

Entrepreneurship, Innovation and Skill Acquisition as Drivers of Technological Development in Nigeria

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Abstract

The development of technology in any given society involves a range of processes which include entrepreneurship, innovation and skill acquisition among others. This study examined the significance of entrepreneurship, innovation and skill acquisition in the process of technological advancement in Nigeria. Data was obtained from secondary materials including books, journals, magazines, periodicals, newspapers, the internet, etc. The economic theory of Entrepreneurship by Cantillon (1755) was adopted as the theoretical framework while content analysis was employed as the tool of data analysis. Findings revealed that entrepreneurship could spur innovation and skill acquisition to facilitate the nation's technology advancement. Hence, the study suggested an entrepreneurship and technology advancement reform in the country.

Keywords:

Entrepreneurship,
Innovation, Skill
acquisition,
Technology
advancement

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Background to the Study

Africa's classification as a third world with all features of underdevelopment is an indication that there is the fundamental lacuna associated with the harnessing and utilization of the human and material resources in the continent. The Global Innovation Index (GII) (2014) surveyed 143 economies around the world, using 81 indicators to gauge both their innovation capabilities and measurable results. Evidence abound empirically, that in this contemporary era, economic development, technology dependent economies surpass economies which are dependent on their natural resources. This has the implication that economies that can remain flexible, adaptive and innovative will reap the benefits of world trade. This is so as the global competitiveness of any economy depends on its science, technology and innovation (STI) capabilities.

In the contemporary global environment, there is a clear shift from domestic affairs to more complex international relationships which in itself, poses new challenges. Thus, developing countries face challenges in the area of attaining competitive advantages in key economic sectors. As observed in the UN Millennium project, inspite of the increasing globalization of technology, the involvement of developing economies in producing new technologies and innovations is quite negligible. The production of technological knowledge is concentrated in industrial countries and developing nations are lagging behind as far as competition on technological frontier is concerned. Against this backdrop it makes sense to reason that the poor developing economies may be better positioned in the game of global competition if, rather than exclusively focusing on catching up at the frontiers, they look inwards to embrace and deploy science, technology and innovation (STI) in specific areas where they have comparative advantage.

Entrepreneurship education has been identified as a major avenue of assisting the youth and even adult to acquire desired skills and capacities to be self-reliant or self-employed, prepare them to be in a position to own ventures and manage them profitably. Entrepreneurship places emphasis on skill acquisition and capacities for self-employment. "Entrepreneurship activity is a dynamic process of creating incremental wealth, wealth created by individuals who assume the major risk in terms of equity, time and/or career commitment or provide value for some product or service" (Hisrich and Peters, 2002).

Earlier in this chapter, the need for developing countries to embrace and deploy science, technology and innovation had been stressed. Entrepreneurship holds the key to the realization of this noble feat. This is buttressed in the views of scholars like Stevenson and Gupert (1985); Bygrave and Hofer (1991), Abraham (1999) and Reiss (2000), to mention but a few. Stevenson and Gupert (1985) defined entrepreneurship as, " a process of creating value by pulling together a unique package of resources to exploit an opportunity" while Bygrave and Hofer (1991) hold that entrepreneurship is, "a process of creating a new organization and pursuing it" – a process which involves all functions, activities and actions associated with the perceiving of opportunities and the creation of organization to pursue them. For Abraham, it is "a process that has to do with the

conceptual approach to doing new things, within a new philosophy of value, purpose, utility, quality and use which satisfies needs". Reiss (2000) defined entrepreneurship as, "the recognition and pursuit of opportunity without regard to one's current control of resources, with confidence and assurance of success, with the flexibility to change topic as necessary and the will to rebound any setback" (Emmanuel, 2008). Entrepreneurship provides the economy with a continuous supply of ideas, skills and innovation necessary to promote competition and the efficient allocation of scarce resources. Clearly, the relationship between skill acquisition, innovation and technology need not be overemphasized.

Statement of the Research Problem

Africa and indeed Nigeria has identified with the global quest to boost entrepreneurship as a way of enhancing innovation and skill acquisition. This is due to the strategic role entrepreneurship has played in stimulating innovation and skill acquisition in driving the growth of economies like those of China, Taiwan, Hongkong, Indonesia, and Japan to mention a few. Recent policies of government have shown much concern over the need to boost entrepreneurship. A good example is the effort at enhancing the ease of doing business in the country which has earned the nation some improvement in its ranking as a potential business destination for even foreign investors. However, the real situation is that recent and current government policies and initiatives do not seem to be achieving the required and anticipated measure of technological development. Hence, this study seeks to interrogate the extent of technological development attained in the country following the efforts to boost entrepreneurship, innovation and skill acquisition.

Objectives of the study

This study seeks to interrogate the extent to which entrepreneurship; innovation and skill acquisition constitute a veritable driving force for the nation's technological advancement. Specifically, the study seeks to:

- a. Establish the role of entrepreneurship in technology development in Nigeria.
- b. Ascertain how much innovation can drive the development of technology in Nigeria.

Research Questions

The study intends to address two questions namely,

- a. What is the role of entrepreneurship in advancing technological development in Nigeria?
- b. How does innovation contribute to the development of technology in Nigeria?

Literature Review

Conceptual clarification

Entrepreneurship: Entrepreneurship is defined as, " an activity that involves the discovery, evaluation and exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes and raw materials through organizing efforts that previously had not existed" (Venkataraman, 1997; Shane and Venkataraman, 2000).

Other definitions subscribe to the notion of innovation as a key attribute of entrepreneurship. From the perspective of Kirzner (1997), “the entrepreneur is an individual who is alert to opportunities for trade”. “Such an entrepreneur is capable of identifying suppliers and customers and acting as an intermediary where profit arises out of intermediary function” (Deakin and Freel, 2006). According to Shane (2003), “the Schumpeter (1934) perspective involves innovations that result in new combinations that spur creative destruction where the newly created goods, services or firms can hurt existing goods, services or firms”. Zimmerer and Scarborough (2005) hold that, “entrepreneurs are new business or combinations that arise in the face of risk and uncertainty for the purpose of achieving profit and growth. It is the view of some scholars like Carland, Boulton and Carland (1984); Watson (2001) that, “the factors which distinguish entrepreneurs most strongly are innovation, opportunity, recognition, process, and growth in a business and employment of strategic management practices in the business.”

In spite of the various attempts to define entrepreneurship, the term “has been correctly characterized as one of the most intriguing but equally elusive concepts in economics” (Banmool, 1968). Part of the difficulty in pinning down its precise meaning stems from the sheer weight of the very fundamental functions it is held responsible for. Depending on what intellectual traditions we follow, entrepreneurship either enhances the allocative efficiency for given ends and means, or drives the dynamic performance of the system through the progressive creation of new products, processes or markets.

Innovation: The ability to innovate is represented by the ability to continuously transform knowledge and ideas into new products, processes and systems, to the benefit of both the organization and the shareholders. Thus, scholars have presented various perceptions of the term 'innovation'. For instance, while Evans (1991), defines innovation as, “the ability to discover new relationships of seeing things from new perspectives and to form new combinations from existing concepts”, Simmonds (1986), opine that, “innovations are new ideas that consist of new products and services, new use of existing products, new markets for existing products or new marketing methods”. Others Slevin (1991), Lumpkin and Dess (1996), Knox (2002) posit that, “innovation can be defined as a process that provides added value and a degree of novelty to the organization, suppliers and customers, developing new procedures, solutions, products and service and new ways of marketing. Simply put by Henderson and Lente (1995), innovation may be viewed as the “implementation of innovative ideas”. For Rogers (1988), innovation, “involves both knowledge creation and diffusion of existing knowledge”. Innovation has its features, some of which vary according to the organization under consideration as some organizational characteristics also vary depending on the type of innovation considered. Down and Mohr (1976) refer to these characteristics as “secondary characteristics of innovation”.

Technology: The simplest form of technology is the development and use of basic tools. Taken from the Greek word TEXVN, it refers to the collection of techniques, skills,

methods, and processes used in the production of goods or services in the accomplishment of objectives, such as scientific investigation. Technology can be the knowledge of techniques, processes and the like, or it can be embedded in machines to allow for operation without detailed knowledge of their workings. An American sociologist Bain (1937), observed that, "technology includes all tools, machines, utensils, weapons, instruments, housing, clothing, communicating and transport devices and the skills by which we produce and use them". The Merriam-Webster Learner's Dictionary offers a definition of the term as, "the use of science in industry, engineering, etc. to invent useful things or to solve problems" and "a machine, piece of equipment, method, etc that is created by technology". The term technology has been given various definitions by previous literatures. For Kumar (1999), "technology consists of two primary components:

1. a physical component which comprises of items such as products, tooling, equipments, blueprints, techniques and processes and,

2. The informational component which consists of know-how in management, marketing, production, quality control, reliability, skilled labor and functional areas. 'The concept of technology does not only relate to the technology that is embodied in the product but is also associated with the knowledge or information of its use, application and the process in developing the product" (Lovell 1998; Bozeman, 2000). Hence, Lan and Young (1996) strongly opine that, "technology is always connected with obtaining certain result, resolving certain problems, completing certain tasks using particular skills, employing knowledge and exploiting assets".

Skill acquisition: In the views of Speelman (2005), "a skill is seen as ability to do something well, usually gained through training or experience". Skills are often acquired after a training session or after a practical. Hence, Speelman defines "skill acquisition as the ability to learn or acquire skills. It involves the development of new skill, practice of a way of doing things usually gained through training or experience". Researchers vary in their perceptions of skill acquisition" as a term. Beach (1990), believes that, "skill acquisition is a process of enlarging people's choice for a long and healthy life, knowledge acquisition for a decent standard of living". This by implication involves freedom from economic, social, and education, as well as access and opportunities for being creative and productive, the enjoyment of self-respect and guaranteed human rights. In the views of Olufemi (2008).

Skill acquisition aims at transforming the human person so as to bring about his/her potentials and make him/her a leader, who will in turn inspire and empower others to excel and articulate meaningful vision for the society.

However, Asante (1998) holds that, "skill acquisition means releasing human energy, ie providing an opportunity for people to make the maximum contribution to their own development and to the self-sustaining development of their communities.

Empirical Literature

Past and Current Works on the Technology, Innovation & Skill Acquisition

Table 1: This section presents past and current works on technology, innovation and skill acquisition in a tabular form as follows:

Name of researcher(s), study title/time frame of study	Geographical scope and content covered	Data source and analytical tools	Findings/ recommendations/conclusion
Ogulana (2018) The Role of Entrepreneurship as a Driver of Economic Growth	Nigeria: The study examined the role of entrepreneurship as a driver of economic growth. It had its focus on small and medium size business concerns. The major variables of concern are the entrepreneur and economic growth.	It was a descriptive study that made use of primary data (questionnaire) administered on 60 persons. It also employed secondary data. The study conducted what it referred to as perspective analysis.	The finding of the study is that Nigeria had depended on oil as the mainstay of the economy which accounts for its economic downturn. It recommends that vigorous pursuit of entrepreneurship is the only way out of the nation's economic and social problems.
Afolabi (2015). The effect of entrepreneurship on economic growth and development in Nigeria	Nigeria: The paper is a discussion on the evolution and current development of principles and practices of entrepreneurship in Nigeria. It also examined the effect of entrepreneurship in fostering economic growth and development. Thus, the main variables of the study were entrepreneur, economic growth, economic development	It employed secondary data which it analyzed by simple percentages, graph and chart.	The study found that Nigeria's economy has continued to grow over the last decade with the real GDP growth rate hovering around 7%. It also found that entrepreneurship can enhance economic growth and development by generating employment through the growth of micro, small, and medium enterprises in Nigeria. It recommended proper policy coordination and policy stability among others.
Farayibi (2015). Entrepreneurship as a driver of economic growth: Evidence from Enterprise development in Nigeria.	Nigeria: The study examined the role of entrepreneurship in the economic growth of Nigeria. It focused on some major variables as entrepreneurship, innovation, economic growth, etc.	Annual time series data obtained from the data base the of international monetary fund (2015). The central bank of Nigeria (CBN) Statistical Bulletin as well as the World Bank Development Indicators were also some of the sources of data. Gaps in the IMF data base were filled with matching data from the South African Reserve Bank as well as the other internet sources. The Error Correction Model (ECM) was one of its analytical tools.	The results reveal that credit to SMEs is statistically significant in the determination of economic growth, implying that increase in entrepreneurial financing has significant effect on economic growth in Nigeria. Particularly the study also found that the increase in the operations and activities of SMEs in Nigeria remains indispensable to the pursuit of economic growth in Nigeria.
Olanipekun and Adeyera (n.d). The impact of entrepreneurship skill acquisition on fresh graduate self-employability status.	Nigeria: The study examined the impact of entrepreneurial skills acquisition on the employability status of Nigerian graduates. The variable of interest were- entrepreneurship, skill acquisition, Nigerian graduates, self-employability, OlabisiOnabanjo University.	Primary data were attained through the use of questionnaire administered and collected from respondents on the spot-thus ensuring a 100% response rate. All statistical analysis were performed using SPSS (SPSS version 20 for Windows, SPSS, Inc. Chicago, IL.)	The major finding of the study is that exposure to entrepreneurship education influences students' intentions of becoming self-employed thus enhancing their employability status.

Theoretical Framework

The Economic Theory of Entrepreneurship (Richard Cantillon, 1755)

Richard Cantillon (1755) is credited with the discovery of economic theory and was the first to fully consider the critical role of entrepreneurship in the economy. Cantillon described entrepreneurship as pervasive and endowed with the most pivotal role.

There are three main actors in Cantillon's economy-- property owners are the main consumers and all production in the economy (supply) is an attempt to meet their subjective wishes and desires (demand). The two remaining actors are primarily distinguished by the nature of their income, which leads to the major characteristics of Cantillon's entrepreneur: living on unfixed income. While wage laborers are on fixed wages, entrepreneurs must subsist with no guarantee of income. In addition to this feature, the entrepreneur is responsible for the production, circulation and exchange of goods in the economy in an attempt to meet the demands of property owners.

Research Methodology

In this qualitative study, data obtained from secondary materials are analyzed using the technique of content analysis. The analysis runs in the following sequence:

Research Question One (1)

What role can entrepreneurship play in advancing technology development in Nigeria?

The role of entrepreneurship in the enhancement of technology development has been underscored in the empirical support by Ogbo and Nwanchukwu (2011) which revealed that, "Small and Medium Enterprises (SMEs) have played and continue to play significant roles in the growth, development and industrialization of many economies the world over". Nigeria has great prospects of achieving technological advancement through entrepreneurship. Private entrepreneurs in Nigeria are known to have and are embarking on innovations in businesses which are technology-based. Two outstanding examples are found in Nnewi, Anambra state where CUTIX CABLES, best known electric cables in the world are produced. There is also the case of INNOSON MOTORS which though a car assembly plant, has been trying to introduce the use of some local components into their products. Many other examples abound all over the country on the use of local component in soap making, pomade, machine parts etc. This indicates that the Nigerian Dream of technological advancement is very much alive and promising technological entrepreneurship is very much in practice in the country. It shows an evidence of the commercialization of the emerging technical discoveries or innovation. INNOSON MOTORS in Anambra state provides a style of business leadership which manifests the identification of high potential technology intensive commercial opportunities, gathering resources such as talent and capitals and managing rapid growth and significant risk using principle decision-making skills. This is exactly what is needed in Nigeria.

Hence, Aderemi, Ilori, Siyanbola, Adegbite and Abereijo (2008), posit that, technological entrepreneurship is needed to make full use of the knowledge of science and technology currently available in meeting market needs, thereby making the country in question more productive and more competitive internationally. According to these authors, “technological entrepreneurship is initiated and culminated in design, development, engineering and commercialization of innovating new products and processes”. This paper holds that the activities of private entrepreneur like the INNOSON FIRM portend great future for technological growth and serves as a source of inspiration to other emerging firms. The point is that, a firm like PEACE MASS TRANSIT, a popular transport Line east of the Niger has equally embarked on vehicle assemblage following the example and encouragement of the INNOSON GROUP.

Research Question Two (2)

How can innovation enhance the development of technology in Nigeria? Until recently, it has not been easy to measure the relationship between innovation and technology (advancement). However, an attempt to achieve this feat has been made by a research in Oslo Manual (OECD, 2005, P. 46), which says that, “an innovation is an implementation of a new significantly improved product (goods or services) or process, a new marketing method, or a new organizational method in business practices, workplace, organization or external relations”. The “Community Innovation Surveys” (CIS), accept that for innovation to be new to the firm, it does not necessarily have to be new to the market or to the whole community. The implication is that innovation includes activities which Schumpeter (1934) would have classified as 'imitation'. An empirical study on the relationship between technology, innovation and firm performance – evidence from e-business in Europe, argues in its conceptual framework that, the performance implication of new technologies, such as information and communication technologies (IT), are mediated by innovative activities that result from the adoption of these technologies. Furthermore, the performance implications can vary across different types of innovation, depending on firm-internal and market-specific factors (Koellinger, 2008).

It is a truism among managers, policy makers and researchers that new technologies and innovations are vital for competitiveness and eventual growth. However, it should also be underscored that not all new technology and innovation leads to success.

The positive and strong relationship between innovation and technology is further buttressed in the study by Sener and Saridogan (2011) on “the effects of science-technology-innovation on competitiveness on economic growth. The paper found that, “countries which have science-technology-innovation oriented global competitiveness strategies have sustainable competitiveness and long growth. It recommended that countries should design science – technology – innovation oriented economic strategies and policies in order to achieve sustainable global competitiveness and long-run growth. The analysis and empirical evidences in this paper indicate that the relationship between innovation and technology is strong and positive. However, this does not imply that all innovations end up successfully. It also shows that while innovations could enhance

technological advancement, technology can also enhance innovation. There are some other important factors that affect the two variables eg government policy, etc. It then stands to reason that, innovation (entrepreneurship) has great potentials in enhancing technology advancement in Nigeria barring other factors as government policy, etc.

Findings

This interrogation led to a number of findings which include:

1. Small and Medium Enterprises (SMEs) have played and will continue to play significant roles in the industrialization of many economies the world over. By implication therefore, they have been enhancing technological development of such economies as they can be no industrialization without technological advancement such as in Nigeria.
2. Individual entrepreneurs in Nigeria are known to have and are still embarking on innovation in businesses that are technology-based eg CUTIX CABLES, Nnewi in Anambra state.
3. Nigeria's technology advancement is still alive and promising given the current practice of technological entrepreneurship which abounds across the country.
4. Innovation, technology and economic growth have strong positive relationship. The causation is two-way indicating that innovation enhances technology advancement which gives Nigeria the hope of developing her technology through entrepreneurship innovation.
5. While innovation generally enhances technological advancement, it has been observed that not all innovations are successful in enhancing technology and economic growth.
6. Countries which have science, technology, innovation-orientated global competitiveness strategies are most likely to have sustainable competitiveness and long run growth.

Conclusion

Entrepreneurship as a concept has often been perceived by many as being synonymous with innovation. Nigeria is blessed with abundant talents in the area of innovation and skill acquisition. However, while innovation is often associated with success, it also has to be emphasized that not all innovations yield the desired results (success). This is the situation in every society such as Nigeria and explains why many in this country lack what it takes to innovate. It also must be underscored that the success of innovation is also dependent on many factors which include government policy. This is not to de-emphasize that there is a strong positive relationship between innovation, technology and all round growth. The implication is that the technological development in Nigeria, can be enhanced by the innovation and creative characteristic of many desired and expected effect on the economy due to many factors which include government policies.

Recommendations

On the basis of the findings in this study, the following are hereby recommended:

1. Since small and medium enterprises (SMEs) have facilitated the industrialization of many other nations, Nigeria should learn from the experiences of such countries to encourage such enterprises.

2. Government in Nigeria should do what it takes to give the necessary support to entrepreneurial ingenuity of the likes of INNOCENT MOTORS and CURTIX CABLES in Nnewi in Anambra State.
3. Technological entrepreneurship which abound across the country should be identified with a view to giving it both technical and financial boost.
4. The effort to support technological entrepreneurship should be carried out meticulously as some innovative experiences are counter-productive

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