

Effect Of Entrepreneurship Education On The Performance Of Small And Medium Enterprises (SMEs) In The Manufacturing Sector In North Central Nigeria

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Abstract

This study examines the effect of entrepreneurship education on the performance of small and medium enterprises (SMEs) in the manufacturing sector in North Central Nigeria. The population consists of 54,657 SMEs, with a sample size of 397 determined using the Taro Yamane formula. Data was collected using a structured questionnaire, and both content and construct validity tests confirmed the validity of the instrument. The reliability of the instrument, measured by Cronbach's Alpha, is 0.868, indicating a high level of consistency. The study employed logit regression models to assess the effect of various types of skills training; technical, managerial, innovative, business networking, and financial on two performance metrics: sales growth (SGT) and quality of service delivery (QSD). The results revealed that innovative skills training ($B = 0.698$, $p = 0.044$, $Exp(B) = 2.010$) and financial skills training ($B = 0.085$, $p = 0.003$, $Exp(B) = 1.089$) have a significant positive effect on sales growth, while technical skills training ($B = -0.826$, $p = 0.128$, $Exp(B) = 0.438$) and managerial skills training ($B = 0.015$, $p = 0.974$) show no significant impact. For quality of service delivery, innovative skills training ($B = 1.184$, $p = 0.000$, $Exp(B) = 3.268$) also emerged as a critical factor, while technical skills training ($B = -2.461$, $p = 0.017$, $Exp(B) = 0.085$) had a significant negative impact. The study concludes that innovative and financial skills training are crucial drivers of improved sales and service quality, while technical and managerial skills show limited direct influence. It recommends a balanced approach to training, prioritizing skills that align with specific performance goals.

Keywords: Entrepreneurship Education, SMEs performance, Sales Growth, Service Delivery, Nigeria

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I. Introduction

The geometrical population growth and the limited economic resources as well as the gaps in government coordination of economic activities and allocation of the scarce resources has given rise to entrepreneurial undertakings. Marina, Rocha & Edson (2022) advanced the importance of entrepreneurship education that, it is derived from the importance of the entrepreneurs to the economic system. In the same manner Mpunga (2021) states that entrepreneurship is a permanent concern in most countries, since new and small firms are the major contributors to new jobs, wealth creation, self-employment, viable and sustainable economy. Globally, countries like Malaysia and several European nations have also recognized the pivotal role of entrepreneurship education in national development. Malaysia, aiming for industrialization by 2030, considers entrepreneurs vital for increasing productivity and maintaining a competitive edge in the global market (Mpunga, 2021). Leo (2018) identifies three categories of entrepreneurship education: "about enterprise" (awareness creation), "for enterprise" (preparation for self-employment), and "in enterprise" (training for established entrepreneurs). Emezue (2020) submit that performance is about achieving the goal entirely, while the level/degree of goal(s) attainment is just the progress carried out by the organization towards its final aim, and we take this level of goal attainment to be a level of performance.

Statement of the Problem

The development of small and medium enterprises in Nigeria has received lately more attention in comparison with other aspects of the economic processes. Small and medium enterprises have a key role to play in the restructuring economies. The establishment of a broad ownership through the development of

independent commercial enterprises, a good number of which are small and medium enterprises, creates the social basis for a competitive economic system. Small and medium enterprises, moreover, are absorbing a considerable proportion of the labour force released by state firms in their adaptation to the new economic system. The fact remains that in recent times, governments in developing economies have introduced a number of programmes and interventions aimed at improving entrepreneurship skills (innovative skills, technical skills, financial skills, managerial skills and networking skills) in order to boost small and medium enterprises (SMEs) performance (consistent increase in employment, output (volume), sales (value), business expansion, business assets, profit, quality service delivery, effectiveness and efficiency). According to Wanyoike and Kithae, (2019) networking capability has four dimensions namely coordination, relational skills, partner knowledge, and internal communication. SMEs are unable to achieve their goals by themselves, they need support and resources from external factors such as other firms, supporting institutions and relatives and friends. Networks are representative of the value at the company level and customers are the focal point of networks, ultimately resulting in value creation for any business, therefore, network relationships allow entrepreneurs to identify opportunity and resources rapidly (Wanyoike & Kithae, 2019). According to Otinga *et al.* (2016), business networking has a direct positive significant relationship with performance of SMEs. The idea of networking is powered by the fact that firms cannot survive and prosper solely through their individual effort, and that each firm's performance depends upon the activities and performance of others (Human & Naude, 2015).

Objectives of the Study

The main objective of the study is to examine the effect of entrepreneurship education on performance of manufacturing small and medium enterprises in the North Central Nigeria. The specific objectives of the study

- i. Ascertain in what ways the exposure to technical skills training of staff of small and medium enterprises result in increased sales growth of their businesses.
- ii. Examine the extent to which the exposure to technical skills training of staff of small and medium enterprises result in quality service delivery of their business.
- iii. Determine the extent to which managerial skills training of the managers of small and medium enterprises lead to increase sales growth of their businesses in North Central Nigeria.
- iv. Ascertain the extent to which managerial skills training of the managers of small and medium enterprises lead to increase quality service delivery of their business.
- v. Determine the extent to which innovative skills training of small and medium enterprises lead to increase sales growth of their businesses in North Central Nigeria.
- vi. Assess the extent to which innovative skills training of small and medium enterprises lead to increase quality service delivery of their business in North Central Nigeria.
- vii. Examine the extent to which business networking skills training of small and medium enterprises lead to increase sales growth of their businesses in North Central Nigeria.
- viii. Determine the extent to which business networking skills training of small and medium enterprises lead to increase quality service delivery of their business in North Central Nigeria.
- ix. Investigate the effect of financial skills training of small and medium enterprises lead to increase sales growth of their businesses in North Central Nigeria.
- x. Ascertain the effect of financial skills training of small and medium enterprises lead to increase quality service delivery of their business in North Central Nigeria.

The hypotheses were formulated to align closely with the specific objectives of the study, ensuring that each hypothesis directly addresses a particular aspect of the research questions. This alignment not only enhances the coherence of the research framework but also facilitates a clearer interpretation of the results in relation to the study's goals.

II. Literature Review

Conceptual Review

Concept of Entrepreneurial Education

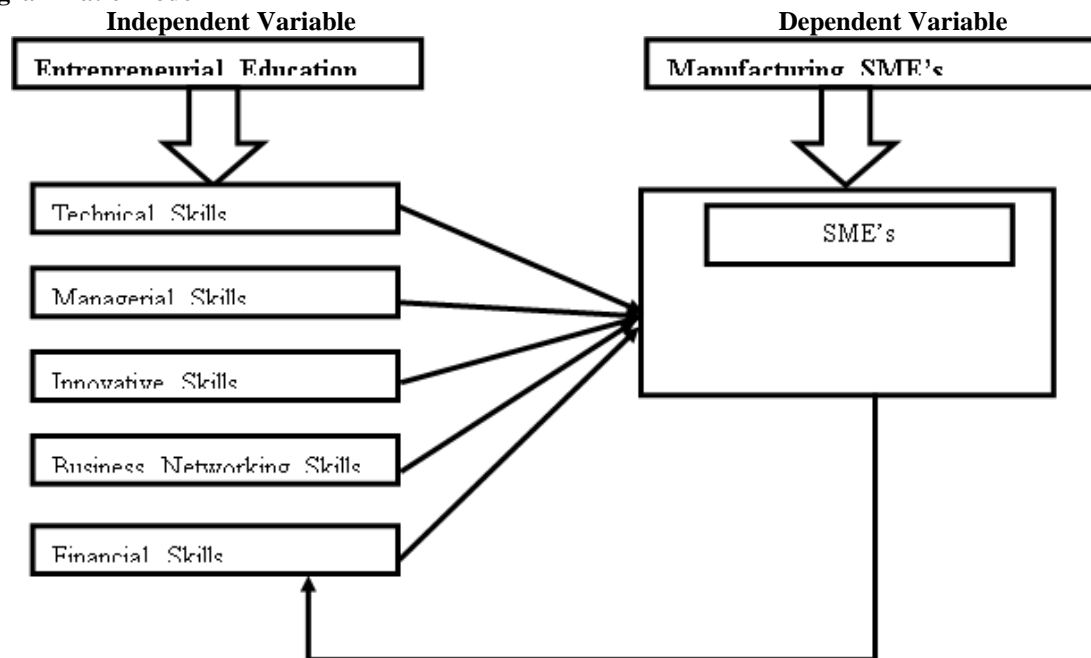
Doan and Sung (2018) defined entrepreneurship education as teaching individuals to begin new organizations effectively, ensure it makes a profit, and accordingly contribute to economic development. That is why Bécharde and Grégoire (2005) contented that entrepreneurship education is a program or course focused on introducing business learning and business creation strategy, aimed at preparing people to engage in startup ventures. While Unachukwu, (2009) observed that entrepreneurship education is the training for innovations and advancement, Nwokike, (2016) comprehended entrepreneurship education as the training that distinguishes how to identify business opportunities, assets distributions, risk administration, and new business creation. Ronge (2002) entrepreneurship education is the study of source of opportunities and process of discovery in

which an individual endeavors, ability of creativity, risk taking, can turn their ideas into action (Ronge, 2002). Entrepreneurship education provides entrepreneurs motivation, knowledge and skills essential for launching a successful venture company (Amaechi, 2007). There are many other dimensions of entrepreneurship education targeted at small and medium enterprises performance such as: customer intensity, resource leveraging, value creation, innovativeness, proactiveness, risk taking, and opportunity focus and so on. However, for the purpose of the study, entrepreneurship education is restricted to; technical skills training, managerial skills training, innovative training, business networking training and financial skills training as advanced by Paolucci, Sansone and Fiore (2019). Technical skills training is vital for businesses to stay competitive amid rapid market changes and evolving technology. Managerial skills are critical for effectively guiding a firm’s resources and achieving organizational objectives, particularly in small and medium enterprises (SMEs). Business networking is a vital strategy for enhancing communication, collaboration, and problem-solving within organizations. Research indicates that factors such as business longevity and manager education influence small firms’ decisions to join formal networks. Financial literacy is crucial for small and medium enterprises (SMEs), enabling entrepreneurs to adapt to economic changes, improve creditworthiness, and enhance performance.

Concept of Small and Medium Enterprises Performance

The performance of small and medium enterprises (SMEs) involves consistently enhancing measures of success, primarily through increasing revenue or profitability. Strategies such as market penetration, product expansion, and diversification are commonly employed to drive growth. A successful enterprise generates positive cash flows that outpace the broader economy, allowing for reinvestment and further development. Business performance can be assessed not only in terms of financial metrics but also through qualitative aspects like customer goodwill and market share.

Diagrammatic Model



Conceptual Model Representation of Variables (Entrepreneurship Education and manufacturing small and medium enterprises Performance)

Source: Adopted from Gold *et al*; (2001); and Shiaw-Tong *et al* (2016) and modified to suite the study context.

Theoretical Review

Resource-Based View Theory

The Resource-Based View (RBV), introduced by Barney (1991) and expanded by Njeru (2013), focuses on how unique firm resources influence growth and competitive advantage. RBV suggests that organizations can outperform rivals by developing rare and valuable resources that are difficult to replicate (Ogbonna & Ogwo, 2013). Resources encompass assets, processes, and capabilities. Effective performance arises when these resources align with the firm's strategy, allowing sustainable growth and performance superiority.

Industrial Organization Theory

Industrial Organization Theory, as proposed by Zou and Cavusgil (1995), highlights the impact of external market forces on competition and firm performance. While external factors are important, internal characteristics also play a critical role. Porter (2008) suggests that industry structure significantly influences competitive strategies. Knight and Dalgic (2000) emphasize that industry structure shapes competitive rules, supported by Lada (2009). The five competitive forces model illustrates how these dynamics affect firm performance, particularly for small and medium enterprises.

The Social Contract Theory

The Social Contract Theory posits that civil society and the state emerge from an agreement among individuals to create a governed collective. Developed by philosophers like Hobbes, Locke, and Rousseau, the theory asserts that state legitimacy derives from this societal contract. Rooted in natural law, it emphasizes governments' duty to ensure citizens' welfare while requiring compliance with laws. This framework underpins initiatives like entrepreneurship programs in Nigeria aimed at promoting economic development.

Review of Empirical Studies

Adwoman (2024) highlighted the positive effects of specific entrepreneurship training on sales growth among SMEs in Ghana, showing that innovative, marketing, and financial literacy training significantly enhanced sales, while technical and managerial skills training did not yield significant results. Similarly, Emezue (2020) emphasized that employee training is crucial for enhancing the performance of manufacturing SMEs in Enugu State, Nigeria, identifying infrastructure and vocational training deficiencies as barriers to effective entrepreneurship education. Ogaba and Laven (2022) focused on the challenges faced by youth in North Central Nigeria, noting that vocational training and skill acquisition are vital for SME development, while Kumar and Kumar (2015) underscored the need for proactive policy interventions to foster an entrepreneurial culture in Nigeria. Afolabi and Kareem (2017) found that entrepreneurship education positively influenced self-employment initiatives among science and technology students, recommending collaborations with entrepreneurs for practical training.

Several studies examined the broader impact of entrepreneurship on economic growth and development. Isiaka et al. (2017) highlighted that many SMEs fail due to inadequate resources and market research, while Akinbola and Popoola (2022) found that ethical training enhances entrepreneurial performance. Saidi (2016) identified a significant relationship between entrepreneurship education and SME performance, urging government interventions. Tende (2014) evaluated government initiatives but noted that credit policies lacked significant influence on entrepreneurial development. Studies by Omorala (2018), Niskanen and Niskanen (2007), and Brown, Earle, and Luper (2004) explored various factors influencing SME growth, emphasizing the need for innovative skills and access to credit. Yasmin (2013) and Osogwu and Anah (2017) found correlations between vocational training and employment generation, while Haibo and Gerrit (2009) examined individual, organizational, and environmental factors affecting firm growth in the Netherlands. Collectively, these studies reveal a consistent theme: targeted entrepreneurship education and skills training are crucial for fostering SME growth and enhancing economic performance, yet many face barriers such as inadequate infrastructure, poor policy frameworks, and insufficient training programs.

The gap in the study is found in lack of entrepreneurial education to MSMEs where the current study is addressing through the entrepreneurship education, in another study, the gap in the study is that the Entrepreneurship Development Centers (EDC) responsible for entrepreneurship training was not included in the study.

III. Methodology

Research Design

The research study adopted a survey research design which follows a quantitative methodology. Quantitative data in this study mean a measurement where numbers are used to represent the phenomenon being studied. A survey research method was adopted because the study investigated thoughts, feelings, and opinions about manufacturing small and medium enterprises owner's entrepreneurship education and the effect of the training on business performance by collecting primary data from the targeted respondents.

Nature and Source of Data

The data is purely primary data in nature because it is a firsthand opinions or facts to be elicited from respondent. The source of data for the study is primary (field work that the data was gathered from first-hand using questionnaire). The data for the study is primary data that would be collected with questionnaire.

Population of the Study

The target population of the study is fifty four thousand six hundred and fifty seven (54,657) SMEs owners that received training from SMEDAN in state capitals in the states within North Central Nigeria;

Table 1 Individual State Population of Trained SMEs Owners

S/No	State	Population
1.	Kwara	10, 082
2.	Kogi	8, 323
3.	Benue	10, 164
4.	Niger	9, 846
5.	Plateau	8, 418
6.	Nasarawa	7, 824
	Total	54, 657

Source: Researchers Tour at SMEDAN Offices in the North Central Nigeria, 2023

Sample and Sampling Techniques

The technique that was used for sample size selection is Taro Yamane (1967) formula:

$$n = \frac{N}{1 + N(e)^e}$$

Where:

n is required sample size,

N is required research population, and

e is tolerable error in judging the population.

For the purpose of this study 5% tolerable error was allowed. Therefore, using the above formula we have;

$$n = \frac{54,657}{1 + 54,65(0.05)^2}$$

$$n = \frac{54,657}{136.6425}$$

$$n = \frac{54,657}{137.6425}$$

$$n = 397.0939$$

n = 397 (Approximately)

Therefore, the sample size for the study was 397.

The Bowley’s 1964 proportional population allocation formula was used in calculating the individual sample size of small and medium enterprises owners according to the state.

The formula is:

Where:

nh is number of units allocated to each state,

n is total sample size,

Nh is number of population in each state

N is population size

Applying this formula, we have;

Kwara State

$$nh = \frac{10,082 \times 397}{54,657} = 73 \text{ (approximately)}$$

Kogi State

$$nh = \frac{8,323 \times 397}{54,657} = 61 \text{ (approximately)}$$

Benue State

$$nh = \frac{10,164 \times 97}{54,657} = 74 \text{ (approximately)}$$

Niger State

$$nh = \frac{9,846 \times 397}{54,657} = 72 \text{ (approximately)}$$

Plateau State

$$nh = \frac{8,418 \times 397}{54,657} = 61 \text{ (approximately)}$$

Nasarawa state

$$nh = \frac{7,824 \times 397}{54,657} = 56 \text{ (approximately)}$$

The questionnaire was distributed purposely through the use of the table of random sampling to the respondents across the states.

Instrument of Data Collection

The questionnaire served as the primary research instrument for data collection, essential for achieving the study's objectives. This method is justified as the research relies on cross-sectional data, focusing on people's attitudes, beliefs, and behaviors. A structured self-administered questionnaire was delivered in person by the researcher or field assistants, allowing for clarifications. It utilized a four-point Likert scale, measuring responses from strongly agree (4) to strongly disagree (1), to gather primary data effectively.

Validation of Research Instrument

Validity measures how well a research instrument assesses what it intends to measure. This study employed both content and construct validity tests. Content validity was established through expert opinions from five senior university lecturers in business management specializing in entrepreneurship education. Construct validity was examined via factor analysis, utilizing Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity to ensure sampling adequacy. A pilot test with 30% of the sample confirmed the instrument's validity and reliability.

Table 2: Kaiser-Meyer-Olkin and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.938
Bartlett's Test of Sphericity	Approx. Chi-Square	15.257
	df	21
	Sig.	.001

Source: SPSS Version 26 Result, 2024

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy resulted in 0.938, indicating that the instrument for measuring the effect of entrepreneurship education on the performance of manufacturing SMEs in North Central Nigeria is highly suitable for factor analysis, with a KMO value above 0.90 deemed "marvelous." This suggests strong correlations among variables such as Sales Growth and Financial Skills Training. Additionally, Bartlett's Test of Sphericity yielded a significant Chi-Square value of 15.257 and a p-value of 0.001, confirming that the correlations between variables are statistically significant and supporting the KMO result. Together, these findings validate the instrument's ability to accurately capture the relationship between entrepreneurship education and SME performance, enhancing the study's credibility.

Table 3: Communalities

	Initial	Extraction
SGT	1.000	0.761
QSD	1.000	0.963
TST	1.000	0.835
MST	1.000	0.778
IST	1.000	0.851
BNT	1.000	0.903
FST	1.000	0.784

Source: SPSS Version 26 Result, 2024

Legend: SGT = Sales Growth, QSD = Quality of Service Delivery, TST = Technical Skills Training
MST = Managerial Skills Training, IST = Innovative Skills Training, BNT = Business Networking Training,
FST = Financial Skills Training

The communalities table from the Principal Component Analysis (PCA) shows the variance explained by extracted factors for each variable. Initial values for all variables are 1.000, indicating total variance, while extraction values reveal actual proportions. Sales Growth (SGT) has a communality of 0.761, indicating 76.1% variance explained, and Quality of Service Delivery (QSD) shows an exceptionally high 0.963 (96.3%). Other strong values include Technical Skills Training (TST) at 0.835, Managerial Skills Training (MST) at 0.778, Innovative Skills Training (IST) at 0.851, Business Networking Training (BNT) at 0.903, and Financial Skills Training (FST) at 0.784. These high extraction values affirm the validity of the instrument in measuring the effects of entrepreneurship education on SME performance in North Central Nigeria.

Table 4: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.491	21.295	21.295	1.491	21.295	21.295	1.323	18.896	18.896
2	1.281	18.301	39.596	1.281	18.301	39.596	1.234	17.622	36.518
3	1.069	15.267	54.863	1.069	15.267	54.863	1.191	17.017	53.535
4	1.010	14.422	69.285	1.010	14.422	69.285	1.103	15.750	69.285
5	.842	12.026	81.311						
6	.775	11.067	92.378						
7	.534	7.622	100.000						

Extraction Method: Principal Component Analysis.

Source: SPSS Version 26 Result, 2024

Legend: SGT = Sales Growth, QSD = Quality of Service Delivery, TST = Technical Skills Training, MST = Managerial Skills Training, IST = Innovative Skills Training, BNT = Business Networking Training, FST = Financial Skills Training

The Total Variance Explained table highlights the validity of the instrument measuring entrepreneurship education's effect on the performance of manufacturing SMEs in North Central Nigeria. Four components exhibit eigenvalues greater than 1, indicating their significant contribution to variance explanation. The first component has an eigenvalue of 1.491, accounting for 21.29% of the variance, while the second explains 18.30%. Together, these first two components explain 39.60%. The third and fourth components further contribute 15.27% and 14.42%, respectively, leading to a cumulative explained variance of 69.29%. After rotation, the variance distribution changes slightly, with the first component now explaining 18.90% and the fourth 15.75%. This substantial cumulative percentage suggests that the four components adequately capture the variance in the data, validating the study's constructs.

While components five to seven explain less overall variance—12.03% for the fifth and less than 11% for the sixth and seventh—excluding them could overlook important information. Although their contributions are smaller, these components may address specific aspects of SME performance not captured by the primary components. Therefore, retaining all constructs is vital for a comprehensive analysis, ensuring that the multifaceted effects of entrepreneurship education on SME performance are fully considered. The findings underscore the instrument's robustness and reliability, highlighting the importance of including all dimensions for an accurate understanding of the factors influencing SME performance in the region.

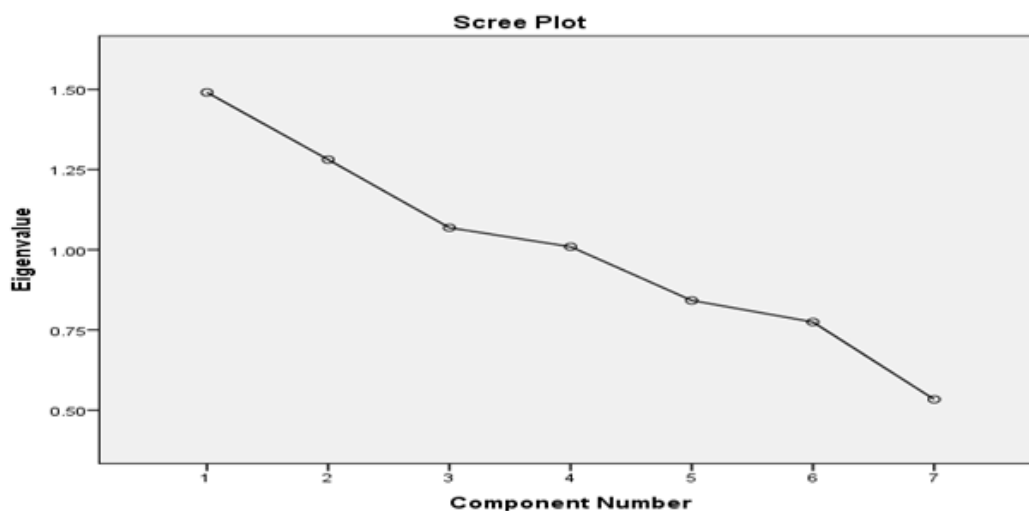


Figure 1: Scree plot

The scree plot in Figure 1 illustrates the eigenvalues of the components against their respective numbers, aiding in determining the number of factors to retain for analysis. A steep decline in eigenvalues for the first four components indicates they explain a significant portion of the variance, as their eigenvalues exceed 1. However, the remaining components have eigenvalues close to 1, suggesting they also capture meaningful variance that should not be overlooked. Retaining all constructs is crucial for instrument validity, as the first four components, while capturing the majority of variance, may miss subtle yet critical aspects of entrepreneurship education's effect on SME performance. Excluding components like Business Networking Training (BNT) and Financial Skills Training (FST) could lead to an incomplete understanding of the factors influencing SME performance. Therefore, including all seven constructs ensures a comprehensive analysis and enhances the instrument's validity.

Reliability of Research Instrument

Table 5: Reliability Statistics

Variable	Code	Cronbach's Alpha
Sales Growth	SGT	.930
Quality of Service Delivery	QSD	.879
Technical Skills Training	TST	.898
Managerial Skills Training	MST	.860
Innovative Skills Training	IST	.831
Business Networking Training	BNT	.860
Financial Skills Training	FST	.820
Overall Cronbach Alpha Coefficient		.862

Source: SPSS Version 26 Result, 2024

The reliability analysis for Sales Growth (SGT) yields a Cronbach's Alpha value of 0.930, indicating a very high level of reliability and strong internal consistency among the items measuring this variable. A value above 0.9 suggests that the responses regarding sales growth are dependable and reflect a coherent construct. This high reliability signifies that SGT significantly contributes to explaining the effect of entrepreneurship education on SME performance, reinforcing its importance in the study. Quality of Service Delivery (QSD) and Technical Skills Training (TST) also demonstrate excellent reliability with Cronbach's Alpha values of 0.879 and 0.898, respectively, indicating that these constructs produce consistent results and are well-aligned. Other variables, including Managerial Skills Training (MST) and Business Networking Training (BNT), have values of 0.860, while Financial Skills Training (FST) is at 0.820. Although these values are slightly lower, they still reflect good internal consistency. Overall, the high Cronbach's Alpha scores across the constructs validate the instrument used in the study, ensuring that it effectively captures the various dimensions of entrepreneurship education and its impact on SME performance in North Central Nigeria, thus supporting the reliability of the data for further analysis.

Measurement of Variables

This study assessed variables as nominal data using dummy variables coded as 1 or 0. The effect of entrepreneurship education on manufacturing SMEs' performance in North Central Nigeria was analyzed through several factors. Sales Growth was coded as 1 for high growth and 0 for low growth, while Service Delivery was coded as 1 for efficiency. Other variables include Technical, Managerial, Innovative, Business Networking, and Financial Skills Training, all coded as 1 if received and 0 if not. These variables were used to evaluate SME performance comprehensively.

Model Specification

In explicit form of the model, the model can be stated as:

For Sales Growth (SGT):

$$\text{logit}(\text{SGT}) = b_0 + b_1\text{TST} + b_2\text{MST} + b_3\text{IST} + b_4\text{BNT} + b_5\text{FST} + U_t$$

Where:

logit(SGT) is the log odds of Sales Growth.

b_0 is the intercept.

$b_1, b_2, b_3, b_4,$ and b_5 are the coefficients for the independent variables.

U_t is the error term.

For Quality of Service Delivery (QSD):

$$\text{logit}(\text{QSD}) = c_0 + c_1\text{TST} + c_2\text{MST} + c_3\text{IST} + c_4\text{BNT} + c_5\text{FST} + V_t$$

Where:

logit(QSD) is the log odds of Quality of Service Delivery.

c_0 is the intercept.

$c_1, c_2, c_3, c_4,$ and c_5 are the coefficients for the independent variables.

V_t is the error term.

A Priori Expectations

$c_1 > 0, c_2 > 0, c_3 > 0, c_4 > 0, c_5 > 0$

Based on the variables, we can hypothesize the following relationships:

Technical Skills Training (TST): Higher TST should lead to increased Sales Growth and Quality of Service Delivery.

Managerial Skills Training (MST): Better managerial skills should contribute to improved Sales Growth and Quality of Service Delivery.

Innovative Skills Training (IST): Innovative skills might positively impact Sales Growth and Quality of Service Delivery, especially in competitive markets.

Business Networking Training (BNT): Effective networking can lead to increased sales opportunities and improved service delivery.

Financial Skills Training (FST): Financial knowledge can help businesses manage resources more efficiently, potentially leading to higher sales and better service.

The coefficients in these models represent the change in the log odds of the dependent variable for a one-unit increase in the corresponding independent variable, holding all other variables constant.

Variable Definition

The independent variable for the study is entrepreneurship education (Technical Skills Training, Managerial Skills Training, Innovative Skills Training, Business Networking Training and Financial Skills Training) and dependent variable is SMEs Performance (increase in employment, increase in output, business expansion. Increase in business assets, increase in sales and quality of service delivery).

Justification of the Methods

The inferential (logit regression) statistics was used for the study because the dependent variable is categorical variable. The data collection though collected in four point scale was categorized into categorical data leading to the use of probability regression model such as the logit regression in determining the effect of the independent variables on the dependent variables of the study.

Technique for Data Analysis

Logistic regression was used in this study to estimate the effect of entrepreneurship education on manufacturing SMEs performance in the North Central Nigeria. Logistic regression is a statistical method for predicting the probability of a binary outcome. It is a type of generalized linear model (GLM) that uses the logistic function to model the probability of an event occurring. The logistic function is a sigmoid function that takes any real number as input and outputs a probability between 0 and 1 (Levy, 2019). Akighir, Ngutsav & Asom, (2011) have successfully used this model to investigate and forecast many probability based studies. In Logit model, the endogenous variable is a dichotomous or dummy variable with (1) representing low income and (0) for high income (Imran, Shahnawaza & Abo, 2009).

IV. Results And Discussion

Presentation of the Logit Regression Results

Analysis of specific objective one to three

Table 6: Classification Table for the Model

Observed		Predicted			
		SGT		Percentage Correct	
		.00	1.00		
Step 0	SGT	.00	0	66	.0
		1.00	0	331	100.0
	Overall Percentage				
Observed		Predicted			
		QSD		Percentage Correct	
		.00	1.00		
Step 0	QSD	.00	0	85	.0
		1.00	0	312	100.0
	Overall Percentage				

Source: SPSS Result, Version 26.0

The logit regression results for Model I on Sales Growth (SGT) indicate that the model failed to classify any cases in the ".00" category correctly, while it accurately predicted 100% of cases in the "1.00" category, suggesting a bias towards expecting sales growth. Overall, the model achieved an 83.4% correct prediction rate. In Model II for Quality of Service Delivery (QSD), no firms without service quality improvement were correctly classified, but 100% of those experiencing improvements were accurately predicted, resulting in a 78.6% overall correct prediction rate. This indicates the model's effectiveness in identifying firms with service delivery improvements but a limitation in predicting firms with no improvements.

Table 7: Omnibus Tests of Model Coefficients for Model I & II

SGT Model		Chi-square	df	Sig.
Step 1	Step	62.739	5	.000
	Block	62.739	5	.000
	Model	62.739	5	.000
QSD Model				
Step 1	Step	36.428	5	.000
	Block	36.428	5	.000
	Model	36.428	5	.000

Source: SPSS Result, Version 26.0

The Omnibus Tests of Model Coefficients for Model I (Sales Growth, SGT) and Model II (Quality of Service Delivery, QSD) indicate statistical significance. Model I has a Chi-square value of 62.739 with a significance level of 0.000, showing that predictors like technical and managerial skills training significantly influence sales growth. Model II also reports a Chi-square value of 36.428 with a significance level of 0.000, confirming the impact of these predictors on service quality. Both p-values are below 0.05, highlighting the importance of skills training for enhancing business performance outcomes.

Table 8: Model Summary for Model I & II

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Model I	22.911 ^a	.618	.796
Step			
Model II	35.932 ^a	.588	.670

Source: SPSS Result, Version 26.0

The model summary for Model I (Sales Growth, SGT) shows a -2 Log likelihood value of 22.911, with a Cox & Snell R Square of 0.618 and a Nagelkerke R Square of 0.796, indicating that 79.6% of the variance in sales growth is explained by the predictors. In Model II (Quality of Service Delivery, QSD), the -2 Log likelihood is 35.932, with a Cox & Snell R Square of 0.588 and a Nagelkerke R Square of 0.670, explaining 67% of the variance in service quality. Both models highlight the significant impact of skills training on business performance.

Table 9: Hosmer and Lemeshow Test for Model Fitness

Step	Chi-square	df	Sig.
Model 1	3.138	6	.752
Step	Chi-square	df	Sig.
Model 1	2.608	6	.971

Source: SPSS Result, Version 26.0

The Hosmer and Lemeshow Test results indicate that both Model I (Sales Growth, SGT) and Model II (Quality of Service Delivery, QSD) exhibit a good fit. For Model I, the Chi-square value is 3.138 with a p-value of 0.752, while Model II has a Chi-square value of 2.608 and a p-value of 0.971. Both p-values exceed the 0.05 threshold, confirming no significant difference between observed and predicted values. This suggests that the various skills training predictors effectively explain outcomes in sales growth and service delivery, reinforcing the reliability of the models and their robust relationships with business performance.

Table 10: Variables in the Equation

Model I: SGT		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1 ^a	TST	-.826	.542	2.323	1	.128	.438	1.510	1.266
	MST	.015	.456	.001	1	.974	1.015	.415	2.480
	IST	.698	.347	4.052	1	.044	2.010	1.019	3.967
	BNT	-1.834	.497	13.630	1	.000	.160	.060	.423
	FST	.085	.028	9.132	1	.003	1.089	.040	1.399
	Constant	1.950	.842	5.356	1	.021	7.026		

Model II: QSD									
Step 1 ^a	TST	-2.461	1.033	5.673	1	.017	.085	.011	.647
	MST	-.049	.351	.019	1	.890	.952	.478	1.897
	IST	1.184	.283	17.551	1	.000	3.268	1.878	5.687
	BNT	-.088	.333	.070	1	.791	.916	.477	1.758
	FST	.279	.319	.767	1	.381	1.322	.708	2.471
	Constant	2.634	1.137	5.371	1	.020	13.930		

a. Variable(s) entered on step 1: TST, MST, IST, BNT, FST.

Source: SPSS Result, Version 26.0

Legend: SGT = Sales Growth, QSD = Quality of Service Delivery, TST = Technical Skills Training, MST = Managerial Skills Training, IST = Innovative Skills Training, BNT = Business Networking Training, FST = Financial Skills Training

a) Technical Skills Training and Sales Growth

The findings of this study reveal no significant impact of technical skills training on sales growth. Supporting studies by Emezue (2020) and Ogaba & Laven (2022) emphasize the limitations of technical training, citing factors like inadequate infrastructure that hinder its effectiveness, suggesting that non-technical skills may be more crucial. In contrast, Afolabi & Kareem (2017) and Isiaka et al. (2017) argue that technical skills can positively contribute to entrepreneurship and business success, highlighting the ongoing debate between the value of technical and non-technical skills.

b) Technical Skills Training and Service Delivery

The current study finds a negative and significant relationship between technical skills training and service quality. Supporting studies by Akinbola & Popoola (2022) and Saidi (2016) stress the need for a holistic approach to skills training, indicating that a narrow focus on technical abilities might overlook essential soft skills that enhance customer satisfaction. However, findings by Niskanen & Niskanen (2007) and Brown et al. (2004) suggest that technical training can enhance both growth and service delivery, presenting a contradiction to the current study's results.

c) Managerial Skills Training and Sales Growth

This study indicates that managerial skills training has minimal impact on sales growth, with a coefficient approaching zero and no significant relationship detected. Supporting evidence from Haibo & Gerrit (2009) and Oluwaremi et al. (2016) underscores the importance of managerial skills in promoting business growth. Conversely, other studies, such as those by Sani et al. (2022) and Osogwu & Anah (2017), imply that broader factors, including education and entrepreneurship development, may overshadow the specific effects of managerial training on sales performance.

d) Managerial Skills Training and Service Delivery

The findings reveal no significant relationship between managerial skills training and service delivery, suggesting that improvements in managerial skills do not directly enhance service quality in the businesses studied. Supporting studies by Kamau (2016) and Gbam (2017) argue for the importance of managerial training in driving business performance. In contrast, Abiola (2014) and Kriss (2012) highlight that without addressing structural challenges, managerial training alone may be insufficient to improve service delivery.

e) Innovative Skills Training and Sales Growth

The study found that innovative skills training significantly positively affects sales growth among SMEs in North Central Nigeria. Supporting studies by Ndubuisi et al. (2020) and Tarek et al. (2013) illustrate that skills training enhances business performance and financial outcomes. However, contradictory evidence from Robinson et al. (2020) and Ismaila (2020) suggests that other factors may diminish the impact of innovation, indicating a complex interplay of influences on sales growth.

f) Innovative Skills Training and Service Delivery

The study shows that innovative skills training significantly enhances service quality in SMEs in North Central Nigeria. This aligns with findings from Egbide et al. (2013) and Umaru and Chinelo (2016), who stress management and entrepreneurial skills for SME profitability. While skills training is vital, Essien (2014) and Lawal et al. (2017) highlight external constraints like infrastructure and corruption as critical challenges. This study uniquely emphasizes innovative training's direct impact on service delivery, enhancing SME competitiveness.

g) Business Networking Training and Sales Growth

The study finds a significant negative impact of business networking training (BNT) on sales growth, suggesting excessive networking without focusing on other development aspects can be counterproductive. This contrasts with Emezue (2020) and Ogaba and Laven (2022), who highlight the importance of comprehensive training. The study underscores that exclusive networking emphasis may hinder sales, adding a new dimension to understanding training's effects on business outcomes, particularly in SMEs.

h) Business Networking Training and Service Delivery

The findings indicate a significant negative impact of business networking training (BNT) on service delivery, suggesting an overemphasis on networking detracts from critical business aspects. This contrasts with Emezue (2020) and Ogaba and Laven (2022), who stress employee training for SME performance. The study reveals that an exclusive focus on networking may limit service quality, highlighting the need for a balanced training approach that includes diverse skills for optimal performance.

i) Financial Skills Training and Sales Growth

The study reveals that financial skills training (FST) significantly boosts sales growth, with empirical support from Saidi (2016) and Akinbola and Popoola (2022). This aligns with Niskanen and Niskanen (2007), who emphasize financial literacy as key for firm growth. However, it contrasts with findings from Tende (2014) and Omorala (2018), which downplay financial skills' importance. The study argues for targeted financial training to enhance business performance, challenging the notion that general skills suffice.

j) Financial Skills Training and Service Delivery

The findings suggest that financial skills training (FST) positively impacts service delivery but lacks statistical significance, indicating limited influence on service quality. This aligns with Yasmin (2013) and Osogwu and Anah (2017), who acknowledge positive but weak relationships between training and performance. Contrarily, Oluwaremi et al. (2016) highlight external factors like taxation as more significant for SME growth. The study proposes that FST alone may not drive substantial business improvements, emphasizing the need for a broader approach.

V. Conclusion And Recommendations

Conclusion

The findings of this study highlight the complexity of how different skill sets impact both sales growth and quality of service delivery. While innovative and financial skills training emerged as critical factors driving improved sales and service outcomes, the role of technical and managerial skills appears more complex. Innovative skills training, in particular, plays a significant role in improving business performance, suggesting that businesses that foster creativity and adaptability are more likely to see substantial gains in both sales and service delivery. The importance of financial skills is also emphasized, particularly for resource management and sustainable growth. Conversely, technical skills training, while often essential for operational efficiency, may not directly enhance sales growth or service quality. This finding indicates that focusing exclusively on technical competencies might lead businesses to overlook other critical drivers of performance, such as innovation and customer engagement. The result also reflects the potential mismatch between technical skills and customer-oriented outcomes, suggesting that businesses should adopt a more holistic approach to employee training that balances technical proficiency with innovation and customer-centric practices. The study underscores the limited impact of managerial and business networking training on both sales growth and service quality in this context. While these areas are traditionally considered essential for overall business success, their direct influence on performance metrics may be less pronounced. This implies that businesses aiming for immediate improvements in sales or service quality may need to focus on more specialized training, such as innovation and financial management, while ensuring that managerial skills and networking are developed in tandem with other performance-driven initiatives.

Recommendations.

Based on the findings of the study the following recommendations are made:

- a. While technical skills are important for operational tasks, businesses should consider complementing these skills with other strategic competencies, as technical training alone may not significantly drive sales growth or service quality.
- b. Since managerial skills training showed minimal impact on both sales growth and service quality, businesses should assess whether current managerial training programs are aligned with performance goals and explore more impactful alternatives.

- c. Given its strong positive influence on both sales growth and service quality, businesses should invest heavily in innovative skills training to foster creativity, adaptability, and responsiveness to market needs.
- d. Excessive focus on networking may not translate into immediate sales growth or improved service quality. A more balanced approach that integrates networking with other skill development strategies is recommended.
- e. Financial skills training is critical for improving sales growth, as it helps businesses manage resources effectively. Therefore, expanding financial training initiatives could drive better business performance.
- f. Businesses should tailor their training programs to focus on skills that directly enhance performance metrics, such as innovation and financial management, while ensuring a comprehensive approach that addresses diverse business needs.
- g. The mixed impact of technical and managerial skills training suggests that training programs should be context-specific. Companies should analyze their unique needs and goals before designing training interventions.
- h. To enhance service quality, businesses should integrate innovation into their service models, focusing on creative problem-solving and adopting new methods or technologies that meet customer demands effectively.
- i. While financial skills training is not a strong predictor of service quality, it could still enhance service delivery by improving resource management. Businesses should continue to develop financial skills as part of their broader service strategy.
- j. Businesses should regularly evaluate the effectiveness of their training programs, focusing on metrics like sales growth and service quality, and adjust their investments to ensure alignment with key performance objectives..

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