishment of science entrepreneurship in primary to tertiary education curricula;
8. Government through her ministry of education should pass a law that will permit the successful graduating of students who have technically passed at least 35% out of 40% of the entrepreneurial trades and as such can produce something that is marketable;
9. Government should provide the needed facilities like technical laboratories, demonstration classrooms, etc. that will integrate science entrepreneurship in education;
10. Government should extend science entrepreneurship programmes to both educated and non-educated youths. This will help to curb down any forms of anti-social vices;
11. Extension of this entrepreneurship programme to the prisons by the Government will be highly advised. Since, prison detention is the only way one can be forcefully transformed, Government through her ministry of interior should make this available to all the convicts;
12. Youths should embrace programmes and efforts by the government to ensure entrepreneurship success for national development.
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