

## Technological innovations and entrepreneurial growth in developing countries

Duncan Barkebo Chepchieng<sup>1</sup> & Dr P. P. Kithae<sup>2</sup>

<sup>1</sup>Master of Management and Leadership student, Management University of Africa,  
P.O. Box 29677, Nairobi, <sup>2</sup>Director of Research, Management University of Africa,  
P. O. Box 29677 Nairobi

### Abstract

*This paper set out to review studies that have been done in the area of technological innovation and the growth of entrepreneurship in developing countries. Specifically, the review aimed at examining the challenges facing entrepreneurial growth in developing countries and develop a conceptual foundation that demonstrates the synergy between entrepreneurial growth and technological innovation in developing countries. The literature review found out that entrepreneurial growth in developing countries face challenges associated with the entrepreneurial environment and the individual capacity of entrepreneurs. However, even beyond these, entrepreneurial growth in developing countries still faces a distinct lag in the diffusion of technological innovations from developed countries. This is partly due to low and falling levels of investment in R&D and huge bureaucracies in government procedures. The study concluded that technological innovation has a positive role in entrepreneurial growth in developing countries and thus investment in building the capacity of entrepreneurs, partnerships and collaborations that stimulate technological innovations are critical if the benefits that entrepreneurship offers are to be realized.*

**Keywords** Technological innovation, Entrepreneurship, Entrepreneurial Growth, Innovation



**Duncan Barkebo Chepchie**

Duncan Barkebo Chepchie is a student at Management University of Africa undertaking Master of Management and Leadership. He has interest in studying the impact of technologies in the growth of business in Africa. He is currently a project manager in a Non-Governmental organization in Upper Eastern- Kenya. His interests includes writing and leadership training.

He can be reached on [dchepchieng34@gmail.com](mailto:dchepchieng34@gmail.com)



**Peter Paul Kithae, PhD**

Dr Peter Paul Kithae is currently the Director, Research, Development and Innovations of the Management University of Africa; the honorary treasurer for the Kenya Red Cross Society, Upper Eastern Kenya Region and a Senior Consultant with the Total Quality Management firm of Consultants. Among Dr. Kithae's published work include a Print book on "Technology adoption and its effect on performance of Youth-Led Micro and Small Enterprises, printed in June, 2015, a paper on the Extent the government has shaped MSE's destiny towards achievement of Kenya's vision 2030; A paper on the Effect of quality improvement practices on micro and small enterprise performance and another on Unleashing Potentiality of Our Youth through Entrepreneurship Training: A Must for Realization of Kenya's Vision 2030 among others. Dr Kithae is a career civil servant who has successfully worked as a Chief Youth Officer for three years and later as a Principal Youth Officer for two years in charge of Youth Development services in Makueni and Kirinyaga counties respectively. He has attended a lot of seminars and workshops and has facilitated a number of them. Among these are project planning and management, performance contracting, capacity assessment training and disaster preparedness and response. He is a renowned educationist, having been a senior Lecturer at the Management University of Africa for over three years, a part-time lecturer at the University of Nairobi, Embu Campus for four years and a lecturer of Entrepreneurship, management and Business Studies in various tertiary institutions for over 18 years. Dr Kithae has also been a Senior Examiner and Team leader for Business Studies with the Kenya National Examinations Council for over 10 years and a Senior Examiner for Research methods with the Kenya Institute of Management for over five years.

## Introduction and research objectives

Entrepreneurship, being the result of a disciplined, systematic process of applying creativity and innovation to needs and opportunities, utilizes to a large extent technology to ensure its growth is guaranteed. Technological innovation must be a constant process because most technologies change quickly and therefore the need to ensure entrepreneurial growth constantly relies on it (Zimmerer & Scarborough, 2008). It is important to link technology to innovation in the creation of a business venture and its survival.

In developing as well as developed countries, technological innovation is not only about innovating at the frontier, but also about adapting existing products and processes to achieve higher levels of productivity as applicable to their local contexts (Ndesaulwa & Kikula, 2016). However, for technological innovation to have an impact on entrepreneurial growth in developing countries, other factors ought to be addressed. They include, availability of capital for new product development and introduction of the said products into the market, management of innovation in medium-sized and large organizations, organizational and Government structures intended to facilitate innovation, investment strategies related to research and development, the innovator as an individual and as a personality type, and technology transfer from developed to developing nations (Ndesaulwa & Kikula, 2016)

### Statement of the problem

Empirical evidence has demonstrated a surge in entrepreneurial growth in developing countries. The Global Entrepreneurship Index report (OECD, (2006) notes that, entrepreneurship in developing countries is held back by institutional factors. Of all the regions analyzed, Sub-Saharan Africa's mean score for institutional factors is the lowest, at 0.31. Technology absorption was rated at 16%, and the biggest strength was in opportunity perception at 34%. Product and process innovation was at 28% and 17% respectively (A'cs, Szerb, & Lloyd, 2018). This scenario has been contributed partly through barriers associated with technological innovation that permeates every sector of the economy. However, for many entrepreneurial ventures in developing countries, access and optimization of such innovations hinder their ability to exploit and promote their growth. The challenge is further multiplied by weak policies and non-supportive environment for adoption of technologies. The increased need for new technology globally is a signal for developing countries to support technological innovations so as to boost entrepreneurial development if they are to build and expand entrepreneurship and make progress towards achieving the sustainable development goals. The purpose of this study is therefore to find out the role of technological innovations on entrepreneurial growth in Developing countries

The overall aim of this paper was to provide a conceptual foundation for understanding the role of technological Innovation in entrepreneurial growth in developing countries. Specifically the review aimed at examining the challenges facing entrepreneurial growth in developing countries to develop an integrative framework that underscores the synergy between entrepreneurial growth and technological innovation in developing countries.

### Theoretical background and informing literature review

#### Schumpeter's Innovation Theory

The concept of the role of innovation and entrepreneurship as main precursors to economic growth is one of Schumpeter's major contribution to economics in the first half of the twentieth century (Sledzik, 2013). Schumpeter argues that anyone who wishes to make profits must innovate. Innovation is at the center of economic growth and that the element of 'creative destruction' is central to entrepreneurship (Schumpeter J. A., 1961). For Economic development to occur, a series of historical and structural changes must be in place. They include invention, innovation, diffusion, and imitation, the entrepreneur being at the middle of these processes.

It is important therefore to underscore the fact that entrepreneurial growth in developing countries can be boosted largely by technological innovations. According to Schumpeter, the possibility of entrepreneurs drawing upon the

discoveries of scientists and inventors creates completely new opportunities for investment and growth (Sledzik, 2013) In Schumpeter's vision, innovation is an endogenous process. In terms of technology, Schumpeterian theory notes that it is dynamic and constantly changing. According to Schumpeter, the entrepreneurs are the individuals who carry out innovations (Schumpeter J. A., 1961)

It is, therefore, the entrepreneur who is the agent through which innovation and eventually development takes place. This underscores the fact that in developing countries, entrepreneurial growth challenges which are at the individual level plays a key role in their ability to innovate and stay ahead of the markets. As noted earlier, these include the entrepreneur's knowledge and skills, their ability to access capital, and their risk tolerance levels.

## Research methodology

This paper sought to conduct a review of existing empirical literature on the technological innovation and its impact in entrepreneurial development in developing countries. To achieve this objective, the authors conducted a rigorous review of literature and documentary information related to the subject matter. The paper is thus purely based on desktop and library research methodology. In this regard articles selected from top entrepreneurship journals, and research papers have been surveyed. The review is mainly on technological innovation and growth of entrepreneurship from 2009 to date.

## Research findings and discussions

Baron and Shane (2008) note that innovation involves any effort to keep the entrepreneur's product ahead of the alternatives offered by competitors on any dimension that is desirable to customers, including quality, features, speed, cost, and so on. Technology exerts a significant influence on the ability to venture in entrepreneurship and is viewed both as a major source of competitive advantage and of new product innovation (Letangule & Letting, 2012). The important role of technology innovation for entrepreneurial growth was first highlighted by Schumpeter (1956). It was emphasized that increase in capital and labor was not solely responsible for economic growth. Technology was the other factor that increased the productivity of capital and labor. (Loukil, 2016). Entrepreneurs that can combine customer value innovation with technology innovation have an increased chance of enjoying sustainable growth and profitability (Letangule & Letting, 2012).

## Entrepreneurial growth in developing countries

Entrepreneurship exists in the context of their particular geography – be that their local, national, or even supranational economy and society. The mix of attitudes, resources, and infrastructure is known as the entrepreneurship ecosystem. While a number of developing countries have used different policies and strategies in their development pursuits, two forms of industrial policy were particularly prominent. The first was import substitution - a process of industrialization by producing previously imported goods for the country's domestic market and Export promotion (Zoltan & Nicola, 2009). Both development approaches relied on strong state intervention and persistent market distortions to sustain their viability, thus often crowding out or thwarting altogether the traditional and important role of entrepreneurship. These economic growth strategies were noted to have major challenges including the creation of bureaucratic systems that resulted in permanent inefficiencies in industries and corruption in Government offices – both important barriers to productive entrepreneurship. Olafsen & Cook (2016) identify three main frameworks to understanding growth of entrepreneurship. The individual level posits that successful entrepreneurs have something others do not possess.

For example, typical successful entrepreneurs have certain psychological traits such as higher risk tolerance and an internal locus of control have been found to be characteristics indicative of successful growth entrepreneurs (Olafsen & Cook, 2016). Secondly, growth of entrepreneurship can be attributed to the age and size of the firm. Third, is the environmental level where the role of effective institutions or the 'entrepreneurial ecosystem', which are a set of characteristics external to the firm that create the conducive environment for entrepreneurial growth is responsible for entrepreneurial growth. Its components include regulatory frameworks, human capital, and access to finance, social networks, and cultural characteristics.

Specifically, empirical studies have identified a number of challenges facing entrepreneurial growth in developing countries. Sharma, *et al.* (2013) noted that, knowledge gap (geographical and cultural) among entrepreneurs in developing countries leads to unawareness of demand markets and how to access such markets. Secondly, finance is the lifeblood of any enterprise. The authors note that entrepreneurial growth is highly affected by lack of access to loan facilities, inability to raise equity capital due to limited financial knowledge among others. Third, technology plays an important role in entrepreneurial development. Lack of access to appropriate technology and equally access to capital to fund technological innovation plays a key role. Human resource skills and capacity remains a barrier to entrepreneurial growth. It is a challenge to get experts to run new technologies in developing countries compared to developed nations (Sharma, Chaudhary, Bala, & Chauhan, 2013).

According to Nicolav & Zoltan (2009), the knowledge and information gap in developing countries is a major external barrier to entrepreneurship. The authors note that in many developing countries, even basic education is inaccessible to a major share of the population. Technology, research and development is lagging, and in some cases, non-existent.

### **Technological innovation and entrepreneurial growth in developing countries**

Loukil (2016) identifies two main reasons why technological innovation is important for developing countries; Spurring of economic growth and reduction of poverty. This role was first highlighted by Schumpeter (1956) through the argument that increase in capital was not solely responsible for economic growth, and that there was another factor that represented technical change and improved productivity of labour and capital (Schumpeter J. A., 2010) On the other hand, to reduce poverty, developing countries must innovate in areas of Agriculture, Health and Education. Innovation is the ability to apply creative solutions to problems and opportunities to enhance or to enrich people's lives (Zimmerer & Scarborough, 2008). Technological innovation and the growth of entrepreneurship are a fundamental part of development process of all nations, especially developing countries. Empirical evidence reveals that successful technologies are those rooted in the entrepreneur. Entrepreneurs, who develop or innovate technologies, do so from as much as the re-invention of historical techniques or an adaptation of local technology from advanced industrialized countries (Letangule & Letting, 2012). In developing countries however, Innovation and technology environment are by nature, problematic, characterized by poor business models, political instability and governance conditions, low education level and lack of world-class research universities, an underdeveloped and mediocre physical infrastructure, and lack of solid technology based on trained human resources (Ndesaulwa & Kikula, 2016).

### **Empirical studies on technological innovation and entrepreneurship**

This section presents the empirical studies done globally on innovation and entrepreneurship across developing countries. The objective is to cast light on the research, existing results and conclusions thereon which is useful in gap identification. Understanding entrepreneurship, the processes by which firms enter and exit markets, and in particular the nature of expanding firms, is fundamental to understanding the process of structural transformation and ultimately increased productivity (World Bank Group, 2016). This will need a rebalance of priorities and concerns globally to achieve a paradigm shift where the relevance of cross - cutting issues, such as technology and innovation, is not contestable (Olafsen & Cook, 2016)

In addition to enabling global business, technological innovation serves as a crucial stimulator of rising economic prosperity and competitiveness for developing countries. However, Ndesaulwa & Kikula (2016) argue that because technological knowledge and skills are cumulative in nature, first mover advantages have created major global disadvantages. The authors further note that connecting local technological needs to international technological opportunities is a particular challenge for many developing countries. It is important to underscore that innovation is not necessarily inaccessible and neglected in developing countries, but that many readily available conceptions do not give an overall view of the role of technological innovation in entrepreneurship.

It thus follows that in examining the role of technological innovation and growth of entrepreneurship, it has to be appreciated that changes in technology locally as well as globally will affect innovation and in turn entrepreneurship. Borrowing ideas related to technology for developing countries helps their entrepreneurs to focus on delivering incremental improvements to foreign designs, rather than accruing the risks associated with development of new products and technologies (Ndesaulwa & Kikula, 2016). However, there exists the concern that even though sustainable growth in entrepreneurship is the best way to fight poverty and that innovation is key to achieving it, entrepreneurship in developing countries, still grows at a snail's pace.

The process of innovation therefore largely follows the path of developed countries to developing ones (Olafsen & Cook, 2016). Entrepreneurial growth in developing countries have been hampered by other non-economic factors such as bureaucracy with resultant corruption. In addition, low rates of secondary and tertiary education, inadequate infrastructure (especially electricity and telephony), weak financial systems, health and insecurity are major contributors to curtailment of entrepreneurial growth. This is largely the story (and present challenge) of entrepreneurial growth and in addition technological innovation and development in developing countries.

### **Entrepreneurial innovativeness or orientation**

It is clear that innovation is an activity which entrepreneurs engage in all the time in the course of running a firm. However, Continuous learning is considered to be important in sustaining industrial knowledge and experiences which can result in firm innovativeness (Nassiuma, *et al.*, 2018).

The authors argue that apart from being highly knowledgeable, experience and skilled, entrepreneurs, also require highly skilled laborers. The study revealed that at the heart of innovation in the entrepreneurial ventures lies the aspect of human capital that cannot be ignored. Their study further identified that entrepreneurial attitudinal and behavioral competencies are critical inputs for enhancing firm innovativeness. Age and gender were also found to play a role in the capability of an entrepreneur to innovate. However, this was more attributed to emotional orientation rather than knowledge and expertise.

### **Investment in technological innovation**

Another study reveals that the amount of investment into a technological innovation is directly related to the growth of entrepreneurship. Expenditures on Research and Development (R&D) are the main inputs of the innovation activity (Loukil, 2016). The author further notes that the new growth theory suggests that innovation depends mainly on scientists and engineers engaged in R&D and existing knowledge. Developing countries have had little investment in Research and Development for innovation to boost entrepreneurship. According to United Nations Educational Scientific and Cultural Organization (UNESCO) database, the Central and East European countries do not reach the European target of 3% of Gross Domestic Product (GDP) investment in favour of R&D (UNESCO, 2010). However, China had performed well in this area. In fact, in 2010 the share of R&D expenditures in GDP is equal to 1.73% in 2010, and 2.11% in 2016. It is important to note that access to finances for technological innovation is often a by-product of the overall economic environment in a country. Olafsen & Cook (2016) conclude that one of the biggest market failures for potential high growth firms in developing countries is related to the difficulties in financing innovation, as these firms often rely on innovation-intensive growth. Technological Innovation therefore has risks which tend to be exacerbated in the context of developing countries, where the path to scale is more volatile.

### **Assimilation of technological innovations**

Studies have demonstrated the role in which a country's ability to successfully transfer and assimilate technology has on the growth of entrepreneurship. China has been seen to be successful in accelerating technological innovations. China's success lies in its effort to obtain technological innovations – Technovation from abroad, in combination with its willingness to invest in domestic R&D (Mirani, 2013) China attracted most of this technology into its manufacturing sector. Technological innovation is highly linked with Manufacturing (Ndesaulwa & Kikula, 2016). Another study on relationship between entrepreneurship, innovation and sustainable development, concludes that it is necessary to strengthen innovation capacity of companies by stimulating applied research for innovative products and services, by improving cooperation between industries and research centers. One of the solutions is partnerships and scientific collaboration with developed countries, supported by a creative friendly environment in developing countries (Kardos, 2012)

## **5. Conclusions and recommendations**

Entrepreneurial growth in developing countries is still faced with both endogenous and exogenous constraints. Technological innovation therefore has become an indispensable ingredient in entrepreneurial growth. Empirical studies have identified entrepreneurial growth challenges in developing countries. Entrepreneurship ecosystem challenges such as inefficient bureaucracies in Government, corruption, lack of skilled labour force and limited access to capital. Equally, the entrepreneur orientation to innovation and their risk tolerance plays a role. As seen in this review,

the relative economic growth of the developing countries hinges on its ability to boost entrepreneurship. Over the years, technological innovation has been high in developed countries. Creating links between invention, adoption of innovation and growth of entrepreneurship is one of the most important challenges facing developing countries. This coupled with limited funding for R&D as a proportion to country's GDP. There are a variety of ways in which governments can help trigger entrepreneurial growth; for instance, by supporting technological innovation centers or 'incubators', increasing funding in innovation research, embracing Information Communication technology in automating public services and investing in education and entrepreneurship skills training. Developing countries also need to develop policies that enable easier access for capital to build new innovations, and allow ease of assimilation or transfer of innovations from developed countries

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