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Empirical Analysis on Innovation and Implication for Entrepreneurship Development in Nigeria

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Abstract
The study seeks to assess the nature of the relationship between innovation and entrepreneurship development, ascertain the extent of the relationship between creativity and innovation, ascertain the extent of the relationship between innovation and competitive advantage, and determine the measures of innovation outputs in Nigeria. The study was carried out primarily through the survey method and interview of entrepreneurs/CEOs in Anambra and Enugu States in Nigeria. Secondary data were obtained through books, journals and internet. The questionnaire was designed in likert scale format. The researcher conducted a pre- test on the questionnaire to ensure the validity of the instrument. Data collected were presented in frequency tables. Pearson product-moment Correlation coefficient was used to test hypotheses 1, 2, and 3 while chi- square was used to test hypothesis (4) using SPSS.
Keywords: Innovation, Entrepreneurship, Creativity, and Competitiveness

1.0: Introduction

In today's highly competitive world, business success depends increasingly on the ability to innovate. In today's global knowledge economy, knowledge is the primary source of innovation, sustainable value and wealth. The development and productive use of knowledge is becoming the key process of value creation for organizations as well as for societies. The autonomous professionals are becoming the driver of innovation and success. They will only play this role strongly, when they can act as entrepreneurs (Keursten, 2007).

Innovation is the application of better solutions that meet new requirements, unarticulated needs, or existing market needs. This is accomplished through more effective products, processes, services, technologies, or ideas that are readily available to markets, governments, and society. The term innovation can be defined as something original and, as consequence, new that breaks into the market or society. (Frankelius, 2009).

Innovation is the process of creating and implementing a new idea (Hellriegel et al, 1999).

Innovation differs from invention in that innovation refers to the use of better and, as a result, novel idea or method, whereas invention refers more directly to the creation of the idea or method itself.

Innovation differs from improvement in that innovation refers to the notion of doing something different rather than doing the same thing better (www.en.wikipedia.org/wiki/innovation).

The companies that have done the best over the long time are those who are the most creative and innovative. These organizations don't copy what others do, instead, they may use innovative ideas from others as a spring board to come up with a unique application, product, or service for themselves. They tend to distance themselves from the competition rather than compete with them. If they see another company copying what they do, they create something new and better. They are able to leverage their creativity and their innovative capabilities to attain long- term success (www.twitter.com/DanielBurrus).

Innovation is the development of new value through solutions that meet new needs, or adding value to old customers by providing new ways of maximizing their current level of productivity. It is the catalyst to growth. With rapid advancements in transportation and communications over the past few decades, the old world concepts of factor endowment and comparative advantage which focused on an area's unique inputs are outmoded for today's global economy (www.en.wikipedia.org/wiki/Innovation).

Information technology and changing business processes and management style can produce a work climate favourable to innovation (http://forbesindia.com). Recent research findings highlight the complementary role of organizational culture in enabling organizations to translate innovative activity into tangible performance improvements (Salge and Vera, 2012).

Innovation can be developed by less formal on-the job modifications of practice, through exchange of professional experience. The more radical and revolutionary innovations tend to emerge from research and development, while more incremental innovations may emerge from practice. Innovation by businesses is achieved in many ways, with much attention now given to formal research and development for breakthrough

innovations. Research and development help spur on patents and other scientific innovations that lead to productive growth in such areas as industry, medicine, engineering, and government (Mark et al, 2008).

Innovation processes usually involve: identifying needs, developing competences, and finding financial support (Kline, 1985).

All organizations can innovate, including for example hospitals, universities and local governments (Salge and Vera, 2009). For instance, Lagos State Government in South West Nigeria in an attempt to tackle the perennial traffic jam in Lagos metropolis introduced special designated buses called "BRT Buses" to ply designated routes created for the buses in 2011. This innovative idea greatly saves time and money for all grades of workers and employers in Lagos city with a population of over 5 million people. Statistics from the BRT Bus secretariat shows that over 3 million people are transported in the buses daily within Lagos metropolis.

1.1: Objectives of the Study

The study has the following specific objectives

(1) To assess the nature of the relationship between innovation and entrepreneurship development
(2) To ascertain the extent of the relationship between creativity and innovation
(3) To ascertain the extent of the relationship between innovation and competitive advantage
(4) To determine the measures of innovation outputs in Nigeria

1.2: Hypotheses

(1) There is a positive relationship between innovation and entrepreneurship development
(2) There is a significant relationship between creativity and innovation
(3) There is a significant positive relation between innovation and competitive advantage
(4) Innovation outputs can be measured in terms of technology transfer, labour productivity, and shareholder's return.

1.3: Methodology

The study was carried out primarily through the survey method and interview of entrepreneurs/CEOs in Anambra and Enugu States in Nigeria. Secondary data were obtained through books, journals and internet. A sample size of 50 entrepreneurs was randomly selected from the lists of entrepreneurs in Anambra and Enugu States in Nigeria. The questionnaire was designed in likert scale format. The researcher conducted a pre- test on the questionnaire to ensure the validity of the instrument. Data collected were presented in frequency tables. Pearson product-moment Correlation coefficient was used to test hypotheses 1, 2, and 3 while chi- square was used to test hypothesis (4) using SPSS

2.0: Literature Review

2.1: Creativity and Innovation

Times of economic recession have necessitated an imperative need for innovation and creativity, more importantly for small business and start-up entrepreneurs.

Creativity is a function of knowledge, curiosity, imagination, and evaluation. The greater your knowledge base and level of your curiosity, the more ideas, patterns, and combinations you can achieve, which then correlates to creating new and innovative products and services. But merely having the knowledge does not guarantee the formation of new patterns. Creativity refers to generating new ideas. Innovation refers to the application of an idea. Therefore innovation is applied creativity. Creativity and innovation may seem similar but are actually quite different processes. Creativity is the thinking process involved in producing an idea or a concept that is new, original, useful, or satisfying to its creator or to someone else.

Innovation refers to doing new things. Creativity involves coming up with a new idea, whereas innovation involves implementing the new idea (Rue and Byars, 2000).

2.1.1: Strategies for increasing Creativity and Innovation

- Innovation is based on knowledge, there is need to continually expand your knowledge base. Read things you don't normally read.
- Be careful about how you are perceiving things, in other words defer judgement.
- Practice guided imagery so you can see a concept come to life.
- Let your ideas incubate, by taking a break from them.
- Experience as much as you can. Exposure puts more ideas into your subconscious
- Actively seek out new experiences to broaden your experience portfolio.
- Actively seek out new experiences to broaden your experience portfolio.
- Look where others are not looking to see what others are not seeing (www.twitter. Com/DanielBurrus).

2.2: Types of Innovation

- **Technical Innovation:** This is the creation of new products and services
- **Process Innovation:** Creating a new means of producing, selling and/or distributing an existing product or service.
- **Administrative Innovation:** Administrative innovation occurs when creation of a new organisation design better supports the creation, production, and delivery of products and services.

Significant technical innovations are the ones that often make headlines, but process and administrative innovations are the more common types of innovation in typical organisations (Hellriegel et al, 1999).

2.3: Innovation and Entrepreneurship

Academic research and hands – on experience have established a relationship between entrepreneurship and innovation. The survival of entrepreneurs is highly dependent on developing new products and services. Many businessmen are seeing the economic recession as the best time to focus on innovation and new opportunities. Entrepreneurship and innovation can be challenging and disruptive, but if the organisation is able to withstand, then they can reap rich rewards. Unconventional ideas that seem impractical in the beginning can lead to some excellent innovations. When the organisation is at start-up or maturing stage, it is wise to innovate constantly. This will sustain demand and margins for the entrepreneur. The concept of incremental change does not work with innovation, with it is disruptive innovation. A disruptive innovation has the unique capacity to transform the market through drastic improvements in the quality of the product or its price. Entrepreneurship and innovation both require financial assistance and support for it to be successful. Entrepreneurship and innovation are synonymous key stimulants for economic growth. Innovations usually spark change both socially and economically.

Entrepreneurs continuously look for better way to satisfy their customer base with improved quality, durability, service and price which come to fruition in innovation with advanced technologies and organisational strategies (Heyne et al, 2010).

2.4: Measures for Innovation

- ✓ **Organisational Level:** The measure of innovation at the organizational level relates to individuals, team- level assessments, and private companies from the smallest to the largest. Measures of innovation for organizations can be conducted by surveys, workshops, consultants, or internal benchmarking. Corporate measurements are generally structured around balanced scorecards which cover several aspects of innovation such as business measures related to finances, innovation process efficiency, employees' contribution and motivation, as well as benefits for customers. Measured values will vary widely between businesses, covering for example new product revenue, spending in research and development, time to market, customer and employee perception and satisfaction, number of patents, additional sales resulting from past innovations (Davila et al, 2006).
- ✓ **Political Level**: For the political level, measures of innovation are more focused on a country or region competitive advantage through innovation. In this context, organizational capabilities can be evaluated through various evaluation frameworks, such as those of the European Foundation for quality measurement. The OECD - OSLO Manual (1995) suggests standard guidelines on measuring technological product and process innovation.

2.4.1: Several indexes exist that attempt to measure innovation:

- **The Innovation Index:** developed by the Indian Business Research Center, to measure innovation capacity at the country or regional level in the United States (www.statsamerica.**org/**innovation/data).
- **The OSLO Manual** is focused on North America, Europe, and other rich economies.
- **The Global Innovation Index:** this international innovation index is one of many research studies that try to build a ranking of countries related to innovation. To rank the countries, the study measured both innovation inputs and outputs. Innovation inputs included government and fiscal policy, education policy and the innovation environment. Innovation outputs included patents, technology transfer, and other research and development results; business performance, such as labour productivity and total shareholder returns, and the impact of innovation on business migration and economic growth.

2.5: Innovation Theory

- **Cycles and Long Wave Theory:** In Schumpeter's view, technological innovation is at the center of both cyclical instability and economic growth, with the direction of causality moving clearly from fluctuations in innovation to fluctuation in investment and from that to cycles in economic growth, moreover, Schumpeter sees innovations as clustering around certain points in time periods that he refers to as "neighborhoods of equilibrium", when entrepreneurial perception of risk and returns warranted

innovative commitments. These clustering, in turn lead to long cycles by generating periods of acceleration in aggregate growth rate.

- Technological view of changes is at the root of the long cycle needs to demonstrate: change in the rate of innovation governs changes in the rate of new investments and that combines impact of innovation clusters takes the form of fluctuation in aggregate output or employment.
- The process of technological innovation involves extremely complex relation among a set of key variables - inventions, innovations, diffusion paths and investment activities.
- The impact of technological innovation on aggregate output is mediated through a succession of relationship that has yet to be explored systematically in context of long wave. New inventions are typically very primitive at their birth. Their performance usually poor, compared to existing technologies as well as their future performance.
- Moreover, the cost of production, at this initial stage, is likely to be high - indeed, in some cases, a production technology may simply not yet exist, as is often observed in major chemical inventions, pharma inventions, etc.
- The speed with which inventions are transformed into innovations, and consequently diffused will depend upon actual and expected trajectory of performance improvement and cost reduction (Schumpeter, 1939, 1942, 1982 and 1975).

2.6: Results and Discussion

This section presents the analysis of data collected in the course of this study. Data were presented in tables for analysis. Hypotheses 1, 2, and 3 were tested by pearson product- moment correlation coefficient while hypothesis 4 was tested by chi-square test statistics using SPSS.

Table (1): What is the Nature of the Relationship between Innovation and Entrepreneurship Development

S/N		AGREEMENT	DISAGREEMENT	TOTAL
1	There is a positive relationship between innovation and entrepreneurship development	48(33.3)	02 (16.7)	50
2	There is no positive relationship between innovation and entrepreneurship development	05 (33.3)	45 (16.7)	50
3	The survival of entrepreneurs is highly dependent on developing new products and services	47 (33.3)	03 (16.7)	50
	Total	100	50	150

Source: Field Survey, 2014.

Hi: There is a positive relationship between innovation and entrepreneurship development

Table (2) Descriptive Statistics of Innovation and Entrepreneurship Development

	Mean	Std. Deviation	N
Innovation	1.1800	.52255	50
Entrepreneurship	1.2600	.59966	50

Table (3) Correlations of Innovation and Entrepreneurship Development

		innovation	Entrepreneurship
Innovation	Pearson Correlation	1	.890(**)
	Sig. (2-tailed)		.000
	N	50	50
Entrepreneurship Development	Pearson Correlation	.890(**)	1
	Sig. (2-tailed)	.000	
	N	50	50

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

Source: SPSS Version, 15.00

Table (2) shows the descriptive statistics of the innovation and entrepreneurship development, with a mean response of 1.1800 and standard deviation of .52255 for innovation and a mean response of 1.2600 and standard deviation of .59966 for entrepreneurship and number of respondents (50). By careful observation of standard deviation values, there is not much difference in terms of the standard deviation scores. This implies that there is about the same variability of data points between the dependent and independent variables.
Table (3) is the Pearson correlation coefficient for Innovation and entrepreneurship development. The correlation coefficient shows 0.890. This value indicates that correlation is significant at 0.05 level (2tailed) and implies that there is a relationship between innovation and entrepreneurship (r = .890). The computed correlations coefficient is greater than the table value of r = .195 with 48 degrees of freedom (df. = n-2) at alpha level for a two-tailed test (r = .890, p< .05). However, since the computed r = .890 is greater than the table value of .195 we reject the null hypothesis and conclude that there is a positive relationship between innovation and entrepreneurship development (r =.890, P<.05).

Table (4): What is the Extent of the Relationship between Creativity and Innovation

S/N		AGREEMENT	DISAGREEMENT	TOTAL
1	There is a significant relationship between creativity and innovation	49 (32)	01 (18)	50
2	There is no significant relationship between creativity and innovation	02 (32)	48 (18)	50
3	Innovation is applied creativity because innovation implements the idea that was created.	45 (32)	05 (18)	50
	Total	96	54	150

Source: Field Survey, 2014.
Hi: There is a significant relationship between creativity and innovation

Table (5) Descriptive Statistics of the Relationship between Creativity and Innovation

	Mean	Std. Deviation	N
Creativity	1.4000	.67006	50
Innovation	1.3000	.67763	50

Table (6) Correlations of the Relationship between Creativity and Innovation

		Creativity	Innovation
Creativity	Pearson Correlation	1	.539(**)
	Sig. (2-tailed)		.000
	N	50	50
Innovation	Pearson Correlation	.539(**)	1
	Sig. (2-tailed)	.000	
	N	50	50

** Correlation is significant at the 0.01 level (2-tailed).
Source: SPSS Version, 15.00

Table (5) shows the descriptive statistics of the creativity and innovation, with a mean response of 1.4000 and standard deviation of .67006 for creativity and a mean response of 1.3000 and standard deviation of .67763 for innovation and number of respondents (50). By careful observation of standard deviation values, there is not

much difference in terms of the standard deviation scores. This implies that there is about the same variability of data points between the dependent and independent variables.

Table (6) is the Pearson correlation coefficient for creativity and innovation. The correlation coefficient shows 0.539. This value indicates that correlation is significant at 0.05 level (2tailed) and implies that there is a relationship between Creativity and Innovation (r = .539). The computed correlations coefficient is greater than the table value of r = .195 with 53 degrees of freedom (df. = n-2) at alpha level for a two-tailed test (r = .539, p< .05). However, since the computed r = .539 is greater than the table value of .195 we reject the null hypothesis and conclude that there is a significant relationship between creativity and innovation (r =.539, P<.05). Keursten, 2007 asserts that the development and productive use of knowledge is becoming the key process of value creation for organizations as well as for societies.

Table (7): What is the Extent of the Relationship between Innovation and Competitive Advantage

S/N		AGREEMENT	DISAGREEMENT	TOTAL
1	There is a significant positive relationship between innovation and competitive advantage	46 (30.3)	04 (19.6)	50
2	There is no significant positive relationship between innovation and competitive advantage	05 (30.3)	45 (19.6)	50
3	Innovation is one of the success drivers for competitive advantage	40 (30.3)	10 (19.6)	50
	Total	91	59	150

Source: Field Survey, 2014.

Hi: There is a significant positive relationship between innovation and competitive advantage

Table (8) Descriptive Statistics of the Relationship between Innovation and Competitive Advantage

	Mean	Std. Deviation	N
Innovation	1.2000	.57143	50
Competitive	1.6400	.85141	50

Table (9) Correlations of the Relationship between Innovation and Competitive

		innovation	Competitive
Innovation	Pearson Correlation	1	.787(**)
	Sig. (2-tailed)		.000
	N	50	50
Competitive	Pearson Correlation	.787(**)	1
	Sig. (2-tailed)	.000	
	N	50	50

Source: SPSS Version, 15.00

Table (8) shows the descriptive statistics of the innovation and competitive advantage, with a mean response of 1.2000 and standard deviation of .57143 for innovation and a mean response of 1.6400 and standard deviation of .85141 for competitive advantage and number of respondents (50). By careful observation of standard deviation values, there is not much difference in terms of the standard deviation scores. This implies that there is about the same variability of data points between the dependent and independent variables.

Table (9) is the Pearson correlation coefficient for innovation and competitive advantage. The correlation coefficient shows 0.787. This value indicates that correlation is significant at 0.05 level (2tailed) and implies that there is a relationship between innovation and competitive advantage (r = .787). The computed correlations coefficient is greater than the table value of r = .195 with 48 degrees of freedom (df. = n-2) at alpha level for a two-tailed test (r = .787, p< .05). However, since the computed r = .787 is greater than the table value of .195 we reject the null hypothesis and conclude that there is a significant positive relation between innovation and competitive advantage (r =.787, P<.05). Salge and Vera (2012) stress that in organizational context, innovation may be linked to positive changes in efficiency, productivity, quality, competitiveness, market share, etc.

Table (10): What are the Measures of Innovation Outputs in Nigeria

S/N		AGREEMENT	DISAGREEMENT	TOTAL
1	Innovation output can be measured in terms of technology transfer	47 (45)	03 (5)	50
2	Innovation output can be measured in terms of labour productivity	46 (45)	04 (5)	50
3	Innovation output can be measured in terms of shareholder's return	42 (45)	08 (5)	50
	Total	135	15	150

Source: Field Survey, 2014.

Hi: Innovation outputs can be measured in terms of technology transfer, labour productivity, and shareholder's return

Table 11 Chi-Square Test for Measures of Innovation Outputs in Nigeria

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.342(a)	2	.310
Likelihood Ratio	2.984	2	.225
Linear-by-Linear Association	.796	1	.372
N of Valid Cases	150		

Source: SPSS Version, 15.00

Table (11) is the output of the computed Chi-Square values from the cross tabulation statistics of observed and expected frequencies with the response options of agree and disagree based on the responses of the research subjects from the organisations. Pearson. Chi-Square computed value (X^2_c= 12.342) is greater than the Chi – Square tabulated value (X^2_t =5.99) with 2 degrees of freedom (df) at 0.05 level of alpha (X^2_c = 12.342, p, < .05)

Decision Rule

The decision rule is to accept the alternate hypothesis if the computed Chi- Square value is greater than tabulated Chi-Square value otherwise reject the null hypothesis.

Decision

Since the Pearson Chi- Square computed X^2_c= 12.342 is greater than Chi- Square table value X^2_t =5.99, the null hypothesis is rejected and alternate hypothesis is accepted. Thus, we conclude that Innovation outputs can be measured in terms of technology transfer, labour productivity, and shareholder's return.

Concluding Remarks

Innovation is the development of new value through solutions that meet new needs, or adding value to old customers by providing new ways of maximising their current level of productivity. It is the catalyst to growth. In the organisational context, innovation may be liked to positive changes in efficiency, productivity, quality, competitiveness, market share, and others. A high degree of uncertainty focused on market intelligence leads to an innovative and successful business model. Companies cannot grow through cost reduction and reengineering alone, innovation is the key in providing aggressive top-line growth, and for increasing bottom-line results.The following suggestions were proffered as government aid to innovation and entrepreneurship:

- Invest in education, as innovation and entrepreneurship require an intelligent and creative workforce
- Minimize barriers and simplify procedures for boosting innovation and entrepreneurship
- Focus on research and development for the benefit of innovation and entrepreneurship.
- Attract foreign direct investment which helps in raising funds for innovation and entrepreneurship.
- Encourage international trade that will lead to exchange of products, ideas, and markets which is favourable for both innovation and entrepreneurship.
- Help the organizations to write off the tax in case of a failure in innovation and entrepreneurship.
- Encourage universities and research organizations to work with the business sector for a mutual benefit.
- Recognize and reward innovation and entrepreneurship.

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