
Diversifying Nigeria Economy through Technology: Prospects and Challenges

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ABSTRACT

No nation has witnessed sustained growth, development, or a significant reduction in poverty without economic diversification. This paper examines diversifying the Nigerian economy through technology: prospects and challenges. In recent years, Nigeria has experienced a shortfall in the price of crude oil. The devastating effect was severe because Nigeria has one source of revenue. There is a need to embrace economic diversification via technology education because it exposes youths to opportunities to enhance their careers as an alternative to overdependence on white collar jobs and a reduction in unemployment. As many countries follow a path to economic diversification, the main drivers include a broad level of political commitment and societal support towards the goals of economic development, poverty reduction, and social stability. The achievement of economic diversification through technology is not without challenges; the sector is faced with inadequate power supply, poor infrastructure, corruption, and so on. It was recommended that the Nigerian government fix critical infrastructure to encourage technological diversification.

Keywords: *Economy, Diversification, Technology, Education.*

INTRODUCTION

Economic diversification is the basic strategy used to enhance sustainable income for a country's growth and development. Anyachie and Areji (2015) define economic diversification as a process of determining the economic base activity and status of government in both the production and distribution of goods and services.

It can also be viewed as a shift towards a more varied structure of domestic production and trade with a view to increasing productivity, job creation, and providing the base for sustained poverty reduction in the country.

Nigeria is a nation endowed with huge natural resources distributed in all nooks and crannies of the country. The country also consists of an abundant and prospering population of great people with experience and knowledge capable of transforming the fortunes of the nation's economy. It is worthy of note that some Nigerians have acquired adequate knowledge in technology education, which will enable them to boost the diversification of the nation's economy. Technology education is the application of information handling tools to produce, store, process, distribute, and exchange information (Leo and Zhang, 2006). If these tools are able to work together and combine to form a networked world that reaches every corner of the globe, it will enhance productivity and job creation. However, incorporating technology education into the economic diversification process will, no doubt, promote active participation in global markets, promote political accountability, and improve the delivery of basic service opportunities (UNDP, 2006).

Since the discovery of crude oil in commercial quantity in Olobiri, Bayelsa State, as far back as 1956, the Nigerian government has abandoned other income-generating sectors, such as agriculture, solid minerals, and so on, in pursuance of the proceeds from crude oil. Ozioko-Ikwunusi and Nwaezi (2007) state that crude oil accounts for about 90% of the nation's revenue, which signifies overdependence on the sector. As a matter of fact, Nigeria currently operates a mono-economy system, which poses great danger to the survival of the economy. The decline in crude oil prices in 2016 drove the economy of Nigeria into recession due to overdependence on one sector of the economy. It is therefore important for Nigeria to diversify her economy by embracing technology education, whereby we can have access to global knowledge and communicate with other people, to change the way we think, the way we live, and the environment in which we do business. The amazing population of Nigerian people, which consists of scientists, technologists, entrepreneurs, and so on, is capable of changing the economy of the nation. It could be recalled that the level of technology education, to a large extent, determines the economic growth and development of any nation. Hence, the need for the government to engage in economic diversification becomes imperative for speedy economic recovery, with technology education serving as a key player in that direction. The paper explores the role of technology education in diversifying the Nigerian economy and the prospects and challenges of the economic diversification process.

Concept of Economic Diversification

To understand the concept of economic diversification, it is important to separate the two words, economy and diversification.

The economy is referred to as the social interaction that emphasises the practices, material expression, and discourses associated with the production, use, and management of available resources (Wikipedia in Ozioko et al., 2017). The government's activities to produce goods and services can also be considered part of the economy.

Diversification, on the other hand, is the process of shifting from one sector to another for the purpose of generating revenue. Economic diversification is therefore the process of moving away from a single income source to multiple sources of income through a wide range of sectors and markets. The World Economic Forum (2016) defines economic diversification as the variation in the economic status of a country or the application of a broad range of economic activities to raise the income status of the country.

Traditionally, economic diversification means transitioning away from dependence on a single or few commodities, such as crude oil, to a number of commodities.

Economic diversification broadens the productivity base by allowing the economy to produce multiple products, which helps reduce the risk of price fluctuations and earnings stabilization. The essence of economic diversification is to encourage positive economic growth and development, the creation of jobs, the development of the tourism and textile industries, and the provision of credit facilities for small businesses (CBN, 2010). The prevailing economic recession in the world requires all nations of the world, especially developing countries, to move away from a single income-generating venture to multiple sources of income to enhance stability in economic growth and development.

Meaning of Technology Education

Technology is referred to as the application of scientific knowledge to the practical purpose of human life while education means the process of imparting or acquiring knowledge, skills, values and developing good characters of individuals through formal schooling or teaching process. When put together technology education means a study which provides an opportunity for students to learn about the processes and knowledge that are needed to solve problems and extend human capabilities.

Ogunsola (2005) defines technology education as the use of various information communication tools, such as e-mail, fax, computers, the internet, video conferencing, etc., to facilitate teaching and learning and access global knowledge and communication. Technology education provides people with productivity and creativity skills that promote entrepreneurship and technological advances that play a crucial role in securing economic and social progress and improving income distribution (Ozturk, 2001).

Technology education helps equip young people with diverse skills and competencies needed in the world of work for production, employment, and income generation. It promotes the effective application of available technologies for personal and societal development. It also assists the youth in exploring their potential and abilities towards increasing production and income generation and empowers them to make use of available natural resources for job creation, self-reliance, and employment (UNESCO, 2013). In Nigeria, technical and vocational education is an offshoot of technology education, which has the following goals:

1. To provide trained manpower in the applied sciences, technology and business particularly at craft, advance craft and technical levels.
2. To provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development.
3. Give training and impart the necessary skills to individual for self- reliance economically (Federal Republic of Nigeria, 2013).

For developing countries, the fourth industrial revolution could represent a new model of development driven by social network facilities, knowledge sharing, technological learning, and innovation (Adam, Usman, and Iwkmman, 2018). According to the World Economic Forum (2016), the demand for technology skills will continue to grow, and as a result, providing students with the right skills for the modern workplace is a pressing issue.

Role of Technology in Economic Diversification.

The use of modern technologies in Nigeria is just beginning to gain popularity, and researchers have just started emerging. Through the use of various forms of technology, students deepen their knowledge and carry out investigations and inquiries according to their needs and interests. In view of that, technology education carries out the following roles in economic diversification:

1. It helps in equipping the youth with diverse skills and competencies needed in the world of work for production employment and income generation.
2. It assists the youth to make right choice of vocations or occupation at early stage in life by saving time and energy.
3. It promotes effective application of available technologies for self and societal development services as an alternative source of income and revenue to the government.
4. It enhances the cultivation of information and communication technology (ICT) for business and intellectual development.
5. It assists Nigeria youths in exploring their vocational and technical abilities towards increase in production and income generation.
6. It exposes the youths to extensive range of occupational opportunities for future careers as an alternative to cover self reliance on white collar jobs and reduction in youths unemployment.
7. It encourages youths to make extensive use of available natural resources for job creation, self-reliance and employment for others.
8. It empowers the youth with indispensable and adaptable technological skills for increased productivity and poverty variation.
9. It enables youths to fully make use of their abilities in diverse sectors of technology education.
10. It prepares youth for useful living within the society through creativity (Ogbuanya and Arimonu, 2015).

Another aspect of technology education that is fast gaining ground in the global scene is digital technology. Al-Roubaie (2018) opines that digital technology could increase the country's readiness and support economic diversification, knowledge sharing, and information dissemination. He added that digital technology allows governments to formulate effective strategies and construct policies that ensure inclusiveness and improve equity in the allocation of resources among states or regions for the benefit of all people.

Digital technologies facilitate access not only to knowledge and skills but also to the global value chain to meet international standards. It increases development capabilities by empowering individuals and enterprises to communicate, absorb, and acquire knowledge (Al-Roubaie, Hamdan, and Srea, 2018). It is important for developing countries to increase productivity and foster growth through digital technologies, which allow them to generate linkages to encourage investment in different sectors of the economy. The economy driven by digital technologies could help developing countries diversify output and achieve faster economic growth (**World Economic Forum, 2016**).

Developing capacity for digital technologies enhances innovation, creativity, and knowledge dissemination within and outside the country. Digital technology networks increase communication processes as well as allow people in nations to collaborate and share information, aiming at fostering growth and substance in development to diversify output, create employment opportunities, and improve global competition. Developing countries should leverage external knowledge via digital technologies. All over the world, technological innovations in such areas as mobile communication and associated services such as e-commerce, e-payments, access to cloud computing, and data storage are rapidly changing the ease of doing business and the economics of service delivery (Baldwih, 2018).

These technological developments hold potential welfare consequences for households and women and can greatly enhance the ability of small firms to contest markets and supply new products by improving access to information and the ability to deliver goods and services to consumers and buyers at a much greater scale (International Trade Centre, 2018). This trend shows how small firms sell their products to global markets as well as supply services to larger firms. This aspect of trade diversification using technology is beneficial to countries that have access to technological devices. The economic diversification process is therefore a key component of economic development policy, in which a country moves to a more diverse production and trade structure. Nigeria has the required manpower and natural and physical resources to venture into various sectors to harness and develop its economic base. Through digital technology, countries accelerate the process of economic transformation and speed up the process of participation in the digital economy (World Bank Group, 2016).

Digital technologies not only bring people together but also promote collaboration and access to global value chain.

Prospects for Economic Diversification through Technology

Prospects for economic diversification through technology in more recent times have been due to a drastic fall in oil prices, causing the economic fortune of Nigeria to be dwindling. Over the years, Nigeria has run a monocultural economy where over 90% of its revenue comes from oil and gas exports. This development is not good for a country that wants to lead a community of nations. To attain sustainable economic growth and development, there is a need to explore other avenues that hold promising prospects for the country's economy. While every country follows a path to diversification, a number of common features are apparent for a successful diversification process. The experience of several countries suggests the following drivers of a successful diversification effort to include:

- A broad level of political commitment within the government level and societal support towards the goals of economic development, poverty, reduction and social stability.
- A focus on export growth through foreign direct investment and increasing the range of goods and services exported.
- The presence of influential stakeholders with interest in non-oil mineral export sector.
- Building a strong human capital and institutional capacity to manage the diversification process (Gelb, 2010). Sustainers of diversification drive will require a multi-pronged approach targeted at stimulating experts in the field of technology. It also needs effective policies to support adjustments and reallocations of resources towards new activities and government interventions directed at specific market policy.

As part of measures adopted to diversify the economy, the Nigerian economic growth plan aimed at strengthening economic diversification by focusing on reinstating sustainable growth, promoting a globally competitive economy, and capitalising on human capital development.

The push for the adoption of digital and frontier technologies in e-commerce and global value chains opens new windows of opportunity for developing countries to catch up and narrow the technological gap for developed countries (World Bank Group, 2016). In addition, there are opportunities for leapfrogging energy and communications infrastructure, trade facilitations, and the promotion of financial inclusion among developing countries. During the commodity boom between 2000 and 2007, many countries, such as Brazil, the United Arab Emirates, Saudi Arabia, Peru, and Iran, were able to make higher gains in technological development and also experienced a faster increase in technological development (World Economic Forum, 2016). Integrating technology into the global economy allows developing countries to accelerate their participation in the digital economy. Digital technologies increase the country's readiness and support economic diversification, knowledge sharing, and information dissemination by providing new opportunities for development (Baldwin, 2016). The need for the government to improve business conditions and human capital development, strengthen anti-corruption campaigns, build strong and supportive structures, a solid education framework, effective policy reforms in macro-economies and institutional matters, and support a more diversified economy One key aspect of the emerging knowledge is that the global economy of the 21st century offers new opportunities for poor countries to diversify by participating in an automated value chain through the provision of parts and components (ITC 2018). Diversification tends to increase the demand for labour and deliver jobs of particular importance to resource-dominated economies, with a large number of unemployed youths such as Economic diversification through technology education is a stepping stone towards the rapid transformation of developing countries because it provides a more stable path for equitable growth and development of the economy.

Challenges facing Economic Diversification

The Nigerian government has been making frantic efforts to diversify her economy but has been beset with numerous challenges, such as poor infrastructure, inadequate power supply, a high rate of corruption, weak institutions, unstable policies, a poor and unstable education system, brain drain, and poor information and communication technology (ICT) equipment.

1. **Poor infrastructure:** Nigeria is backward in terms of infrastructure, when compared to developed countries, the road networks are bad , most scientific equipment are in a state of disrepair, even most laboratories are dilapidated to carry out the function of testing and standardization of commodities for export.
2. **Inadequate Power Supply:** The power supply is the key factor to the development of any country. Every business depends on electricity to thrive, in Nigeria the rate of power supply affects large scale production of goods and services for export. Technology cannot operate without effective power supply, the poor power supply not only affects the production but also affects the communication process.
3. **High Rate of Corruption** in Nigeria, corruption has eaten deep into the fabric of the national life, such that it has become an endemic cankerworm in the country.

Diversification involves shifting from one source of income to multiple areas which requires people of sound mind. With the rate corruption presently it becomes impossible to achieve diversification process.

4. **Weak Institution:** The institutions responsible for checking corruption such as Economic and Financial Crimes Commission (EFCC), Independent Corrupt Practices Commission (ICPC) and others are very weak to carry out their statutory duties, this is due to method of appointment, they cannot prosecute their master, (Nigeria situation). Apart from these anti-corruption agencies, several other institutions are also weak to carry out their duties.
5. **Unstable Polices:** The macroeconomic and institutional policies are not stable enough to attract the desired result, and most policies are not sustained to enhance the diversification process. There is ineffective support to implement the policies initiated, and sometimes political interference affects the implementation of the policies.
6. **Poor and Unstable Education System:** A good education system leads to a robust economy. The poor education system is characterised by poor funding, leading to ill-motivated staff, a lack of infrastructure in schools, institutional materials, and long-term strike actions by teachers. All these culminate in poor educational outcomes, which adversely affect the economy. We cannot diversify the economy without the right calibre or manpower to drive the sector. The incessant strike actions by university lecturers have crippled the economy and, hence, rendered our education system unstable.
7. **Brain Drain:** As a result of the high unemployment rate in the country, there is a mass exodus of our engineers, doctors, geologists, technicians, and so on out of the country in search of jobs and an improved standard of living. To achieve economic diversification, the country needs a high proportion of this workforce to cover various sectors of the diversified economy.

It is regrettable to observe that most of these facilities are not available in schools and in government parastatals for effective dissemination of information. The role of ICT gadgets in the communication process cannot be overemphasised, as they aid in transmitting information from one area to another, especially during this period of globalization. The absence of digital instruments in most firms affects the smooth transmission of information to enhance the effective diversification process.

Conclusion

The success of diversification depends largely on the sequencing and timing of investment policy reforms and strong institutional buildings to curb corruption and attract investors. Integrating technology education into the economic diversification process allows developing countries, such as Nigeria, to accelerate the process of participation in the digital economy, create jobs, share knowledge, and disseminate information within the global community. Countries that have entered the technology-driven economic diversification process have made higher gains in technological development.

Recommendations

Based on the issues raised in the paper, it is pertinent to make the following recommendation:

1. **Provision of adequate infrastructure** – Apart from roads, efforts should be made to ensure that our airports, seaports and railways are equipped with modern equipment to attract foreign investors.
2. **Adequate Power Supply:** there should be regular power supply to boost economic diversification, every firm needs power supply but where it is lacking it discourages investment.
3. **Attitudinal Change:** There should be attitudinal change in terms of how we do things in this country. For us to achieve economic diversification we must develop positive mindset and avoid corruption, nepotism and so on.
4. **Establishment of Strong institutions and Stable policies:** We can only achieve diversified economy when our institutions are strong and with stable policies.
5. **Functional Education System** devoid of incessant strike actions and unstable policies.
6. **Establishment of digital technology** centers in every tertiary institution to encourage students' access to the digital tools.
7. Government should leverage on the existing sectors and develop new ones to attract foreign investors into the country.

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