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NEXUS BETWEEN TECHNOLOGICAL INCUBATION ON SMALL BUSINESS PERFORMANCE - A STUDY OF SELECTED SMEs IN ILORIN, KWARA STATE.

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Abstract

Technological incubation has become a global phenomenon as its practice is increasing across the globe. In the United States and the adoption of technological incubation plays a key supportive role for businesses and have continued to grow in many other countries. The study aimed at investigating the relationship of technological incubation on small business performance in Ilorin, Kwara State. A survey and quantitative research method was used in the study. A purposive sampling technique was adopted in selecting a total of one hundred and eighty-four (184) respondents as samples for the study, while relevant data were gathered with the aid of a structured questionnaire. There were 165 respondents out of a total number of 184 staff in the selected organizations (selected SMEs). A hypothesis was formulated, and the descriptive and inferential statistical tool was used to analyze the data. Specifically, correlation analysis was used to examine the extent of the relationship between technological incubation dimensions and organizational performance. The study, however, revealed that the type of technological incubation was one of the major reasons for the organization's success. Finally, technological incubation was found to be a very important key factor for the growth and survival of small-scale businesses in Ilorin.

Key Words: Technology, Incubation, Performance, SMEs, Ilorin

Introduction

Small- or large-scale organizations alike must constantly improve their performance if they are to continue operating (Arslan & Staub, 2013). An organization must continuously raise its performance to compete in today's highly competitive marketplaces. Many emerging nations have embraced the method to encourage entrepreneurship as a crucial part of their social and economic growth. Business incubation procedures were first used in Western economies (Khalid, 2012; Tang, 2014). Despite the expanding body of literature on business incubation, this area of study still has several flaws, some of which are caused by the term's lack of a generally agreed-upon definition as well as its numerous historical variants.

Future research is being stimulated by open questions about definitions, the optimal organizational and operational models, practices, efficacy, and effects (Schwartz & Blesse, 2011, The Odorakopoulos et al, 2014, Voisey, 2006).

The first et al business incubator was established in 1959 in Batavia, New York, in the United States. Since its creation more than 50 years ago, business incubators have become increasingly common. Business incubation has changed over time to encompass a variety of incubation techniques. Business incubators help enterprises in the developed world in a significant way and have repeatedly expanded. The expansion of business incubators globally is evidence of their valued status. A well established network of over 300 business incubators, which assist about 12,000 enterprises, exists in the United Kingdom (UKBI, 2009). Business incubators have been demonstrated to be essential to the expansion and development of businesses on a global scale. Around 23% of incubator tenants in the United Kingdom across a portfolio identify as important to business performance. A business Incubator is a facility designed to assist businesses to become established and profitable during their incubation period (Kekobi, 2006). Business Incubation is a facility that provides medium-scale enterprises and start-ups business with the ideal location to develop and grow their businesses, offering everything from virtual support, and rent-a-desk through to state-of-the-art laboratories and everything in between (UKBI, 2009). The purpose of a technological incubator is to increase the efficiency and effectiveness of an organization.

According to the National Business Incubators Association (NBIA), there were roughly 900 incubators in the United States in 2000. As of 2009, that number has climbed to about 7,500, with about half located in Asian nations. Over the past 50 years, American incubators have had a significant economic influence. According to NBIA estimates, since 1980, North American incubators have strengthened regional and national economies by creating 500,000 employment and commercializing innovative technology. The business incubation program in Kenya is aimed at young to mid-career businessmen. This is so because the productive labour force in Kenya is made up of people between the ages of 22 and 44. Kenya's business incubator program has aided in the development of small businesses.

However, low technological incubation is responsible for the low product quality in the majority of Small and Medium Enterprises in Nigeria, as inferior items are often produced compared to products from other countries. This is not unconnected to a low rate of technical incubation in Nigerian small businesses which significantly impacted the quality of the products. The lack of high-technology incubation is grossly affecting the profitability, efficiency and effectiveness of many small firms in Nigeria, particularly in the Ilorin metropolis. Considering this, the study sought to examine the relationship between technological incubation on the performance of SMEs in Ilorin, Kwara State.

The Objective of the Study

To examine the relationship between technology incubation and SMEs Performance.

Research Hypothesis

Ho¹: Technological Incubation has no significant impact on the performance of small-scale Businesses in Ilorin, Kwara State.

Literature Review

This section focused on the review of the relevant literature related to the concept under study. This includes but is not limited to technological incubation, its types, organizational performance, efficiency, and effectiveness while theories as well as empirical evidence were also discussed.

Conceptual Review

The conceptual review contains a review of all related concepts related to the work under consideration. The concepts such as technological incubation, types of technological incubation, business performance and business efficiency.

a. Technological Incubation

According to Kekobi (2006), technological incubation is a facility created to help enterprises during their incubation stage become established and lucrative. To take advantage of the many potentials presented by new technologies, interest in the technological incubation process is still growing. The provision of affordable workspace, shared facilities, counselling, training, information, and access to an external network for entrepreneurial groups are some of the key areas covered by Hackett and Dilts (2004) that have piqued researchers' interest regarding the performance of small scale businesses (Campbell and Allen, 1987). These factors support venture creation and economic development.

b. Types of Technological Incubation

i. High Technological Incubation

High technological incubation is the scientific technology involving the production or use of advanced and sophisticated devices especially in the field of electronics and computers. Mackenzie (2010) suggests that high technology is more than the product of scientific activity. In the case where technology is drawn on science, the nature is that high technological incubation uses science. High technological incubations are focused on improving an existing product's development efficiency, productivity, and

competitive differentiation. Many organizations use high technological incubation to help maintain or improve their products' market position.

ii. Low Technological Incubation

Low technical incubation is the use of indigenous, traditional, unsophisticated methods that are frequently ethnic or cultural in nature. Producing in small numbers is involved (NAL 2014). Simple, conventional, or mechanical technology is characterized by low technological incubation. According to Kevin, (2016) there is little technological incubation when a new piece of straightforward equipment or technology is introduced and offers value to the firm. According to (Schumacher 2011), the technology used in emerging economies should be purposefully made low-tech. Local resources might be used with a little incubation to create the necessary implements and tools. The tone of their lower size and low technologies were easily adaptable to the needs of the populace.

c. Business Performance

Business performance is a topic that many studies disagree on, and it continues to be debatable among academics worldwide (Barney, 2013). Business performance is the result of all organizational activities and strategies, according to Wheelen & Hunger (2012). Performance denotes excellence, suitability, or functionality. As a result, business performance is a broad term that relates to an enterprise's activities (Roadster, 2008). The most well-known definition of performance was given by Nelly and colleagues in 2002, who stated that it is a process of evaluating the quality, efficiency, and effectiveness of previous acts..." Based on these definitions the operation is divided into two components: A description of how the efficiency of resource use in the production of products or services, means the relationship between the actual and desired outputs for given inputs and the effectiveness that described the degree of organizational goals.

The success of a business depends on the incubation of new technologies. It consists of an organization's actual production or outcomes as compared to its anticipated output or goals and objectives. The performance of an organization is being discussed. All companies' success and progress may be determined by their performance. Business performance comes in many different forms, including financial outcomes, product differentiation, quality, cost structure, and employee performance, all of which contribute to the achievement of corporate goals. Performance is crucial to a company's existence in today's cutthroat business world. Management is interested in finding out how an organization's success is connected to its efforts to enhance product quality (Sousa, 2014). In the end, a company's business success shows whether service excellence is accomplished there. Business results are defined as how much a company grows its sales, earnings, and return on equity. These reflect a company's overall health and are indications of financial performance (Barnett & Salomon, 2006).

d. Efficiency

Efficiency can be explained in two ways, technical and allocative. Technical efficiency refers to organizing available resources in such a way that the maximum feasible output is produced. That is, no alternative organization would yield a larger output. Allocative efficiency, or price efficiency, refers to the use of the budget in such a way that, given relative prices, the most productive combination of resources is obtained. Hasan & Tabbits (2010), note that the internal process measures in the area concerned with efficiency. 'When someone or something uses time and energy well, without wasting any'(Cambridge Dictionary 3rd edition).

In general terms, efficiency refers to "how well" or "how effectively" a decision-making unit combines inputs to produce an output. In the theory of productive efficiency, there are two main components – technical efficiency and allocative efficiency. Technical efficiency focuses on the output produced from a given bundle of inputs and technology, while allocative efficiency focuses on the ability and willingness of an economic unit to minimize costs of production for a given set of input prices through substitution or reallocation of inputs.

Efficiency is oriented towards successful input transformation into outputs. Efficiency relates to the optimal use of resources to achieve the desired output (Chavan, 2009). Mouzas's (2006) findings revealed that efficient information provides different data. Efficiency measures the relationship between inputs and outputs or how successfully the inputs have been transformed into outputs (Low, 2000). Pinprayong & Siengthai (2012) suggest there is a difference between business efficiency and organizational efficiency. Business efficiency reveals the performance of the input and output ratio, while organizational efficiency reflects the improvement of internal processes of the organization, such as organizational structure, culture, and community.

Theories Underpinned

a. Disruptive Incubation Theory

The term “disruptive technology” was coined and introduced in the article “Disruptive Technology: Catching the Wave (1995). The concept of disruptive technology continues a long tradition of the identification of radical technical change in the study of incubation by economists, and the development of tools for its management at a firm or policy level. In the theory, Christensen distinguishes between “low-end disruption” which targets customers who do not need the full performance valued by customers at the high end of the market and “new-market disruption” which targets customers who have needs that were previously unserved by existing incumbents.

“Low-end disruption” occurs when the rate at which products improve exceeds the rate at which customers can adopt the new performance. Therefore, at some point, the performance of the product overshoots the needs of certain customer segments. At this point, a disruptive technology may enter the market and provide a product which has lower performance than the incumbent, but which exceeds the requirements of certain segments, thereby gaining a foothold in the market. In low-end disruption, the disruptor is focused initially on serving the least profitable customer, who is happy with a good enough product.

b. Economic Theory

This theory was postulated by Adam Smith in his book “Wealth of Nations”. This section reviews the different branches of the economic literature on incubation to identify areas where further research is needed and improve the chain-linked model of incubation. Adam Smith in his *Wealth of Nations* (1999) identifies incubation as requiring the investment of money and as an important economic activity inducing gains. It was however Schumpeter who more formally explained the role of economic agents in technical advance. He differentiates between the inventor and the entrepreneur. The latter is defined as one who sees how to fulfil currently unsatisfied needs or perceives a more efficient means of doing what is already being done and receives extraordinary profits as a result (Kamien & Schwartz, 2002). (Schumpeter, 2002) believed that larger firms have a critical advantage concerning incubation.

This theory was further refined by (Galbraith, 2000). The main aim of firms is to maximize expected profits. Hence an industrial organization of large monopolistic firms offers decisive welfare advantages and larger firms can achieve scale economies, diversify, develop a market reputation, etc. as shown by empirical studies (Scherer, 2008, Cohen & Klepper 2010). (Nelson 2003) contends that the more widespread the reputation and name of a firm, the higher the chances of full exploitation of its research efforts. Based on his empirical analysis, (Schmookler, 2008) claimed that after a certain large size, the efficiency of inventive activities varies inversely with firm size. Williamson (2000) further explains the factors which hinder incubation in a large firm.

Another possible reason for the lack of incubation by large firms could be the 'scarcity of ideas' concept (Scotchmer, 2009, Varian, 2008). Ideas develop from the existing technological base and scarcity means that only one inventor caters to the market with his or her idea. Disclosure of the ideas increases the chances that the subsequent idea would come from a rival. Incubation is supposed to be highly competitive and small firms are in a better position to fully exploit it, combined with their focus on new innovative technologies (Hicks & Buchanan, 2009), and take over from the incumbent (Malerba,

Orsenigo, & Peretto 2010). An incubation study carried out in some Latin American firms (Arocena & Sutz, 2010) finds that little is invested in innovative activity.

Schumpeter speaks about the incubation process but does not specifically explain how incubations come about nor does he consider whether there could be overinvestment or too much destruction. A counter explanation is given by Arrow (2000), which presents an investigation into the allocation of resources for incubation. Innovative competition creates higher levels of uncertainty as competition can come from any industry. He was the first to distinguish that invention is different to risk-bearing. These two theories underpinned this study because of the irrelevance to the topic.

Empirical Analysis

There is much empirical evidence from researchers across the globe. For instance, Carter & Williams (2009) and Ayres (2008) indicate in their findings that there exists a strong relationship between technological incubations and the performance of firms. Technology affects the wealth of companies. The use of various aspects of technological incubation is thus expected to have great effects on the performance of firms. Also, Comanor (2005) and Shrieves (2007) indicate in their empirical findings that resources are allocated towards those innovative activities which are easily imitable. Technological Incubation can thus be viewed because of firm size, the industry it belongs to, market demand and structure and associated diffusions that take place.

Methodology

The study methodology employed is survey research designed. It used primary data with the aid of a structured questionnaire using a five-point Likert scale. It also used a sample size of 184 out of the population of 243 SMEs existing in the selected areas of study. It uses both descriptive and inferential statistics to analyze its data using correlation with the aid of SPSS version 22.

Data Presentation and Analysis

Hypotheses Testing

The section focuses on testing the research hypotheses as proposed in this research work. SPSS version 20, particularly correlation Analysis is used to test the hypotheses.

Decision Rule: The strength of evidence in support of the null hypothesis is measured by the P-value. If the p-value is less than the significance level (below 0.05), the null hypothesis is accepted.

Correlations

		low technological incubation	efficiency
low technological incubation	Pearson Correlation	1	.370**
	Sig. (2-tailed)		.000
	N	165	165
Efficiency	Pearson Correlation	.370**	1
	Sig. (2-tailed)	.000	
	N	165	165

** . Correlation is significant at the 0.01 level (2-tailed).

Ho₃: There is no relationship between Low technological incubation and organizational efficiency table shows the Pearson correlation for low technological and efficiency to be 0.370(37.0%)

Interpretation of Result

The table shows the Pearson correlation for high technology and efficiency to be 0.255(25.5%) This implies that there is a weak relationship between high technology and efficiency. The above

correlation table shows that at a 0.01 level of significance, $r = 0.0001$ (2-tailed test). 0.0001 is less than 0.01 which is the set level of significance. This implies that there is a significant relationship between high technology and efficiency. Therefore, we reject the null hypothesis and embrace the alternative.

Discussion of Findings

This implies that there is a weak relationship between low technological and efficiency. The above correlation table shows that at a 0.01 level of significance, $r = 0.0001$ (2-tailed test). 0.0001 is less than 0.01 which is the set level of significance. This implies that there is a significant relationship between low technology and efficiency. Therefore, we reject the null hypotheses and conclude that there is a relationship between low technology and organizational efficiency.

Summary, Conclusion and Recommendations

This study has investigated the relationship between technological incubation on organizational performance in small and medium firms. The results of this study revealed that there is a strong relationship between technological incubation and organizational performance. Based on the findings of this study, it can be concluded that technological incubation has both positive and negative effects on organizational performance. The study found that high and low technological incubation allows organizations to gain a competitive advantage in their market place through unique organizational resources. It is concluded that high and low technological incubation are the best resources to produce charcoal for small firms for them to wax stronger in a globally competitive environment.

Based on the findings of this study, it can be concluded that technological incubation has both positive and negative effects on organizational performance. The study found that high and low technological incubation allows organizations to gain a competitive advantage in their market place through unique organizational resources. It is concluded that high and low technological incubation are the best resources to produce charcoal for small firms for them to wax stronger in a globally competitive environment. It is therefore recommended that organizations should adopt either low or high technology to improve their performance in all ramifications.

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