

**SUSTAINABLE DEVELOPMENT THROUGH A DIGITALIZED
ECONOMY AND PROMOTION OF FUNCTIONAL
ENTREPRENEURSHIP EDUCATION IN NIGERIA**

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Abstract

The objectives of this study were to assess the role of digital and innovative entrepreneurship on sustainable development in Nigeria and also to explore the inter-link between functional entrepreneurship education and attainment of sustainable development in Nigeria. This study which was conducted in Enugu State Nigeria, employed the literature review approach. A total of 21 relevant research articles published in journals with very high impact factor including sustainability, were reviewed. Moreover, the articles selected had to cover areas of study that span across different regions around the world as this was intended to arrive at a conclusion that will be generally acceptable and free from bias. The study concluded that 1) digital and innovative entrepreneurship plays a critical role in the attainment of sustainable development in Nigeria 2) there is an inter-link between functional entrepreneurship education and attainment of sustainable development in Nigeria. The study recommends that the federal government must take the lead to ensure the prioritization of digitalization in the conduct of economic and entrepreneurial activities in the country. Also, entrepreneurship education curriculum and course contents should be designed in such a way that the lessons will be highly appealing, very intensive and practically oriented to the tune of 80% while 20% or less will be left for theoretical foundations and knowledge as this will enhance its functionality and practicability. Furthermore, socio - economic and environmental sustainability and development, should be a salient topic covered in the theoretical aspect of the course contents.

KEYWORDS: Entrepreneurship, Sustainable Development, Digitalization, Education

1. Introduction

The rapidly increasing population is putting pressure on natural resources, land, and economic activities. This has created a slew of social and environmental issues for countries, jeopardizing future survival and growth (Tu et al., 2023). Although individuals and organizations play an active role in addressing the social and environmental issues and eliminating roadblocks to future development, all efforts have proved insufficient to change the situation (Tu et al., 2023). In recent years, various natural disasters, major public health crises, and other emergencies have occurred frequently, which have had a significant impact on the sustainable development of enterprises. Especially since the COVID-19 pandemic, the environmental uncertainty has seriously hindered the sustainable development of enterprises and caused a great impact on the smooth operation of the overall economy (Zhou et al, 2022). The sharing economy, which makes it possible to use the resources already put into circulation and do it efficiently both from an economic and an environmental point of view, is often considered a component of sustainable consumption (Lyaskovskaya & Khudyakova, 2021).

From the internal perspective of enterprises, in the context of digital economy, data has replaced labor, land, and resources and have become the key factor to promote economic development. The transformation of enterprises from focusing on the type and quantity of factor input to focusing on the combination mode and quality has effectively alleviated the problem of resource misallocation and improved the efficiency of resource utilization. From the outside of enterprises, the rapid development of digital economy promotes the establishment and use of digital platforms. The connectivity of digital platforms for enterprises, suppliers, and consumers can effectively reduce the degree of information asymmetry (Zhou et al, 2022). From another perspective, according to Cai et al. (2022), higher education helps drive national economic development by creating social wealth, playing a key role in the sustainability of future development, and contributing to the achievement of the United Nations Sustainable Development Goals. Thus, the focus of entrepreneurship education in various countries is gradually shifting from the scale of the education to the improvement of the quality of education. Consequently, entrepreneurship education, has become an important component of the new economic strategy for job creation, as it produces innovative entrepreneurs which are vital for achieving the United Nations Sustainable Development Goals (Cai et al., 2022).

Therefore, it is urgent to rapidly change the economic development mode quickly and enhance the sustainable development ability of enterprises (Zhou et al, 2022).

1.2 Problem Statement

As the micro foothold of the macro economy, the development quality of enterprises directly affects the steady and healthy development of the economy (Zhou et al, 2022). Technological innovation with digitalization and intelligence as its core features is the key force driving economic growth, the transformation and upgrading of industrial structure, and the sustainable development of enterprises (Zhou et al, 2022).

In Nigeria however, unemployment among tertiary institution graduates has been a major concern in the economy (Faloye & Olatunji, 2018), simply because lots of what we have taken as Nigerian system of education are still bookish, examination ridden and somewhat of a mismatch with the social and economic situation of today. A lot of changes have come into society but the education system has not kept pace with it (Oguntimehin, 2016). The wide application of digital technologies such as 5G technology, big data, cloud computing, and artificial intelligence has significantly boosted social productivity and brought new opportunities for the sustainable development of traditional industries (Zhou et al, 2022) around the world. Nevertheless, Nigeria is yet to take full advantage of this emerging global trend which promotes highly functional entrepreneurship education, composed

of digitally oriented vocations, curriculums and processes for sustainable development.

1.3 Study Objectives

This study by implication is bi-variant in terms of independent variables being studied, and as such, the researcher considers two objectives:

- 1) Assessing the role of digital and innovative entrepreneurship on sustainable development in Nigeria.
- 2) Exploring the inter-link between functional entrepreneurship education and attainment of sustainable development in Nigeria.

2. Review of Related Literature

2.1.1 Digital Economy

Digital economy is a new main economic form following the agricultural economy and the industrial economy (Zhou et al, 2022).

According to Youssef (2022), the digital economy encompasses the use of digital technologies, connectivity, and data-driven innovation to transform industries and facilitate economic growth. This is an important driving force for the innovation and development of enterprises, which can significantly improve the technological innovation level and breakthrough innovation capability of enterprises. In this way, enterprises can be promoted to respond quickly to the external environment, accelerate the digital transformation of the enterprises, and thus improve the sustainable development ability of enterprises (Zhou et al, 2022).

According to Hokkanen et al. (2020), digitalization has enabled the creation of new mechanisms, forms, and models for trade. X-raying the implications of digital economy, Youssef (2022), explained that firstly, the digital economy enables resource efficiency and environmental conservation. Technologies such as the Internet of Things (IoT) and artificial intelligence (AI) can optimize resource consumption, reduce waste generation, and enable smart energy management. By digitizing processes and implementing data-driven solutions, businesses can achieve greater sustainability in their operations. Secondly, the digital economy promotes inclusivity and social equity. Access to digital technologies and connectivity empowers individuals and communities, bridging the digital divide and enhancing social inclusion. Through digital platforms and e-services, underserved populations gain access to essential services such as healthcare, education, and financial services. Digital literacy programs and capacity building initiatives play a crucial role in ensuring that everyone can participate in and benefit from the digital economy. Thirdly, the digital economy supports economic growth and job creation. Digital entrepreneurship, online marketplaces, and e-commerce platforms offer opportunities for small and medium-sized enterprises (SMEs) to thrive in global markets. This can lead to inclusive economic growth and the creation of decent work opportunities. Consequently, in the view of Zhou et al (2022), the digital economy is the power source to promote industrial upgrading and structural optimization as a new factor of production. It has accelerated the pace of technological innovation and significantly improved the efficiency of innovation. It promotes the extensive application of artificial intelligence, technology and robots. This kind of digital power has greatly improved the production efficiency of enterprises.

2.1.3 Specific Advantages of the Digital Economy

According to Zhou et al (2022), specific advantages of having a digital economy includes the following:

- i) Inclusive economic growth and the creation of decent work opportunities.
- ii) Improvement in the quality of the labor force.
- iii) Optimization in the structure of human capital
- iv) Resources allocation efficiency
- v) Improved labor productivity

- vi) Promotion of the marketization disposition processes
- vii) Realization of green production
- viii) Protection of the natural environment
- ix) Continuous enhancement of competitiveness
- x) Promotion of e-commerce and financial technology (Youssef, 2022).

2.1.4 Implicative Disruptions of Digital Technologies on the Economy

According to Herman, (2022), in the current environment, one of the biggest challenges that any business or society faces, is the way in which new digital technologies are adopted, integrated and exploited. As one of the connecting mechanisms between the multiple dimensions of the socioeconomic system, digitalization can be a serious source of challenges to the resilience of this system, providing both new opportunities and new risks with unpredictable consequences.

Youssef (2022), therefore pointed out some specific implications of digitalization on the economy and these challenges include:

- i) Creation of digital gap
- ii) The issue of cyber security
- iii) Problem of data protection.

2.1.5 Entrepreneurship

Entrepreneurship has been described as the ability and readiness to develop, organize and run a business enterprise, along with any of its uncertainties in order to make a profit (Kobani and Douglas, 2022). Entrepreneurship has been widely acclaimed to be a panacea for sustainable economic growth and development, thus, it has been the major source of job growth and economic development in developed, emerging and developing economies in this 21st century. According to Farkas and Gubik (2016), a country's economic performance highly depends on successful entrepreneurship. Nigeria government had acknowledged this fact decades ago, thus, series of entrepreneurship development programmes had been introduced by federal government in the country's tertiary institutions with the primary objective of gearing entrepreneurship development of Nigerian graduates (Faloye & Olatunji, 2018). Hence, entrepreneurship is a form of education, a move towards self-reliance, a reasonable channel that will greatly assist in curbing the employment problems (Oguntimehin, 2016). Entrepreneurial activity is seen as an important driver for employment growth, strengthening economic dynamics, and innovation in countries. The competitiveness of the economy and well-being of individuals are increasingly dependent on an educated society, where universities and their academic staff play an important role in the learning process of students and adults – participants of courses (Uvarova et al, 2021).

Finally, in the submission of Rashidi (2019), entrepreneurship has the potential to reduce poverty, stimulate economic growth and boost innovation, in addition to enhancing social and environmental sustainability.

2.1.6 Entrepreneurship Education

Entrepreneurship education in the works of Kobani and Douglas (2022), includes all teaching, awareness, training and support activities in the discipline of entrepreneurship, in order to develop the mind of an individual to become an entrepreneur with the view of making economic profit. This education embraces various concepts and meanings and they carry different interpretations, as well as commonly used words, such as enterprise education, small business education and entrepreneurship education.

According to Oguntimehin (2016), entrepreneurship education has been identified as a major means of assisting our youths and even adults to acquire desired skills and capacities to be self-reliant or self-employed, particularly

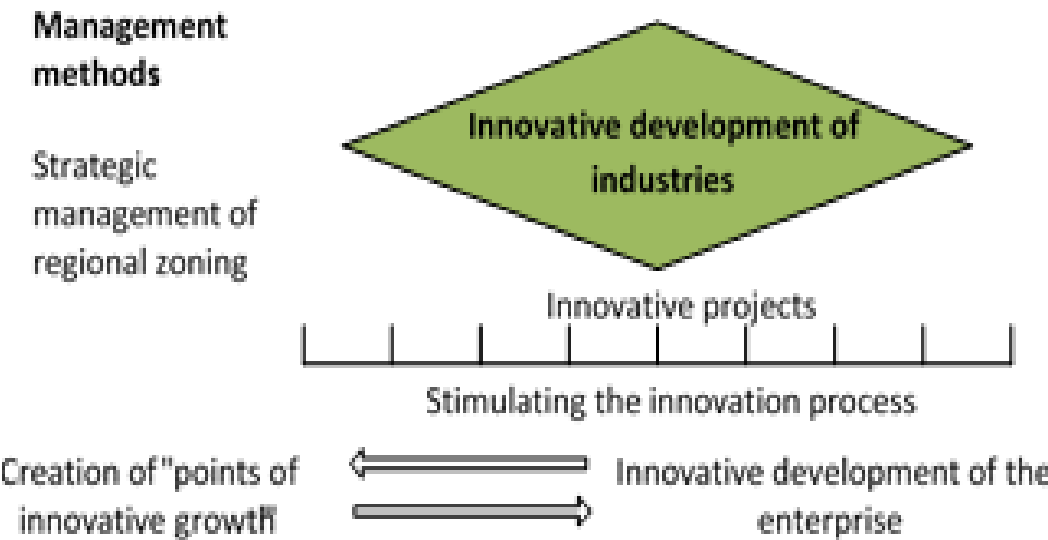
to prepare them to be able to set up their own ventures and manage them profitably. But this type of education if it is given the necessary attention and properly implemented, will produce quality graduates and school leavers that will foster job creation and reduce unemployment and alleviate poverty in Nigeria. When sufficient job opportunities are created, it will invariably help in taking the youths away from criminality, prostitution, drug use and drug abuse, violence, crime, and civil unrest among others (Kobani & Douglas, 2022). No wonder it has been identified by the Nigerian government and policymakers as one of the sustainable sources of job creation (Faloye & Olatunji, 2018).

Liang et al. (2021) citing a study by Cruz et al. (2013) which was on the impact of entrepreneurship education projects on innovation, believed that students receiving management education and entrepreneurship education have more innovative ability than ordinary people, and those who have received professional innovation education and entrepreneurship education are more likely to succeed in their work. This integrated approach will promote achievement of environmental, economic, and socio-cultural goals (Nesterenko et al., 2020).

2.1.7 Objectives of Entrepreneurship Education

The objectives of entrepreneurship education clearly show that it is concerned with the development and survival of both the individual and society, for sustainable socioeconomic and political development to be achieved. These objectives according to Kobani and Douglas (2022), are:

1. To provide meaningful education for young people which could make them self- reliance and subsequently encourage them to derive profit and be self- independent.
2. To provide graduates with the training and support necessary to help them establish a career in small and medium size business.
3. To provide graduates with training skills that will make them meet the manpower needs of society.
4. To provide graduates with enough training in risk management to make uncertainty bearing possible and easy.
5. To stimulate industrial and economic growth of rural and less developed areas
6. To provide graduates with enough training, this will make them creative and innovative in identifying new business opportunities.
7. To provide small and medium sized enterprises with the opportunity to recruit qualified graduates who will receive training and tutoring in the skills relevant to management of the businesses.



(Fig. 2).

Aspects of management:

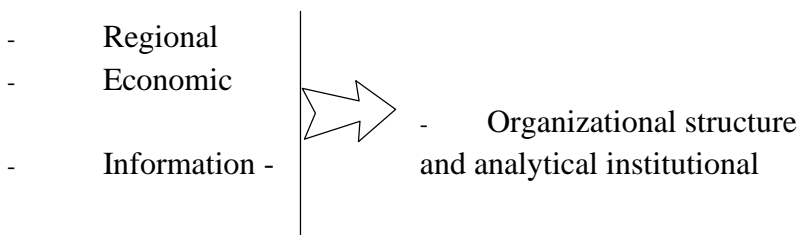


Fig. 2. Schematic diagram of effective management of innovation activities (Uvarova, 2021)

2.1.8 The Trainer and Training Methods

According to Oguntimehin (2016), it is very important to have trainers with entrepreneurial credibility. It is not enough for the trainer merely to know the subject, he or she also needs to have credibility with the trainees in respect of entrepreneurial attributes. Trainers with formal academic qualifications in management subjects are not necessarily the best people to run programmes for start-up or existing small scale/medium business owners or managers. The trainers therefore should be professionals in business community, experts from government departments, technical consultancy organizations. The coordinators too should be specially trained. With regards to the choice and use of methods for the training, they should apply case studies, role playing, simulation exercise, field-trips and market research.

2.1.10 Sustainable Development

Originally developed by the Brundtland Commission in 1987, the concept of sustainable development has been at the forefront of global discussions between researchers and practitioners for over 30 years. The essence of this phenomenon largely corresponds to the main concept set out in the definition by WCED (World Commission on Environment and Development), where sustainable development is considered as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Popov et al., 2022). According to Zhou et al. (2022), the concept of sustainable development is complex and multi-dimensional. It is not only limited to the sustainable development of environment and resources but also includes the innovation dimension. Innovation is a major driver of sustainable development, and achieving the goal of sustainable development requires both fundamental and systematic innovation. Thus, finding ways of moving beyond supporting individualized action, incentivized financial policies and ‘technological fixes’ is necessary for the deeper transformation required to address climate change (Liston & Devitt, 2020). The digital economy has emerged as a powerful force in driving sustainable development, offering innovative solutions to address environmental, social, and economic challenges Youssef (2022). Studies have confirmed that the digital economy has a significant role in promoting the sustainable development of ecological environment and green economy. (Oguntimehin, 2016).

2.1.11 Limitations to Digital Economy in the Attainment of Sustainable Development

According to Youssef (2022), there are a number of obstacles facing the role of the digital economy in achieving sustainable development, and these including the following:

1. Poor infrastructure
2. Lack of digital skills
3. Legislation and Policies
4. Cultural and social challenges

However, governments potentially have the greatest ability to promote the growth of sharing (digital) models by offering economic incentives such as reduced taxes and subsidies, or non-economic incentives eg communication campaigns (Karobliene & Pilinkiene, 2021).

2.1.12 Interplay between Digital Economy, Entrepreneurship Education and Sustainable Development

Based on Herman (2022), deep integration of digital technologies in the economy has a high potential to contribute to sustainable development. However, the development of any community begin with people, their creative capacity and capability ideology, world view, values, norms and orientations. Therefore, the development of a community can only be possible when individual and group members, through the instrumentality of education are able to mobilize and channel their mental resources purposefully, overcome and take control of their environment, manipulate and manage it for their own betterment and for the community at large (Kobani & Douglas, 2022).

The “Transforming our World: the 2030 Agenda for Sustainable Development” resolution adopted by the United Nations (UN) General Assembly in 2015 as a comprehensive policy blueprint, sets 17 Sustainable Development Goals (SDGs), which represent the global priorities for development by 2030 and address the major economic, social and environmental challenges faced by global and national communities (Herman, 2022).

Consider the 17 sustainable development goals being “No poverty, Zero hunger, Good health and Well-being, Gender equality, Clean water and Sanitation, Affordable and Clean Energy, Decent Work and Economic Growth, Industry, Innovation and Infrastructure, Reduced Inequality, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land, Peace and Justice, and Strong Institutional Partnerships to achieve the 17 goals”, entrepreneurship education has been identified as a major tool for achieving these goals for sustainable development (Kobani & Douglas, 2022). Additionally, recent green entrepreneurial innovations in agriculture, packaging, energy and manufacturing, have the potential to directly enhance sustainable production and consumption (support for SDG 12). In other words, the UN 2030 Agenda attempts to restore harmony between progress and sustainability by creating a sustainable world which includes all countries and achieve the kind of “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Herman, 2022).

As buttressed by Samoilkova et al. (2022), the fourth sustainable development goal proclaims the course to quality education and lifelong learning. The eighth sustainable development goal advocates sustainable and inclusive economic growth, entrepreneurship, and innovation. And the ninth sustainable development goal follows sustainable and inclusive industrialization and innovation, scientific research, upgrading industry technological capabilities, expanding access to information and communication technologies, promoting an increase in the spending on research and development, and the number of scientific workers. Achieving all these targets requires close collaboration of business, education and science, and rapid innovation transfer.

With respect to entrepreneurship education, traditional educational approaches contradict the desire for empowerment, change and inventiveness that entrepreneurship education seeks to achieve and have even been associated with lower entrepreneurial intentions, thereby calling for progressive approaches in which learning and experience are merged to mirror future workspaces and emphasize critical thinking, reflection and collaboration. There exist therefore, several software-based solutions that have the ability to enhance creative thinking, collaboration and problem-solving while mitigating specific fragility-related challenges facing entrepreneurship education. Important examples are intelligent-tutoring systems (ITS), mobile applications and simulation games built on foundations of machine learning, artificial intelligence, gaming and mobile app development, among other technologies. Such technologies could have the capability to enhance personalization, collaboration,

engagement in and access to learning, while addressing educational challenges such as shortage of qualified teachers and lack of innovative educational materials, both home-grown and designed elsewhere (Rashid, 2019). This implies that digital technology can be used in promoting entrepreneurial education and training. Hence by enhancing access to and encouraging innovation and entrepreneurship, sustainable economic growth can be fostered, more especially with the social and environmental dimensions of development strengthened (Youssef, 2022).

Additionally, recent green entrepreneurial innovations in agriculture, packaging, energy and manufacturing, have the potential to directly enhance sustainable production and consumption (support for SDG 12). To this end Rashid (2019), emphasized on adaptive and intelligent technologies, though not entirely new, but have only recently become an increasingly- important part of debates concerning enhancing education in challenged environments. Currently, though, such educational technologies range from simple innovations such as Cyber smart Africa's use of PVC pipes, nylon sheets and Nintendo Wii remote controls, to complex ones combining various modern technologies to produce advanced educational software.

Finally, the above is expected to be highly beneficial to two categories of entrepreneurs, being replicative and innovative entrepreneurs, shown to be instrumental for sustainable development. Replicative ones who start new businesses regardless of whether similar firms are already present in the market, are important in fighting poverty, enhancing competition and increasing product supply. Therefore, replicative entrepreneurs could be expected to contribute to reducing poverty and tackling unemployment, directly advancing SDGs 1 and 8. Nevertheless, it is the innovative entrepreneurs, who provide new services and goods needed by the public, create a learning environment for future entrepreneurs, commercialize knowledge and new ideas, generate profitability in the long term and stimulate endogenous change which has the potential to disrupt the status quo. They therefore have the additional advantage of contributing to sustainability, SDG 9 through fortifying local infrastructure, stimulating homegrown technology development and enhancing sustainable industrialization (Rashid, 2019; Kobani & Douglas, 2022).

2.2 Related Theory

2.2.1 The Human Capital Theory

The **Human Capital Theory** is relevant in term of underpinning this particular study. In accordance with the human capital theory which was primarily developed by Gary Becker and Theodore Schultz between the 1950s and early 1960s, possession of higher levels of knowledge, skills and relevant competencies is positively correlated with labor market productivity, thereby underscoring the importance of investment in human capital to enhance economic development. In relation to entrepreneurship education in particular, it is argued that proper education at secondary and post-secondary levels enhances the formation of a creative and inventive population with the necessary business start-up skills (Rashid, 2019).

3. Methodology

This study which was conducted in Enugu State, South East Nigeria, employed the literature review approach. To this effect, a purposeful research method was adopted in which related research articles were deliberately selected for the purpose of review and analysis. A total of 21 research articles published in journals with very high impact factor including sustainability were reviewed. Furthermore, for proper representation, it was important to ensure that the articles reviewed covered topics pertaining to digital economy, environmental sustainability, economic sustainability, entrepreneurship, entrepreneurship education, sustainable development amongst others. Moreover, the articles selected had to cover topics and areas of study that span across different regions around the world as this was meant to enhance the research findings in terms of comparative benchmark

and also, help arrive at a conclusion that will be generally acceptable and free from bias.

4. Discussion of findings

Deducing from the existing literatures the digital economy utilizes data and technology as the main factor of production. Thus, the ability to effectively make use of these digital technologies will invariably, effectively improve the utilization of resources to reduce wastages.

Again, in this modern times of the knowledge economy, sustainable competitiveness and effectiveness in the operations of business entities can only be assured with advanced business innovations and development certainly possible through massive digitalization of enterprises internal operations. Enterprises, in their network interaction via information and communication technology, are able to create and exchange sustainable competitive advantages as they are able to obtain online, necessary data, information, modern concepts, ideas and technological know-how for overall improved performance.

Literatures reviewed also show that digital economy enables environmental conservation. Technologies such as the Internet of Things and Artificial Intelligence are able to optimize resource consumption thereby reducing waste generation, and enable smart energy management which creates a healthier environment fit for human and animal existence. Thus, by digitalizing processes and implementing data-driven solutions, businesses can achieve greater sustainability in their operations, as it is the innovation activities and performance of economic entities that are imperative for sustainable development of both the business enterprises themselves and the environment where they operate.

This study has also found that entrepreneurship through functional entrepreneurship education, has direct positive impact on sustainable development, specifically towards poverty alleviation (SDG1), economic development and unemployment reduction (SDG 8), enhancement of infrastructure and innovation (SDG 9), social equality and inclusion (SDGs 5 and 10) and sustainable production and consumption (SDG 12). This is because empowering individuals with sufficient academic education, creates the necessary human capital to enhance product and process innovation. While specialized entrepreneurship education and training, enhances entrepreneurship-related human capital, skills and behaviors. Thus, functional entrepreneurship education which also involve digital means, processes, applications and procedures, becomes vital in allowing entrepreneurship to reach its full potential. Thus from the above, it can be asserted that there is an inter-link between digital economy, functional entrepreneurship education and attainment of sustainable development in Nigeria.

5.1 Conclusion

Deducing from related literatures reviewed, this study concludes that 1) digital and innovative entrepreneurship plays a critical role in the attainment of sustainable development in Nigeria 2) there is an inter-link between functional entrepreneurship education and attainment of sustainable development in Nigeria. In other words, the digital economy in combination with functional entrepreneurship education, has the potential to catalyze sustainable development by promoting entrepreneurial creativity, resource efficiency, inclusivity, evidence-based decision-making, economic growth and most importantly, environmental sustainability. Thus, embracing the opportunities offered by the digital economy and making entrepreneurship education more functional while addressing the associated challenges, can pave the way for a more sustainable and prosperous future for Nigeria in particular and the world at large.

5.2 Recommendations

In line with the findings, this study recommends that the federal government must take the lead while synergizing with the state governments, and in collaboration with private partnerships, to ensure the prioritization of digitalization in the conduct of economic and entrepreneurial activities in the country. This requires massive

funding which may be achieved through Public Private Partnerships (PPPs), drafting and implementing of functional laws and policies related to the sub-sectors, adequate monitoring and protection of the cyber space to prevent or mitigate likely cybercrimes which are common under massive digitalization of the economy, and sincere commitments from all stakeholders including the government in ensuring that the well - being of both humans and the natural environments are taken into consideration in all of these advancements amongst others. In the aspect of entrepreneurship education, the curriculum and course contents should be designed in such a way that the lessons will be highly appealing, very intensive and practically oriented to the tune of 80% while 20% or less will be left for theoretical foundations and knowledge. This will enhance its functionality and practicability amongst learners while still schooling or after graduation, and at the same time reducing the unemployment gap that currently permeates the Nigerian economy. Furthermore, the need and fundamental procedures of carrying out entrepreneurial activities without jeopardizing socio, economic and environmental sustainability and development both for the current and future generations, should be a salient topic covered in the theoretical aspect of the course contents.

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