

## **Technology and Entrepreneurship Development in Yola South Local Government Area of Adamawa State, Nigeria**

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**Abstract:** *The Study examines technology and entrepreneurship development in Yola South local government area of Adamawa State, Nigeria. The variables unit are Technology, Technology Integration, Challenges, Roles and Entrepreneurship. Special attention was directed to various entrepreneurship schemes and programs, entrepreneurs and small business owners. The sample size of the study was 169 entrepreneurs and business owners. A survey research design was used for the collection of data. Simple percentages, virtual charts, and cross-tabulations were used for describing the data collected, and Chi-square residuals and test statistics were used to analyze the data collected. The findings of the study revealed that technology has been extensively integrated into the production and operational process of small businesses, also it has been integrated into marketing activities at an encouraging rate. Technology has led the shift from the traditional mode of operations into a whole new frontier as well. Among challenges faced in integrating technology into entrepreneurship, the major challenge happened to be the complexity involved in integrating technology into already existing businesses. Finally, technology has impacted economically in the aspects of job creations, as the new businesses that have emanated have employed a minimum average of 2 persons. Amongst several recommendations, the study recommends that Government and Entrepreneurship scheme should pay special attention to integrating technology into the management process of these small enterprises and also ensure that innovation is visible in the products and offers of these small businesses. The government should provide some affordable finance mechanisms (such as equipment leasing) to these entrepreneurs. This will reduce the burden and challenges experienced in trying to integrate technology into entrepreneurship.*

**Keywords:** *Technology, Technology Integration, Entrepreneurship, Adamawa, Nigeria*

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### **I. Introduction**

Over the last two decades, it has been widely recognized that Yola metropolis has become a fundamental basis of economic and social life. In a market-driven world, the Yola metropolis faces two imperatives. First, concerns for socio-economic welfare, notably employment and job creation which is an important indicator of economic growth in the Yola Metropolis. The second imperative here is the ability to develop the City economy. Both imperative calls for Technology and Entrepreneurship, as entrepreneurship tackles the first concern, which is employment and job creation. Technology tackles the second concerns which is the development of the City economy, economy development includes two integrated processes, which are structural change and productivity improvement (Malecki,2017).

Technology and Entrepreneurship have been a key factor in any economic activity. For a sector to be competitive and contribute effectively to sustain growth, it requires increased private and public investment in both technology and Entrepreneurship development. This development must result in enhanced productivity to stimulate and to be proper; it must also generate employment opportunities. Recent times have seen the integration of technology into entrepreneurship development and this has accelerated economic development in developed nations. Entrepreneurship calls for risk-taking initiatives in a competitive economic environment. It encourages innovative activity and puts a region at the forefront of economic progress. Thus, entrepreneurial culture is a prerequisite for the wealth of regions (Audretsch, 2004).

Manfred and Peter (2016) posited that entrepreneurship in the modern sense cannot be separated from the "application of technology to solve current problems". In this light, Entrepreneurship has indeed acquired central importance among the processes that affect the economic change of any city, state or region. Entrepreneurs are essential actors of change, and they can act to accelerate the creation, diffusion, and application of new ideas. In doing so, they not only ensure the efficient use of resources but also take initiatives to exploit business opportunities. Diyoke (2014) highlighted the importance of Technological and Entrepreneurship development which has led to the emanation of various Small and Medium scale enterprises. The propelling factors for newer SMEs are entrepreneurship development which capitalizes on technological

advancement and solutions and aligns it with business opportunities present in the immediate environment. There can be no gain-saying that Nigeria has long recognized the importance and valuable contributions that small and medium enterprises as a major source of new competition can make to poverty alleviation, wealth creation, employment generation, and private sector development. These contributions of SMEs (an offshoot of Technology and Entrepreneurship development) have drawn the attention of Government and policymakers, and in this regard, Policymakers are now giving special attention to Entrepreneurship development factoring technology into it.

In light of the aforementioned background, this study focuses on Technology and Entrepreneurship development in Yola South in aspects of applications, implications, prospects and the emerging trend of technology entrepreneurship. Technology Entrepreneurship collaborates entrepreneurial skills and technological advances and this has been described as one of the instruments recently adopted on a broader scale by the Nigerian government to support entrepreneurship development in Nigeria. Technological entrepreneurship is a key source of economic and social progress. It refers to the creation of new firms by independent entrepreneurs and corporations to exploit technological discoveries.

## **II. Statement of the Problem**

A vast body of research exists on the importance and varied contributions of technology and entrepreneurship to job creation, economic and social development, and growth. Over the past decades, due to constant internal and external pressures of low capacity production, massive unemployment, poverty, collapsed infrastructural facilities, poor governance structure, massive corruption, insecurity of life and property. The economy conditions seem to be deteriorating and thus is yearning for quick intervention. Despite the several entrepreneurial schemes gestures by the State government, the impact of such schemes is still not providing the much-needed redemption. Olowe (2017) posited that the oil boom has destroyed and distorted our attitude to work (resource course) and this has affected the psychological quotient of an average Nigerian who prefers to avoid investments that require special expertise and innovation.

In addition, the school curriculum and Government entrepreneurial schemes are largely not geared towards equipping students and other citizens with much needed technical skills required for self-employment. In addition to this, several entrepreneurial schemes and initiatives still employ the more local and traditional medium of production despite technological advances on such fronts, leaving these entrepreneurs and newly established firms to be far behind. Also, most entrepreneurial activities are concentrated in non-technological priorities. This is because most technologies are foreign and imported; and continuous improvements and innovation from source countries on the imported technologies render them obsolete in no time (Willie et al, 2011). In these regards, this study is focuses on Technology and Entrepreneurial development in Yola South, with respect to extent of technological integration in entrepreneurial ventures and schemes, challenges faced, implications and proffering solutions of the right course of action to eliminate these problems.

### **Objectives of the Study**

the study seeks to; -

- i. Ascertain the extent to which technology has been integrated into entrepreneurial activities in Yola South LGA.
- ii. Examine the roles of technology in entrepreneurship development in Yola South LGA.
- iii. Evaluate the impact of technology on the establishment of new businesses and job creation in Yola South LGA.
- iv. Identify the challenges of integrating technology in entrepreneurship in Yola South.

## **III. Literature Review**

### **Entrepreneurship**

There are many definitions of entrepreneurship in the literature as there are entrepreneurs. It is by no means a new concept and its origin can be traced back to the 11th century when Richard Cantillon first grouped economic agents into three categories; land, finance, and wage earners and those economic agents who engage in market exchange for profit at their own risk. Others like J.B. say actually coined the word entrepreneur to denote one who shifts economic resources from an area of lower into an area of higher productivity and greater yield (Drucker, 1985). Schumpeter in his theory of economic development perceived the entrepreneur as the mechanism for economic change. It was indeed Schumpeter who differentiated that the entrepreneur is not a manager who supervises the production process, carrying out routine activities on the basis of past experience without any exploration of change but one who risks uncertainty and engages in activities that have not been undertaken before.

Entrepreneurship is the function of being creative and responsive within and to the environment. Entrepreneurship activity is a destabilizing force, which starts the process of creative destruction which is the essence of economic development. Drucker (1985) defined entrepreneur as one "who always searches for change, responds to and exploits it as an opportunity. In summary, entrepreneurship is simply the practice of creating new products/services and depending on the degree of activities, different forms of entrepreneurship exist: opportunistic, acquisitive, incubative, initiative and administrative entrepreneurship" etc.

### **Technology Innovation and Entrepreneurship Development in Nigeria**

Entrepreneurship is about starting a new business based on a recognized business opportunity as well as operating and maintaining that business. The belief of some people is that entrepreneurship does not need to be taught and therefore, an entrepreneur is born to be so. It should, however, be noted that for one to be a successful entrepreneur, he/she needs to learn the skills (Griffin and Hammis, 2011). Entrepreneur training is designed to teach the skills and knowledge that is needed to know before embarking on a new business venture. This would enhance the necessary identification and avoidance of many pitfalls awaiting the less well trained and vigilant contemporaries. The training may initially be perceived as a cost in terms of time and money but it would eventually be appreciated. The study carried out by Taiwo et al. (2012), on small scale food companies in Nigeria reported that one major source of technological change in these companies is personnel (operators and craftsmen).

The reasons adduced for these were simplicity of the innovation processes to the workforce; accurate and adequate information about the system of production; and the involvement of the workforce in the initiation and implementation of any technological changes. Moreover, another research finding showed that the key information sources for manufacturing small and medium firms, production and innovation are machinery suppliers, exhibition and trade fairs, client firms, publications, repair workshops (foundries, heat treatment shops, and others), staff of other firms, and social and professional associations, and consultancy firms within and outside the clusters (Oyeyinka-Oyelaran, 2001). Some researchers observe that increasing the profit of an organization is because of the change in technology. (Ruttan, 1997). According to entrepreneur perspective innovations mean creativity. "Innovation is a research area within the Marketing and Entrepreneurship Interfaces a growing area of inquiry" (Hackley and Mumby 1998).

### **Technology Integration in Entrepreneurial Activities**

Technology entrepreneurship is basically a combination of two separate terms from two different disciplines, technology came from the discipline of innovation and entrepreneurship came from the business or commercial discipline. Hence it is an integration of technological and entrepreneurial domains. A technology entrepreneur is a person having specific knowledge and expertise vital for any entrepreneur in order to carry out technology-centered entrepreneurial activities effectively and efficiently. Bailetti (2012) explained that collaborative research and development activities, producing innovative products, evolving new resources and their attributes which leads toward progression in scientific and technological expertise basically discriminates technology entrepreneurship from other entrepreneurship domains.

Today is the era where technology entrepreneurship has to turn out to be an important global portent. It is considered as essential for progression, distinction and a vital tool to attain competitive benefit at organizational, local and national levels. It is becoming a central point of debate which involves initiating new business as well as rising of new startups, regional profitable progressions, opting out the most suitable stakeholders or investors to bring ideas to marketplaces and also educating and give training to managers, scientists, supervisors, engineers, and technologists (Petti & Zhang, 2011). Practitioners and researchers claim that technology entrepreneurship is basically an investment in creating a new venture that accumulates and organizes particular individuals and divergent resources in order to catch value for the organization. According to Shane (2003), this concept is more concerned with combined production grounded on a mutual vision of upcoming technological changes. The mutual vision of variation in technology effects why, when, and in what ways any firm can produce and grasp value. Change in technology can be characterized in numerous ways. For that reason, it is essential to cultivate a shared opinion of any change in technology (Shane & Venkataraman, 2000). This value-creating concept is not only about identifying the technology or market opportunities but basically about investing, exploiting that opportunity and generating high-profit margins for the firm.

According to Abdullah & Ahcene (2011) Technology entrepreneurship is certainly becoming vigorous in the contemporary globalization and liberalization economy as it delivers countless opportunities and empowers effective optimization of the resources to achieve high-profit margins. Technology entrepreneurship also has a great influence on developed nations and takes special attention from developing economies as the technology access and availability blowout with the digital economy. Developing nations have used a clustering strategy to promote their technology entrepreneurial process. There are several factors that have a significant

impact on this process specifically globalization of procedures and standards that were previously used in a particular country or any area (Scott, 2001).

### **The Effects of Technology on New Business and Job Opportunity**

Ansal (2017) examined in four enterprises the impact of new technologies on women's employment in two enterprises in Turkey and determined in these cases there was a definite impact on the number of women employed. A preliminary model describing the potential impact of technology was presented by Cardullo (2017). One of the results of the introduction of new technologies is usually increased industrial productivity. This has been one of the impetuses for scale reducing various enterprises. The National Research Council study concluded (1994) "Over the long term, new technology and production processes tend to promote productivity, competitiveness, and economic growth, all of which contribute to job growth over time" (Cardullo and Ansal, 2017).

New technologies and processes are the main driving force behind economic growth and increased living standards. According to Wilburn and Wilburn (2018) technology is accelerating its ability to help businesses do more with less and provide better results. Artificial intelligence (AI), big data, and the Internet of things (IoT) work together to create programs that businesses can use to decrease the time from product idea to product creation and product creation to customer delivery. Manyika et al. (2013) say that "Advances in artificial intelligence, machine learning, and natural user interfaces (e.g., voice recognition) are making it possible to automate knowledge worker tasks that have long been regarded as impossible or impractical for machines to perform". Big data is "things one can do at a large scale that cannot be done at a smaller one, to extract new insights or create new forms of value, in ways that change markets, organizations, the relationship between citizens and governments, and more" (Mayer-Schönberger & Cukier, 2013).

### **The Challenges of Integrating Technology in Entrepreneurship**

The literature around the area of business and information technology is rife with what is now a fairly accepted list of 'barriers' to the successful implementation of IT in entrepreneurship. These barriers typically include (Management Services, 1997):-

1. The cost of technology.
2. Lack of time to devote to the implementation and maintenance of technology.
3. A lack of technical knowledge combined with the difficulty in finding useful, impartial advice.
4. Lack of use of external consultants and vendors.
5. Short-range management perspectives.
6. A lack of understanding of the benefits that technology can provide, and how to measure those benefits.
7. A lack of formal planning or control procedures.

### **Empirical Analysis**

Several works have been carried out on Technology and Entrepreneurship, in this regard, Diyoke (2014) studied on Entrepreneurship development in Nigeria (Issues, problems, and prospects) and found out that development of entrepreneurs and entrepreneurship is important and can be stimulated through a set of supporting institutions. However, there are a lot of challenges, but there are also prospects especially when resources in the form of capital and human resources one made available in a conducive environment. The study concluded that the challenges of entrepreneurship development in Nigeria are largely that of sourcing of capital, expertise in the management of the business, poor investment decisions.

Muhammad et al (2018) studied on Entrepreneurial Transformation of Malaysian Craftmakers into Craftpreneurs. He reveals that the Malaysian craft industry growth is becoming more complex in the business industry, entrepreneurship draws more attention to the need for emphasizing craft makers, especially for those who are involved in the small and medium enterprise. The study found out the need for emphasizing on personality traits of entrepreneurs and transforming such traits is a key important aspect of entrepreneurship development. Therefore, they recommended the use of a transformational model which will give a clear concept to the industrial practitioner, government sectors, and academicians to plan and implement the development of entrepreneurship in the craft industry.

Manfred and Peter (2011) studied entrepreneurship and regional development. The study made use of the econometric model and they concluded that Entrepreneurship and regional development prompt a rich variety of research questions to regional scientists. It is a domain where industrial organization, cultural geography, location theory, business economics and technology form an intertwined nexus. From a macro or global perspective, the region is a strategic niche in global development. But from a micro perspective, the region is shaped by innovative actions of risk-seeking entrepreneurs. Competition, trust, network organization and public policy are ingredients for win-win situations at the local level. Such elements may offer also new insights into spatial convergence debates.

Philip et al (2016) studied Perceptions of entrepreneurship education by engineering students of Modibbo Adama University of Technology, Yola, Nigeria. The study shows that engineering students positively perceived EE as important to graduate self-employment. They perceived the need for EE in universities in the sense that it will promote self-reliance and self-employment, equip graduates with innovative ideas and business creation skills among others. The relevance and adequacy of the EE curriculum and the quality of lecturers handling EE are strategically important to the success of the program and were positively perceived. These enhance students' interests in EE and increase their intentions to go into self-employment after graduation.

Eneji et al (2018) studied the premises of Technology Innovation and Sustainable Entrepreneurship Development in Nigeria: Stakeholders' Impact Assessment in Central Nigeria. The study seeks to find out the impact of technology innovation on sustainable entrepreneurship development in Nigeria. They concluded that Sustainable entrepreneurship is closely and positively linked with technology innovation, in which the absence of the former is caused by the inadequacy of the latter. Selected amongst stakeholders, factors limiting sustainable entrepreneurship are critically evaluated. The factors or challenges influencing entrepreneurship are extremely problematic and must be resolved for technology innovation to thrive in the country.

### Research Gap

Having reviewed past works on the premises of Technology and Entrepreneurship Development, a vacuum of the hole still exist on the whole context and as such the study aims to fill such vacuum by providing answers to the following research questions left unanswered by past works;

1. To what extent has technology being integrated into entrepreneurial activities in Yola South?
2. What are the roles of Technology and Entrepreneurship in the socio-economic development of Yola South?
3. What impact does technology entrepreneurship has on the establishment of new businesses and job creation?
4. What are the challenges of integrating technological advances into entrepreneurship in Yola South?

### Hypotheses

The study adopted the null form of hypotheses. The following hypotheses were tested;

**HO<sub>1</sub>:** To a large extent technology has not been integrated into entrepreneurial activities in Yola South LGA.

**HO<sub>2</sub>:** Technology and Entrepreneurship play no significant role in socio-economic development.

**HO<sub>3</sub>:** Technological entrepreneurship has no significant impact on the establishment of new businesses and job creations.

**HO<sub>4</sub>:** Integrating technology in entrepreneurship has experienced major challenges.

## IV. Methodology

This research design is a survey design, it will make use of a structured questionnaire (Closed-ended questionnaires) to obtain information from staff and participants of Entrepreneurship schemes, Entrepreneurs, Small scale business owners. The population of this study consists of staff and participants of Entrepreneurship schemes, Entrepreneurs, Small scale business owners situated in Yola South Local Government Area of Adamawa State. The Population is Nine hundred and eighty-seven (987). The sample size for this study was drawn from a population of 987 using Krejcie and Morgan (1970) sample applying precision of 95%. The Krejcie and Morgan's sample size calculation was based given the precision of 95% accuracy. Therefore, the sample size for this study is 169. The data collected was analyzed using descriptive and inferential statistics. Inferential statistics, such as chi-square residual for optimization and chi-square test statistics was adopted for the study. This would be calculated through the use of Statistical Package for Social Scientist (SPSS version 25). This analysis tested the hypothesis of the study and explains the association-ships. The output would be presented in tabular forms. To achieve reliability, the consistency of results across items on the questionnaire was measured with Cronbach's Alpha test of reliability. This verifies the consistency of some latent variables such as Technological Entrepreneurship, New business and job creation, socio-economic development and extent of technological integration to entrepreneurial activities.

**Table 1:** Alpha Cronbach Test for Reliability

Reliability Statistics		
Variables	Cronbach's Alpha Value	N of Items
The extent of Technology Integration	.861	4
Roles and challenges of Technology	.812	2
Technology on Establishment of New Business	.901	4

Cronbach's alpha value of 0.861, 0.812 and 0.901 was obtained, representing the extent of technology integration, roles and challenges of technology and technology on the establishment of new business

respectively. These coefficients indicate high reliability of the study instrument implying the instrument is highly reliable and it consistently measures what it was set out to measure.

**V. Results**

This section analyses the respondent demographics and presents the findings of the study.

**Demographic Analysis of Respondents**

As regard gender, 78.7% of the respondent were male (133 Males), while 21.3% were female (representing just 36 females). As regards marital status, 116 of the respondents were married, while 53 of the respondents were just single, representing 68.6% and 31.4% respectively. This implies the majority of the respondent is having the family's responsibilities. As regards educational status, 10.1% of the respondent were having SSCE and below qualification (17 of the respondents), 26.6% were having Diploma's representing 45 of the respondents, 42.6% are having their first degrees representing 72 of them, 15.4% were having master's degree representing 26 of them, while just 5.3% are Ph.D. holders, representing just 9 of the respondents. As regards age, 67 of the respondents were between the age of 20-29 years representing 39.6%, 51 of them are between the age of 30-39 years representing 30.2%, 37 of them are having between the age of 40-49 years representing 21.9%, 12 of them are between the age of 50-59 years representing 7.1%, while only 2 of the respondents are 60 years and above representing 1.2%, it is evident that majority of them are young adults. As regard ownership of the business, 78.7% of the respondents owns their own business while 21.3% of the respondent doesn't own a business, representing 133 and 36 of the respondents respectively. As regard engagement in entrepreneurship schemes, 50.9% of the respondents were engaged in Entrepreneurial schemes while 49.1% of the respondent are not engaged in entrepreneurial schemes, representing 86 and 83 of the respondents respectively.

**Data Analysis**

This sub-section gave an inferential analysis of the data collected in accordance with the objectives of the study, categorized in sub-sections

**The extent of technology integration into entrepreneurial activities**

This subsection analyses the extent technology has been integrated into entrepreneurial activities in Yola South Local Government Area.

**Table 2: Mean of Technological Integration**

	N	Mean	Variance	Comments
Innovation in Products	169	1.8402	.718	Low
Innovation in Process	169	3.4201	.436	High
Innovation in Management	169	1.9349	.835	Low
Innovation in Marketing	169	2.8639	.654	Moderate

Table 2 gives the mean response of the respondents with respect to the extent to which technology is being integrated into entrepreneurial activities. Innovation in products has a mean of 1.8402 implying a low level of technology integration is made towards the product itself. Innovation in the process has a mean response of 3.42, implying a very high level of technology integration is made towards the process of product development. Innovation in management has a mean response of 1.93, implying a low level of technology integration is being made towards business management in Yola south local government area. Innovation in marketing has a mean response of 2.86, implying that moderately, technology is being integrated into the marketing activities of entrepreneurs in Yola south local government area.

**Table 3: Innovation in Product (Chi-Square Residual)**

	Innovation in Products		
	Observed N	Expected N	Residual
Not Really	66	42.3	23.8
Low	74	42.3	31.8
Moderate	19	42.3	-23.3
High	10	42.3	-32.3

Table 3 revealed that a low level of technology integration is being made towards product innovation, having a chi-square residual of 31.8.

**Table 4: Innovation in Process (Chi-Square Residual)**

<b>Innovation in Process</b>			
	<b>Observed N</b>	<b>Expected N</b>	<b>Residual</b>
Low	16	56.3	-40.3
Moderate	66	56.3	9.7
High	87	56.3	30.7

Table 4 revealed that a high level of technology integration is being made towards process innovation, having the highest chi-square residual of 30.7.

**Table 5: Innovation in Management (Chi-Square Residual)**

<b>Innovation in Management</b>			
	<b>Observed N</b>	<b>Expected N</b>	<b>Residual</b>
Not Really	57	42.3	14.8
Low	85	42.3	42.8
Moderate	8	42.3	-34.3
High	19	42.3	-23.3

Table 5 revealed that a low level of technology integration is being made towards management, having the highest chi-square residual of 42.8.

**Table 6: Innovation in Marketing (Chi-Square Residual)**

<b>Innovation in Marketing</b>			
	<b>Observed N</b>	<b>Expected N</b>	<b>Residual</b>
Not Really	6	42.3	-36.3
Low	50	42.3	7.8
Moderate	74	42.3	31.8
High	39	42.3	-3.3

Table 6 revealed that a moderate level of technology integration is being made towards marketing, having the highest chi-square residual of 31.8.

**Table 7: Chi-square test statistics for the extent of technology integration**

<b>Test Statistics</b>				
	<b>Innovation in Products</b>	<b>Innovation in Process</b>	<b>Innovation in Mgt.</b>	<b>Innovation in Marketing</b>
Chi-Square	74.621 <sup>a</sup>	47.231 <sup>b</sup>	88.964 <sup>a</sup>	56.633 <sup>a</sup>
Df	3	2	3	3
Asymp. Sig.	.000	.000	.000	.000

Table 7, gives the chi-square statistics of tables 3, 4, 5, and 6 respectively. A p-value of 0.000 (0.01) was obtained for all four tables, implying that the result was statistically significant. This indicates a low level of innovation in product, a high level of innovation in process, a low level of innovation in management and a moderate level of innovation in marketing.

**Roles of Technology in Entrepreneurship Development**

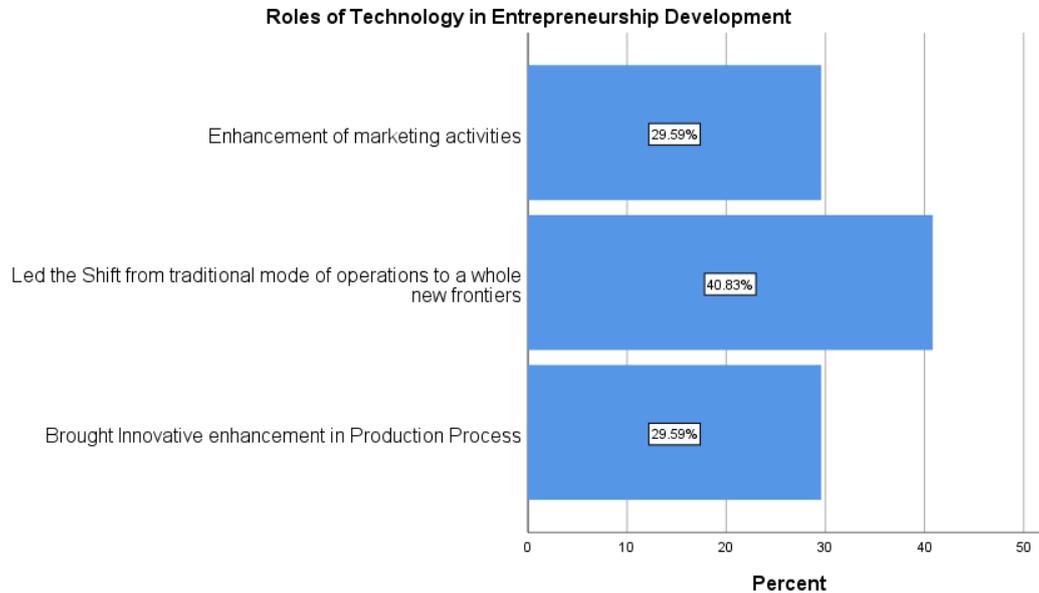
This subsection critically analyses the roles of technology in entrepreneurship development in Yola South Local Government Area.

**Table 8: Roles of Technology in Yola**

<b>Roles of Technology in Entrepreneurship Development</b>			
	<b>Observed N</b>	<b>Expected N</b>	<b>Residual</b>
Brought Innovative enhancement in Production Process	50	56.3	-6.3
Led the Shift from the traditional model of operations to a whole new frontier	69	56.3	12.7
Enhancement of marketing activities	50	56.3	-6.3

In Yola south local government area, technology has brought innovative enhancement in production process and enhancement of marketing activities, but majorly technology has led the shift from traditional mode of operation to a whole new frontiers, this is evident in table 8 as it has the highest chi-square residual of 12.7, the other 2 options came not too far with a chi-square residual of -6.3 each. This is clearly virtualized in figure 1.

**Figure 1:** Chart virtualizing the roles of technology in entrepreneurial development



**Table 9:** Chi-square test statistics for Roles of technology in entrepreneurship development

Test Statistics	
Roles of Technology in Entrepreneurship Development	
Chi-Square	4.272 <sup>a</sup>
Df	2
Asymp. Sig.	.018

Table 9 presents the chi-square test statistics results for table 8, with a p-value of 0.018, this implies that the result obtained is statistically significant. This indicates that the major role played by technology towards entrepreneurship development is that it led the shift from the traditional mode of operations to a whole new frontier. Other role played include; bringing innovative enhancement in production process and enhancement in marketing activities.

**Challenges of integrating technology into Entrepreneurship**

This section critically analyses the challenges of integrating technology into entrepreneurship activities in Yola south local government area.

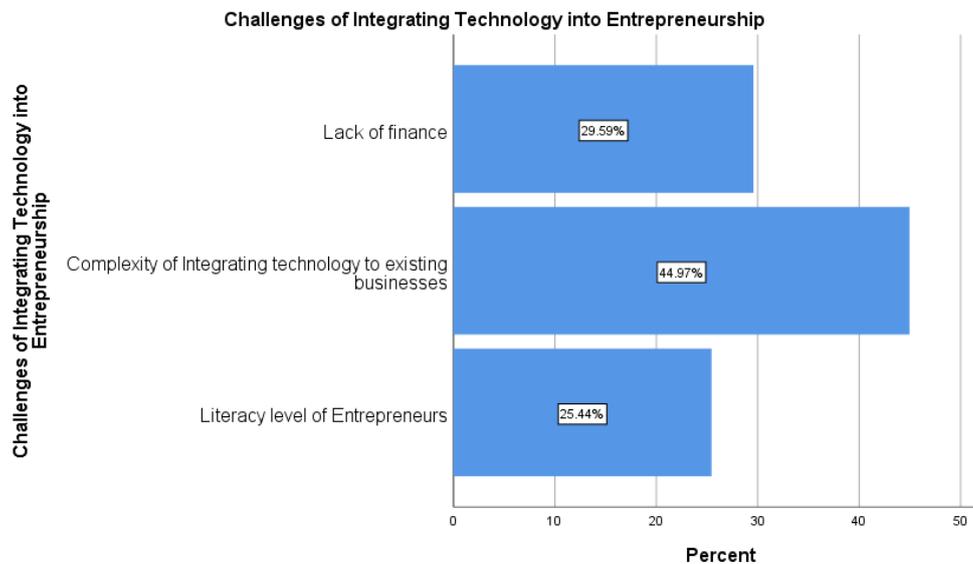
**Table 10:** Challenges of technology integration

Challenges of Integrating Technology into Entrepreneurship			
	Observed N	Expected N	Residual
The literacy level of Entrepreneurs	43	56.3	-13.3
The complexity of Integrating technology to existing businesses	76	56.3	19.7
Lack of finance	50	56.3	-6.3

Table 10 revealed that the complexity of integrating technology into existing businesses happens to be the greatest challenge of integrating technology into entrepreneurship in Yola. This has the highest chi-square residual of 19.7. This is followed distantly by lack of finance (with a chi-square residual of -6.3). The literacy

level of entrepreneurs still poses as a minor challenge of integrating technology into entrepreneurship, this has a chi-square residual of -13.3. This is clearly virtualized in figure 2.

**Figure 2:** Chart virtualizing the challenges of integrating technology into entrepreneurship



**Table 11:** Chi-square statistics for challenges of integrating technology into entrepreneurship

Test Statistics	
Challenges of Integrating Technology into Entrepreneurship	
Chi-Square	10.734 <sup>a</sup>
Df	2
Asymp. Sig.	.005

Table 11 presents the chi-square test statistics results for table 10, with a p-value of 0.005, this implies that the result obtained is statistically significant. This indicates that the major challenge of integrating technology into entrepreneurship happens to be the complexity of integrating technology into existing businesses. Other challenges include a lack of finance and literacy levels of entrepreneurs.

**Technology on Establishment of new business and job creation**

This subsection analyses the impact of technology on the establishment of new business and job creations.

**Table 12:** Emanation of new businesses

Newer businesses have emanated			
	Observed N	Expected N	Residual
Disagreed	1	42.3	-41.3
Uncertain	2	42.3	-40.3
Agreed	30	42.3	-12.3
Strongly Agreed	136	42.3	93.8

Table 12 above that the majority of the respondents strongly agreed to the fact that the application of technology in entrepreneurship has led to the emanation of new businesses. This has the highest chi-square residual of 93.8.

**Table 13:** Empowerment of Residents

Entrepreneurship schemes have empowered several residents			
	Observed N	Expected N	Residual
Disagreed	2	42.3	-40.3
Uncertain	15	42.3	-27.3
Agreed	96	42.3	53.8

Strongly Agreed	56	42.3	13.8
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Table 13 revealed that the majority of the respondents agreed to the fact that the various entrepreneurship schemes have empowered several residents. This has the highest residual of 53.8, followed closely by strongly agreed with a residual of 13.8.

**Table 14: Employment made by Newer businesses**

Newer businesses that emanated has to be able to employ a minimum of 2 persons			
	Observed N	Expected N	Residual
Strongly Disagreed	3	33.8	-30.8
Disagreed	5	33.8	-28.8
Uncertain	31	33.8	-2.8
Agreed	65	33.8	31.2
Strongly Agreed	65	33.8	31.2

Table 14 revealed that the majority of the respondent strongly agreed and agreed to the fact that newer businesses that have emanated were able to employ a minimum of 2 persons. Strongly agreed and agreed has the same chi-square residual of 31.2.

**Table 15: Technology Financing**

Entrepreneurship schemes have supported an area of technology financing			
	Observed N	Expected N	Residual
Strongly Disagreed	5	33.8	-28.8
Disagreed	18	33.8	-15.8
Uncertain	70	33.8	36.2
Agreed	44	33.8	10.2
Strongly Agreed	32	33.8	-1.8

Table 15 revealed that it is quite uncertain if entrepreneurship schemes have supported in the area of technology financing, the majority of the respondent was uncertain, as this has the highest chi-square residual of 36.2.

**Table 16: Chi-square statistics for technology on Job creation**

Test Statistics				
	Newer businesses have emanated	Entrepreneurship schemes have empowered several residents	Newer businesses that emanated was able to employ a minimum of 2 persons	Entrepreneurship schemes have supported the area of technology financing
Chi-Square	290.195 <sup>a</sup>	128.775 <sup>a</sup>	110.438 <sup>b</sup>	73.870 <sup>b</sup>
Df	3	3	4	4
Asymp. Sig.	.000	.000	.000	.000

Table 16 presents the chi-square test statistics results for tables 12, 13, 14 and 15, with a uniform p-value of 0.000 (0.01), this implies that the results obtained were statistically significant. This indicates that newer businesses have emanated, several residents have been empowered, and newer businesses have employed a minimum of 2 persons. Nevertheless, it is quite uncertain if entrepreneurship schemes have supported in areas of technology financing.

### Test of Hypotheses

**HO<sub>1</sub>:** *To a large extent technology has not been integrated into entrepreneurial activities in Yola South LGA.* (Null Hypothesis is rejected and Alternate Hypothesis accepted). This is Justified in table 7 as technology has been largely integrated into the production process and to a certain extent in marketing activities.

**HO<sub>2</sub>:** *Technology and Entrepreneurship play no significant role in socio-economic development.* (Null Hypothesis is rejected and Alternate Hypothesis accepted). This is Justified in table 9, as technology has played a major role in leading the shift from traditional modes of production and operations into the newer frontier.

**HO<sub>3</sub>:** *Integrating technology in entrepreneurship has not experienced major challenges.* (Null Hypothesis is rejected and Alternate Hypothesis accepted). This is Justified in table 11, as there exist complexities in integrating technology into entrepreneurship, also the literacy level of entrepreneurs and lack of finance has also posed as major challenges in integrating technology into entrepreneurship.

**HO<sub>4</sub>:** *Technological entrepreneurship has no significant impact on the establishment of new businesses and job creations.* (Null Hypothesis is rejected and Alternate Hypothesis accepted). This is Justified in table 16, as newer businesses that have employed a minimum of 2 staff have emanated as a result of technological entrepreneurship.

## VI. Discussion Of Findings

The study empirically examines technology and entrepreneurship development in Yola South Local Government Area. According to the findings, technology has been integrated highly into entrepreneurial activities (most especially in the aspect of the production process and innovation in marketing). In terms of roles technology plays in entrepreneurship development, majorly it has led the shift from the traditional mode of operations to a whole new frontier, minorly it has innovative enhancement in the production process and it has brought enhancement of marketing activities. Some challenges do exist with respect to integrating technology into Entrepreneurship, the major challenge happens to be the complexity of integrating technology into an existing business, other challenges include literacy level of the entrepreneurs and lack of finance. Technology has impacted on the establishment of new businesses and job creation, in light of this, newer businesses have been emanated, several residents of the localities have been empowered by some entrepreneurship schemes, also newer businesses employed an average of 2 persons from different business settings.

## VII. Conclusion

The findings of the study revealed that technology has been extensively integrated into the production and operational process of small businesses, also it has been integrated into marketing activities at an encouraging rate. Technology has led the shift from the traditional mode of operations into a whole new frontier as well. Among challenges faced in integrating technology into entrepreneurship, the major challenge happened to be the complexity involved in integrating technology into already existing businesses. Finally, technology has impacted economically in the aspects of job creations, as the new businesses that have emanated have employed an average of 2 persons. In light of this conclusion, it is recommended that;

1. The government and Entrepreneurship scheme should pay special attention to integrating technology into the management process of these small enterprises and also ensure that innovation is visible in the products and offers of these small businesses.
2. The government should provide some affordable finance mechanisms (such as equipment leasing) to these entrepreneurs. This will curtail the burden and challenges experienced in trying to integrate technology into entrepreneurship.

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