



Production Techniques and Technological Orientation on the Performance of Manufacturing Industries in Nigeria

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Abstract

Nigerian production system are still at a very low level stage since many of its operators are still using the traditional-based approaches rather than adopting modern technologies (Apulu, 2012). These study broad objective determine the influence of production techniques and technological orientation on the performance of manufacturing industries in Nigeria. The study employed a descriptive survey design of ten (10) manufacturing industries which cut across Kaduna, Kano and Jigawa State of Nigeria. Regression analysis was used in determining the relationship between production techniques and organizational performance. The result shows that, correlation coefficient R is 0.741, implying that there is a strong positive relationship between performance (Y) and production technique (X) on first hypothesis while the second hypothesis of Regression result on technological orientation and the performance of manufacturing industries in Nigeria shows that computed correlation coefficient R is 0.888, this implying that there is also a strong positive relationship between Performance (Y) and technological orientation (X). The findings and recommendations called upon organizational owners and managers to go for deep environmental scanning and be creative and innovative to transit into technological trend of meeting up with today's global challenges.

Key words: Creativity and innovation; Manufacturing industries; Production techniques; Technological orientation

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INTRODUCTION

The important nature of manufacturing industry on economic growth and development serves as a veritable vehicle for the achievement of national economic objectives of employment generation and poverty reduction. Cost of investment as well as the development of entrepreneurial capabilities including the turning around nature of our indigenous technology makes it to serve as the propelling force that moves the country's engine economic growth and development which in most cases, is been facilitated by the adoption of new technology. Manufacturing is that aspect of the industry that produces tangible goods, services and waste products. It consists of about 80% of industry (Unyimadu & Chiekezie, 2012). For any organization to meet up with the 21st century of competitiveness in business, such organization must be creative. Considering the challenges and the need to adapt and survive in this present knowledge era, research and development department of any manufacturing industry need to be innovative and creative to implement actions that will increase the ability to develop, attract and retain talents. Creativity is viewed as the process of generating business ideas and needs in an enabling environment conducive to both the development of ideas and their implementation to facilitate organizational growth (European Innovation Score Board, 2009). However, business enterprises need to constantly be creative in order to ensure growth and success in the competitive global environment. In order to grow, manufacturing industries have to adapt with the spirit of creativity and innovation approach that will enable them gain a competitive edge in the dynamic business environment (Mwangi & Namusonge, 2014). Due to the market competitiveness, organizations are expected to be creative in developing new products and services that will survive in the highly competitive environment (Epetimehin, 2008). Technology helps firm to improve in their business processes and decrease cost. Technology is considered as one of the strategic resources that has contributed to

firms' performance and forms the cornerstone of gaining competitive advantage (Kraaijenbrink, Spender, & Groen, 2010). Technological adaptation is a major determinant of innovation capacity. Boosting indigenous technological capability thus remain a major development challenges in Nigeria. The challenge is more pronounced in the industrial sector because industry forms the centre of technological activities in any economy. In a national system of innovation, firms which constitute the industry are the centers of technological innovation that sustain economic growth (Freeman, 1995; Muchie & Baskaran, 2009).

Statement of the Problem

Nigerian production system are still at a very low level stage since many of its operators are still using the traditional-based approaches rather than adopting modern technologies (Apulu, 2012). Most Nigerian manufacturers are of the view that constant power failure which causes increase in cost of production is been affected by the selling price. Nigerian products suffers most with the Nigerian common mentality that any of her locally made products are sub-standard, so therefore, must be lower in market price. An average Nigerian operator would always hinge his failure on lack of access to finance, some others think otherwise, arguing that inappropriate management skills, lack of adoption of change and new technologies, difficulty in accessing global market, lack of entrepreneurship skills and technical know-how, poor infrastructure etc. are largely responsible (Johnson, 2011; Akingunola, 2011; Sanusi, 2011). However, the obsolete technologies implemented cannot meet the production and services challenges of today (Vision 20:20 Technical Report on SMEs, 2009). Based on these backdrops, the study general objective is to determine the influence of production techniques and technological orientation on the performance of manufacturing industries in Nigeria.

The study Specific objectives are:

- To determine the influence of production techniques on the performance of manufacturing industries in Nigeria.
- To examine the impact of technological orientation on the performance of manufacturing industries in Nigeria.

Performance is decomposed into change in product which is measured by sales volume, market share, profitability and organizational growth.

Production technique is proxied by organizational creativity, high quality and quantity of goods produce and the efficacy for global competitiveness.

Based on the aforesaid objectives, the following research questions are critically articulated.

- To what extent does production technique influence the performance of manufacturing industries in Nigeria?
- To what extent does technological orientation impact the performance of manufacturing industries in Nigeria?

However, the study drew some hypothetical guess to empirically achieve its stated objectives and research questions asked. These include;

Ho¹: Production technique does not influence the performance of manufacturing industries in Nigeria.

Ho²: Technological orientation has no impact on the performance of manufacturing industries in Nigeria.

1. REVIEW OF RELATED LITERATURE

1.1 Conceptual Clarification

Today's clarion call is based on the need to become creative and innovative as most manufacturing setting cannot grow without adhering to the change initiative and organizational creativity. Creativity is the ability to combine ideas in unique way or to make unusual association between ideas while innovation is the process of taking a creative idea and turning it into a product that can be used or sold (Coulter, 2006). Creativity is the only gateway to reaching innovation which means that without creativity, there will be no innovation and no business survival. According to Osisioma (2009), creativity is the generation of novel ideas while the successfully implementation of this idea is innovations. In order to gain competitive advantage in today's dynamic market place, it is increasingly necessary for enterprises to streamline their processes so as to reduce costs, lead time and improve performance. However, if business processes are left unattended and not consciously adapted to the changing environment, they become impediments to innovation (Prahalad & Krishnan, 2008). The ability to make capacity operate competitively requires something more: the tacit knowledge, skills and experience related to specific technologies that is collected by enterprises and cannot be imported or brought in. These processes involve creating new skills, partly by formal education but usually and more importantly by training and the experience of new technologies. Technological capability refers to the ability to make effective use of technological knowledge in production, engineering and innovation in order to sustain competitiveness in price and quality (the skills, knowledge & institutions). Technological knowledge is built up using scientific methods described in books, tested by experiments and can make deliberate progress by doing practical things or producing things (Bell & Pavitt, 1993; Arnold & Thurriaux, 1997). Such capability enables a firm to create new technologies and to develop new products and processes in response to the changing economic environment (Linsu, 2010; Wiegratz, 2009; Page, 2010).

1.2 State of the Manufacturing Industry in Nigerian Industrial Development

According to Dibua and Dibua (2012), industrial development is arguably the engine of sustained long-term economic development. Industrial development represents

a deliberate and sustained application and combination of suitable technology, human resources, management techniques and their resources to improve the production system. The economic argument for embarking on industrial development is that rising productivity in the economy depends largely on industrial performance often obtained through technological innovation, which result from improved factor input combinations. This higher wage rate associated with the modern industrial sector attracts the surplus labour from the subsistence traditional sectors have advanced. Industrial development has produced synergy between the two sectors, and net economic welfare has improved considerably for every strata of the population. In view of this, the main features of industrial development in Nigeria as cited in Dibua and Dibua (2012), may be enunciated as follows:

- **Low Capacity Utilization by Firms:** Capacity utilization which was as high as 70% in the 1970s declined to 32% in the 1990s and is presently reported to be 44.3% in 2002 and 46.2% in 2003.
- **Low Contribution to Gross Domestic Product:** The contribution of industrial sector has been only about 4% in recent years. Low industrial value addition and overtly import-dependent production system.
- **Low Contribution of Small and Medium-Sized Enterprises (SMEs)** to total industrial production, and weak linkage between SMEs and large-sized firms.
- **Absence on Local Industrial R & D:** Industry is largely user of results of foreign R & D multinational affiliates are notably dependent on their parent companies for R & D while local firms gave little interest in investing R & D consequently, there is lack of locally based technology intensive firms.
- **Low Employment in the Industrial Sector Arising from Industrial Closures due to Relatively High Cost Manufacturing Environment:** For example, the textile sector, which used to be the highest single employer of labour in the private sector in the 1970s, has virtually wind up. Efforts to revive the sector remained unsuccessful.
- **Limited Exports of Industrial Goods (Less Than 1% of Total Exports).** Based on the above characteristics, it is pertinent to state that industrial development in Nigeria shows an imbalance in the national capacity to produce and consume technology. On the production side, the economy is predominantly agricultural or mining based; has a relatively small manufacturing sector; a trade structure dominated by exports of primary products and the importation of manufactured goods; a low level of literacy and a deficiency in skilled personnel. On the consumption side, the domestic market though large, has relatively weak purchasing power, low per capita income; majority of the population relies on subsistence production, and consumption patterns is skewed towards the urban consumer whose tastes are fashioned after imported

goods. In these circumstances, manufacturing industry remains highly constrained, and policy mechanisms that promote an effective national system of innovation would be required to build innovation capacity in manufacturing industry (Adeoti & Olubamiwa, 2009; Adeoti, Odekunle, & Adeyinka, 2010).

1.3 Empirical Review

Akpan (2011) conducted a study on nation's economic development through adequate industrialization. The study is empirical in nature examining the relationship between industrialization and economic development with focus on Nigeria. The Ordinary Least Square (OLS) technique was adopted in line with diagnostic test for the model. Finally, the study advocates that a responsible government should embrace industrialization for meaningful economic growth so as to enhance export and discourage import.

Adeoti, Odekunle, and Adeyinka (2010) disclosed that tackling innovation deficit in the agro-food processing in Nigeria remains difficult in spite of improved contribution of agriculture to GDP in recent years. The empirical evidence from the analysis demonstrated that building innovation capacity in the Nigeria agro-industry is constrained by poor infrastructure, inadequate policy and inappropriate attitude of key innovation agents. Consequently, there has been limited firm-level R & D capability and knowledge institution such as the universities have been unable to achieve commercialization of inventions that could engender innovation in agro-industry.

Elom (2014) argued on globalization and competitiveness linking his view on selected manufacturing companies. In his opinion, globalization of markets and to uncertain business environment has increased the level of competitiveness, which is putting increasingly greater pressure on organizations to increase their competitive advantage. He summarized that a country can only provide the enabling environment and the infrastructure that enables the firm to acquire and maintain competitive edge.

Unyimadu and Chiekezie (2012) conducted a theoretical and empirical study on manufacturing and entrepreneurship. They are of the view that manufacturing industry is the most important sector of the economy as about 80% of the industries fall into the category. The study is empirical in nature and it uses the secondary data, oral interview and model modification. The study scope captured the five south-eastern states in Nigeria using the probability sampling to determine the towns in the south-eastern Nigeria. The study was emphatic on the application of the system's cybernetic model as a transformer of manufacturing process and output of the improvement in entrepreneurship in the south eastern Nigeria.

Mwangi and Namusonge (2014) conducted a study on the influence of innovation on small and medium enterprises (SME) growth: A case of garment manufacturing industries in Nakuru Country Kenya. The study is aimed at determining the influence of technology,

product and process innovation/creativity on growth of garment manufacturing industries in Nakuru considering the sales volume and profitability of the firms within the industry. The study was mainly descriptive survey design. Research respondents were selected through stratified random sampling and purposive sampling techniques. Data was collected using structured questionnaire and was analyzed with the aid of statistical packages for social sciences (SPSS 20). The findings showed that there is strong link between innovation/creativity and growth of business as a result to increase in sales volume and higher profitability. The study concluded that the medium scale industry was one of the key sub-sector targeted under the country's strategy for economic recovery creativity and innovation to enhance their sustainability. The study recommended that government should establish close link with manufacturers to encourage them implement the strategy of creativity and innovation which will help the sector to grow.

However, many scholars researched on the area of manufacturing, industrialization, globalization and agro-industry. But greater majority of these studies undertaken and the volume of literature sourced from them almost exclusively focus their attention on funding, managerial and infrastructural problem aspect of the manufacturing sector and industrial habitation in Nigeria. But in today's world, productive activities and consequently the growth and development of economies hinged on one important aspect and factor which is – technological adoption, diffusion, use and management (Gera & Gu, 2004). This study is therefore prompted generally by the need to determine all of the above mentioned issues of contention through analyses and assessment of related variables; production techniques through technology and creativity adoption of organizational change slogan that will increase sales, market growth and organizational performance.

1.4 Theoretical Framework

This study is anchored on Rogers (1962) Diffusion of Innovations (DOI) theory and Unified Theory of Acceptance and Use of Technology (UTUAT) by Venkatesh, Morris, Davis, and Davis (2003). The Diffusion of Innovation (DOI) theory was developed in an attempt to describe the patterns of adoption of new technologies. In

this model, Rogers classified adopters as; (1) Innovators (2) Early adopters (3) Early majority (4) Late majority, and (5) Laggards while the Unified Theory of Acceptance and Use of Technology (UTUAT) describes how users come to accept and use new technology. UTUAT aims to explain user intentions to use new technology as well as to explain subsequent usage behavior. The theory holds on four key constructs: performance expectancy, effort expectancy, social influence and facilitating conditions which are direct determinants of usage intentions and behaviour (Venkatesh, et al., 2003).

2. METHODS

The study employed a descriptive survey design and adopts a cross-sectional research design where data was collected only once. However, the study is focusing on Ten (10) manufacturing industries in Kaduna, Kano and Jigawa State of Nigeria.

Table 1
Distribution and Selection of Industries

S/N	Selection of Industries	Selected Number of Industries
1.	Agro and allied Industries	20
2.	Aluminum Industries	25
3.	Animal feeds Industries	35
4.	Chemical Industries	45
5.	Cosmetic Industries	42
6.	Foods and Beverages' Industries	20
7.	Iron, Steel and Ceramics Industries	25
8.	Pharmaceuticals Industries	23
9.	Plastic Industries	15
10.	Wood furnishing and finishing Industries	60
	Total	310

Note. Adapted from Field Survey, 2016.

Proportional sampling technique was used to select the number of industrial owner and manager. The reliability of the study was determined through pilot study. Each items of the questionnaire was based on two options Yes or No. meanwhile, data generated from respondents responses were analyzed through regression and correlation analysis using statistical packages for social sciences (SPSS) Version 18.

Table 2
Questionnaire

S/N.	Description	Number of Respondents			
		Yes %		No %	
1.	There is increased demand for products/services from customers who never bought from or patronize our services before?	256	83	54	17
2.	We have the ability to respond to and accommodate new products, new markets, or new competitors in the market?	247	80	63	20
3.	We have a very good return on investment (ROI) profile in the last 3 years?	240	77	70	23
4.	We have the ability to add new products/services to the company stability very often?	254	82	56	18
5.	We often survey the market for new and up to date machines and equipments?	256	83	54	17
6.	Our customers are likely to recommend our company products/services to a friend or colleague?	246	79	64	21

Note. Adapted from Field Survey, 2016.

In question 1, the result showed that 256 responses representing 83% of the total respondents for the study said Yes or assert that There is increased demand for products/services from customers who never bought from or patronize our services before while 54 responses representing 17% of the total respondents for the study said No to the assertion. From the findings, it can be deduced that creative product influences its sales volume.

The question 2 reviewed that 247 responses representing 80% of the total respondents for the study said yes that they have the ability to respond and accommodate new products, new markets, or new competitors in the market while 63 responses representing 20% of the total respondents said no to the assertion.

In question 3; 240 responses representing 77% of the total respondents from the study said yes, that they have a good return on investment (ROI) profile in the last 3 years while 70 responses representing only 23% of the total respondents said no, to that assertion.

In question 4, the results shows that 254 responses representing 82% of the total respondents for the study assert that they have the ability to add new products/ services to the company stability very often while 56 responses representing only 18% of the total respondents for the study said no to that assertion.

The question 5, findings also reviewed that 256 responses representing 83% of the total respondents for the study said that they often survey the market for new and up to date machines and equipments while 54 responses representing only 17% said no to the assertion.

Finally, question 6, results showed that 246 responses representing 79% of the total respondents of the study said yes, that their customers do recommend their companies products/services to friends or colleagues. From the findings, it can be affirmed that majority are of the view that technology orientation is been influenced by Production techniques which held higher profitability of their industrial products.

Test of Hypotheses

Question 1 was used to test hypothesis 1 while question 4 was used to test hypothesis 2.

Decision Rule:

In testing the hypothesis, we reject H_0 and accept H_1 if the calculated value is greater than the table value at 0.05 confidence level. While we accept H_0 and reject H_1 in other-wise results.

Hypothesis 1

H_{01} : To determine the influence of production techniques on the performance of manufacturing industries in Nigeria.

The first objective of this study is to what extent do production techniques influence the performance of manufacturing industries in Nigeria. Therefore, the empirical data associated with this regression results are stated below;

$Y = f(X)$ Model 1

$Y = b_0 + b_1 x + \mu_t$

Dependent variable: Y
 Method: Ordinary Least Square (OLS)
 Sample: 1-10

Table 3
No. of Observation: 10

Variable	Coefficient	Std. Error	t-	t-Statistic	Prob.
C	12.081	5.447		2.218	0.057
X	2.504	0.803		3.117	0.014

Note. Adapted from SPSS, 18. $r^2 = 0.548$, $r = 0.741$, Durbin Watson = 2.96.

The coefficient of the constant term is 12.08. The associated sign is positive, implying at zero performance of the independent variable, performance (Y) will increase by 12% approximately. The regression coefficient of production techniques (X) carries positive sign and the t-value (3.117) is statistically significant at 5%. The significance is ascertained as the 0.05 (5% level of significance) is greater than p-value of the regression coefficient of production techniques (X) (0.014). The computed coefficient of determination ($r^2 = 0.548$) shows that 54.8% of the total variation in performance (Y) is accounted for by the independent variable (production techniques) while 45.2% of the total variation in Y is attributable to the influence of other factors that are not including to the regression function.

However, the computed correlation coefficient R is 0.741, implying that there is a strong positive relationship between the performance (Y) and production technique (X). The volume of Durban Watson (DW) is 2.96 using 5% level of significance, and $K1 = 1$ (one) and $N = 10$ degree of freedom, the tabulated lower (TL) and upper limits of Durbin Watson statistics (2.96) is greater than the upper limit (1.320), there is no evidence of autocorrelation in the model.

Hypothesis 2

H_{02} : To examine the impact of technological orientation on the performance of manufacturing industries in Nigeria.

The second aim of the study is to ascertain the extent to which technological Orientation influence the Performance of manufacturing industries in Nigeria.

Therefore, the empirical data associated with this regression result are stated below:

$Y = f(X)$ Model 2

$Y = b_0 + b_1 x + \mu_t$

Dependent Variable: Y
 Method: Ordinary Least Square (OLS)
 Sample: 1-10

Table 4
No. of Observations 10

Variable	Coefficient	Std. Error	t-	t-Statistic	Prob.
C	7.188	4.008		1.793	0.111
X	3.252	0.595		5.467	0.001

Note. Adapted from SPSS, 18. $r^2 = 0.789$, $r = 0.888$, Durbin Watson = 1.65.

The coefficient of the constant term is 7.188. The associated sign is positive, implying at zero performance of the independent variable, Performance (Y) will increase by 7% approximately. The regression coefficient of technological orientation (X) carries a positive sign and the t-value (5.467) is statistically significant at 5%. The significance is ascertained as the 0.05 (5% level of significance) is greater than p-value of the regression coefficient and technological orientation (X) (0.001). The computed coefficient of determination ($r^2 = 0.789$) shows that 78.9% of the total variation in Performance (Y) is accounted for, by the independent variable (Technological Orientation) while 21.1% of the total variation in Y is attributed to the influence of other factors that are not included in the regression function.

However, the computed correlation coefficient R is 0.888, It's implying that there is a strong positive relationship between Performance (Y) and technological orientation (X). The value of Durbin Watson (DW) is 1.65. Using 5% level of significance and $K1 = 1$ (one) and $N = 10$ degrees of freedom, the tabulated lower (TL) and upper limits of Durbin Watson statistics (1.65) is greater than the upper limit (1.320), there is no evidence of autocorrelation in the model.

3. DISCUSSION AND IMPLICATION OF FINDINGS

It was found that the t-calculated value of regression coefficient of technological orientation (X) in the first model is 3.117 while its t-tabulated value is 2.306. Since the t-calculated (3.117) is greater than the t-tabulated value (2.306), H_0 is rejected and we conclude that product creativity has positive relationship with sale volume of your industrial products. Using a two tail test, the t-calculated value of regression coefficient of technological orientation (X) in the second model (2.306), H_0 is rejected and we conclude that technological orientation has positive influence on the profitability of products.

In the first model, it was established that production techniques has positive relationship with organizational performance (sales volume) of your industrial products. Thus, it is estimated from the result that 1% increase in production techniques (X) on the average will lead to increase by 2.5% in performance (y). The sign borne by X in the first mode is in conformity with the prior test. If your organizations adopt production techniques, organizational performance (sales volume) will be maximized.

In the second model, the result showed that technological orientation influences performance in the quality of products. Therefore, it is found that 1% increase in technological orientation (X) on the average, will lead to increase by 3.3% in performance (Y). The sign borne X in the second model is in conformity with the

prior expectation. Should your organization embark on technological orientation, profitability will be increased.

CONCLUSION

In today's business concept, firms are to embrace the culture of technological orientation and be innovative in enterprise through the adaptation of change slogan. Organizations are adverse to be entrepreneurial incline which is the anchoring symbol on creativity and innovation for the sustainability and growth of an enterprise. However, the manufacturing industries under study are on the very speedy move for knowledge creativity and innovative in ideas which they transform raw materials into valuable products, modernizing their products on regular basis to meet up with global competition that will lead to importation of similar products. Creativity and innovation are the only means to resurrect and stand firm to challenge their foreign counterparts and regain their pride in the nation's economy. Manufacturing industries are expected to upgrade their products with up to date technology to enhance their sales volume and ensures higher profitability in order to survive in the competitive business environment.

RECOMMENDATIONS

Based on the findings, the following recommendations are appropriate for manufacturing industries to transit into the technological trend.

- The owners, managers and staff of any industry to be creative and innovative in their daily operations.
- Intensive training and development programmes should be adhered to as it will help in meeting up the current global market challenges.
- Regular power supply should be made available as that will serve as a subsidizing means from government and will also make the product affordable.
- Government supports are needed through making efforts to availability of free access to loans with low interest rate.
- Finally, favorable business environments should be made available as this will encourage more investors to key into other sectors of the economy and as such, increase revenue for government and break into the barriers of unemployment crisis.

REFERENCES

- Adeoti, J. O. (2002). Building technological capacity in the less developed countries: The role of a national system of innovation. *Science and Policy*, 29(2), 95-104.
- Adeoti, J. O., & Olubamiwa, O. (2009). Towards an innovation system in the traditional sector: The case of the Nigerian cocoa industry. *Science and Public Policy*, 36(1), 15-31.

- Adeoti, J. O., Odekunle, S. O., & Adeyinka, F. M. (2010). *Tracking innovation deficit: An analysis of university firm interaction in Nigeria*. Ibadan, Nigeria: Evergreen Publishers.
- Akingunola, R. O. (2011). Small and medium scale enterprises and economic growth in Nigeria: An assessment of financing options. *Pakistan Journal of Business and Economic Review*, 2(1).
- Akpan, P. L. (2011). Periscoping industrialization and economic development of emerging economies: An empirical evidence from Nigeria. *Global Journal of Management and Social Sciences*, 39-40.
- Akpulu, I. (2012). *Developing a framework for successful adoption and effective utilization of ICT by SMEs in developing countries: A case study of Nigeria* (Doctoral dissertation). University of Wolverhampton.
- Arnold, J., Robertson, I. T., & Cooper, C. L. (1995). *Work psychology: Understanding human behaviour in the workplace*. Pitman, UK: Financial Times/Prentice Hall.
- Bell, M., & Pavit, K. (1993). Technological accumulations and industrial growth: Contracts between developed and developing countries. *Industrial and Corporate Change*, 2(1).
- Coulter, M. (2006). *Entrepreneurship in action* (2nd ed.). New Delhi, India: Prentice Hall of India.
- Dibua, E. C., & Dibua, E. C. (2012). *Production techniques and technological adaptation in Nigerian manufacturing industry (A study of some selected firms)*. Paper presented at Department of Business Administration 2012 Conference, Nnamdi Azikiwe University, Awka.
- Elom, E. M. (2014). *Globalization and competitiveness: Evidence from manufacturing Companies* (Unpublished Doctoral dissertation). Nnamdi Azikiwe University, Awka.
- European Innovation Score Board. (2009). *Proinnoeuropa Paper No. 15*. Enterprise and Industry, European Commission.
- Foreman-Peck, J., Makepeace, G., & Morgan, B. (2006). Growth and profitability of SMEs: Some welsh experience. *Journal of Regional Studies*, 40(4).
- Gera, S., & Gu, W. (2004). The effect of organizational innovation and information technology on firm performance. *Journal of International Productivity Monitor*, 9.
- Johnson, M. (2011). *Getting Nigerian business online initiative*. A Speech Delivered by the Minister of Communication Technology at the Opening Ceremony of the GNBO SMB Fair in Lagos, Nigeria.
- Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of Management*, 36(1), 349-372.
- Linsu, K. (2010). *The dynamics of technology learning in industrialization UNV/INTECH Discussion Papers ISSN 1564-8370*. Retrieved from www.google.com
- Mgbemena, I. C. (2015). *Flexibility strategy and the performance of selected commercial banks in Nigeria* (Unpublished Master's thesis). Nnamdi Azikiwe University, Awka.
- Mwangi, M. S., & Namusonge, M. J. (2014). Influence of innovation on small and medium enterprise (SME) growth: A case of garment manufacturing industries in Nakuru County. *International Journal for Innovation Education and Research*, 2(6), 102-112.
- Osisoma, B. C. (2009). *Practical guide to business entrepreneurship*. Lagos, Nigeria: Publication of Association of National Accountants of Nigeria ANAN.
- Page, J. (2009). *Seizing the day? The global economic crisis and African manufacturing*. Paper presented at the African Development Bank, Exports Meeting on the Impact of the Global Economic Crisis, Tunis.
- Prahalad, C., & Ramswamy, V. (2004). Co-creation experience: The next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5-14.
- Rogers, E. M. (1962). *Diffusion of innovations*. New York, NY: The Free Press.
- Sambo, A. (2015). *An assessment of the impact of technology on the performance of small business enterprises in some selected cities of northern Nigeria* (Unpublished Doctoral dissertation). Department of Management and Information Technology, Abubakar Tafawa Balewa University, Bauchi.
- Sanusi, L. S. (2011). *Growth prospects for the Nigerian economy*. Convocation lecture held at the University of Benin, Nigeria.
- Thomson, D. J., & Murad, M. A. (2011). External environmental factors influencing the technology adoption diffusion decision in Malaysian manufacturing and service SMEs. *Progress in Business Innovation and Technology Management*, 013-022. Retrieved from <http://www.apbitm.org>
- Unyimadu, S. O., & Chiekezie, M. O. (2012). *Manufacturing and entrepreneurship: A theoretical and empirical study*. Paper presented at Department of Business Administration 2012 Conference, Nnamdi Azikiwe University, Awka.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27, 425-478.
- Vision 2020. (2009). *Report of the SMEs sector national technical working group on small and medium enterprises (SMES)*. Abuja, Nigeria.
- Wiegatz, J. (2009). *Africa's human resource challenge: training, business culture and economic development*. Kampala, Uganda: Fountain Publishers. Retrieved from www.google.com
- Wu, D. (2009). *Measuring performance in small and medium enterprises (SMEs) in the information and communications technology industry* (Unpublished Doctoral dissertation). College of Management, RMIT University.