Gusau Journal of Economics and Development Studies (GUJEDS),
vol 7, no 1 August, 2026 ISSN: 2786-9695 (Print) 3027-1126 (Online)

MODERATING EFFECT OF INNOVATION CAPABILITY ON THE INFLUENCE OF HUMAN CAPITAL ON THE PERFORMANCE OF SMES IN KADUNA STATE

DOI: https://doi.org/10.57233/gujeds.v7i1.20

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Abstract *Despite this immense potential, SMEs in Kaduna State and across Nigeria face numerous constraints that impede their performance and sustainability. These constraints are closely linked to the core variables of this study. First, deficiencies in human capital hinder the ability of SMEs to innovate and respond effectively to market changes. The study examined the moderating effect of innovation capability on the influence of human capital on the performance of SMES in Kaduna State. The population of this study comprises of Small and Medium Enterprises (SMEs) operating within Kaduna State. Kaduna State has one thousand and seventy-two (1,072) SMEs (SMEDAN, 2022). Sample size of 285 were drawn from the population using Krejcie and Morgan (1970). The findings of the study revealed that human capital has significant relationship with Small and Medium Enterprise performance and innovation capability significantly moderates the relationship between human capital and Small and Medium Enterprises performance. The study recommended that entrepreneur should strive for more knowledge, attend seminars, and enrol for courses that will promote his personality traits towards improving and having a rewarding business outfit.*

Keywords Human capital, SMEs Performance and Innovation Capability

INTRODUCTION

The performance of businesses—whether large corporations or small and medium-sized enterprises (SMEs)—remains a critical determinant of economic growth, social welfare, employment creation, and sustainable development in any economy. A high-performing SME sector enhances

productivity, strengthens entrepreneurial dynamism, and contributes significantly to national competitiveness and inclusive economic prosperity. Recent global reports emphasize that SMEs constitute the backbone of economic development, accounting for the majority of businesses worldwide and contributing substantially to Gross Domestic Product (GDP), innovation, and job creation (World Bank, 2019; Olaleye et al., 2024).

SMEs play a pivotal role in driving economic growth and development globally, often regarded as the backbone of national economies due to their substantial contributions to employment, innovation, and GDP. According to the World Economic Forum (2022), SMEs represent nearly 90% of all firms worldwide, generate about 50% of global employment, and contribute up to 40% of GDP in emerging markets, underscoring their economic significance. Their impact is even more pronounced in specific regions; for example, midsize firms in Canada—though accounting for only 1.6% of all businesses—contribute 12% of national GDP, while in Malaysia, midsize enterprises make up just 2% of businesses yet contribute approximately 40% of the country's GDP, reflecting their disproportionate influence on economic productivity and stability. In developed economies, SMEs act as engines of technological advancement, industrial diversification, and innovation-driven competitiveness (Acs et al., 2018).

Despite this immense potential, SMEs in Kaduna State and across Nigeria face numerous constraints that impede their performance and sustainability. These constraints are closely linked to the core variables of this study. First, deficiencies in human capital development hinder the ability of SMEs to innovate and respond effectively to market changes (Chika & Chike, 2021; Ali et al., 2024; Ilukena et al., 2024).

Human capital (HC)one of the most frequently studied human capitalhas shown divergent results. Numerous studies document that employee skills, expertise, experience, and entrepreneurial competencies significantly enhance SME productivity and competitiveness (Akinboade& Bamidele, 2023; Olughor et al., 2021; AlQershi et al., 2022; Jayabalan et al., 2020; Kim & Tran, 2024; Kampoowale et al., 2025). Conversely, other scholars argue that contextual constraints such as inadequate training, poor managerial capacity, limited access to knowledge resources, and weak operational systems diminish HC's contribution to performance, especially in resource-constrained Nigerian environments (Raza et al., 2023; Salihu & Dahiru, 2022; Jacob et al., 2022; Muhammad Shafiee et al., 2024). These contradictions suggest that the relationship between human capital and SME performance in Kaduna remains unclear and warrants further investigation.

LITERATURE REVIEW

This section presents a comprehensive review of relevant literature to establish a theoretical and empirical foundation for the study.

SME performance is widely recognized as a multidimensional construct that encompasses financial and non-financial

indicators reflecting the overall effectiveness, competitiveness, and sustainability of small and medium enterprises. Contemporary scholarship emphasizes that SME performance extends beyond traditional financial metrics such as profitability, sales growth, and return on assets to include non-financial dimensions such as customer satisfaction, innovation outcomes, operational efficiency, employee development, and strategic adaptability (Essien & James, 2024; Chinwe et al., 2025; Otache, 2024). This expanded perspective aligns with modern strategic management views, which argue that holistic performance evaluation is essential for capturing the complexities and competitive realities of SMEs operating in dynamic environments.

Human Capital

Human capital (HC) is commonly treated as a pivotal intangible resource within the broader construct of intellectual capital. Different scholars have attempted the definition of the concept of human capital. For example, Schultz (1961) framed human capital as investments people and societies make in education, training and health that increase productive abilities. Schultz argued that spending on education and training should be treated like investments in a produced means of production similar to physical capital because such investments raise the productivity and earnings of individuals and the economy as a whole. This view emphasizes human capital as a stock of acquired productive capabilities built via purposeful investment (Schultz, 1961).

The Concept of Innovation capabilities

Innovation capability represents a firm's capacity to conceive, develop, and implement novel ideas, processes, or products, serving as a cornerstone for competitive advantage in an increasingly globalized and technology-driven marketplace. Scholars such as Wang and Ahmed (2002), Rezazadeh (2015), and Najmabadi (2015) define innovativeness as the ability to introduce new offerings or penetrate new markets by integrating strategic orientation with openness to technological adoption and commercialization.

Review of Empirical Studies

Human Capital and SME Performance

"Pivotal internal capabilities, encompassing intellectual capital and marketing orientation, have emerged as indispensable drivers of small and medium-sized enterprises (SMEs) performance, enabling firms to leverage knowledge assets, align market strategies, and sustain competitiveness in increasingly dynamic business environments.

Timothy (2022) examines how top managers' human-capital endowments (formal education and sector experience) influence SME productivity and whether marketing innovation mediates that relationship. Using a quantitative cross-sectional design, the study collected primary data from 309 SMEs in Tanzania (owners/managers) selected via multi-stage sampling; data were gathered with a structured questionnaire and analyzed with Partial Least Squares Structural Equation

Modelling (PLS-SEM). The study finds that top managers' educational attainment positively and significantly predicts SME productivity, and that marketing innovation partially mediates this effect; managers' years of sector experience positively influence technological innovation but had an insignificant direct effect on productivity.

Dinku, Singh, and Singh (2024) investigate the direct effect of human capital (formal education, managerial skills) on SME performance and the mediating role of innovation practice. The study used a quantitative cross-sectional survey of Ethiopian SMEs; sampling and sample sizes are reported in the article (stratified/convenience techniques used to reach SME owners/managers), data were collected via a validated questionnaire, and analyses included CB-SEM or PLS-SEM to test direct and mediated paths. The authors report significant positive direct effects of HC dimensions on SME outcomes (sales growth, profitability proxies) and show that innovation practice significantly mediates the HC performance link. Recommendations include prioritizing training and managerial capability building while institutionalizing innovation practices.

Okoye et al. (2022) focus on SMEs in Nigeria's South-East region to assess whether investments in human capital (training, skill acquisition) translate into improved firm performance. Using a survey research design, the study sampled SME owners/managers via stratified sampling; the sample size and sampling procedure are specified in the paper. Data were collected using structured questionnaires measuring training intensity, employees' qualifications, and firm performance indicators (sales growth, profitability), and analyzed with regression techniques (OLS and diagnostic tests).

Innovation capabilities and SMEs performance

The moderating role of innovation capabilities becomes particularly evident in dynamic or competitive markets, where SMEs must leverage internal strengths to outperform rivals. By acting as a catalyst, innovation capabilities can determine the strength and direction of the relationship between pivotal capabilities and performance, making their presence a contingency factor. For IC, innovation capabilities unlock latent potential in knowledge assets; for MO, they convert market data into competitive offerings; and for EO, they ensure entrepreneurial risks pay off. Recent research underscores this: Salim and Rahim (2023) showed innovation capabilities moderate IC's performance effects; Holm and Jensen (2024) found they enhance MO's impact in Nordic SMEs; and Fernandez and Torres (2022) noted their role in strengthening EO-driven growth, suggesting a nuanced interplay.

In resource-scarce SME contexts, innovation capabilities directly contribute to performance by enabling firms to do more with less, such as through cost-saving processes or niche market innovations. This efficiency directly impacts profitability and survival rates. As a moderator, innovation capabilities can mitigate weaknesses in pivotal capabilities e.g., compensating for limited IC by creatively leveraging existing knowledge or enhancing weak MO with novel customer solutions thus stabilizing their performance effects. Evidence supports

this: Yusuf and Bakar (2023) found innovation capabilities boost performance in digital SMEs; Desai and Patel (2023) showed they moderate EO's resilience impact; and Kariuki and Ndung'u (2021) highlighted their role in amplifying IC's effect in East Africa, pointing to context-specific moderation.

Finally, innovation capabilities link to performance by fostering agility, a critical SME trait in fast-paced industries, allowing firms to pivot quickly and seize opportunities, directly improving growth and market position. As a moderating variable, they can amplify or dampen the relationship between pivotal capabilities and performance epending on their strength e.g., weak innovation capabilities might constrain EO's risk-taking benefits, while strong ones could supercharge IC's knowledge utilization. This conditional role suggests innovation capabilities as a linchpin in capability-performance dynamics. Recent studies confirm this: Singh and Verma (2021) linked innovation capabilities to sustainable performance; Park and Tran (2022) found they moderate MO's effects across cultures; and Wu and Li (2024) showed their amplification of EO in tech SMEs, highlighting their versatile moderating potential.

Theoretical Framework

This study will be anchored by the Resource-Based View (RBV) theory developed by Barney (1991), which states that a firm's sustainable competitive advantage is derived from its unique resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN). In this study, the RBV theory is relevant as it explains how pivotal internal capabilities such as human capital serve as critical resources that can enhance SMEs' performance, while innovation capability acts as a moderating factor that strengthens this relationship. Barney (1991), defines firm resources as "all assets, capabilities, organisational processes, firm attributes, information, knowledge etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness."

2.9 Model of the Study

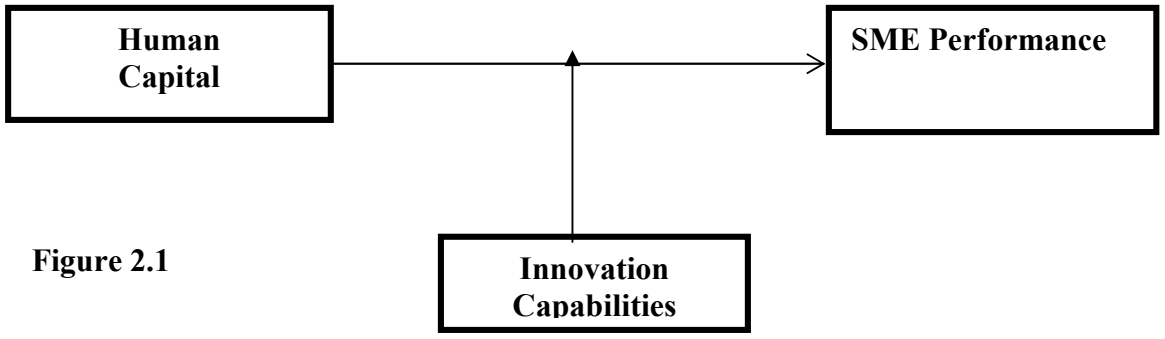


Figure 2.1

The model in figure 2.1 represents the framework of the study. The independent variables is human capital predicting the dependent variable SMEs performance and innovation capabilities is the moderator for the study.

RESEARCH METHODOLOGY

This section presents the methodological procedures adopted to investigate the moderating role of innovation capability in the relationship between human capital and SME performance in Kaduna State.

This study employs a quantitative research design utilizing a survey method to gather and analyze primary data from small and medium enterprises (SMEs) in Kaduna State.

The population of this study comprises of Small and Medium Enterprises (SMEs) that are only located and operated within Kaduna State. Kaduna State has one thousand and seventy-two (1,072) SMEs (SMEDAN, 2025).

Sample size determination is the act of choosing the number of observations or replicates to include in a statistical sample. The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample (Nakhata, 2018). The sample size was determined using Krejcie and Morgan (1970), because of large population, in most studies researchers hardly study the entire population. Therefore, sample is always drawn from the population. The sample size drawn from the population is 285 using Krejcie and Morgan (1970).

However, in order to take care of response bias and improper filling of some respondents to return the questionnaire, 30% of the above minimum sample size was added as suggested by Israel, (2013). 86 respondents which is the 30% of the sample size will be added to the calculated sample size of 285 which brings it to 371 questionnaires administered. In order to locate the sample out of the population, the researcher adopted simple random sampling technique.

The present study employs simple random sampling techniques. In this case, each element of the population has an equal chance of been selected as a subject. The choice of this procedure in the present study is due to the fact that, the simple random sampling procedure has the least bias and offers the most generalizability as each and every element can fall within the sample (Hair, *et. al.* 2017).

Sources and method of Data collection

For this study, primary data will be collected through a self-administered questionnaire designed to investigate the impact of intangible firm resource namely human capital the performance of Small and Medium Enterprises (SMEs) in Kaduna State, Nigeria.

Technique of Data Analysis

In this study, data will be analyzed using SmartPLS (Partial Least Squares Structural Equation Modeling, PLS-SEM), a method well-suited for examining complex models involving multiple variables and their interrelationships.

RESULTS AND DISCUSSION

This chapter presented the results of data analyzed using SPSS and Smart PLS-SEM.

Data analysis and Presentation

The respondents cut across the owners and managers of SMEs who were participated to the research and made up three hundred and seventy-one (371).

Table 4.1 Administered Questionnaire

Questionnaire	Number	Percentage
Distributed Questionnaire	371	100
Received Questionnaire	342	92.2
Unreturned Questionnaire	29	7.8
Questionnaire with defect	18	4.9
Valid Questionnaire	324	87.3

Table 4.1 presents the administered questionnaire to the owners and managers of SMEs, this shows that the valid questionnaire stood at 87%.The 87% respondent's rate adequately represents the population of the study, and would therefore be utilized for the analysis purpose. 29 copy or 8% of the questionnaire were not returned while 18 (5%) copies have some defects and therefore was rejected.

Partial Least Square (PLS)

After collecting valid and adequate data, the researcher employed Statistical Package for the Social Sciences (SPSS) version 18 for preliminary analyses. For the main analysis, the study employed partial least squares (PLS) 2 path modeling. Partial Least Squares Path Modelingis a name that does not provide many clues about what it is or what it can do. Simply put, Partial Least Squares Path Modeling is a statistical data analysis methodology that exists at the intersection of Regression Models, Structural Equation Models, and Multiple Table Analysis methods.

Measurement Model

The dependent variable is SMEs performance and has a total of 5 indicators, while the independent variable is human capital with 4 indicators and the moderator, innovation capability with 5 indicators.

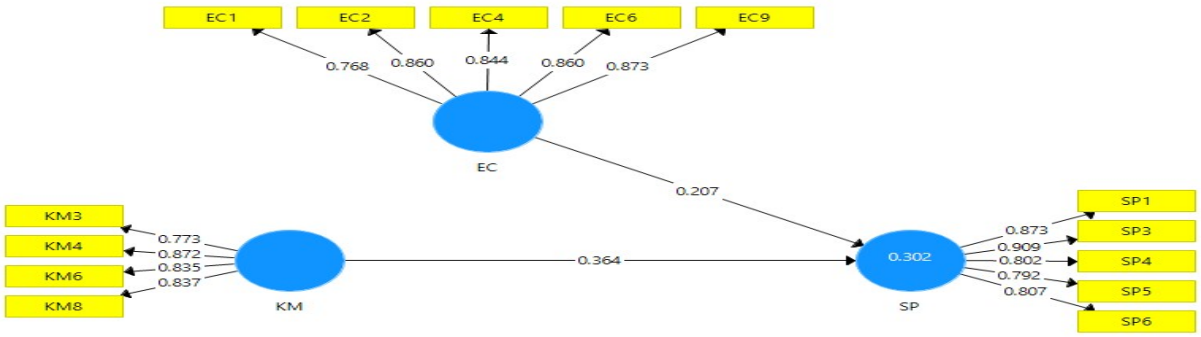


Figure 4.1 PLS Algorithm

From figure 4.1, it shows that the independent variable has 4 indicators, while the moderator has 5 indicator and the dependent variable has 5 indicators.

Relationship	Beta	Standard Deviation	T Statistics	P Values	Decision
HC -> SP	0.310	0.120	2.592	0.010	Rejected
HC*IC -> SP	0.153	0.026	5.794	0.000	Rejected

Table 4.3 presented the results of the test of hypotheses. Human capital was positively and significantly related with SMEs performance having a relation (Beta value = 0.310, t-value = 2.592 & p value =0.010). Similarly, the moderating effect of innovation capability on the relationship between human capital and SMEs performance was positive and significant with a (Beta value = 0.153, t-value = 5.794 and p value = 0.000).

Structural Model

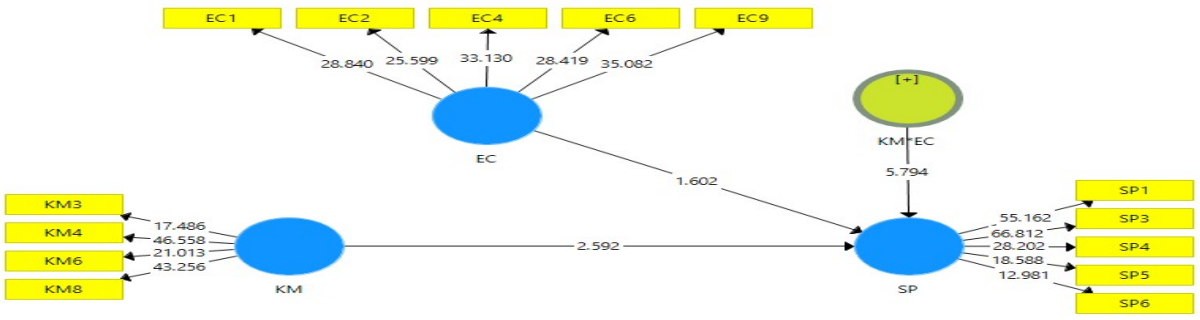
This section presents the structural equation model of the data analysis. Specifically, standard bootstrapping procedure was employed using a number of 5000 bootstrap samples to assess the significance of the path coefficients of both direct relationships (Hair *et al*., 2017). Nevertheless, as the objectives of this study are to empirically examine the direct relationships between independent variables (IVs) and the dependent variable (DV) using a moderating variable (MV). Under the structural model, the study tested the hypothesis of the study.

Hypotheses Testing for the Relationship

As can be seen in Figure 4.6, the model specifically analyzed direct and indirect relationships represented by hypotheses **H_{01}**: There is no significant relationship between human capital and SMEs performance **H_{02}**: Innovation capability does not significantly moderate the relationship between human capital and SMEs performance.

Thus, the assessment of the structural model using bootstrapping is reported in figure 4.3 and table 4.3 below.

PLS Bootstrapping result



Relationship	Beta	Standard Deviation	T Statistics	P Values	Decision
HC -> SP	0.310	0.120	2.592	0.010	Rejected
HC*IC -> SP	0.153	0.026	5.794	0.000	Rejected

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CONCLUSION AND RECOMMENDATIONS

Conclusion

The study concluded that human capital has significant relationship with Small and Medium Enterprise performance and innovation capability significantly moderates the relationship between human capital and Small and Medium Enterprises performance.

Recommendations

On the basis of the findings of the study following suggestions are provided to the various stakeholders.

i. Since human capital has significant relationship with Small and Medium Enterprise performance. An entrepreneur should strive for more knowledge, attend seminars, and enrol for courses that will promote his personality traits towards improving and having a rewarding business outfit. He must be ready to seek for information on how to deal with issues bordering on business growth and sustainability.

ii. Since innovation capability significantly moderates the relationship between human capital and Small and Medium Enterprises performance. Innovations should be made as priority of the business to improve performance.

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