
Repositioning Science Teacher Education to Handle and Prevent an Economic Recession in Nigeria

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Abstract

The decline in Nigeria's growth rate between the first and second quarter of 2016 signalled the beginning of the recession in Nigeria. Recession in Nigeria led to the high unemployment rate, increase in poverty rate, and decline in industrial productivity among others. Even though Nigeria was declared technically out of recession, the aftermaths are being experienced months after the declaration. Recession in Nigeria was found to have been caused by high level of corruption, fall in oil price, high exchange rate, and low economic activities among others. The science teacher imparts knowledge and skills of science and technology to learners for active participation in economic activities. The science teacher also develops the potentials of learners, as well as imparts desirable attitudes to learners through the acquisition of scientific attitudes. Individuals with skills and well-developed potentials are well equipped for economic activities. Again, individuals with acceptable values would not engage in corrupt practices. Engagement in economic activities and decline in corruption eliminate recession. Deficient curriculum and lack of incentives for science teachers among others are challenges facing science teacher education in Nigeria. Effective science teachers cannot be produced in the midst of these challenges. Science teacher education in Nigeria, therefore, requires repositioning to produce science teachers who can impart knowledge, skills and acceptable values to learners. In order to reposition science teacher education in Nigeria, the curricular of sciences in teacher education should be reviewed to include the acquisition of appropriate practical skills, and science teachers should be well remunerated among others.

Every country (economy) experiences fluctuations in business (business cycle). These fluctuations or upward and downward movements of business involves shifts over a period of time between periods of the boom (rapid economic growth) and periods of decline or stagnation popularly referred to as periods of recession. Between 2007 and 2010 Nigeria recorded a strong annual growth rate of above 6% (Frivota Economics, 2017). In 2015, the growth rate generally declined to 2.7%, and by the first quarter and second quarter of 2016, it further declined, which signalled the onset of economic recession in Nigeria. According to Frivota Economics (2017) economic recession in Nigeria was based on certain factors such as over-reliance on export of commodities to support government revenue, high youth unemployment, corruption, low levels of productivity in agriculture, solid minerals, manufacturing and services, a weak and concentrated energy base, inefficient transport and a deep fall in oil prices.

However, by the second quarter of 2017, the National Bureau of Statistics (NBS) announced that Nigeria has emerged out of recession. According to NBS, the nation's Gross Domestic Product (GDP) grew by 0.55% (year-on-year) in real terms, indicating the emergence of the economy from recession after five consecutive quarters of contraction since the first quarter of 2016 (Olawoyin, 2017). During the second quarter of 2017, aggregate GDP stood at ₦26, 986,005.20 million in nominal terms, compared to ₦23, 547,466.9 million in the second quarter of 2016, resulting in a nominal GDP growth of 14.60%. Even though, technically, Nigeria is out of recession, the prevailing social and economic situations in Nigeria indicate otherwise. This is based on the fact that unemployment is high (18.8%), productivity is low, economic activities are low, household income is low and poverty is high to mention but a few.

The National Policy on Education (Federal Republic of Nigeria, FRN, 2013) stated that education is an instrument par excellence for affecting national development. The teacher is saddled with the implementation of the curriculum by imparting knowledge and skills to the learners in order to bring about the required development or change within the society. The science teacher imparts skills and knowledge of science (and technology) to learners. The recognition by world economies that science and technology are essential instruments for national development x-rays the pivotal position of the science teacher in national development. Recession as an economic problem and its consequences can be tackled by an efficient and functional science teacher education. The efficient and functional science teacher is needed in Nigerian schools so that sciences curricular can be well implemented which will result in the production of school leavers that can actively engage in economic activities and bring about positive changes in the society. The comprehensive education of the science teacher is, therefore important. Repositioning science teacher education in Nigeria should be paramount in order to produce the science teachers that are functional and efficient in performing the duty of teaching science and technology in Nigerian schools. There is the need to sustain the growth in the economy, as well as tackling the prevailing consequences of the recession in the country.

What is Recession?

Generally, the concept, recession, is referred to as a period of decline in economic activities or a contraction of the business cycle. It is an upward and downward movement of economic activities over medium-to-long term periods in a free market economy (Tule *et al.*, 2012). It is universally accepted that two consecutive quarters of contraction in the real gross domestic product is considered a recession. During the period of contraction economic activities slows down considerably. However, the National Bureau of Economic Research (NBER) Business Cycle Dating Committee defined a recession as a significant decrease in economic activities spread across a nation and lasting more than a few months, normally seen in employment, production, real income and other indicators (Claessens & Kose, 2009).

In the periods of recession macroeconomic indicators contract, Gross Domestic Product (GDP), household income, capacity utilization, business income, investment spending, employment and other indicators decline in periods of recession (Claessens & Kose, 2009). Nevertheless, business cycles have periods of the boom (prosperity) and followed by periods of contraction (recession), slump and eventually recovery. During the period of prosperity there is low unemployment, high standard of living, increase in production and consumption and so on. People live in affluence and the government has much revenue to provide essential services. In periods of recession economic activities decline, unemployment increases, household income decreases and standard of living of citizens are low. For example, during the period of recession in Nigeria unemployment rose to 14.2% by the fourth quarter of 2016 from 13.9% in the previous third quarter of the same year, with the number of unemployed in the labour force increasing by 351,015 persons (Kolawole, 2017). The extreme recession is referred to as depression. In periods of depression, most macroeconomic indicators decline to last for a long period of time, usually more than two years (Claessen & Kose, 2009).

Underlying Causes of Recession in Nigeria

- **Growth in labor force but lacking pre-requisite skills:** The amount of labour force is a determinant of growth in economic activities in any country. The population of Nigeria is growing at a rate of 2.28%, with equally an increase in a number of people that are willing and available for work (Frivota Economics, 2017). For example, by the fourth quarter of 2017, the labour force (economically active population or working age population) increased to 85.9 million. The rise in the labour force should have resulted to increase in economic activity and productivity, instead, both declined. This suggests that the Nigeria labour force lack quality and appropriate skills, implying inefficient and non-functional educational system.

- **High levels of unemployment with low productivity:** As at the fourth quarter of 2017 unemployment rate was 18.8% (Vanguard, 2017). The unemployment level of 18.8% is high when compared with the values for smaller sister African countries such as Benin Republic (1.0%), Madagascar (1.2%), and Guinea (1.7%). The high

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unemployment rate is equivalent to the loss of economic activity and low levels of productivity. Low level of productivity is related to the level of efficiency of labour which is deployed in the process of production. Low level of efficiency of labour negates productivity.

- **Disproportionate exchange rate:** The devaluation of the Nigeria currency has made naira much weaker than most international currencies. High exchange rate caused low business investments, low levels of entrepreneurship, and in general economic activities slowed down. Most businesses hardly break even, customers demand was low and there is the high cost of raw materials which skyrocketed the cost of production. Most businesses reduced the quality and quantity per unit of their products and worst still increased their prices even when their quality and quantity have been reduced. People cannot invest or establish businesses because of the prevailing unfavourable business environment. Most business concerns could not cope with the situation and they ended up sacking workers while it cannot equally employ new ones over a long period of time.

- **Oil price fall:** The international crude oil price fell so drastically that at a certain period the price was as low as \$20 per barrel. This contracted government revenue and she was unable to meet up with her development responsibilities. Again, money was scarce in the country, and her fiscal policies to contend with recession further contracted the revenue and money available for investment. Nigeria being a mono-economy suffered because of global shock in oil price.

- **Weak power base:** Nigeria has a weak power base. The electricity generation, transmission and distribution are inadequate and inefficient to meet energy demands of the country and for industrial activities. Households and industries depend largely on petrol and diesel-powered generators for energy generation. Worst still, the pump price of petrol and diesel was high making it difficult for generator users to cope. This caused increases in the cost of doing business in Nigeria, thereby hampering or slowing down economic activities.

- **Lack of security:** Over a period of time the Niger Delta region of the country witnessed militant activities which resulted in the destruction of oil pipelines and general fear within the region. Crude oil exploration and exploitation was disrupted and due to fear, many oil companies closed down. Nigeria could not produce the number of crude oil barrels she is expected to produce yearly. The North East region of the country faced years of Boko Haram insurgency. Lives were lost, businesses closed down, cattle were killed or rustled, farmlands were destroyed, and economic activities generally halted. Herdsmen and farmers clashed and are still clashing so that many communities and many farmers left farming out of fear and destruction of their farmlands. Many foreign investors could not invest in the economy due to security issues. In the presence

of insecurity economic activities cannot grow and investments cannot take place and as such poverty and unemployment prevailed.

- **The scarcity of raw materials:** Production cannot take place in the absence of raw materials. Industrial activities revolve around creating values out of raw materials. Most raw materials needed in Nigerian industries, whether small or big, are imported and coupled with high exchange rate their procurement were expensive. Industries ran at high cost and cannot break even and sustain it.
- **Corruption:** One of the major social problems Nigeria has been suffering over the years is corruption. There were reports of cases of large sums of public money stolen by highly placed Nigerians. This money was stacked away in foreign banks. Hence, money that the government would have used for development and investment were stolen by corrupt individuals. Corruption no doubt contributed immensely to a decline in revenue for the government and resulted in a recession. Government became so stingy and money could no longer flow. Free flow of money makes more money available for investment and production.

Science Teacher as an Agent of Societal Change and Development

- **Teacher of professionals:** Teachers are those who educate the learners in schools. Teaching, which is the duty of a teacher, is a special career which gives rise to other professional areas. All professionals in science and technology-related fields passed through the tutoring and guidance of science teachers. Professionals such as Medical Doctors, Nurses, Pharmacists, Medical Laboratory Scientists, Radiographers, and Engineers are specially trained in specific skills, and in most cases they are employed. It is either they are employed in public or private sector or they are self-employed or both. Training in these science-related professional has helped so much in reducing unemployment and poverty in Nigeria which are aftermaths of recession.
- **Identifier and developer of learners potentials:** The teacher identifies and facilitates the development of the potentials of learners. In any science class, there are learners with varying potentials. There are ones that have potentials for engineering, technology, nursing, crafts in electrical works, auto-mechanics and other areas. The science teacher discovers these talents and potentials and assists them in developing it. Economic activities are boosted when a large number of people apply their potentials in specific areas of the economy such as agriculture, technical and engineering fields. People have the potentials for employment when they have specific skills to engage in economic activities. Individuals with specific skills are highly needed in the society. Most competencies in science and technology-related skills do not usually give room for unemployment.

- **Imparter of desirable attitudes to learners:** The teaching profession is different from other professions in that the teacher deals with important human aspects such as cognitive, affective, and psychomotor. Indeed, the teacher performs important roles in moulding the character, values and attitudes of the learners and makes them responsible citizens. An important aspect of the study of science is research through experimentation. Scientists are expected to report exactly and objectively the results of their research. They are expected to be truthful, objective, tolerant, open-minded, and resourceful among others in doing science. Indeed, in doing science learners learn values that make them responsible citizens. A major factor that plunged Nigeria into recession is lack of values that culminated into corruption. People engaged in corruption with much impunity which affected business activities and development. The science teacher through careful planning and execution of experimentation imparts the right values to the learners.

- **A Good planner:** The science teacher is a good planner. He/she plans and prepares the environment for learning. The science teacher plans what to teach and the strategies he/she to applies to ensure that his/her objectives are achieved. The planning ability of the science teacher can be translated in the lives of learners. This is because the science teacher is a role model. The learners emulate his attitudes, values, and skills in the course of teaching and learning process. The learners also emulate his/her good conduct, as well as the spirit of hard work and good planning. A nation ruled by good planners and hard-working citizens may not easily go into recession.

The Challenges Facing Science Teacher Education in Nigeria

- **Low enrollment of students into science teacher education:** The National Policy on Education, (FRN, 2013) provided that professional training in teaching in Nigeria shall be carried out by Colleges of Education, Faculties of Education in the universities, Institutes of Education, National Teachers' Institute, National Institute for Nigerian Languages (NINLAN), National Mathematics Centre, and Schools of Education in the Polytechnics. However, the numbers of students that enrol to study science-related disciplines are abysmally low when compared to other disciplines. Generally, most candidates do not have interest in embarking on science teacher education because they will eventually end up in teaching. In most cases, candidates who do not have interest in teaching are drafted into science teacher education studies because they could not be admitted in the areas of their interest. No nation can develop without science teachers. Science teachers implement the sciences curricular to meet the development aspirations of the nation. Science teachers are critical to the scientific and technological advancement of Nigeria. The dearth of students in science-related courses in teacher training institutions is not a good omen for the advancement of the society. Combat against recession and elimination of its aftermaths is directly-related to the

availability of science teachers in the economy because of the important roles they play in training professionals who are directly involved in economic activities.

- **Lack of computers/internet, and incompetence in the use of computers:** The Communication and Information Technology (ICT) bring different peoples of the world closer together, helping them to become more aware of their humanity and shared concerns and hopes for the future (UNESCO, 1998). ICT has become part of the core education, alongside reading, writing and numeracy (UNESCO, 2002). ICT devices have become best educational facilities necessary to facilitate teaching and learning of science. ICT can be applied in every area of science and science teacher education. For example, spreadsheets can be used to tabulate and calculate results of experiments, science students and science teachers can create and use databases for storing information, students and teachers can use a word processor or presentation software to report the results of experiments or research, measurement and tools to communicate among others. Most teachers of science in Nigerian schools lack adequate knowledge and skills in ICT. Through the internet, advanced and recent developments in science and art of teaching are obtained from various sources all over the world. Teachers require a wide range of information to prepare their lessons. There is a wide range of computing devices that are currently applied in teaching that requires knowledge and skills in the computer to use or operate. However, in most teachers training institutions, computer and internet access are lacking or inadequate. Again, computer education is taught under general studies, and this is not accompanied with in-depth practical skills. Even though a science teacher trainee might have good grades in computer studies but his/her technical or practical skills may be low or absent.

- **Lack of incentives to science teachers:** Incentives are required to attract the best brains in science teacher education studies. In the past, scholarships were given to candidates that wish to offer science, mathematics and technology education in tertiary schools and special incentives are given to science and mathematics teachers to keep them in teaching and to encourage new entrants into the profession. Previously in some states in Nigeria teachers of science subjects and Mathematics were offered special science allowances ahead of other teachers. Working conditions for science teachers should be such that will enhance effective learning and enable them to concentrate on their professional duties. The status of science teachers should be broadly comparable with other professional and technical groups such as physicians, lawyers and engineers.

- **Deficiency in the sciences curriculum for science teacher education:** The curriculum is essential to enable quality learning and supports education that is relevant to holistic development (UNESCO, 2016). The curriculum provides the connection between education and development. The curriculum should emphasize the acquisition of skills for employment and entrepreneurship that are essential for development. The

acquisition of practical and technical skills by learners ensures their employability and increases their chances of being entrepreneurs. Technical skills drive economic activities. Technology is widely described as the application of scientific knowledge and research with the aim of developing products or processes for the use of man. Indeed technology is applied science. Hence, the learning of science in schools cannot be divorced with the acquisition of practical or technical skills. In the teacher training institutions, the sciences are taught and learnt without the acquisition of appropriate and relevant technical skills to accompany them. This explains why science teachers cannot impart practical or technical skills to students. When the science teacher trainee eventually leaves school he/she remain unemployable, neither can he/she engage in any meaningful economic activity. If the curricular of science courses offered in teacher education are embedded with practical, technical and occupational competencies the teachers will be in a better position to impart the skills to learners which will diversify their employment chances. Most teachers of science lack specific practical or technical skills and therefore cannot impart the skills to learners as a result of deficiencies in the science teacher education curriculum. Unemployment and lack of economic activity breed recession.

- **The teaching of science is an all comers affair:** Professionalism issues are common in the field of teaching in Nigeria. Teacher education involves training for the attainment of attitudes, skills, and knowledge considered desirable so as to make them efficient in their work in accordance with the needs of a society (Osuji, 2009). Teaching is a profession, and it is a form of public service which requires of teachers expert knowledge and specialized skills, and it is acquired through rigorous and continuing study (UNESCO, 1998). According to Teachers Registration Council of Nigeria TRCN (2005), teaching is a systematic, rational and organized process of transmitting knowledge, attitudes, and skills in accordance with professional principles. Those who do not perform the act in accordance with the professional principles are therefore not teachers. Again, a teacher is a person who had undergone approved professional training in education at appropriate levels capable of imparting knowledge, attitudes, and skills to the learner (TRCN, 2005). Most teachers of science in Nigeria are not professional teachers, indeed they are not teachers. Most of the science teachers did not acquire formal teacher education, and therefore lack the strategies for imparting knowledge. Qualified science teachers are required in the schools so that the aspirations of producing scientists and technologists for national development would be achieved. Competent scientists and technologists are the fulcra by which economic activities revolve especially in times of recession and beyond.

Conclusion

The science teacher prepares and produces future scientists, technologists, other professionals as well as technocrats who have the skills to participate in economic

activities and eliminate and prevent a recession in the country. Hence, the education of the science teacher is important for the rapid development of the country.

Recommendations for Repositioning Science Teacher Education in Nigeria

Based on the foregoing, the researcher recommended that:

1. Science teachers should be remunerated above other teachers to encourage more people to develop an interest in science teacher education.
2. Scholarships and any other incentives should be given to candidates that have interest in science teacher education.
3. The curricular of sciences in teacher education should be restructured to include the acquisition of knowledge and technical/practical skills, as well as trade competencies.
4. Teachers that do not have practical or technical skills should not be recruited to teach science in schools. Serving science teachers should be retrained in practical or technical skills.
5. ICT education should be made a core course in science teacher education. Teachers should ensure that students demonstrate competence in ICT before they graduate.

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