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ENTREPRENEURSHIP EDUCATION AND VENTURE INITIATIVES AMONG UNIVERSITY GRADUATES IN NORTHEASTERN NIGERIA

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ABSTRACT: This study explores the impact of entrepreneurship education on the venture initiatives of university graduates in Northeastern Nigeria, focusing on graduates' readiness to engage in business, venture size, and business intentions. Northeastern Nigeria, which includes states such as Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe, has faced economic and social challenges due to prolonged insurgency, with high graduate unemployment despite annual outputs of over 600,000 graduates in Nigeria. Given this context, the study examines the role of entrepreneurship education in fostering entrepreneurial intentions among graduates residing in the region. Using a structured questionnaire adapted from the Global Entrepreneurship Monitor and other sources, data was collected from a representative sample of 1,200 graduates across Bauchi, Gombe, and Taraba states. Probit and negative binomial regression models were employed to analyze the data, assessing the influence of variables such as entrepreneurship theoretical knowledge, practical skills, and personal entrepreneurial characteristics on venture engagement. The findings reveal that while male graduates and those with high practical skills show a greater tendency to engage in ventures, other factors like age, educational background, and satisfaction with the entrepreneurship education structure also significantly impact graduates' entrepreneurial actions. Graduates from fields such as arts, social sciences, and sciences display varying levels of engagement, influenced by their educational experiences. The results highlight the importance of aligning entrepreneurship education with practical skills development to encourage graduates' active participation in ventures, thereby addressing unemployment in Northeastern Nigeria.

Keywords: Entrepreneurship, Entrepreneurship Education, Venture Initiative, University Graduate

INTRODUCTION

Entrepreneurship education among university students is increasingly becoming a crucial issue among policymakers around the world (Thelma, Sylvester & Ngulube, 2024; World Bank, 2019). This is principally true in developing countries where unemployment rates are high (International Labour Organization, 2019). Nigeria's unemployment rate among the working population in 2019 was 24.5 percent and more than 30 percent among graduates (National Bureau of Statistics (NBS), 2019). In this context, promoting self-employment and small business initiatives are presently forefront priorities in the country's national agenda.

In fact, this prompted the Federal Government of Nigeria to direct the National Universities Commission (NUC) and the Tertiary Education Trust Fund (TET-Fund) to develop fundamental machinery for the establishment of entrepreneurship training centres among

universities in the country. The National Universities Commission (NUC) integrated entrepreneurship education into Nigerian university curricula to promote self-reliance among graduates. Tertiary Education Trust Fund (TET-Fund) supported this initiative by providing modern entrepreneurship facilities in public universities. Together, these efforts aim to enhance skills, foster innovation, and improve employment opportunities through entrepreneurship training and skill acquisition. Following the above, the tacit expectation by policy makers in the country is that entrepreneurship education, as currently practiced, would improve the entrepreneurial skill of university students and make them job creators rather than job seekers after graduation.

In this regard, entrepreneurship education is seen as a viable way to enhance their chances of employment (Eesley & Lee, 2021; Hafiz & Latif, 2020; Na-Allah *et al.*, 2018; World Bank, 2019; Overwien, Jahnke & Leker, 2024). This is so because graduates who have knowledge of entrepreneurship would be able to conceive business idea(s), set up, nurture and bolster a new business in order to be self-employed (Bello, Jibir & Ahmed, 2018 Kachalla, 2023; Nbebe, 2019; World Bank, 2019).

This paradigm shift in university education in Nigeria requires a holistic investigation to assess its impact on students' ability to be self-reliant after graduation. Although there are few studies conducted on the impact of entrepreneurship education on self-employment in Nigeria (Abiodun, Irefin & Olaposi, 2016; Alabi, Mafimisebi, & Oladejo Ekpoh, 2022; Jiddah, 2016; Nbebe, 2019; Ngerem & Ezikpe, 2016; Oyinlola, *et al.*, 2024; Overwien, Jahnke & Leker, 2024; Rafiana, 2024), however it is observed from the literature that majority of the previous studies are conducted in southern regions of the country. To the best of our knowledge, there are little or no studies providing such evidence for the northeastern region of Nigeria. In addition, the study will unveil the success or otherwise of the NUC and TET-Fund on the introduction of entrepreneurship education and skills as general study courses and the establishment of entrepreneurship development study centers across public universities, respectively. Therefore, the main objective of this study is to assess the impact of entrepreneurship education on venture initiatives among university graduates in Northeastern Nigeria.

This study adds to the existing research on Entrepreneurship Education by examining its impact on the venture initiatives of university graduates in North-Eastern Nigeria. It uses a robust empirical methodology to address gaps in previous studies, which were mostly focused on the southwestern region of Nigeria. The paper argues that the knowledge and skills gained from Entrepreneurship Education significantly influence graduate employment and entrepreneurial ventures, offering valuable insights for policymakers and educational agencies.

The rest of this paper is structured into several key sections; a review of conceptual, theoretical and empirical literature; a methodology section detailing data sources and the analytical methods employed; a discussion of the findings; and finally, the conclusions, which includes policy recommendations based on the research outcomes.

LITERATURE REVIEW

Conceptual Clarifications

Academics, policy analysts, and research organizations have variously defined and expounded on the concepts of entrepreneurship, entrepreneurship education, and venture initiative. Though

the definitions are inexhaustible, there seems to be a cloudless consensus on what each concept implies.

Entrepreneurship

Entrepreneurship is the process of emergence, behaviour, and performance of entrepreneurs (Ogundele, 2000). According to Ologbon and Adekunle (2024), entrepreneurship involves perceiving business opportunities and utilizing scarce resources profitably, with a focus on making a profit regardless of the product or service being offered. It is the act of creating, designing, or introducing unique products into the market to sell and generate profits, often starting as a small-scale venture with the aim of expanding into a larger business entity.

In line with this consensual meaning, this study defines entrepreneurship as a process of perceiving profitable and marketable opportunities, mobilizing required resources to initiate and nurture a business venture, or diversifying an existing venture with a view to fully materialize the opportunities. The person who does all these is called an entrepreneur.

Entrepreneurship Education

Entrepreneurship education consists of a body of formalized training that aims to educate, inform, and train individuals who show an interest in venture creation or developing a small business (Adeola & Bolarinwa, 2010). It is also defined as the process of equipping people with the skills to be aware of commercial opportunities and the insight, self-esteem, skills, and knowledge to take action based on them (Uzo-Okonkwo, 2013). Entrepreneurship education equips individuals with the knowledge and skills to recognize and exploit opportunities, establish successful ventures, and contribute to society by creating economic and social value. An entrepreneur is characterized by traits such as boldness, confidence, innovation, and the ability to foresee profitable opportunities, and make judgmental decisions about resource coordination. Entrepreneurship education aims to prepare individuals to be enterprising, take risks, manage outcomes, and either create jobs for themselves or become entrepreneurial thinkers (Ologbon & Adekunle, 2024).

In the same vein, entrepreneurship education within the context of this study connotes all elements of knowledge delivery that seek to empower students to become self-reliant after graduation. In other words, entrepreneurship education (EE) could be taken to mean a well-structured, pedagogical cum practical process of instilling entrepreneurial attitudes, mindsets, skills, knowledge, and competencies in people with the ultimate goal of transforming them to be self-employed. Thus, EE could be viewed as a human capital investment that aims to impart or augment entrepreneurial competencies to people in a formal setting. The concept of EE came about based on the aphorism that “entrepreneurs can be made”. However, there is controversy in the literature regarding how entrepreneurship education outcomes should be measured in academic research (Duvel-Covetil, 2013; Hafiz & Latif, 2020; Torrance, 2013). Some of these measures include students’ awareness and interest, skills and acquisition, entrepreneurship intention, number of enterprises owned by graduates, innovation, and community impact, among others (Falkang & Alberti, 2000; Duvel-Covetil, 2013). Recent literature advocates the tailoring of many measures of entrepreneurship education in exploring its impact on graduate self-employment. Thus, to complement the existing literature, this study will apply multiple measures to avoid measurement bias and ensure robust results.

Venture Initiatives

Venture initiatives among university graduates encompass various activities aimed at fostering entrepreneurship and venture creation. Venture initiatives among university graduates refer to structured programs and activities designed to foster entrepreneurship, innovation, and business creation among students and recent alumni. These initiatives typically include educational programs, incubators and accelerators, funding opportunities, mentorship, and networking resources (Shane, 2004). They aim to support the development of new businesses and social enterprises, providing the necessary tools and resources to help young entrepreneurs succeed.

According to recent studies, these initiatives are critical in bridging the gap between academic knowledge and practical business skills, thus driving economic growth and innovation (Kuratko, 2020). Universities offer courses and workshops on entrepreneurship, provide access to business incubators and accelerators, and facilitate networking events with industry professionals and potential investors (Shane, 2004). For instance, programs like MIT's Martin Trust Centre for MIT Entrepreneurship and Stanford's StartX are prime examples of how academic institutions are fostering entrepreneurial ecosystems within their campuses (Roberts & Eesley, 2011).

Furthermore, venture initiatives often include funding opportunities through grants, competitions, and university-linked venture capital funds, which are crucial for young entrepreneurs who may lack access to traditional financing (Wright et al., 2006). Mentorship programs, which connect graduates with experienced business leaders, are also a key component, providing guidance and support as young entrepreneurs navigate the complexities of starting and growing a business (St-Jean & Audet, 2012). In summary, venture initiatives among university graduates are comprehensive programs that integrate education, funding, mentorship, and networking to promote entrepreneurship and innovation, thereby contributing to broader economic and societal benefits.

Finally, in line with this study, venture initiative refers to a set of unique qualities of an effective entrepreneur, particularly self-starting, proactiveness, far-sightedness, innovation, optimism, and persistence toward obstacles characterizing venture creation, growth, and/or diversification.

Theoretical Review

Are entrepreneurs born or made? While strong differences of opinion exist on this issue, there is growing acceptance that entrepreneurial skills and attitudes can be imparted through the education process (Scott, Rosa & Klandt, 1998). When individuals complete entrepreneurship education courses, they are more inclined to do entrepreneurial things or become more effective as entrepreneurs (McMullan & Vesper, 2000). The fostering of enterprise education has taken on a new imperative since the onset of globalisation. Globalisation emphasizes the private sector, entrepreneurship, trade, the use of technology, and partnerships between government and business. In today's rapidly evolving and globalizing societies and economies, education must foster entrepreneurial cultures and attitudes and provide the necessary tools. Formal education - primary, secondary, post-secondary and post-graduate studies, adult training and lifelong learning programmes - must incorporate these goals. (OECD, 1998)

The USA took the lead in developing enterprise education and supporting entrepreneurship and small business. The Small Business Administration was established in 1953. Small business courses at the tertiary level were first established in the late 1940s and entrepreneurship courses in the 1960s (Solomon, Winslow & Tarabishy, 1998). By the late 1990s, over 400 universities in the USA offer entrepreneurship courses (Hills & Morris, 1998). The enormous growth in the number of small business and entrepreneurship courses in the USA was fuelled in part by student dissatisfaction with the traditional big-business focus of business education (Solomon & Fernald, 1991).

Recognition of the crucial role that entrepreneurship and small business had to play in creating a vibrant economy and reducing unemployment came with the release of the Bolton Report in 1971. Entrepreneurship education started in British universities in the 1970s. The 'enterprise culture' was first identified by British Prime Minister Margaret Thatcher in the 1980s and was primarily aimed not at directly stimulating entrepreneurship either at the small business or big business level but at developing enterprising people and inculcating an attitude of self-reliance (Gibb, 1993). The aim was to have an enterprise culture not a dependency culture. Although the message was unpalatable to many, the theme endured resulting in the establishment of enterprise courses in British universities. One of the most significant events in recent years for the UK Higher Education sector was the Dearing Committee Report which clearly favoured the expansion of entrepreneurship education (NCIHE, 1997).

In Australia, the 1995 Karpin Report concluded that Australia did not support an enterprise culture and needed to develop a more entrepreneurial spirit. Karpin attributed the lack of a strong small business culture partly to the lack of enterprise and entrepreneurial studies in Australian educational institutions. Breen and Bergin (1999) found that since the early 1990s, there has been growth in the number of entrepreneurship and small business courses and subjects offered. It was felt that, although the number of subject offerings had grown since the 1995 Karpin Report, this would stabilize. However, it was expected that the number of student enrolments would increase. Entrepreneurship and small business were still relatively minor fields of study as enrolments in this area represented less than one percent of the students enrolled in undergraduate business and management courses in Australian universities.

Entrepreneurship education in Nigerian universities is mandated by a 2004 national policy, requiring the inclusion of entrepreneurship courses in the curriculum to enhance student entrepreneurial outcomes. Nigerian universities are increasingly focusing on promoting entrepreneurship and innovation to drive economic development, with initiatives like the Presidential Entrepreneurship Summit and the National Science, Technology, and Innovation Road map supporting these efforts. Some universities have gone beyond the policy by establishing entrepreneurship development centres and organizing activities like hackathons to foster entrepreneurial skills among students (Oyinlola et al., 2024)

The dominant theories of enterprise education/intention are the enterprise event model developed by Shapere and Sokol (1982), the psychological-economic model by Bird (1985) and Davidson (1995), Dyer's (1994) model of entrepreneurship career, Bandura's (1977) social learning theory and Ajzen (1991)'s theory of planned behaviour. All these theories emphasize the effect of entrepreneurial education on career choices and behaviour. To ensure the generalization and capturing of the peculiarities of entrepreneurship education among university graduates, the study plans to consider building its analysis on three theories: the Dyer's (1994) model of entrepreneurship career and Bandura's (1977) social learning theory and Ajzen (1991)'s theory of planned behaviour.

Dyer's (1994) model of entrepreneurship career emphasizes the importance of learning from experiences and interactions in shaping an individual's entrepreneurial path. Its main emphasis is on the processes and stages undergone in the pursuit of entrepreneurial careers, integrating personal characteristics, life stages, and career development processes. In relation to entrepreneurship education and intention, the model highlights the significance of awareness of entrepreneurship and early exposure as a career option, developing the necessary skills, reinforcing the importance of role models or mentorship and learning experimentally.

Bandura's (1977) social learning theory places emphasis on observation, imitation, and modeling, which is highly relevant to entrepreneurship education. By observing successful entrepreneurs and engaging in experiential learning through internships, simulations, and collaborative projects, students can internalize effective business strategies and problem-solving skills. Role models and mentors play a crucial role in this process, providing real-life examples and guidance. Constructive feedback and rewards further reinforce positive behaviours and motivate students. Analysing case studies also helps students understand the complexities of entrepreneurship. This holistic approach helps aspiring entrepreneurs develop the skills and mindset needed for success.

Ajzen (1991)'s theory of planned behavior focuses on the antecedents of entrepreneurial intention, such as attitude toward entrepreneurial behavior, perceived social norms, and self-efficacy, which are crucial in predicting entrepreneurial behavior. This theory provides a framework to understand how entrepreneurship education can shape students' attitudes, perceived norms, and sense of control, thereby fostering entrepreneurial intentions and actions. This theory underscores the importance of educational interventions in preparing and motivating individuals to pursue entrepreneurial ventures.

The integration of these theories will create a comprehensive framework in order to understand how individuals' learning experiences, social influences, and personal attitudes collectively impact their entrepreneurial intentions and behaviours, providing valuable insights for entrepreneurship education and venture initiatives.

Empirical Literature

The empirical literature on the impact of entrepreneurship education on university graduates' venture initiatives reveals varied findings. The majority of the studies support a positive relationship, while others highlight limited or no significant effects.

Positive Impacts of Entrepreneurship Education

A substantial body of research indicates that entrepreneurship education enhances the entrepreneurial intentions and capabilities of university students, fostering their self-employment initiatives. Studies by Xuchen et al. (2023) in China and Brodmann, Grun, and Barouni (2016) in Tunisia suggest that entrepreneurship education improves students' skills, competencies, and entrepreneurial mindset, which in turn positively influences their intentions to start ventures. Similarly, Yunxia (2022) and Ekpoh and Edet (2011) also found that exposure to entrepreneurship education boosts students' entrepreneurial intention and abilities, supporting the notion that such education plays a crucial role in preparing graduates for entrepreneurial ventures.

Additional support for these positive impacts is seen in research conducted by Lüthje and Franke (2003), Sanchez and Sahuquillo (2017), and Hafiz and Latif (2020), which demonstrate that students' entrepreneurial aspirations and self-employment potential are enhanced through targeted entrepreneurial training. This theme is also resonated in studies by Duval-Couetil and Long (2015), Fayolle and Linan (2014), Ebewo, Rugimbana and Shambare (2017), and Lopez, Nassif and da Silva (2015), who consistently show a positive relationship between entrepreneurship education and graduate preparedness for self-employment. These findings suggest that entrepreneurship education helps university students develop the necessary skills to succeed in entrepreneurial endeavors, including risk management, innovation, and business strategy.

Conditional Success of Entrepreneurship Education

However, the success of entrepreneurship education is not without its challenges. A critical theme emerging from the literature is that the quality of teaching and the availability of training facilities are essential factors in determining the effectiveness of entrepreneurship education. Hanachor and Needom (2018) and Volkman (2004) argue that while entrepreneurship education can foster entrepreneurial intentions, its success largely depends on the pedagogical quality and resources available to students. This suggests that even in institutions where entrepreneurship programs are offered, their impact can be limited if they lack the infrastructure or are poorly designed. In addition, Yiping and Danqing (2018) further expand this by contrasting seminar-based pedagogy with traditional methods, suggesting that interactive and dynamic teaching styles may better cultivate an entrepreneurial mindset in students. Ultimately, both teaching quality and method, coupled with institutional resources, are key to shaping the entrepreneurial potential of graduates.

Contradictory Findings

Despite the predominantly positive findings, several studies indicate that entrepreneurship education may not significantly influence self-employment outcomes. Lin et al. (2023) and Oosterbeek, van Praag, and Ijseelstern (2010) found no significant effects of entrepreneurship education on the self-employment initiatives of graduates. Likewise, studies by Amaewule (2007), Ngerem and Ezikpe (2016), and Nwangwu (2007) suggest that education may not always translate into practical entrepreneurial activity as it has an insignificant effect. This suggests that while entrepreneurial education can improve knowledge and skills, other factors—such as individual motivation, access to capital, and market conditions—may play more substantial roles in determining entrepreneurial success.

In summary, the majority of studies support the notion that entrepreneurship education significantly influences university graduates' entrepreneurial intentions and venture creation initiatives, primarily by enhancing their skills and entrepreneurial mindset. However, the effectiveness of such education depends on the quality of instruction and available resources. At the same time, a smaller body of research challenges the notion that entrepreneurship education alone is a significant driver of graduate self-employment, suggesting that other external factors may be more decisive in fostering entrepreneurial outcomes. Based on the literature reviewed, the hypothesis is stated as;

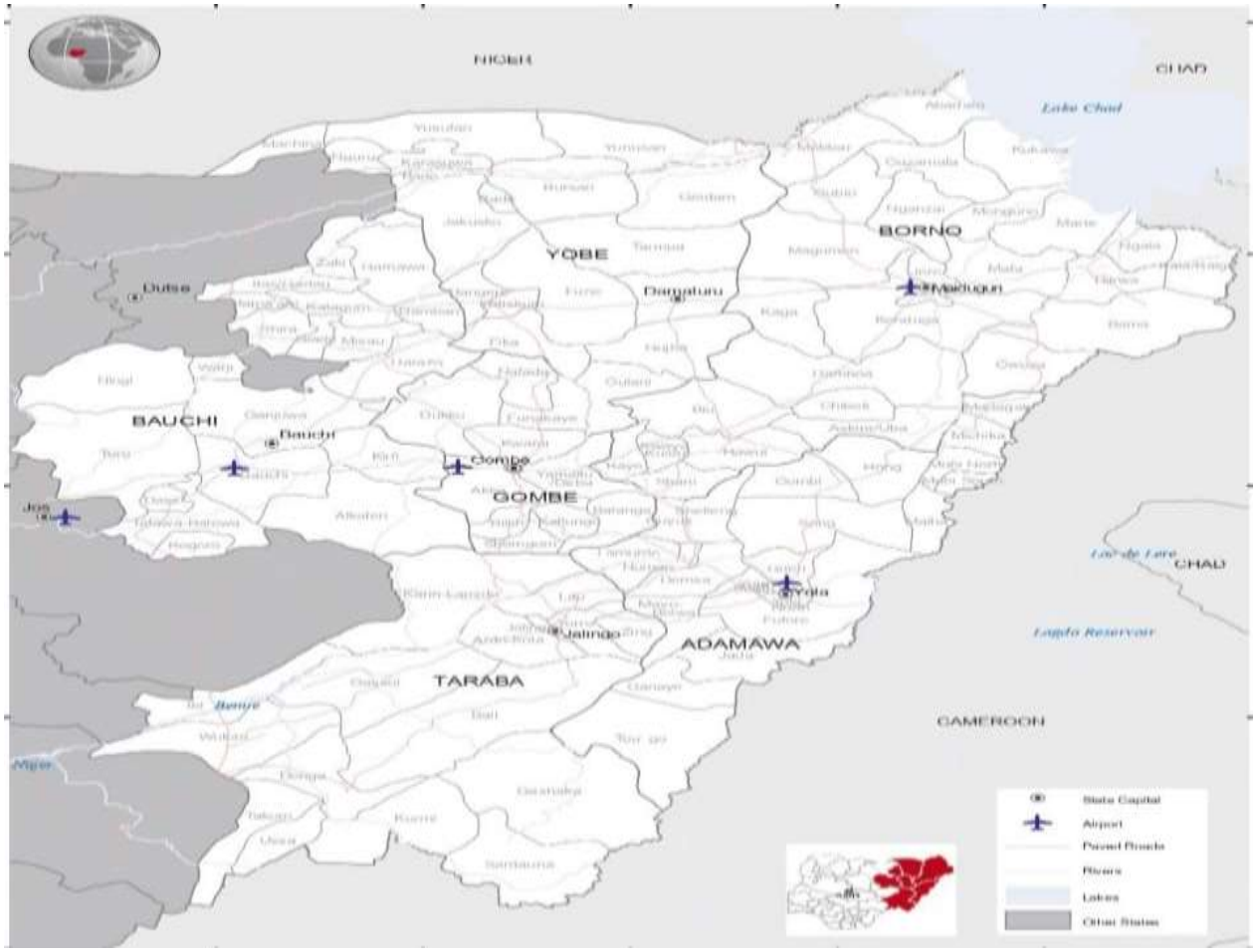
H1: Entrepreneurship education will be expected to have a significant impact on university graduates' venture initiatives.

From the literature, we observed that the most serious limitation of previous studies on entrepreneurship education is the use of only one measure of graduates' outcomes in empirical assessment. This study moves the debate further by considering more than one measure.

DATA AND METHODOLOGY

Description of Study Area

Northeast Nigeria is one of the six (6) geo-political zones in Nigeria consisting of Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe states. The zone has a population of about 30 million people (National Bureau of Statistics, 2023) and it occupies the largest landmass in the country, covering about one-third of Nigeria's total area. In terms of vegetation, the zone is dichotomised into the semi-desert Sahelian savanna and the tropical West Sudanian savanna ecoregions.



Source: United Nations Office for the Coordination of Humanitarian Affairs (2016)

Figure 1: Map of North-eastern Nigeria

The economy of Northeastern Nigeria is chiefly agrarian, with about 80% of the population engaged in agriculture (UNDP, 2017) including cultivation of grains, vegetables, and livestock farming. North east's nominal GDP was estimated at about ₦12.5 trillion (about US$28.7 billion) in 2021 (BudgIT, 2023). We have chosen the zone because it has recently suffered from significant economic and social devastation due to over a decade of *Boko Haram* terrorism. Roughly, Nigeria produces over 600,000 university graduates annually from its

various tertiary institutions, including public and private universities and about 8 percent of persons with post-secondary education was unemployed in the second quarter of 2023 (National Bureau of Statistics, 2024). While there are over 250 universities in Nigeria comprising federal, state, and private institutions; only about 20 of the universities are in North east.

Data Collection and Instrument

This study seeks to collect data directly from university graduates in the zone on their entrepreneurial experience and character, and entrepreneurship education among other things. The instrument for data collection is a structured questionnaire consisting a majority of closed-ended questions with few open-ended ones. The questions are designed in plain English to the understanding of the respondents. In drafting the questionnaire, we adapted some parts of Global Entrepreneurship Monitor (GEM) and Lüthje and Franke's (2003) questionnaires that reflect the main indicators of venture initiatives: entrepreneurial intention, perception of opportunities, perceived capabilities, fear of failure, self-starting, pro-activeness, risk taking, persistence towards obstacles, creativeness/innovativeness and so on.

Sample Size and Sampling Techniques

The target population of this study includes all university graduates in North-east Nigeria with a graduation year of at least 2008, which is a year after the introduction of compulsory entrepreneurship general study courses in Nigerian universities. The respondents are drawn from different graduates that studied different courses in different universities across Nigeria. The requirement for participation in the survey is that the respondent must be a resident of North east at the time of the study. This is to improve the inference power of the study's findings. We made efforts to obtain the official and latest figures of university graduates in Northeast Nigeria by contacting and browsing through the websites of relevant authorities in Nigeria (National University Commission, National Bureau of Statistics, Federal Ministry of Education and Joint Matriculation Board), but our efforts returned unfruitful. To this end, we conclude that the target population is indefinite or unknown. To compute a representative sample size for the study, we employ *Z* score formula for unknown population as specified in equation (1):

$$n = \frac{Z^2 P(1-P)}{e^2} \qquad (1)$$

Where *n* is the sample size; *Z* represents the critical value of a confidence level; p is the proportion of the target population in the general population; and e is the level of precision or margin of error. Taking a confidence level of 95 percent (with a *Z*=1.96), *P*=50 percent and *e*=5 percent yield a sample size (n) of 384.16≈400 for each of the three states to be surveyed. Thus, a total of 1,200 copies of the questionnaire is instead administered to reduce the rates of attrition and non-response(s) as well as other associated problems of fieldwork.

We utilize a two-stage sampling technique to draw the respondents. In the first stage, we apply both convenient and simple random sampling techniques to select three (3) of the states in the zone. Given our limited resources, we conveniently selected Bauchi and Gombe states as we could cheaply sponsor many research assistants to cover the states. For the third state, we applied a simple random technique of pick-and-obey approach and ended up with Taraba state. The selected states (Bauchi, Gombe and Taraba states) are not only representative of the region

but also of Nigeria to a large extent as they are more heterogeneous ethnically and religiously than Borno and Yobe states. Only Adamawa state is comparable to the selected states in terms of ethnic and religious heterogeneities. The second stage deals with the application of a simple random sampling technique to draw the respondents from the states' metropolises. The research assistants are deplored to important wards and public offices of the states to administer the questionnaire to any person they meet at home, in the street or office but the respondent must a university graduate.

Model Specifications, Variables' Measurements and Estimation Techniques

This study explores the impact of entrepreneurship education on university graduates' venture initiatives in North-east Nigeria. The study is underpinned by an eclectic theory consisting of a model of entrepreneurship career, social learning and planned behaviour theories as propounded by Dyer (1994), Bandura (1977) and Ajzen (1991), respectively. While these theories underscore the importance of entrepreneurship education in fostering entrepreneurial spirits through learning from experience, interaction, imitations and attitude to entrepreneurship; they implicitly acknowledge the role of personal entrepreneurial characteristics and socioeconomic characteristics. Equation (2) specifies the theoretical relationship between venture initiatives and entrepreneurship education among university graduates.

$$VEI_g = \vartheta_0 + \vartheta_1 ETK_g + \vartheta_2 EPS_g + \vartheta_3 SEC_g + \vartheta_4 PEX_g + \vartheta_5 COV_g + \mu_g \quad (2)$$

Where VEI_g stands for venture initiatives of a graduate g; ETK_g represents the graduate's level of entrepreneurship theoretical knowledge acquired, SEC_g stands for a graduate's level of satisfaction with entrepreneurship education structure; PEX_g is for personal entrepreneurial characteristics; and COV_g is a vector of controlled variables including a graduate's gender, age (in years), the time interval between the now and entrepreneurship education etc. μ_g is the error term and $\vartheta_{1\text{-}5}$ are the parameters to be estimated.

Dependent Variables: The study utilizes three (3) variables to serve as the proxies of venture initiatives: the graduate currently engaging in a business, the number of employees of the graduate's venture and the graduate's intention to create a business venture. The study creates binary dummies for whether or not a graduate currently engages in a business and for whether or not a graduate intends to start a business. A number of employees of the graduate's venture measure the size of the enterprise.

Independent Variables: The study creates indices of entrepreneurial theoretical knowledge, entrepreneurial practical skills acquired at the university and personal entrepreneurial characteristics. In the questionnaire, the study employs 12 questions (on opportunity identification, marketing, nature of business, communication skills, risk, market research, feasibility, networking, and financial management, among others) to test the graduates' depth of entrepreneurial theoretical knowledge acquired. Their responses are first binarily coded and then their summation is divided by 12. For entrepreneurial practical skills, the study generates 11 questions (on successful application of practical skills acquired, proficiency in the use of practical tools and equipment, quality control, time management, commitment to upgrading the skills, teamwork, efficient resource management etc.) to test a graduate's depth of the practical skills acquired. All these questions have ordinal responses (high, moderate, low and

very low), which are coded from 4 to 1 respectively. The index is constructed by dividing the summation of the responses by 11.

Also, an index of personal entrepreneurial characteristics by generating 10 questions (on problem-solving skills, motivation to succeed, planning, consultation, risk-taking, among other things) and questions have ordinal responses (never, rarely, sometimes, usually and always), which are coded from 1 to 5 respectively. The summation is also divided by 11 (the number of questions).

For engaging in a business, number of employees of graduate's venture and graduates' intention to create a business venture models, the study applies binary Probit regression model, which uses maximum likelihood (ML) method to estimate the probability of happening of an event as explained by changes in certain explanatory variables. Probit regression model takes it for granted that the error term has a normal distribution function (Maddala, 1992). In equation (3), the study specifies a binary probit regression model:

$$Prob(y_i = 1|x_i) = \Phi(x_i\beta + \varepsilon_i) \quad (3)$$

Where $Prob(y_i=1|x_i)$ is the probability for the graduate current engagement in business venture as induced by variations in the dependent variables (x_i); Φ is normal cumulative distribution function and n=1, 2, …, n^{th} term. β's are the parameters of the explanatory variables to be computed; and ε_i represents error term, which is $\varepsilon_i \sim IN(0, \sigma^2)$.

Given that the standard normal transformation $\Phi(\cdot)$ restricts the probability to fall between 0 and 1, equation (4) is the specification of the cumulative normal distribution for the error term of Probit regression model.

$$Prob(y_i = 1) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{Z_i} e^{S^2/2}\, ds \text{ where } Z_i = \Phi^{-1}(Prob) = x_i\beta \quad (4)$$

s is the standardized normal variable; and ds stands for density. We are majorly interested in the marginal effects of the independent variables in the estimated Probit regression model, and as such, we specify the marginal effect in equation (5):

$$\frac{\partial Prob(y_i = 1|x_i)}{\partial x_{ik}} = \frac{\partial E\{y_i|x_i\}}{\partial x_{ik}} = \Phi(x_i'\beta)\beta_k \quad (5)$$

Where ∂ is the operator for partial derivative. Equation (8) is a sort of partial effect of a variable while holding others constant.

Since the number of employees of a graduate venture is a *count* variable taking non-negative integer values, poisson and negative binomial regression models are the most appropriate models. Since negative binomial regression model provides an over-dispersion (whether or not variance is greater than mean) test, the study estimates negative binomial regression model unless the test suggests otherwise. Negative binomial regression is an econometric method used mainly to model count data, especially when the data exhibit over-dispersion. This regression technique is an extension of Poisson regression that assumes equality between mean and variance of the count data. The models is computed using *Maximum Likelihood* (ML) method

not ordinary least square (OLS) method (Verbeek, 2004). Equation (6) specifies negative binomial regression model:

$$Prob(y_i|x_i) = E\{y_i|x_i\} = \exp\{x_i'\beta + \varepsilon_i\} = \exp\{x_i'\beta\} \text{ since } E\{\varepsilon_i\} = 0; \ \& \ \varepsilon_i \sim IN(0, \sigma^2) \quad (3)$$

Where y_i is the number of employees of the graduate venture; x_i is a vector of dependent variables; ε_i is an error term; and β's are the parameters to be computed.

PRESENTATION AND DISCUSSION OF RESULTS

Table 1 presents the characteristics and distribution of the respondents suggesting how representative the sample is. The table reveals that male graduates dominated the sample as around 67 percent of the respondents are male. In the table, most of the graduates surveyed (78.42 percent) currently engage in business venture. Vast majority of them have an intention to start a new business venture (90.37 percent). More than 70 percent of the graduates are satisfied with the entrepreneurship education curriculum at the universities

Table 1 suggests that the graduates surveyed mostly studied art, management and social science courses (48.6 percent), followed by those who studied science courses (30.1 percent), education courses (8.7 percent), technical and engineering courses (7.7 percent), medical and para-medical courses (4.1 percent), and law courses (0.96 percent).

Table 1: Socioeconomic Distribution of the Respondents

	Dummy Variables			
Variables	**Category**		**Frequency**	**Percentage**
Gender	Female		348	33.53
	Male		690	66.47
Graduate Current Business Engagement	Yes		814	78.42
	No		224	21.58
Graduate Business Intention	Yes		938	90.37
	No		100	9.63
Satisfaction with Entrepreneurship Education Structure	Very Satisfied		342	32.95
	Satisfied		390	37.23
	Neutral		148	14.41
	Dissatisfied		106	10.21
	Very Dissatisfied		54	5.20
Disciplines	Arts, Management & Soc. Scie.		504	48.55
	Education		90	8.67
	Law		10	0.96
	Medicine & Para-medics		42	4.05
	Sciences		312	30.06
	Technical & Engineering		80	7.71
	Continuous Variables			
	Mean	Standard Deviation	Minimum	Maximum

Number of Employees	4.109	2.976	0	25
Age (Years)	28.294	4.787	17	70
Year-Interval	4.161	2.298	0	13
Entre. Knowledge Index	0.711	0.539	0	1
Entre. Practical Skills Index	3.117	0.545	1	4
Person Entre. Characteristics	3.577	0.814	0	5

Source: Authors' computations

The average number of employees of graduate enterprises is 4 (US$110.04), with some enterprises having as small as no employees while others have as many employees as 25. This means the graduate enterprises are small in nature. The table further shows that the average age of the respondents is approximately 28.3 years and the youngest among them is 17 years old while the oldest is 70 years old. Average time interval from the year of attending the entrepreneurship education is 4.2 years, suggesting the graduates are virtually afresh with entrepreneurial knowledge and practical skills acquired. In Table 1, the graduates reported to have acquired 71.1 percentage of the entrepreneurial knowledge on average. The graduates appear to have acquired reasonable levels of entrepreneurial practical skills and personal entrepreneurial characteristics.

Table 2: Effects of Entrepreneurship Education on Graduate Venture Engagement & Expansion

Currently Engaging/	Probit Marginal Effects			Negative Binomial		
Venture Size	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.003	0.003	0.002	0.007	0.008*	0.009*
	(0.002)	(0.002)	(0.002)	(0.005)	(0.004)	(0.004)
Male	0.001	0.001	-0.009	0.199***	0.197***	0.160***
	(0.028)	(0.028)	(0.028)	(0.053)	(0.053)	(0.050)
Year-distance	0.005	0.004	0.003	0.003	0.004	0.007
	(0.006)	(0.006)	(0.006)	(0.013)	(0.014)	(0.013)
Entre. knowledge	-0.105***	-0.096***	-0.089**	0.213***	0.205**	0.210**
	(0.037)	(0.034)	(0.035)	(0.082)	(0.082)	(0.084)
Satisfied with Edu. Struc.		0.043***	0.041***		-0.020	-0.022
		(0.011)	(0.011)		(0.029)	(0.028)
Entre. Practical skills	0.033*	0.002	-0.010	0.256***	0.270***	0.256***
	(0.019)	(0.021)	(0.022)	(0.047)	(0.052)	(0.052)
Personal Entr. Charac.	0.027*	0.021	0.017	0.025	0.026	0.017
	(0.015)	(0.015)	(0.015)	(0.035)	(0.035)	(0.035)

Technical & engineering			0.147**			0.082
			(0.59)			(0.129)
Sciences			0.077**			-0.028
			(0.038)			(0.083)
Arts, mgt. & social scie.			0.106***			0.138*
			(0.035)			(0.079)
lnalpha (Over-dispersion)				-1.792***	-1.795***	-1.822***
				(0.171)	(0.169)	(0.163)
Wald chi2	333.0***	347.4***	337.2***	3229.1***	3319.4***	3745.3***
Hat-squared	0.033	0.070	-0.305	-0.113	-0.044	-0.020
	(0.167)	(0.163)	(0.349)	(0.374)	(0.348)	(0.327)
Pseudo-R^2	0.014	0.027	0.044	0.004	0.005	0.006
Observations	1,038	1,038	1,018	814	814	800

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

In Table 2, entrepreneurial knowledge acquired significantly reduces the likelihood for a graduate to currently engage in any business activity by 9-11 percentage points in models 1-3. This finding contradicts those of Nbebe (2019), Sanchez and Sahuquillo (2017) and Xuchen et al (2023). The possible explanations for this could be the mismatch between theories of entrepreneurship and markets as the theories concentrate much on ideal or optimal conditions for creating a business, including having large capital, a wide network, or a well-defined market, while the reality is far from being ideal. When depicting the challenges of entrepreneurship, entrepreneurial theory usually exaggerates the risks and uncertainties surrounding the process of setting up a business. This could overwhelm graduates and become more risk-averse to starting a venture. Interestingly, the level of entrepreneurial practical skills acquired enhances the chances for a graduate to currently engage in a business venture (see model 1 in Table 2). This has further corroborated the argument for a mismatch between theory and reality. This finding echo those of Ebewo, Rugimbana and Shambare (2017) and Lima et al. (2015). Practical skills enable the graduates to benefit from learning by doing, to develop a problem-solving mindset, and become more confident and flexible in their entrepreneurial endeavours.

As expounded by planned behaviour theory, individuals' positive attitude to and perception of entrepreneurship could incentivise them to become entrepreneurs themselves. In same token, the graduates' level of satisfaction with the structure of entrepreneurship education significantly increases their probability to engage in a venture by 4.3 percentage points currently. When we control for broad areas of study, only entrepreneurial theoretical knowledge and level of satisfaction with the structure of entrepreneurship education remain consistently significant with the same signs and slightly smaller marginal effects (see model 3 in Table 2).

Table 2 further reveals that both entrepreneurial theoretical knowledge and entrepreneurial practical skills acquired are expected to significantly increase the number of graduate venture employees by 21 and 27 percentage points, respectively (see model 4-6). Over-dispersion test reveals the presence of over dispersion, making negative binomial regression model more appropriate than Poisson regression model. The knowledge and the skills are both important

for the graduate to expand their business as they enable the graduate entrepreneurs to be strategic in decision-making, innovative and adaptive, to network and collaborate, and to efficiently manage their resources for market expansion.

Table 3 depicts that while entrepreneurial theoretical knowledge lowers the chances for a graduate to have intention to start a business; entrepreneurial practical skills raise the likelihood for a graduate to have intention to start a business. As under current business engagement model, same explanations could be advanced for the findings. Theoretical knowledge could lead to a mismatch between theories of entrepreneurship and markets and overstressing the risks and uncertainties associated with setting up a business. Practical skills, through learning by doing, problem-solving mindset, and boosting of confidence and flexibility, motivate graduates to become entrepreneurs.

Deduced from the findings, entrepreneurial theoretical knowledge and entrepreneurial practical skills are more effective for business expansion than for venture engagement and intentions among the university graduates. For the graduates to appreciate and utilise what they have been taught, they should have some level of business experience. The business experience allows the graduates to bridge the gap between theories and realities, thereby filtering the knowledge based on the applicability and context.

Table 3: Probit Marginal Effects of Entrepreneurship Education on Graduate Venture Intention

Venture Intention	**(1)**	**(2)**	**(3)**
Age	-0.005***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)
Male	0.002	-0.001	-0.002
	(0.017)	(0.016)	(0.015)
Year-distance	-0.002	-0.003	-0.003
	(0.003)	(0.003)	(0.003)
Entre. knowledge	-0.016*	-0.013	-0.015**
	(0.010)	(0.008)	(0.007)
Satisfied with Edu. Struc.		0.035***	0.036***
		(0.005)	(0.006)
Entre. Practical skills	0.063***	0.034***	0.038***
	(0.011)	(0.011)	(0.011)
Personal Entr. Charac.	0.045***	0.038***	0.043***
	(0.009)	(0.008)	(0.008)
Technical & engineering			-0.026
			(0.030)
Sciences			-0.048**
			(0.023)
Arts, mgt. & social scie.			-0.068***
			(0.020)
Wald chi2	545.3***	485.4***	505.2***
Hat-squared	0.305*	-0.206	-0.097
	(0.179)	(0.132)	(0.123)
Pseudo-R^2	0.139	0.190	0.200
Observations	1,038	1,038	1,018

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Conclusion and Recommendations

In conclusion, the study highlights the effectiveness of entrepreneurship education in fostering entrepreneurial spirit and skills among graduates. A balanced approach combining theoretical knowledge with practical skills development empowers graduates to navigate the theory-practice gap. While theoretical knowledge alone may deter entrepreneurial intentions, practical skills acquired through hands-on experience, problem-solving and confidence-building motivate graduates to start businesses. Integrating theoretical and practical aspects unlocks entrepreneurial potential, driving business growth and economic development.

To harness this potential, the study recommends that government support should prioritize funding, tax incentives and business-friendly policies that foster a conducive entrepreneurial ecosystem, enhance access to finance, mentor-ship and networking opportunities and empower graduates to become successful entrepreneurs and job creators. Policymakers and educators should revise the entrepreneurial curricula to balance theoretical and practical elements, integrating internships, apprenticeships, mentor-ship programs and startup incubators. This experiential learning will enable graduates to apply concepts in real-world settings, filter knowledge by applicability and develop skills for effective business expansion, ultimately driving entrepreneurial growth, job creation and economic prosperity. In a nutshell, the study emphasized the critical role of entrepreneurship education in fostering a vibrant entrepreneurial ecosystem and recommends a collaborative effort between policymakers, educators, and stakeholders to create a supportive environment that empowers graduates to drive economic growth, innovation and prosperity. In line with the findings, the study proffers the following recommendations:

1. Entrepreneurship education curricula should regularly be refined and updated to ensure relevance, effectiveness and high students' satisfaction. Also, to increase female participation in entrepreneurship education, targeted initiatives should be implemented such as scholarships specifically for women, mentor-ship programs (pairing female students with successful female entrepreneurs) and gender-specific entrepreneurship training that will address unique challenges faced by women. These initiatives will ensure equal opportunities and foster a more inclusive entrepreneurial ecosystem.
2. Entrepreneurship education should integrate experiential learning, incorporation of real-world examples, case studies of successful and failed businesses, and field trips to entrepreneurial hubs and incubator centres. This practical approach will provide students with hands-on learning experience that will foster an entrepreneurial mindset and skills, improve critical thinking abilities, and foster a culture of creativity and innovation.
3. Entrepreneurship education programs should be tailored to various academic backgrounds, including art, management, social science, science, engineering and medical fields. This will enable graduates to apply entrepreneurial principles to their respective domains.
4. Students from diverse disciplines, such as the arts, management, and sciences, should be united to create novel business solutions, leveraging the power of collective creativity and expertise. Regular assessments of entrepreneurship education programs should be carried out from time to time so as to identify areas for improvement. This can involve incorporating feedback from graduates, industry experts and employers to ensure the curriculum remains relevant and effective.
5. Higher institutions of learning should organise regular networking events and foster industry connections to encourage collaboration, knowledge exchange and business opportunities between graduate entrepreneurs, professionals and industry experts.
6. To foster a robust entrepreneurial ecosystem, higher institutions of learning should

establish a collaborative network that will be focused on exchanging best practices in entrepreneurship education, co-developing projects, initiatives and advancing research and innovation. This collaborative effort will help promote entrepreneurship, drive economic growth and enhance regional development.

Author's Contributions

Adamu Jibir, Musa Abdu, Fatima Bala and Farida Bello developed the study idea, designed, analyzed and interpreted the data. The authors also wrote the final draft of the article. All the authors have participated in critically reviewing the article and approved the final draft for publication.

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