

## EFFECT OF TECHNOLOGY BUSINESS INCUBATION ON START-UPS OPERATION

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### Abstract

*This study examined effect of technology incubation programme on start-ups operation in Akure, Ondo state. Nigeria. The study employed cross section survey design. The sample for this study consisted of 168 respondents which were randomly selected out of the population of 298 entrepreneurs who had graduated from the incubation centre. The study used primary data specifically structured questionnaire, and linear regression was used for data analysis. Findings revealed that mentoring and, technology transfer foster the development of start-up ventures and entrepreneurs. The study concluded that technology business incubation is a good medium for nurturing entrepreneurs and their ventures in the country as they contribute to solving the tripartite societal need of job creation, poverty reduction and economic development. The study recommended that Government should intensify effort in funding qualified personnel and provide modern technology needed to boost incubation activities in the country.*

**Keywords:** Incubation, Incubatees, Job creation, Mentoring, Startup, and Technology

### Introduction

Technology business incubation (Tbi) has attracted the attention of scholars, stakeholders academia, government and professionals over the years. It is considered as a vital tool for promoting entrepreneurship both in developed and developing countries. This is done through the nurturing, mentoring, strengthening and ensuring the survival of start-ups considering the role they play in the economic development of nations.

Technology incubation centres have assumed a lot of significance by providing an enabling environment for young entrepreneurs to deal with difficulties associated with nurturing new businesses by providing bundle of support and services that will assist in strengthening and sustaining the businesses.

Africa is a developing continent and the need for industrialisation is very crucial.

Industralisation has led to the establishment of African Incubator Network (AIN), a development programme anchored by Infodev. Infodev is a research capacity building and advisory service organisation that seeks to help developing countries and their international partners to use information and connection broadly and effectively as tools for poverty reduction and sustainable economic growth (Evelyn & Eno, 2014). Business incubators nurture start-up enterprises by providing an enabling environment for entrepreneurs where they will have access to shared infrastructure, coaching, business and financial servicing, and linkages with domestic and international markets (Alfred, 2015). Infodev provides support services in twenty four (24) incubator projects in ten (10) African countries, namely: Angola, Ghana, Kenya, Rwanda, Mauritius, Mozambique, Nigeria, Senegal, Uganda and South-Africa respectively. Scholars have agreed that business incubation is a vital tool for value creation, nurturing, mentoring of start-ups and entrepreneurs to ensure the survival and growth of start-ups in the economy considering their role in job creation, value creation, wealth creation and economic development (Hanadi & Micheal, 2013).

Nigerian government adapted the concept of business incubation in 1993 with the establishment of Business Incubation center in Agege, Lagos. This is followed by the establishment of Kano center in 1994; and Calabar and Aba in 1996. The establishment of TBIs continued until the end of 2016 with the establishment of four more TBIs in Kogi, Benue, Nasarawa, Jigawa and Katsina. The chairman, Technology Business Incubation in Nigeria stated in an interview that the numbers of TBIs centers available could not provide jobs to the teeming Nigerian population, therefore Federal Government encouraged private partnership to allow individual to establish more private Technology business incubation in the country to assist in that direction (Punch, 2016). Incubators support services is geared towards improving the survival rate of start-ups, reduced costs, risks and support them to sustain their businesses by this they fulfill economic needs of job creation, technology transfer and economic development have direct impact on fostering entrepreneurship development in the country. It has been discovered that Start-ups and new companies fail because of lack of mentoring, managerial ability; skills, exposure, competences and support at the early stage of development. This hinders enterprise growth and expansion (Jaygoft, 2014).

### Objectives of the Study

The objectives of this study are:

- i. to investigate the effect of business incubation on technology transfer; and
- ii. to determine the significance of mentoring on start-ups operation

### Hypotheses of the Study

The following hypotheses were formulated for this study:

H<sub>01</sub>: Business incubation has no significant effect on start-ups technology transfer.

H<sub>02</sub>: Mentoring has no significant effect on startups operation

### Literature Review

The idea of business incubation was conceived as a supportive mechanism to support startups and to promote the development of SMEs and entrepreneurship in both developed and developing countries. The broader goals of technology incubation are to create jobs, economic development, technology transfer, and commercialisation of technology through the provision of professional and advisory services to start-ups and also mentoring, nurturing, and strengthening them to survive. The objective is to grow new entrepreneurial venture and SMEs respectively (Henry, 2014). Scholars have agreed that business incubation is a vital tool for economic development, growth and technology transfer in both developed and developing economies. Government also provide the range of services to start-ups to reduce rate of failure Costs and risks reduction are all parts of government intervention programme globally to ensure start-ups and SMEs survive and sustain their business .This is believed to have direct effect on the economy (Danz, 2013). Business incubator is defined as a tool that facilitates and supports the incubatees to influence their business opportunities. Business incubation is one of the many development tools aimed to foster innovative enterprise creation and growth.

Findings of ten incubators by Al-Mubarak & Wong, (2013) using four indicators as cited by the author viewed incubators managers as important measure of incubation performance and also discussed why some incubators perform than others. According to them, four indicators for measuring incubatees operation are growth, sales ,employment creation and increase in market share are all indicators that show start-ups are expanding their operation.

### Technology Transfer

Technology transfer is the process by which a developer of technology makes its technology available to a commercial partner that will exploit the technology. Technology transfer can be seen as the process of advancing of technology from one place to another Sounder, Nasher, &Padmanatha, 1990). Technology transfer is also refers to movements of technology from the research institute to industry or from one place to another (Partil 2002). Urbano (2013) opine that technology transfer is the process sharing of knowledge that is applied to research in technology agencies, universities, laboratories and other institutions that are capable of knowledge sharing. Urbano (2013) further posits that effective knowledge sharing among entrepreneurs will lead to technology transfer. This entails the provision of training support for developing entrepreneurs. In this case, an innovation based incubator should involve highly specialised and qualified team. Moreover, technology transfer would be enhanced by effective back up through leveraging on the experience of senior staff.

Technology and innovation are bedrock of development in developed economies where technology transfer is eminent through technology commercialisation of Research and Development (R&D) result. Technology and scientific advancing are changing the world rapidly than ever before. Development in information technologies new materials, new fuels, and new technology are unleashing new wave of innovation. Thus they are creating more opportunities to entrepreneurial business to gain competitive advantage at regional, national and global level Technology transfer programme should feature opportunity for shared knowledge among entrepreneurs. Through shared knowledge relationship, entrepreneurs can adopt resources and combine competencies and thereby increasing their value. Technology includes characteristics that promote effective performance. This will include opportunity for knowledge transfer, effective training support and effective back up that will help start-ups in their operation.

### Concept of Start-up Operation

Start-up ventures are newly born ventures that are struggling to survive. The ventures formed based on their innovative ideals and grow to survive the hurdles at their early stage. It is widely accepted that new start-ups are the engine room for economic development through employment generation (Chandra, 2013) and support for technological advancing, increase competition, economic revival of regions, innovation and technology transfer. Also, Tilana (2015) reveal that start-

ups introduce new product, new knowledge or utilise previous knowledge created by others to develop their new product and services. They contribute to economic growth through innovation.

### Mentoring

Today mentoring is gaining ground in the business outfits. According to Dee, Livesey and Minshau (2012), mentoring has increased the popularity and practice of what the current literatures consistently report on its benefits to both incubatee and business development. There are extremely few findings that cited specific measurable benefits and impact of start-ups performance. This is because mentoring is treated as essentially qualitative in nature and not subject to more quantitative research or the fact that mentoring is often packed into more complex support programme and it is not evaluated on its own. However, Dee, Livesey and Minshau (2017) highlight several benefits of mentoring to both the mentor and the mentee. The benefits of mentoring to a mentor included increased business activities, leadership development, increased idea generation and increased performance through enhanced understanding. While the benefits of mentoring to the mentees, on the other hand, are improved performance and productivity improved knowledge and skill improved creativity and innovation, encouraging positive risks taking ability; empowerment and wellbeing, and faster learning and decision making skills. Also, the start-ups benefits include: strategic change, partnership innovation and change and better problem solving skills. Incubates mentoring will go a long way to improve the start-ups operation and performance in enterprise. This will lead to more job creation, poverty reduction, technology transfer and even economic development.

### Empirical Review

In a study conducted by Nkem, (2016) where issues in sustainable innovation policy in Technology Business Incubation as the key factors for successful Entrepreneurship development in Nigeria were discussed. According to him, previous Nigerian government have designed a lot of support policies geared towards helping the SMEs but the implementation of this policies fail. The policies were juicy on paper but the implementation is a big challenge in Nigeria. He concluded that successful factor and ingredients for successful TBIs have to do with a sustainable policy in the sight of government. If these policies were implemented they can boost Entrepreneurship development and SMEs. Selma, Martin and Marli (2016). The study identified empirical evidences on the

characteristics of business incubators performance in Israel, Italy and Chile. The characteristics of business incubation among the three countries differed and the characteristics have a positive impact on business incubators performance.

Sean and Faye (2016) who explored technology business incubators as a driver of "Pivotal Talent" development in China, Chinese government has put up so many programmes to convince thousands of Chinese both in and outside China who have the entrepreneurial intention that fuel entrepreneurial incubator movement. Hanadi, Michael and Rasheed (2013) also examine business incubators as tools for Economic growth and technology transfer in developed countries. From their findings, it shows that business incubation programme has an active role in job creation, technology transfer, commercialisation of R&D to support economic growth. In addition, Nobuya (2013), in his studies, investigated the factors that affect the success of technology incubators. From his findings, technological skills of management are associated with the success of technology incubators when entrepreneurs are engaged in technological development. Globally, stakeholders are increasingly recognizing the impact of business incubation on startups operation as key for the growth of SMEs and development of entrepreneurship.

### Methodology

The population of the study were entrepreneurs under incubation centre between 2012 and 2017 in Akure, Ondo State, Nigeria. These set of entrepreneurs were the pioneer graduands at the Akure incubation centre. The research adopted a cross section survey by using a close ended questionnaire, 168 respondents who are staff of enterprises were sampled. The reliability of the instrument was tested and simple linear regression was used for the analysis.

### Reliability of Research Instrument.

**Table 1 Reliability of Research Instruments**

Variables	Cronbach's Alpha (a)	Number of Items	Remark
Technology transfer	0.735	7	High Reliability
Mentoring	0.748	7	High Reliability
Enterprise creation	0.745	7	High Reliability
Job creation	0.748	7	High Reliability

**Source:** Field survey, 2018.

### Hypotheses Testing

#### Test for Hypothesis One

H0: Business incubation has no significant effect on start-ups technology transfer

**Table 3 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.636 <sup>a</sup>	.404	.376	.911

Source: Field Survey,2018

#### a. Predictors: (Constant), Technology Transfer

The model summary, as illustrated in table 2, indicates that R square is .404. This however, implies that 40.4% of variation in the dependent variables (job creation) was explained by the constant (technology transfer) while the remaining 59.6% may be due to other variables that are not included in the model. Hence, this analytical result of the regression (model formulated) is useful for making predictions, since the value of  $R^2$  is not significantly close to 1. It therefore shows that the degree of relationship between the two variables is not high but moderate.

**Table 3 ANOVA<sup>a</sup>**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	82.182	7	11.740	14.146	.000 <sup>b</sup>
Residual	121.169	146	.830		
Total	203.351	153			

Source: Field Survey,2018

a. Dependent Variable: Job creation

b. Predictors: (Constant), technology transfer

Table 3 summarizes the result of the analysis of variation in the dependent variable with large value of residual sum of squares (121.169) compared to the regression sum of squares with the value of 82.182 (this value indicates that the model fails to explain a lot of the variation in the dependent variables. However, the estimated F-value (14.146)) as given on the table above with significance value of 0.000; which is less than p-value of 0.05 ( $p < 0.05$ ) means that the explanatory variable elements as a whole cannot jointly influence the dependent variable (technology transfer).

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	1.743	.202		8.621	.000	1.344	2.142
1 Technology transfer	.181	.088	.636	2.065	.000	.008	.355

Source: Field Survey,2018

#### a. Dependent Variable: Job Creation

The coefficient table 4 above shows that the simple model expresses the constant (i.e technology transfer) as it affects business incubation. According to the table, the t-test coefficient is 8.621 and the p-value is 0.000 which is far less than 0.05. This is the bench-mark of p-value. The implication is that the adopted variables are statistically significant.

The simple linear regression is applied to the hypothesis and the decision to be taken depends on the P value obtained. For the hypothesis, the decision rule is to reject the null hypothesis and accept the alternate hypothesis where the P value is less than 0.05 and/or to accept the null hypothesis ( $H_0$ ) and reject the alternate hypothesis ( $H_1$ ) where P value is greater than 0.05

#### Interpretation

Since the coefficient of technological change is positive, this passes the sign test and shows that there is a positive relationship between the perceived business incubation and job creation.

From table 4.  $R = 0.636$  represents the correlation coefficients. R is a measurement of strength in association between two variables (dependent and independent). It is also the degree of relationship existing between two or more variables. This shows a 63.6% level of relationship between the two variables.

The R square value of 0.404 shows that there is a 40.4% level in the coefficient of determination i.e. technology transfer was determine (business incubation) to 40.4% and the remaining 59.6% will be account for the error term and external variation in the equation. This shows that there is a moderate degree of determination between the variables.



**Decision:** For hypothesis one, the significance is 0.000 which is far less than 0.05. The null hypothesis ( $H_0$ ) is rejected and the alternate hypothesis ( $H_1$ ) is accepted. Therefore, business incubation has significant effects on startups technology transfer.

Table 5 Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	2.105	.197		10.700	.000	1.716	2.493
Mentoring	.225	.082	.365	2.744	.004	.063	.386

Source: Field Survey,2018

## a. Dependent Variable: enterprise growth

The dependent variable as shown on table 5 is the enterprise growth. This was used as a yardstick to examine the effects between the two variables (i.e. mentoring and enterprise growth). The predictors mentoring as depicted in table ,It is obvious that there is a direct relationship between mentoring and enterprise growth.

According to the result on table 5, mentoring t-test coefficient is 10.700 and the p value is 0.004 which is less than 0.05 (i.e.  $P < 0.05$ ). This means that these variables are statistically at 5% significant level. The overall summary of this regression outcome in relation to the coefficient of Mentoring has significant effects on the start-ups operation.

**Decision:** As a result of the outcome, the null hypothesis ( $H_0$ ) is rejected on the basis that the p-value is less than 0.05. Hence the alternative hypothesis is accepted; that mentoring has significant effect on starts-ups operation.

## Test for hypothesis two

$H_0$ : Mentoring has no significant effect on start-ups operation.

Table 6 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.365 <sup>a</sup>	.133	.091	1.118

Source: Field Survey,2018

## a. Predictors: (Constant), Mentoring

The model summary as illustrated on table 6 indicates that R square is 13.3. This, however, implies that 13.3% of variation in the dependent variables (enterprise growth) was explained by the constant (mentoring) while the remaining 86.7% may be due to other variables that are not included in the model. Hence, this analytical result of the regression (model formulated) is useful for making predictions since the value of  $R^2$  is not significantly close to 1. It, therefore, shows that the degree of relationship between the two variables is not high but low degree of correlation.

Table 7 ANOVA<sup>a</sup>

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	27.618	7	3.945	3.159	.004 <sup>b</sup>
Residual	179.849	144	1.249		
Total	207.467	151			

Source: Field Survey,2018

## a. Dependent Variable: Enterprise growth

## b. Predictors: (Constant), Mentoring

Table 7 summarised the result of the analysis of variation in the dependent variable with large value of residual sum of squares, comparison to the regression sum of squares with the value of 27.618 (this value indicated that the model fail to explain a lot of the variation in the dependent variables. However, the estimated F-value (3.159) as given in the table above with significance value of 0.004; is less than p-value of 0.05 ( $p < 0.05$ ) which means that the explanatory variable elements as a whole cannot jointly influence the dependent variable (enterprise growth).

Table 8 Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	2.105	.197		10.700	.000	1.716	2.493
Mentoring	.225	.082	.365	2.744	.004	.063	.386

Source: Field Survey,2018

## a. Dependent Variable: enterprise growth

The dependent variable as shows in table 8 is the enterprise growth. This was used as a yardstick to examine the effects between the two variables (i.e. mentoring and enterprise growth). The predictors is mentoring as depicted in table 8, It is obvious that there is a direct relationship between mentoring and enterprise growth. According to the result in table 8 mentoring t-test coefficient is 10.700 and the p

value is 0.004 which is less than 0.05 (i.e.  $P < 0.05$ ). This means that these variables are statistically at 5% significant level. The overall summary of this regression outcome in relations to the coefficient of Mentoring has significant effects on the startups operation.

**Decision:** As a result of the outcome, the null hypothesis ( $H_0$ ) is rejected on the basis that the p-value is less than 0.05. Hence the alternative hypothesis is accepted; that mentoring has significant effect on starts ups operation .important to maintain the status quo.

### Conclusion and Recommendations

The study concluded that technology incubation has a significant effect on startups operation in Akure, Ondo State. Also, the study further concluded that technology incubation has a huge impact on their operation. The study concluded that technology incubation has a significant effect on startups activities, survival and sustainability of businesses that reduce the rate of business failure. In addition, it was concluded that technology incubators play a vital role in nurturing and mentoring of SMEs and entrepreneurs and ensure that they contribute their quota in solving the triple economic need of poverty reduction, job creation and economic development. Also, business incubation has significant effect on technology transfer, commercialisation and knowledge sharing. Based on the findings of the research the study, it is recommended that:

- i. Government should intensify efforts on funding and equipping Technology Business Incubation Centres with the right personnel and modern technology needed to boost incubation of startups in the country.
- ii. The enterprises should take recognizance of maintaining the momentum of the type of innovation so as to keep the activities of the market and give room for future expansion. Also, the technology incubation programme has shown to be effective tools in developing and assisting in enterprises in Nigeria

### References

- Alfred, J.O. (2015). Business incubation as a tool for economic development in developing countries: Lesson for the emerging nation on business incubation. *Journal of Management Sciences*, 2 (3), 8-17.
- Chandra, A. & Fealeny, T. (2013). Business incubation in United State of America,

- China and Brazil: A comparison of role of government incubator and financial. *Journal of Technology Transfer*. 5(3), 8-9.
- Dey, P (2012). Incubation of micro and small enterprises– An approach to local economic development. *International Journal of Science Engineering Research*,
- Dee , N. J. (2017). Incubation and innovation, theory a practice-West Suffolk working Paper .Theory of incubation and innovation practice working paper for SMEs and entrepreneurs. 5(5), pp, 5-10.
- Danz, U.M.(2016). New and old business benefits from small business support services. *Journal of Small Business Management*,
- Evelyn, A & Eno, I. (2014) Performance effectiveness of business incubation in Nigeria. *Business and Economic Journal*.
- Hanadi, M. A. & Michael, B. (2014). The road map of international business incubation performance. *Journal of International Business Incubation performance*.
- Jaygoft, D. & Van, P.J.S. (2014). Small business incubation environment in South Africa. *Mediterranean. Journal of social sciences*.
- L'ubica, L. (2012) The Role of business incubators in supporting the SMEs start-ups. *Acta Polytechnica Hungarica. Journal of Management*,
- Nkem, O. O. (2016). Supportive government policy as a mechanism for business incubation performance. *International Journal of Information system and social Change*.
- Nobuyo, F. (2013). which factors do affect business in incubation activities in Nigeria? *Journal of Advance Management Studies*, 1(1), 23-28.
- Partil, R.P. (2004). Technology Transfer in Manufacturing industry: objectivity issues and policy Approches int. J pharm Res. Dev, 2(10), 43-48.
- Salamzadeh, A.(2014). Youth Entrepreneurship in developing countries: Do young people know their potentials? Proceeding of the international conference on youth and our culture Heritage, 15-18, Samsin, Turkey.
- Selma, R. M. (2016). Empirical evidence about the characteristics and business performance; a framework of multiple cases. *American International Journal Of Contemporary Research*. 6 (1), 34-39.
- Seam, C. & Faye, A. S. (2016). Business incubators as driver of “pivotal talent” development in China. *Journal of Global Business Management*. 12 (2), 45
- Sounder, W.E., Nasher, A. S & Padmanathana, V.A (1990). Guide to the best technology transfer for practice, *Journal of Technology transfer*, 15, 1-2
- Tilana, L.(2015). Impact of business incubation in shaping entrepreneurial mindset in Nigeria. *Journal for small Business Management* 3 ( 4), 23-29
- Urban, D.A. (2013). Entrepreneurial Universities socioeconomic impacts of academic entrepreneurship in a European region. *Economic Development Quarterly Review*, 27(1), 40-50