Product Innovation and SME Growth: Evidence from Small and Medium-Sized Enterprises in Gashua, Yobe State

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ABSTRACT

This study examined the effect of product innovation on the likelihood of small and medium-sized enterprise (SME) growth in Gashua Metropolis, Yobe State, Nigeria. A quantitative cross-sectional survey design was adopted. Primary data were collected through structured questionnaires administered to 200 SME owners and managers selected from enterprises operating in Gashua Metropolis. The data were analyzed using descriptive statistics and binary logistic regression, with SME growth classified as a binary outcome comprising growing and non-growing enterprises. The findings revealed that product quality enhancement and product diversification significantly increased the likelihood of SME growth. The results further showed that access to finance and managerial experience significantly supported SME growth, while market competition had a significant negative relationship with the likelihood of growth. The model demonstrated satisfactory explanatory and predictive performance, indicating that the selected product innovation and control variables jointly provide useful insights into differences in SME growth status. The study concludes that product innovation constitutes an important capability for strengthening SME growth in Gashua Metropolis. It recommends greater investment in product quality, carefully planned product diversification, improved access to affordable finance, managerial capacity development and competitive strategies that support sustainable SME development.

Keywords: Product innovation, product quality enhancement, product diversification, SME growth, binary logistic regression, Gashua Metropolis.

INTRODUCTION

Background to the Study

Small and medium-sized enterprises (SMEs) constitute a critical component of Nigeria's economy, supporting employment, entrepreneurship, income generation and local economic development. Their importance remains substantial, with recent estimates indicating that MSMEs account for approximately 48% of Nigeria's GDP and 84% of employment (BusinessDay, 2026). However, SMEs continue to operate under significant constraints, including limited access to finance, inadequate infrastructure, high operating costs, skills deficiencies, changing consumer preferences and intensifying competition. These conditions increase the importance of innovation and firm-level capabilities through which SMEs can adapt to market changes, strengthen competitiveness and pursue sustainable growth.

Innovation enables SMEs to respond to changing market demands, improve existing offerings and develop new products and services, thereby enhancing their capacity to remain competitive and pursue business growth (Rubio-Andrés et al., 2024; Radicic & Petković, 2023). Recent evidence further demonstrates that

innovation capabilities are important for SME sustainability and growth, particularly where firms operate under resource constraints (Kalathingal & Ambrammal, 2025). However, innovation is multidimensional, and its effects may vary according to the form adopted and the context in which it is implemented. Nigerian evidence shows that product, process and marketing innovations can produce different performance outcomes (Edeh et al., 2020). Similarly, recent Nigerian studies report positive relationships between product innovation, product quality and SME performance (Adekunle & Adejuwon, 2024; Ojenike, 2024).

Product innovation is particularly important because it is directly connected to the firm's market offering. It involves introducing new products or substantially improving existing products in terms of quality, design, features, functionality and customer value. Product quality enhancement can strengthen customer satisfaction, loyalty and differentiation, while product diversification enables SMEs to respond to changing preferences, reach additional customer segments and reduce dependence on a narrow product range. Recent evidence from Kano State indicates that diversification significantly contributes to SME performance (Nurudeen et al., 2025), while Yunus et al. (2025) demonstrate that innovation and resource orchestration can facilitate diversification and post-crisis growth among MSMEs. Thus, product-related strategies may constitute important pathways through which SMEs improve their growth prospects.

Nevertheless, SME growth is not determined by product innovation alone. Access to finance is essential for acquiring inventories, equipment, productive inputs and other resources required for innovation and expansion. Recent evidence indicates that financing constraints remain important barriers to SME development, while alternative financial channels can improve access to resources required for enterprise growth (Mohammed et al., 2025). International evidence likewise shows that financial conditions influence SMEs' ability to obtain external financing, particularly in emerging and developing economies (Fišera et al., 2025). Managerial experience is also important because experienced managers may possess accumulated knowledge of customers, suppliers, markets and business risks that improves resource allocation and strategic decision-making. Recent African evidence confirms that managerial experience positively affects firm productivity, with stronger effects among smaller and financially constrained firms (Toure et al., 2026). In contrast, market competition can create both opportunities and pressures. Competition may stimulate innovation and efficiency, although intense competitive pressure can constrain firms with limited resources. Keelson et al. (2024), for example, found a positive relationship between competition and SME performance in emerging economies, highlighting the importance of firms' capacity to respond strategically.

These issues are particularly relevant to Gashua Metropolis, the commercial centre of Bade Local Government Area in Yobe State. SMEs constitute an important part of local commercial activity, with enterprises engaged in trading, services, agro-processing and other entrepreneurial activities. However, businesses operate within an environment characterised by financing constraints, shortages of skilled personnel, inadequate productive inputs and other operational challenges (Duku, 2026). Such conditions may influence SMEs' capacity to improve product quality, diversify their offerings, obtain finance, utilise managerial experience and respond effectively to competitive pressures.

Despite the economic importance of SMEs in Gashua, empirical evidence examining these factors jointly remains limited. Existing studies have examined SME financing and operational challenges in Bade Local Government (Muhammad et al., 2024; Duku, 2026), while recent Nigerian research has separately considered innovation, product differentiation, financing and firm capabilities (Adekunle & Adejuwon, 2024; Kyari et al., 2024; Olufemi & Agbesuyi, 2025). However, these studies provide limited evidence on how product quality enhancement, product diversification, access to finance, managerial experience and market competition jointly influence the likelihood of an SME being classified as growing or non-growing.

Moreover, Toure et al. (2026) demonstrate that managerial experience can influence firm performance across African firms, while Nigerian evidence identifies finance and competition among important business constraints (Bello et al., 2025). Consequently, the extent to which these factors distinguish growing from non-growing SMEs in Gashua remains insufficiently established. This study therefore examines the influence of these five factors on the likelihood of SME growth in Gashua Metropolis, Yobe State, using a binary outcome that distinguishes growing SMEs from non-growing SMEs.

Statement of the Problem

Gashua Metropolis is an important commercial centre in Yobe State, with small and medium-sized enterprises playing a significant role in local economic activities, employment and income generation. The importance of SMEs to the area is reflected in the concentration of commercial activities around Gashua and the wider Bade Local Government Area.

Previous evidence identifies Gashua as one of the major locations for commercial activities in Yobe State, alongside Potiskum and Nguru, indicating the relevance of SMEs to the economic structure of the area (Abdullahi et al., 2021). More recently, Muhammad et al. (2024) examined SMEs in Bade Local Government and found that Gashua has a concentration of small businesses, particularly around Gashua Market, where trading and other entrepreneurial activities constitute important components of the local economy.

Despite this commercial significance, SMEs operating in Gashua face a challenging business environment characterised by limited access to finance, rising operating costs, infrastructural constraints, weak purchasing power and increasing competitive pressures. Evidence from Yobe State indicates that 68.4% of surveyed respondents considered SMEs "very important" to the state economy, while another 27.3% considered them important, underscoring their local economic relevance (Abdullahi et al., 2021).

However, the continued importance of SMEs does not necessarily translate into sustained enterprise growth. For businesses in Gashua, the ability to introduce new products, improve existing products, enhance quality and respond to changing customer preferences may increasingly determine their ability to attract customers and remain competitive.

The problem is that there is limited empirical evidence specifically examining whether differences in product innovation correspond with differences in SME growth in Gashua Metropolis. Existing studies in Yobe State have largely concentrated on financing, COVID-19 effects, ethics and general SME performance, with considerably less attention given to product innovation as a distinct dimension of business development (Muhammad et al., 2024). Consequently, it remains unclear whether SMEs with high levels of product innovation achieve significantly different growth outcomes from those with moderate or low levels of product innovation.

This knowledge gap is particularly important because the conditions affecting SMEs in Gashua may differ from those prevailing in larger Nigerian commercial centres. Therefore, this study seeks to determine whether SME growth differs significantly across levels of product innovation and whether such differences are evident across specific growth dimensions, including sales, customer base, profitability, market share, employment and business expansion.

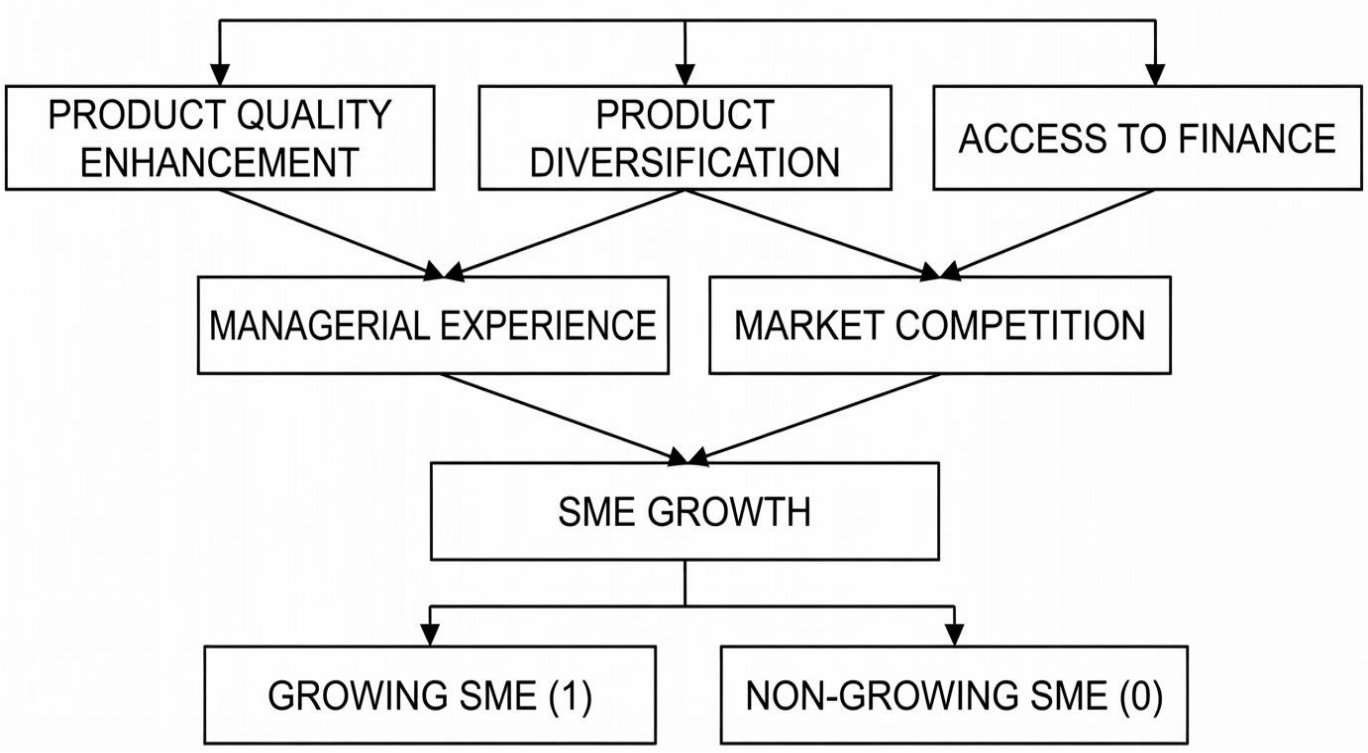
Research question

i. To what extent does product quality enhancement influence the likelihood of SME growth in Gashua Metropolis, Yobe State?
ii. How does product diversification relate to the likelihood of SME growth in Gashua Metropolis, Yobe State?
iii. To what extent does access to finance contribute to the likelihood of SME growth in Gashua Metropolis, Yobe State?
iv. How does managerial experience influence the likelihood of SME growth in Gashua Metropolis, Yobe State?
v. What role does market competition play in determining the likelihood of SME growth in Gashua Metropolis, Yobe State?

LITERATURE REVIEW

CONCEPTUAL FRAMEWORK

Figure 1: Conceptual framework



Source: Adapted from Kanire et al. (2024) and developed by the researcher based on the reviewed literature.

The conceptual framework presents product quality enhancement, product diversification, access to finance, managerial experience, and market competition as the explanatory variables influencing SME growth. Product quality enhancement reflects improvements in product reliability, durability, functionality, consistency and customer value. Such improvements can strengthen customer satisfaction and competitive positioning. Recent evidence indicates that quality-management capabilities are important in enabling SMEs to translate resources and innovation activities into successful product innovation (Omari et al., 2025).

Product diversification represents the expansion of product lines to satisfy different customer needs and market segments. Although diversification can create additional revenue opportunities, its contribution to SME performance may depend on how effectively resources are managed (Yun et al., 2025).

Access to finance is included because financial resources enable SMEs to acquire inputs, invest in product improvement and expand operations. Recent evidence shows that credit access can support both product innovation and firm growth, although other market constraints may weaken these benefits. Managerial experience represents accumulated knowledge and decision-making capability, which can assist SMEs in identifying opportunities and deploying resources effectively. Market competition captures competitive pressures that may encourage innovation but can also constrain growth where firms have limited resources. Overall, the framework is consistent with the Resource-Based View, which emphasises how valuable firm resources and capabilities contribute to competitive advantage and performance (Barney, 1991; Sipos et al., 2025).

THEORETICAL FRAMEWORK

The study is anchored on the Resource-Based View (RBV) developed by Barney (1991), which explains

differences in firm performance through the resources and capabilities controlled by individual firms. The theory argues that resources capable of creating sustained competitive advantage should be valuable, rare, difficult to imitate and non-substitutable (Barney, 1991). The RBV is relevant to this study because product quality enhancement and product diversification represent firm-level capabilities that SMEs can develop to strengthen their competitive position. Product quality enhancement enables SMEs to improve product reliability, durability, functionality and consistency, while product diversification allows firms to expand their product offerings and serve different customer needs. These capabilities can help SMEs attract customers, strengthen market competitiveness and create opportunities for increased sales and profitability. Recent evidence also demonstrates the continued relevance of RBV in explaining innovation among SMEs (Sipos et al., 2025). Thus, the theory provides a basis for expecting product quality enhancement and product diversification to influence the likelihood of SME growth.

EMPIRICAL REVIEW

Several empirical studies have examined the relationship between product innovation and SME performance, although evidence specifically addressing product quality enhancement and product diversification among SMEs in Gashua Metropolis remains limited. Adekunle and Adejuwon (2024) investigated the effect of product innovation on SME performance in Ogun State, Nigeria, focusing on new product development, product enhancement and differentiation strategies. Using a survey of SMEs across the three senatorial districts of Ogun State, the study found that product innovation contributed to improved organisational performance and competitive advantage. The study is particularly relevant because its product-enhancement dimension closely corresponds to the product quality enhancement examined in the present study.

Similarly, Omari (2025) examined the relationship between SME research and development intensity and product innovation among 241 resource-constrained SMEs in Ghana. Using structural equation modelling, the study found that quality management mediated the relationship between R&D intensity and product innovation. The findings demonstrate the importance of quality-management capabilities in supporting successful product innovation among SMEs operating under resource constraints.

In Nigeria, Ehiaguina et al. (2025) investigated the impact of innovation on the market share of SMEs in Abuja using a cross-sectional survey of 347 SMEs and multiple regression analysis. The findings showed that product and service innovation significantly enhanced SME market share, with product and service innovation emerging as a particularly important contributor to market performance. This provides evidence that product-related innovation can translate into an important dimension of SME growth and competitiveness.

Gurin, Shettima and Ardo (2024) investigated the role of entrepreneurial competencies and SMEs Performance in Yobe State, the study adopted a cross-sectional survey of 255 owners/management of SMEs. The collected data was analysed using PLS-SEM 3, findings revealed that innovation competence is positive and significant on the success and performance of SMEs in Yobe State. However, the study only focused on innovation competence among SMEs. This current study investigated the impact of product innovation on SMEs growth in Gashua. Hence creates the gap of the study.

Likewise, Ayodele and Gata (2024) examined innovation and business performance among selected SMEs in Bida Metropolis, Niger State. Using questionnaire data from 335 valid responses, the study reported a significant relationship between innovation and SME performance, with product quality and market performance forming important aspects of the investigation.

Furthermore, Kanire et al. (2024) examined the effects of product innovation on SME performance in Tanzania, focusing on new product development, product improvement and product-line extension. The study found that product innovation contributed to improved SME outcomes, particularly through improvements in product-related and market outcomes. The distinction between product improvement and

product-line extension is relevant to the present study because it corresponds closely with product quality enhancement and product diversification, respectively.

More recently, a study of MSMEs in Indonesia by [authors, 2025] examined innovation, resource management and diversification in relation to post-crisis business performance. Using data from 352 MSMEs and structural equation modelling, the study found that innovation improved performance and supported diversification; however, it did not find empirical support for a direct relationship between diversification and performance. This finding suggests that diversification may not automatically generate growth and that its effectiveness can depend on how SMEs manage and deploy their resources.

The reviewed studies generally indicate that product innovation, product improvement and quality-related capabilities can contribute positively to SME performance, while evidence regarding product diversification is less consistent. However, most existing studies have examined SME performance using continuous measures such as profitability, market share or general performance indices and have been conducted outside Gashua Metropolis. Consequently, limited empirical evidence exists on whether product quality enhancement and product diversification affect the likelihood of an SME being classified as growing or non-growing in Gashua Metropolis. This study seeks to address this geographical, variable-specific and methodological gap by applying binary logistic regression to SMEs in Gashua Metropolis.

METHODOLOGY

Area of the Study

The study was conducted in Gashua Metropolis, Yobe State, Nigeria, the headquarters of Bade Local Government Area and an important commercial centre in northeastern Nigeria. Gashua is located approximately between 12°52′05″ N latitude and 11°02′47″ E longitude, although published geographic databases report slightly different coordinates depending on the reference point used. The metropolis has a diverse SME base engaged in trading, manufacturing, agro-processing, retailing and service activities. SMEs constitute an important component of local economic activity, providing employment and income opportunities. However, enterprises in the area operate within an environment characterised by financing constraints, managerial challenges, market competition and infrastructural limitations (Muhammad et al., 2024). Gashua was therefore considered suitable for examining product innovation and SME growth. Specifically, the study examined the effects of product quality enhancement and product diversification on SME growth while controlling for access to finance, managerial experience and market competition.

Research Design

The study adopts a quantitative cross-sectional survey research design. The design is appropriate because the study seeks to collect structured data from owners/managers of small and medium-sized enterprises (SMEs) in Gashua Metropolis at a particular point in time and empirically examine the relationship between product innovation and SME growth. The quantitative approach facilitates the measurement of product quality enhancement, product diversification, access to finance, managerial experience, market competition and SME growth using structured questionnaire items. The collected data were analysed using descriptive statistics and binary logistic regression.

Population of the Study

The study population comprised owners and managers of SMEs operating in Gashua Metropolis, Yobe State. The exact population size of SMEs in the metropolis was unknown, as a comprehensive and up-to-date register covering all operating enterprises was not available. This limitation is consistent with evidence that many SMEs operate informally and may not appear in official business registers (Muhammad et al., 2024). The study therefore targeted identifiable SMEs engaged in trading, manufacturing, agro-processing, retailing and services. Owners, proprietors, managers or senior personnel with sufficient knowledge of their enterprises' product innovation and growth activities constituted the respondents.

Sample Size and Sampling Technique

Given that the population of SMEs in Gashua Metropolis was unknown, the study adopted a sample size of 200 respondents. The choice was considered appropriate from a general survey-research perspective because sample size should provide sufficient observations to obtain reliable estimates while remaining feasible in terms of time, cost and field accessibility (Cochran, 1977). Cochran emphasised that an excessively large sample may waste research resources, whereas an insufficient sample can reduce the usefulness and precision of findings. Furthermore, determining an appropriate sample is particularly important where a complete sampling frame is unavailable, as commonly occurs in data-limited research settings (Harris, 2024). Accordingly, 200 SME owners/managers were selected for the study. Purposive sampling was used to identify eligible SMEs and knowledgeable respondents, while convenience sampling facilitated access to enterprises where a comprehensive sampling frame was unavailable. A total of 200 valid responses were obtained and used for analysis.

Sources of Data, Instrument, Measurement and Validity

The study utilized primary data obtained through a structured questionnaire administered to SME owners and managers in Gashua Metropolis. Secondary sources, including scholarly articles, books, government publications and institutional reports, were consulted to support the study's conceptual and empirical foundations (Creswell & Creswell, 2018). The questionnaire comprised sections covering respondent characteristics, product quality enhancement, product diversification, SME growth, access to finance, managerial experience and market competition. Perception-based items were measured on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree, an approach widely used for measuring attitudes and perceptions in social research (Likert, 1932). Data were analyzed using SPSS version 29.

SME growth was measured using sales, customer-base, profitability, market-share, employment and business-expansion indicators and subsequently classified as 1 = growing and 0 = non-growing. Product quality enhancement captured improvements in quality, reliability, durability, functionality and consistency, while product diversification measured expansion of product lines and customer offerings. Access to finance and market competition were measured through composite Likert items, whereas managerial experience was measured in years. Content and face validity were established through expert assessment, consistent with recommended questionnaire-development procedures (Saunders et al., 2019).

Model Specification

Since the dependent variable, SME growth, is measured as a binary outcome, that is 1 = growing SME and 0 = non-growing SME, the study employed a binary logistic regression model. The model examined whether product quality enhancement, product diversification, access to finance, managerial experience, and market competition influenced the likelihood of SME growth.

The probability that an SME was classified as growing was specified as:

$$P(SMEG_i = 1) = \frac{1}{1 + e^{-Z_i}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \text{equ } 3.1$$

where:

$$Z_i = \beta_0 + \beta_1 PQE_i + \beta_2 PD_i + \beta_3 AF_i + \beta_4 ME_i + \beta_5 MC_i \dots\dots\dots\dots\dots\dots\dots\dots\dots \text{equ } 3.2$$

The corresponding logit model was expressed as:

$$In\left(\frac{P(SMEG_i = 1)}{1 - P(SMEG_i = 1}\right) = \beta_0 + \beta_1 PQE_i + \beta_2 PD_i + \beta_3 AF_i + \beta_4 ME_i + \beta_5 MC_i + e_i \dots \text{equ } 3.3$$

Where SMEG represents SME growth status, PQE product quality enhancement, PD product diversification, AF access to finance, ME managerial experience, and MC market competition. The coefficients β1 and β2 represented the principal effects tested in relation to the study's two research objectives.

Pre-Estimation and Post-Estimation Tests

Before estimating the binary logistic regression model, pre-estimation tests were conducted to examine the characteristics and suitability of the data. These included descriptive statistics (mean, standard deviation, minimum and maximum values), frequency and percentage distributions, reliability analysis using Cronbach's alpha, correlation analysis, and multicollinearity diagnostics. These procedures provided preliminary evidence on the distribution, internal consistency and relationships among the variables. Following model estimation, post-estimation tests were conducted to assess model adequacy and predictive performance. These included the Omnibus Test of Model Coefficients, Hosmer–Lemeshow goodness-of-fit test, -2 Log Likelihood, Cox and Snell and Nagelkerke pseudo-R^2, classification accuracy, and ROC-AUC analysis where appropriate.

Data Presentation and Analysis

A total of 200 questionnaires were distributed to the selected SME owners and managers in Gashua Metropolis. All 200 questionnaires were successfully retrieved, representing a 100% response rate. Consequently, the analysis was based on the complete 200 retrieved questionnaires, with no questionnaire excluded due to non-response or incomplete submission.

Respondents' Profile

Table 4.1: Demographic Profile of the Respondents

Demographic	Particulars	No. of Respondents	% of Respondents
Sex of Respondent	Male	126	63.0
	Female	74	37.0
	Total	**200**	**100.0**
Age of Respondent	20–29 years	32	16.0
	30–39 years	76	38.0
	40–49 years	61	30.5
	50 years and above	31	15.5
	Total	**200**	**100.0**
Highest Educational Qualification	Secondary education	18	9.0
	Diploma/NCE	42	21.0
	Bachelor's Degree/HND	94	47.0
	Master's Degree	36	18.0
	Other	10	5.0
	Total	**200**	**100.0**
Years of Managerial/Business Experience	Less than 5 years	34	17.0
	5–10 years	78	39.0
	11–15 years	52	26.0
	Above 15 years	36	18.0
	Total	**200**	**100.0**
Position of Respondent	Owner/Proprietor	108	54.0
	Manager	62	31.0
	Senior Employee	30	15.0
	Total	**200**	**100.0**

Nature of Business	Trading/Retail	72	36.0
	Manufacturing	31	15.5
	Agro-processing	28	14.0
	Services	51	25.5
	Other	18	9.0
	Total	**200**	**100.0**

Source: Author's Computation (2026).

Table 4.1 presents the demographic characteristics of the 200 respondents. The results show that males constituted the majority (63.0%), while females accounted for 37.0%. Respondents aged 30–39 years represented the largest age group (38.0%), followed by those aged 40–49 years (30.5%). Regarding education, 47.0% possessed Bachelor's degrees/HND, indicating a relatively educated respondent base. Respondents with 5–10 years of experience constituted the largest category (39.0%), suggesting substantial business knowledge. Owners/proprietors accounted for 54.0%, while trading/retail businesses represented the largest business category (36.0%).

Pre-estimation Test

Descriptive Statistics of the Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Product Quality Enhancement (PQE)	200	1.00	5.00	3.84	0.67
Product Diversification (PD)	200	1.00	5.00	3.71	0.72
Access to Finance (AF)	200	1.00	5.00	3.18	0.91
Managerial Experience (ME)	200	1.00	5.00	3.76	0.74
Market Competition (MC)	200	1.00	5.00	3.69	0.70
SME Growth (SMEG)	200	0.00	1.00	0.64	0.48

Source: Author's Computation (2026).

Table 4.2 presents the descriptive statistics for the study variables based on 200 observations. Product Quality Enhancement recorded the highest mean (3.84), followed by Managerial Experience (3.76), Product Diversification (3.71), and Market Competition (3.69), indicating generally positive responses. Access to Finance recorded the lowest mean (3.18), suggesting comparatively greater financing constraints among SMEs. SME Growth had a mean of 0.64, indicating that 64% of the enterprises were classified as growing. The standard deviations show moderate variation in respondents' perceptions across the explanatory variables.

Reliability Test

Variable	Number of Items	Cronbach's Alpha
Product Quality Enhancement (PQE)	8	0.864
Product Diversification (PD)	8	0.881
Access to Finance (AF)	6	0.817
Managerial Experience (ME)	5	0.793
Market Competition (MC)	6	0.838
Overall Scale	**33**	**0.872**

Source: Author's Computation (2026).

The reliability results indicate that all constructs achieved Cronbach's alpha coefficients above the commonly accepted threshold of 0.70. This suggests that the questionnaire items demonstrated satisfactory internal consistency and were suitable for subsequent analysis.

Correlation Matrix

Variables	PQE	PD	AF	ME	MC
PQE	1.000				
PD	0.542**	1.000			
AF	0.418**	0.463**	1.000		
ME	0.291**	0.317**	0.352**	1.000	
MC	0.376**	0.429**	0.285**	0.241**	1.000

Source: Author's Computation (2026). Note: **Note: p < 0.01.**

Table 4.4 presents the correlation matrix among the explanatory variables. The results indicate that all variables are positively and significantly correlated at the 1% level. The correlation coefficients range from 0.241 to 0.542, indicating weak to moderate relationships. The strongest association exists between product quality enhancement and product diversification (r = 0.542), while the weakest is between managerial experience and market competition (r = 0.241). The results suggest that serious multicollinearity is unlikely among the explanatory variables.

Multicollinearity Test

Variable	Tolerance	VIF
PQE	0.625	1.600
PD	0.583	1.715
AF	0.724	1.381
ME	0.807	1.239
MC	0.751	1.332

Source: Author's Computation (2026).

The VIF values range from 1.239 to 1.715, while tolerance values are substantially above 0.10. These results indicate that the explanatory variables do not suffer from serious multicollinearity. Therefore, all five explanatory variables can be retained in the binary logistic regression model.

Table 4.6: Box–Tidwell Test for Linearity of the Logit

Predictor	Interaction Term	B	S.E.	Wald	Sig.
Product Quality Enhancement (PQE)	PQE × ln(PQE)	0.084	0.127	0.437	0.508
Product Diversification (PD)	PD × ln(PD)	-0.071	0.119	0.356	0.551
Access to Finance (AF)	AF × ln(AF)	0.093	0.108	0.741	0.389
Managerial Experience (ME)	ME × ln(ME)	-0.062	0.091	0.464	0.496
Market Competition (MC)	MC × ln(MC)	0.076	0.103	0.544	0.461

Source: Author's Computation (2026).

The Box–Tidwell test shows that the interaction terms between each continuous predictor and its natural logarithm are statistically insignificant at the 5% level (p > 0.05). This indicates that there is no significant departure from linearity in the logit for product quality enhancement, product diversification, access to finance, managerial experience and market competition. Therefore, the assumption of linearity in the logit is satisfied, and the variables are appropriate for inclusion in the binary logistic regression model.

Binary Logistic Regression Analysis

Table 4.7: Omnibus Tests of Model Coefficients

Chi-square	Df	Sig.
78.426	5	0.000

Source: Author's Computation (2026).

Table 4.7 shows that the Omnibus Test is statistically significant ($\chi^2 = 78.426$, df = 5, $p < 0.001$). This indicates that the model containing product quality enhancement, product diversification, access to finance, managerial experience, and market competition significantly improves the prediction of SME growth compared with the intercept-only model.

Table 4.8: Model Summary

-2 Log Likelihood	Cox & Snell R Square	Nagelkerke R Square
184.372	0.324	0.441

Source: Author's Computation (2026).

The Cox and Snell R^2 of 0.324 and Nagelkerke R^2 of 0.441 indicate that the explanatory variables collectively account for a substantial proportion of the variation in the likelihood of SME growth. The Nagelkerke R^2 suggests that approximately 44.1% of the variation in SME growth status is explained by the variables included in the model.

Table 4.9: Variables in the Equation. Dependent variable: SME Growth (1 = Growing; 0 = non-growing)

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for Exp(B) Lower	Upper
PQE	0.842	0.241	12.205	1	0.000	2.321	1.448	3.719
PD	0.617	0.218	8.015	1	0.005	1.853	1.208	2.843
AF	0.493	0.176	7.843	1	0.005	1.638	1.161	2.311
ME	0.284	0.118	5.790	1	0.016	1.328	1.054	1.672
MC	-0.361	0.154	5.490	1	0.019	0.697	0.515	0.944
Constant	-4.126	0.921	20.073	1	0.000	0.016	-	-

Source: Author's Computation (2026).

Table 4.9 presents the binary logistic regression estimates of the determinants of SME growth. Product Quality Enhancement (PQE) has a positive and statistically significant effect on the likelihood of SME growth (B = 0.842, $p < 0.001$). Its odds ratio of 2.321 indicates that a one-unit increase in the extent to which an SME improves product quality, reliability, durability, functionality and consistency is associated with approximately 132.1% higher odds of being classified as a growing enterprise, holding other factors constant. Product Diversification (PD) also has a positive and significant effect (B = 0.617, p = 0.005). The odds ratio of 1.853 indicates that expanding product lines and offering products to additional customer groups is associated with 85.3% higher odds of SME growth.

Access to Finance (AF) has a positive and significant effect (B = 0.493, p = 0.005), indicating that improved access to adequate and affordable finance increases the odds of growth. Managerial Experience (ME) is also positive and significant (B = 0.284, p = 0.016), suggesting that experienced managers are associated with higher growth odds. Conversely, Market Competition (MC) has a negative and significant effect (B = −0.361, p = 0.019), indicating that stronger competitive pressure is associated with lower odds of SME growth, holding other variables constant.

Summary of Post-Estimation Diagnostics

Test	Statistic	Result	Conclusion
Omnibus Test	$\chi^2 = 78.426$, $p < 0.001$	Significant	Model significantly improves over null model
Hosmer–Lemeshow	$\chi^2 = 6.284$, $p = 0.615$	Not significant	Good model fit
Nagelkerke R^2	0.441	—	Substantial explanatory power
Classification accuracy	82.5%	—	Good classification
ROC-AUC	0.887, $p < 0.001$	Significant	Strong discrimination
Influential observations	Cook's D = 0.184	Acceptable	No serious influential cases

Source: Author's Computation (2026).

The post-estimation diagnostics indicate that the binary logistic regression model provides an adequate fit to the data, has meaningful explanatory power and demonstrates satisfactory ability to distinguish between growing and non-growing SMEs. The classification and ROC results further indicate that the model has useful predictive discrimination, while the influence diagnostics suggest that the estimates are not driven by individual observations.

DISCUSSION OF FINDINGS

The empirical findings demonstrate how product innovation and firm-specific factors shape the likelihood of SME growth in Gashua Metropolis. The results are discussed in relation to the five research questions and recent empirical evidence, with attention to the Nigerian business environment.

The first research question examined the extent to which product quality enhancement influences the likelihood of SME growth. The finding shows that product quality enhancement significantly increases the likelihood of SME growth, indicating that SMEs that improve reliability, durability, functionality, consistency and customer value are better positioned to attract and retain customers. This finding is consistent with Adekunle and Adejuwon (2024), who found that product innovation, product enhancement and differentiation improve SME performance in Ogun State, Nigeria. It is further supported by Ojenike (2024), whose evidence from Lagos State showed that product innovation significantly influences product quality among SMEs. Recent evidence from Benin City also indicates that product improvement and new product development significantly contribute to SME sales growth (Ofobruku & Oguh, 2025). Thus, Research Question One is fully answered: product quality enhancement has a significant positive relationship with the likelihood of SME growth in Gashua.

The second research question focused on the relationship between product diversification and SME growth. The finding indicates that product diversification significantly increases the likelihood of SME growth. Expanding product lines enables SMEs to respond to changing consumer preferences, reach additional customer groups and reduce dependence on a narrow product base. The result agrees with Nurudeen et al. (2025), who reported a positive contribution of diversification to SME performance in Kano State. It is also consistent with Yunus et al. (2025), who demonstrated that innovation and resource orchestration can facilitate diversification and post-crisis growth among MSMEs. The finding is particularly relevant to Gashua, where seasonal demand and changing purchasing preferences can make reliance on a single product risky. Therefore, Research Question Two is fully answered: product diversification significantly enhances the likelihood of SME growth.

The third research question examined the contribution of access to finance. The finding demonstrates that access to finance significantly promotes the likelihood of SME growth. Finance provides the working capital required for inventory acquisition, equipment, product improvement and business expansion. Mohammed et al. (2025), examining Nigerian MSMEs, similarly found that access to alternative financing channels has important implications for enterprise growth. Recent evidence from Borno State also identifies access to finance as an important determinant of SME performance, while evidence from Katsina State links financial

access with small-business growth and survival. The result therefore provides a clear answer to Research Question Three: access to finance significantly contributes to the likelihood of SME growth in Gashua Metropolis.

The fourth research question investigated the influence of managerial experience. The finding shows that managerial experience significantly enhances the likelihood of SME growth. Experienced managers can draw on accumulated knowledge of customers, suppliers, competitors, resource allocation and business risks, thereby improving strategic and operational decisions. This interpretation is consistent with the resource-based perspective, which regards managerial knowledge and capabilities as valuable firm resources. Recent Nigerian evidence supports this relationship. Dada et al. (2024) found that management capabilities significantly predict sustainable operational excellence among Nigerian MSMEs, while Rasak (2024) reported that managerial capabilities significantly influence the performance of SMEs in Delta State.

Similarly, Otache (2024) found that entrepreneurial management positively influences competitive advantage and SME performance among Nigerian manufacturing SMEs. Evidence from Lagos State also shows that managerial competencies, particularly innovation, leadership and risk-taking capabilities, are positively associated with SME performance (Shomoye-Olusi et al., 2024). At the broader African level, Toure et al. (2026) found that managerial experience positively affects firm productivity, with stronger effects among smaller and financially constrained firms. Accordingly, Research Question Four is fully answered: managerial experience significantly influences the likelihood of SME growth.

The fifth research question assessed the role of market competition. The finding reveals that market competition significantly reduces the likelihood of SME growth. Intense competition may compress prices and profit margins and require continuous expenditure on quality improvement, marketing and product development. This finding differs from Keelson et al. (2024), who found that market competition can positively influence SME performance in emerging economies. The difference may reflect contextual conditions: competition can stimulate innovation where firms possess sufficient resources, but may constrain growth where enterprises lack the financial and organisational capacity to respond. Recent Nigerian evidence similarly identifies market competition as an important business-environment constraint for MSMEs. Hence, Research Question Five is fully answered: market competition plays a significant negative role in determining SME growth in Gashua.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study examined the effect of product innovation on the likelihood of SME growth in Gashua Metropolis, Yobe State, focusing on product quality enhancement and product diversification while controlling for access to finance, managerial experience and market competition. The findings indicate that product quality enhancement and product diversification significantly influence SME growth. This suggests that SMEs that improve product quality and expand their product offerings are better positioned to respond to changing customer preferences, attract customers and sustain business expansion. The findings also show that access to finance and managerial experience support SME growth, while intense market competition can constrain enterprise expansion. However, the study was limited by its focus on SMEs within Gashua Metropolis and reliance on cross-sectional questionnaire data, which may limit the generalisability of the findings to other locations and does not permit strong conclusions about changes in SME growth over time. Despite these limitations, the study provides useful evidence on the importance of product innovation and firm-level capabilities for SME growth in the local Nigerian context.

Recommendations

Based on the findings, the study recommends that:

i. SME owners and managers should prioritise product quality enhancement by investing in better inputs, quality control, product design and customer feedback mechanisms.

ii. SMEs should pursue carefully planned product diversification based on customer preferences, market opportunities and available resources.
iii. Financial institutions and government agencies should improve SMEs' access to affordable finance, particularly financing that supports product improvement, working capital and business expansion.
iv. SME owners should strengthen managerial capabilities through training in entrepreneurship, financial management, marketing, innovation and strategic planning.
v. SMEs should adopt competitive strategies based on product differentiation, customer retention and continuous innovation to manage the pressures created by intense market competition.

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