



## Relevance of innovativeness in enhancing productivity among Nigeria's entrepreneurs

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### ABSTRACT

This paper examines the relationship between innovativeness and productivity among entrepreneurs. Specifically, it examined the impact of new product development, market exploration, and technological advancements on entrepreneurs' productivity. A survey research design was adopted with a population of 1,416 registered SMEs in Nigeria. A total of 312 sample sizes were administered a structured questionnaire. Data collected was analyzed using PLS-SEM. Findings revealed that market exploration has the strongest effect on entrepreneurs' productivity, followed by new product development and technology advancement. It concluded that innovativeness is significantly vital for entrepreneurs' productivity of selected registered SMEs. It is therefore recommended that SME owners in Kwara state enhance their entrepreneurs' productivity by focusing on adopting unique technology advancements, supporting new product development, and engaging in market exploration, which can ensure that innovativeness is met, thereby helping to enhance entrepreneurs' productivity.

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## INTRODUCTION

In today's rapidly evolving business environment, the ability to adapt and implement new ideas has become a critical determinant of success for small and medium-sized enterprises (SMEs). This is particularly evident in regions like Ilorin, Kwara State, where registered SMEs are increasingly leveraging creative approaches to improve their operational efficiency and market competitiveness. Studies have shown that businesses that embrace novel strategies often experience significant improvements in their output and overall performance (Adeyemi, 2020; Olugbire et al., 2020). For instance, research conducted on SMEs in Nigeria highlights that firms adopting advanced technological tools and unique business models tend to outperform their peers in terms of productivity and profitability (Adeyemi, 2020). It suggests that integrating fresh ideas and methodologies can serve as a catalyst for growth, especially in resource-constrained settings.

The dynamic nature of modern markets necessitates continuous improvement and adaptation, which can be achieved by adopting forward-thinking practices. (Ogunleye et al., 2020), SMEs that prioritize the development of unique solutions to market challenges are more likely to achieve sustainable growth. It is further supported by evidence from Ilorin, where SMEs that have embraced creative problem-solving techniques report higher levels of customer satisfaction and market share (Ojo et al., 2022). Additionally, the role of external support systems, such as government policies and access to funding, cannot be overlooked. For example, SMEs in Kwara State that have benefited from government grants and training programs have demonstrated a greater capacity to implement innovative practices, leading to enhanced productivity (Olugbire et al., 2020). These findings underscore the importance of fostering an ecosystem that encourages the adoption of new ideas and technologies.

Moreover, the relationship between creative approaches and business performance is often mediated by factors such as organisational culture and leadership style. A study by Adetunji and (Adeyemi, 2020) reveals that SMEs with leaders who encourage experimentation and risk-taking are more likely to achieve higher levels of productivity. This is consistent with findings from Ilorin, where businesses with a culture of continuous learning and improvement have reported significant gains in operational efficiency (Ojo et al., 2022). These insights underscore the importance of SMEs investing in human capital development and cultivating an environment that promotes creativity and collaboration. New Product Development (NPD) can significantly hinder an entrepreneur's productivity due to the extensive resources, time, and cognitive effort required. Entrepreneurs often face challenges in balancing the demands of NPD with their other responsibilities, leading to burnout and reduced efficiency. According to a study by (Cooper & Sommer, 2018), the iterative nature of NPD, which involves continuous feedback loops and revisions, can lead to decision fatigue and mental exhaustion among entrepreneurs. It is further compounded by the need to manage cross-functional teams, secure funding, and navigate regulatory hurdles, all of which can divert attention from core business activities (Cooper & Sommer, 2018).

Additionally, the uncertainty associated with NPD outcomes can create stress and anxiety, further impairing productivity (Kahneman et al., 2019). The pressure to innovate while maintaining operational efficiency can lead to a phenomenon known as "innovation fatigue," where entrepreneurs become overwhelmed by the constant need to develop new products (Kahneman et al., 2019). It is particularly problematic in highly competitive markets where the failure rate of new products is high, and the cost of failure can be substantial (Cooper & Sommer, 2018). Market exploration, while essential for identifying new opportunities, can also be a significant drain on an entrepreneur's productivity. Conducting market research, analysing data, and interpreting consumer behaviour requires a substantial investment of time and resources. According to a study by (Slater et al., 2014), entrepreneurs often struggle with the ambiguity and complexity of market data, which can lead to analysis paralysis and delayed decision-making. It is particularly challenging for small businesses and startups that lack the resources to conduct comprehensive market research (Slater et al., 2014). Furthermore, the need to stay abreast of rapidly changing market trends and consumer preferences can lead to information overload, which in turn reduces productivity (Slater et al., 2014). The constant need to pivot and adapt to new market conditions can also create a sense of instability and uncertainty, which can be mentally taxing for entrepreneurs (Kahneman et al., 2019). It is compounded by the fact that market exploration often involves a high degree of trial and error with no guarantee of success, leading to frustration and decreased motivation (Kahneman et al., 2019).

Technological advancements, while offering numerous benefits, can also pose significant challenges to an entrepreneur's productivity. The rapid pace of technological change requires entrepreneurs to continuously update their skills and knowledge, which can be time-consuming and mentally exhausting. The need to stay competitive in a technology-driven market often leads to a phenomenon known as "technostress," where entrepreneurs feel overwhelmed by the constant need to adapt to new technologies (Tran et al., 2024). It is particularly challenging for older entrepreneurs who may not be as familiar with emerging technologies and may struggle to keep up with the learning curve (Aquino Nunez et al., 2025). Additionally, the implementation of new technologies often involves significant upfront costs and disruptions to existing processes, which can temporarily reduce productivity (Tran et al., 2024). The pressure to adopt new technologies can also lead to a sense of

inadequacy and self-doubt, particularly if the entrepreneur lacks the necessary technical expertise (Kahneman et al., 2019). It can result in decreased motivation and a reluctance to take risks, further impairing productivity (Zhang et al., 2025). Specifically, the objectives of the study will include determining the effect of new product development on entrepreneurs' productivity, investigating the influence of market exploration on entrepreneurs' productivity, and examining the influence of technological advancements on entrepreneurs' productivity.

The ability of people or organisations to develop, accept, and utilise novel concepts, procedures, or products that add value is referred to as innovativeness. It is a multifaceted concept that encompasses risk-taking, inventiveness, and the willingness to challenge the status quo (Damanpour et al., 2018). Because it allows businesses to adapt and adjust to shifting market conditions and evolving needs, innovation is often regarded as a key driver of competitive advantage (Baregheh et al., 2009). Being inventive is crucial in the context of entrepreneurship because it enables business owners to spot and seize opportunities that others would overlook (D. Audretsch et al., 2020). Higher levels of innovation are associated with improved financial success and long-term sustainability, according to research (Eidelman et al., 2019). Moreover, innovativeness encompasses not only technological improvements but also organisational, process, and business model innovations (Foss & Saebi, 2018). Collectively, these diverse forms of innovation contribute to the overall growth and resilience of commercial activities. The resource-based view (RBV) of the company, which posits that distinctive resources and skills are essential to achieving a persistent competitive advantage, is a fundamental component of the concept of innovativeness (Helfat & Raubitschek, 2018). According to (Teece, 2018), innovativeness is a dynamic quality that enables businesses to adjust their resources and adapt to changes in the environment. Across various sectors and circumstances, empirical research has consistently shown that innovativeness is positively correlated with company success (Crossan & Apaydin, 2010). The innovation significantly increases organizational agility and market responsiveness (López et al., 2023).

Furthermore, entrepreneurial orientation, which encompasses traits like proactiveness and risk-taking, is frequently associated with innovativeness (Mousa & Arslan, 2023). It implies that being innovative is not just a stand-alone quality but also an essential part of a more comprehensive entrepreneurial attitude. To remain relevant and competitive in today's fast-paced corporate world, firms must cultivate an innovative culture (Hyland & Beckett, 2005). Small and medium-sized enterprises (SMEs) offer powerful innovative value due to their ability to respond quickly, along with their market adaptability and capacity for rapid operational changes. A SME's innovativeness involves their ability to design and execute new value-adding products, such as ideas, as well as products, processes, and business frameworks (Baregheh et al., 2009; Eidelman et al., 2019). Innovativeness encompasses the creation of fresh ideas and their effective implementation, particularly for competitive SMEs (Del Vecchio et al., 2021). The innovativeness of SMEs relies on their customer-centred relationships, as well as adaptable organisational frameworks and a business-minded orientation (D. B. Audretsch et al., 2018; Hervás-Oliver et al., 2021). Innovativeness represents how organisations integrate new ideas ahead of competitors within their sector (Scuotto et al., 2022). Various studies agree that SMEs succeed by utilising their limited resources to develop innovations that lead to competitive advantages (Gunday et al., 2011; Laforet, 2011). Through digital transformation and open innovation techniques, small and medium-sized enterprises enhance their innovative capabilities by collaborating with external partners to integrate advanced technological systems (Scuotto et al., 2022). The innovative abilities of SMEs represent a complex framework that forms a fundamental requirement for their market viability and expansion process.

Entrepreneurial productivity refers to the efficiency and effectiveness with which entrepreneurs utilize resources to achieve desired outcomes, such as revenue growth, market expansion, and value creation (Loots & van Bennekom, 2023). It measures the effectiveness of entrepreneurs in converting inputs, such as time, capital, and labour, into outputs, including products, services, and profits (Deans et al., 2025; Liu et al., 2026). Productivity in entrepreneurship is often influenced by factors such as skill level, access to resources, and the ability to manage uncertainty (Alshebami, 2025). High levels of entrepreneurial productivity are associated with increased innovation, job creation, and economic growth (D. Audretsch et al., 2020). Moreover, productive entrepreneurs are better equipped to

navigate competitive markets and capitalize on emerging opportunities, thereby contributing to the overall dynamism of the economy (Autio et al., 2014).

The concept of entrepreneurial productivity is closely tied to the idea of entrepreneurial capital, which encompasses the knowledge, skills, and networks that entrepreneurs bring to their ventures (Skorodziyevskiy et al., 2025). Research has shown that entrepreneurs who invest in developing their human and social capital tend to achieve higher levels of productivity (Eidelman et al., 2019). Additionally, the use of technology and digital tools has been found to significantly enhance entrepreneurial productivity by streamlining processes and reducing operational inefficiencies (Nambisan, 2017). Entrepreneurs who leverage digital platforms and data analytics are more likely to achieve scalable growth (Liu et al., 2025). Furthermore, entrepreneurial productivity is not solely dependent on individual efforts; it is also influenced by the broader ecosystem, including access to funding, supportive policies, and collaborative networks (Gao, 2025). Therefore, fostering an environment that supports entrepreneurial productivity is crucial for driving innovation and economic development.

Innovativeness has a profound influence on entrepreneurial productivity, as it enables business owners to identify and capitalise on new opportunities, streamline operations, and deliver value in innovative ways. Entrepreneurs may provide innovative solutions to challenging issues and improve their competitiveness in ever-changing markets by cultivating an innovative culture (Autio et al., 2014). According to research, creative entrepreneurs who can utilise cutting-edge technology and best practices are more likely to experience increased productivity (Baron & Tang, 2011). Companies that prioritise innovation, for example, tend to outperform their rivals in terms of revenue growth and market share (Lee et al., 2019). It implies that by promoting efficiency and effectiveness across a range of corporate operations, innovativeness serves as a catalyst for entrepreneurial output.

Moreover, the relationship between innovativeness and entrepreneurial productivity is reinforced by the ability of innovative entrepreneurs to adapt to changing market conditions and customer preferences (do Adro et al., 2022). Innovativeness enables entrepreneurs to continually refine their products and services, ensuring they remain relevant and competitive (Zahra, 2012). Empirical evidence also suggests that innovative entrepreneurs are better equipped to manage risks and uncertainties inherent in the entrepreneurial process (McMullen & Shepherd, 2006). Demonstrated that firms with high levels of innovativeness are more resilient in the face of economic downturns and market disruptions (Kara, 2018; McMullen & Shepherd, 2006; Yang & Fu, 2025). This resilience translates into sustained productivity, as innovative entrepreneurs can pivot and adapt their strategies in response to external challenges. Overall, the integration of innovativeness into entrepreneurial practices is essential for achieving long-term productivity and success.

New product development (NPD) plays a pivotal role in enhancing an entrepreneur's productivity by fostering innovation and creating competitive advantages. Entrepreneurs who engage in NPD are often able to differentiate their offerings in saturated markets, which can lead to increased market share and revenue growth (Salmelin et al., 2026). The process of developing new products encourages entrepreneurs to adopt a proactive approach to problem-solving, which can improve their operational efficiency and decision-making capabilities (Jones, 2024). Furthermore, NPD often involves cross-functional collaboration, which can enhance team cohesion and knowledge sharing, thereby boosting overall productivity (Danso-Abbeam et al., 2018). Firms with robust NPD processes experienced a 25% increase in productivity compared to those that did not prioritize innovation (Harmancioglu et al., 2007). It highlights the significance of NPD as a catalyst for entrepreneurial success. Additionally, the iterative nature of NPD enables entrepreneurs to refine their products based on customer feedback, resulting in higher customer satisfaction and repeat business (Guo et al., 2025). By strengthening the entrepreneur's capacity to adjust to shifting market demands, this cycle of continuous improvement improves product quality and increases productivity (Guo et al., 2025). Moreover, NPD can significantly impact an entrepreneur's productivity by fostering a culture of creativity and experimentation. Entrepreneurs who prioritize NPD are more likely to invest in research and development (R&D), which can lead to breakthrough innovations and long-term growth (Hernandez-Perlines et al., 2021). This investment in R&D often yields the development of proprietary technologies or processes that can provide a sustainable competitive advantage (Martínez-Falcó et al., 2024). Entrepreneurs who allocated at least 10% of their revenue to research

and development (R&D) experienced a 30% increase in productivity over five years. Additionally, NPD can enhance an entrepreneur's ability to attract and retain top talent, as innovative companies are often known to be more attractive workplaces (Robinson et al., 2013). This influx of skilled employees can further drive productivity by bringing fresh perspectives and expertise to the organization. NPD is a critical factor in enhancing entrepreneurial productivity, as it fosters innovation, improves operational efficiency, and creates a culture of continuous improvement (Khan & Ansari, 2024).

Market exploration is a critical driver of entrepreneurial productivity, as it enables entrepreneurs to identify new opportunities and adapt to changing market dynamics. Entrepreneurs can make more informed strategic decisions by conducting market research and gathering important information about consumer demands, preferences, and emerging trends (Brown-Robertson, 2015). Entrepreneurs can foresee changes in demand and adjust their services accordingly, thereby maintaining a competitive edge, thanks to this proactive approach to market analysis (Taylor, 2018). Entrepreneurs who routinely engaged in market investigation activities were 20% more productive than those who relied solely on their current understanding of the market (Mueller et al., 2012). It highlights the importance of market research in fostering successful entrepreneurship. Additionally, market research may reveal unexplored markets or niches that offer fresh sources of income and expansion prospects (Snyder, 2025). Entrepreneurs can lessen their dependence on a particular market and mitigate risks while increasing long-term productivity by diversifying their market presence (White & Scheld, 2024). Market research may help entrepreneurs discover new opportunities and boost their productivity by fostering a culture of innovation and adaptability. Entrepreneurs who aggressively pursue new markets are more likely to test out innovative goods, services, and business strategies, which may result in game-changing inventions (Martínez-Falcó et al., 2024). An entrepreneur's willingness to embrace change and take calculated risks can significantly improve their ability to respond to market disruptions and capitalize on emerging trends (Nguyen et al., 2024). Entrepreneurs who continuously explored the market had a 35% higher chance of achieving above-average productivity levels (Miner, 1997).

Additionally, market exploration can enhance an entrepreneur's ability to build strategic partnerships and alliances, providing access to new resources, technologies, and expertise (Parker, 2006). These collaborations can further drive productivity by enabling entrepreneurs to leverage external capabilities and scale their operations more effectively. Market exploration is a vital component of entrepreneurial productivity, as it enables entrepreneurs to identify new opportunities, foster innovation, and build strategic partnerships (Saxe et al., 2020). Thus, we propose the second hypothesis, which states that market exploration has a positive influence on entrepreneurs' productivity. Technological developments have a significant impact on entrepreneurs' productivity, as they enable them to grow faster, work more efficiently, and streamline their operations. By utilising advanced technologies such as automation, machine learning, and artificial intelligence (AI), entrepreneurs can significantly reduce the time and effort required to perform repetitive tasks, thereby freeing them to focus on more strategic endeavours (Kiani, 2025). Entrepreneurs who utilised AI experienced a 40% increase in production due to enhanced operational and decision-making efficiency (Tanveer et al., 2024). It illustrates how technology can dramatically improve entrepreneurial success. Additionally, technological advancements have enabled improved data management and analysis, which may help entrepreneurs identify development opportunities and make more informed decisions (Wilson et al., 2022). Entrepreneurs can enhance efficiency and creativity by leveraging data analytics to gain a deeper understanding of consumer behaviour, market trends, and operational performance (García-y-García et al., 2025).

By facilitating remote work and collaboration—two factors that have gained significance in the digital age—technology innovation can increase entrepreneurial productivity. Entrepreneurs can work with teams and stakeholders from any location in the world by utilising cloud-based platforms, video conferencing tools, and project management software, thereby increasing flexibility and efficiency (Robinson et al., 2013). Furthermore, technological advancements can help create new income streams and business models, such as digital marketplaces and e-commerce platforms, which can greatly increase an entrepreneur's market reach and profitability (Nguyen et al., 2024).

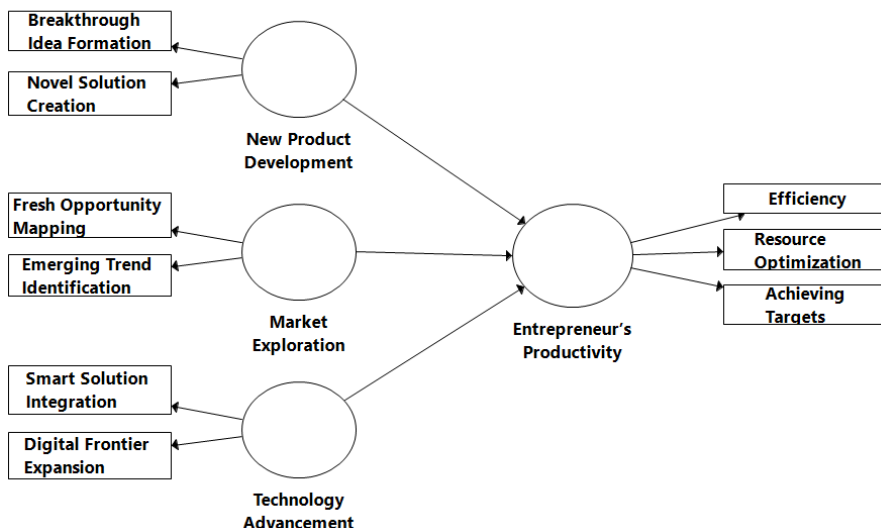
Entrepreneurs can enhance operational efficiency and unlock new growth and expansion opportunities by adopting technological innovations. Technology advancement is a key driver of entrepreneurial productivity, as it enables entrepreneurs to streamline operations, enhance collaboration, and innovate at a faster pace (Awashreh & Hamid, 2025).

## METHOD

A descriptive survey design was employed in this study to gather information from a population of participants and describe the phenomenon. The population of this study consisted of 1,416 registered SMEs in Kwara State. To select participants, the sampling process began with a comprehensive list of student entrepreneurs created from verified students across various campus faculties, followed by the use of a random number generator until the target sample size was reached. Each student entrepreneur in the sampling frame was assigned a unique identifier, allowing for a random selection process that ensured unbiased participant selection and improved sample representativeness, as every individual had an equal chance to be chosen. 312 SMEs were determined to be the final sample size using Taro Yamane's formula for determining sample sizes. The primary tool utilized in this study to collect information was a structured questionnaire. The questionnaire was structured into two parts, with the first part covering items related to innovativeness and the second part covering items related to productivity. A 5-point Likert scale was used for measurement, and the instrument was administered physically. Construct validity was employed in this study to examine the questionnaire's validity and determine whether the report's notion of the effect of innovativeness on entrepreneurs' productivity is accurate. A Cronbach's Alpha analysis of the questionnaire's internal consistency items was carried out. To evaluate the impact of the independent factors on the dependent variable, structural equation modelling, or SEM, was employed.

### Model Specification

This research report has one independent and one dependent variable; the independent variable is innovativeness, and the dependent variable is an entrepreneur's productivity. The study employed structural equation modelling (SEM), so the following model was used.



**Figure 1.** Conceptual Framework of the Study

The structural equation model proposed in this study conceptualizes Entrepreneur's Productivity (EP) as an endogenous construct that is influenced by three major latent dimensions of innovation and strategic capability. The first dimension, New Product Development, is reflected by Breakthrough Idea Formation (BIF) and Novel Solution Creation (NSC), emphasizing the entrepreneur's ability to generate disruptive ideas and translate them into creative problem-solving outputs. The second dimension, Market Exploration, incorporates Fresh Opportunity Mapping

(FOM) and Emerging Trend Identification (ETI), capturing proactive behaviors in discovering untapped market segments and anticipating shifts in consumer or industry demands. The third dimension, Technology Advancement, is represented by Smart Solution Integration (SSL) and Digital Frontier Expansion (DFE), describing entrepreneurs' competencies in adopting advanced technologies and leveraging digital transformations to strengthen business operations. The model is expressed as:  $EP = f(\text{New Product Development [BIF + NSC]} + \text{Market Exploration [FOM + ETI]} + \text{Technology Advancement [SSL + DFE]})$ . Altogether, the framework posits that productivity in entrepreneurial contexts is not merely the outcome of operational efficiency but is largely driven by the synergistic interplay of innovation generation, market-driven adaptability, and technology-based value creation.

**Table 1.** Variable Definition

Independent Variable: Innovativeness		
Variables	Measures	Meaning
New Product Development	BIF= Breakthrough Idea Formation	Enables the entrepreneur to conceive novel and disruptive product ideas that can drive market differentiation.
	NSC= Novel Solution Creation	This allows the entrepreneur to develop unique and innovative solutions that address unmet customer needs.
Market Exploration	FOM = Fresh Opportunity Mapping	This enables the entrepreneur to identify emerging market trends and untapped opportunities for innovative products or services.
	ETI= Emerging Trend Identification	This enables the entrepreneur to anticipate and capitalise on emerging market shifts, facilitating the development of innovative offerings.
Technology Advancement	SSL= Smart Solution Integration	This enables entrepreneurs to leverage advanced technologies to create innovative and efficient solutions for their businesses.
	DFE = Digital Frontier Expansion	This allows the entrepreneur to explore and adopt cutting-edge digital technologies, enabling the development of innovative digital products or business models.
Dependent Variable: Entrepreneur's Productivity		
Entrepreneur's Productivity	Efficiency	This enables them to maximise the output of their efforts, resulting in increased productivity.
	Resource Optimization	This enables them to effectively utilise and manage their available resources, resulting in increased productivity.
	Achieving Targets	This enables them to consistently meet or exceed their predetermined goals and objectives, demonstrating their overall productivity.

## RESULT AND DISCUSSION

### RESULTS

#### Descriptive Analysis of Responses and Normality Test

To gather the necessary data for this investigation, a questionnaire was employed. A total of 275 replies, or 88.1% of the anticipated sample size, were recorded; 37 more responses are needed to reach the predicted sample size. Therefore, the data used in this study consists of legitimate replies.

**Table 2.** Descriptive Analysis and Normality Test

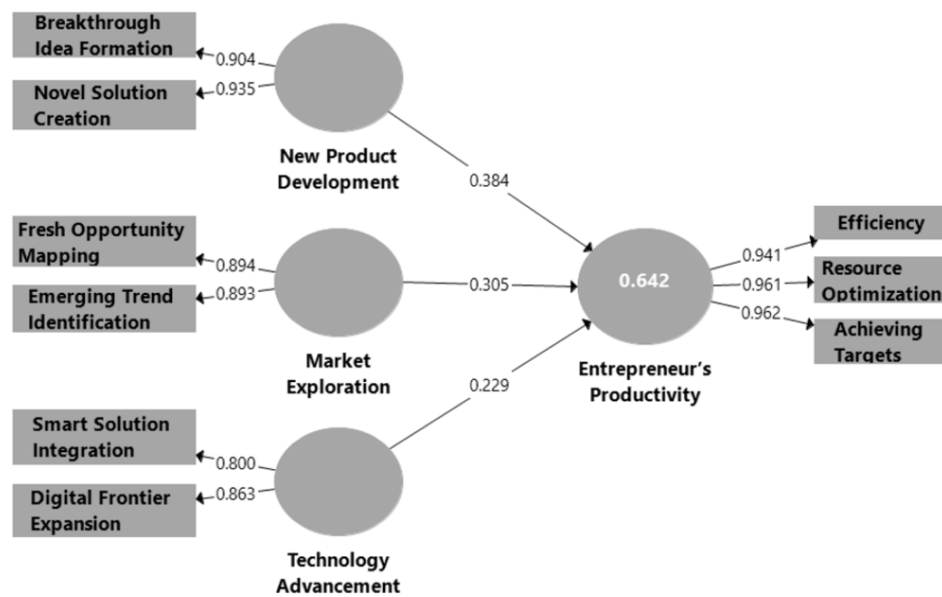
	Mean	Standard Deviation	Excess Kurtosis	Skewness	Number of Observations Used
Entrepreneur's Productivity 1	3.840	1.350	-0.297	-0.964	275.000
Entrepreneur's Productivity 2	3.956	1.361	0.002	-1.156	275.000
Entrepreneur's Productivity 3	3.920	1.373	-0.085	-1.119	275.000
Market Exploration 1	3.447	1.282	-0.862	-0.476	275.000
Market Exploration 2	3.200	1.206	-0.691	-0.290	275.000
New Product Development 1	3.236	1.323	-1.065	-0.300	275.000
New Product Development 2	3.480	1.325	-0.824	-0.575	275.000
Technology Advancement 1	2.935	1.201	-0.903	-0.051	275.000
Technology Advancement 2	3.375	1.305	-1.067	-0.296	275.000

The mean and standard deviation of the variables or indicators used in the study are displayed in Table 2 and were obtained from the questionnaire employed in the study. The study examined the inventiveness and productivity of entrepreneurs. Several important indicators were evaluated, each of which provided insight into a distinct facet of these traits. For both academics and practitioners, the mean scores, standard deviations, and number of observations used for each indicator provide insightful information and important implications. The comparatively high mean score (above 3) for the questions indicates that respondents believe there is a strong correlation between an entrepreneur's productivity and innovativeness. Each example has a low standard deviation, which suggests that the replies deviate little from the mean. These descriptive findings highlight the complex relationship between innovativeness and an entrepreneur's level of production. The significance of an entrepreneur's productivity through successful innovativeness is emphasized by these. This illustrates the average practices and variation in respondents' perceptions of the innovativeness and entrepreneurial productivity indicators measured in the study.

According to the distribution's normality results, the sample size exceeds 100, meaning that an absolute skewness value of  $\pm 1.0$  or less is required for the data to be considered normal. Additionally, for kurtosis, a typical peak should have an absolute value of  $\pm 3.0$  since any result below that threshold might be serious and cause worry. According to the normality results, every variable fell below the  $\pm 1.0$  absolute value barrier, and the kurtosis results likewise fell within the  $\pm 3.0$  absolute value. All of the data submitted for the research is regularly distributed, according to the findings of the normality test, and may be used for further analysis and deduction. This implies that all the variables used to measure innovativeness are normally distributed and have a moderate mean with minimal deviation from the mean. This implies that the factors help determine the causal link between an entrepreneur's effective innovativeness and productivity.

#### **Assessment of Measurement Model**

To assess the effect of innovativeness on entrepreneurs' productivity, the variables used to measure innovativeness include new product development, market exploration, and technology advancement, in relation to entrepreneurs' productivity.



**Figure 2.** A path model of innovativeness and entrepreneurs' productivity

Figure 2 illustrates how the structural route model examines the impact of innovativeness on an entrepreneur's productivity. The model includes new product development, market exploration, and technological advancement as independent variables, and one dependent variable: the entrepreneur's productivity. According to the model's findings, the productivity of entrepreneurs is significantly enhanced by each of the three independent factors. It suggests that firms should value innovation, as it can improve the productivity of entrepreneurs. The specific effects indicate that each of the independent factors has a significant impact on the productivity of entrepreneurs. New product development has the highest strength of relationship with entrepreneurs' productivity. This is followed by market exploration, which has a positive impact of 0.305 units on entrepreneurs' productivity. The last effect is recorded in technology advancement, which can cause 0.229 units of positive change in entrepreneurs' productivity. It implies that companies should concentrate on fostering innovation to increase the productivity of entrepreneurs since all innovativeness factors has positive effect.

**Table 3.** Construct Reliability and Validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Entrepreneur's Productivity	0.952	0.969	0.912
Market Exploration	0.747	0.888	0.798
New Product Development	0.820	0.917	0.846
Technology Advancement	0.758	0.818	0.692

Table 3 displays the construct reliability and validity of the latent variables used in this study. These metrics help assess how well these variables capture the core concepts they are intended to represent. Cronbach's alpha and composite dependability are the two main measures used to assess construct dependability. Cronbach's alpha assesses the internal consistency of a latent variable by determining the extent to which each item is related to every other item. Good quality is demonstrated by the internal consistency scores of the four latent variables, which exceed 0.7. Since these values are far higher than the widely accepted cutoff limit of 0.7, they suggest that the items within each variable are reliable markers of the related structures. All the variables in this study demonstrate strong

composite dependability, providing a more trustworthy measure of reliability, with all values exceeding 0.7. The latent variables' high values suggest that they are reliable predictors of the constructs they stand for.

The table also includes the Average Variance Extracted (AVE), which assesses the convergent validity of each latent variable. The degree to which items in a variable measure the same underlying concept and are connected is known as convergent validity. The AVE value in the table exceeds the recommended threshold of 0.5. It implies that the elements of each latent variable are assessing their respective constructs together and are convergent. The results suggest that the latent variables in this study have strong reliability and construct validity. Hence, the constructs used in this study are valid and reliable measures.

**Table 4.** Discriminant Validity

	Entrepreneur's Productivity	Market Exploration	New Product Development	Technology Advancement
Entrepreneur's Productivity	0.955			
Market Exploration	0.671	0.893		
New Product Development	0.735	0.617	0.920	
Technology Advancement	0.676	0.567	0.714	0.832

Table 4 presents the findings of the discriminant validity of the study constructs. There is strong evidence of discriminant validity for the latent variables of market exploration, entrepreneur productivity, new product development, and technological advancement. Discriminant validity determines whether these constructs are distinct from one another and not closely related. It is clear from examining the off-diagonal values of the correlations between these variables. The diagonal values, which show the correlations of each variable with itself, are substantially higher than the correlations between other variables. This supports the notion that each latent variable is unique and measures a separate feature of the overall construct, as indicated by the stronger relationship each latent variable has with itself than with the other constructs. The productivity of entrepreneurs is highly correlated with their own efforts, more so than it is with the development of new products, the advancement of new technologies, and market exploration. Comparatively speaking to its correlations with the other factors, market exploration has a substantial association with itself. However, this is also true for other variables. These results imply that the latent variables are measuring distinct concepts rather than just different manifestations of the same underlying construct. This implies that the measuring approach is suitable for the study's goals, as it effectively distinguishes between four crucial elements: market exploration, entrepreneurial productivity, new product development, and technological advancement. This evaluates the independent variable's correlation. The purpose is to determine whether two independent variables are not associated and yielding the same results. In this study, the expected association between the independent variables is evaluated using the variance inflation factor (VIF).

**Table 5.** Inner VIF Values

	Entrepreneur's Productivity	Market Exploration	New Product Development	Technology Advancement
Entrepreneur's Productivity				
Market Exploration	1.705			
New Product Development	2.363			
Technology Advancement	2.156			

The VIF values for the latent variables on the productivity of entrepreneurs are shown in Table 5. It is encouraging that the VIF numbers for market research, new product creation, and technological innovation are all far below the 10-point cutoff. It implies that these latent variables do not exhibit significant multicollinearity. In other words, since there is no significant correlation between these variables, multicollinearity is not a major concern when they are included in this analysis. The coefficient of determination results presented in Table 6 indicate that the proposed model explains a substantial proportion of the variance in Entrepreneur's Productivity. Specifically, the R Square value of 0.642 demonstrates that approximately 64.2% of the variation in entrepreneurial productivity can be accounted for by the combined effects of New Product Development, Market Exploration, and Technology Advancement. The adjusted R Square value of 0.638 further confirms the robustness of the model, indicating only a minimal reduction when adjusting for the number of predictors. These findings suggest that the structural model possesses strong explanatory power in predicting entrepreneurial productivity within the context of this study. The productivity model of the entrepreneur is effective in describing the variability of the entrepreneur's productivity, as indicated by the R-squared and modified R-squared values. The model's performance appears to be unaffected by the addition of numerous latent variables. The adjusted R-squared value is nearly the same as the actual R-squared value. It suggests that overfitting or excessive complexity are unlikely outcomes of including the independent variables in the model. This implies that even after accounting for potential issues with model complexity, the model's explanatory power remains high.

**Table 6.** Assessment of the Effect Size ( $f^2$ )

	Entrepreneur's Productivity	Market Exploration	New Product Development	Technology Advancement
Entrepreneur's Productivity				
Market Exploration	0.152			
New Product Development	0.174			
Technology Advancement	0.068			

In statistical analysis, the degree of correlation or impact of independent factors on a dependent variable is measured by the effect size, often denoted as  $f^2$  and presented in Table 6. The individual impact of market exploration, new product development, and technology advancement on entrepreneurs' productivity is evaluated with the f-square. Every independent variable has values greater than 0.02, which is regarded as a minor effect size. This implies that every variable has a moderate effect size, meaning that each one has a discernible effect on the productivity of entrepreneurs. Stated differently, variations in any of the factors can account for a modest amount of the variation in an entrepreneur's productivity.

**Table 7.** Bootstrapping Results Showing Path Coefficient for Structural Model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
Market Exploration -> Entrepreneur's Productivity	0.305	0.309	0.055	5.524	0.000
New Product Development- > Entrepreneur's Productivity	0.384	0.381	0.075	5.115	0.000
Technology Advancement- > Entrepreneur's Productivity	0.229	0.228	0.066	3.453	0.001

The null hypothesis that innovativeness has no significant impact on entrepreneurial productivity was tested using bootstrap path coefficient analysis, as shown in Table 7. The findings indicate that technological advancement, new product development, and market exploration are significant factors of innovativeness that have a positive impact on entrepreneurial productivity. When the relationship between entrepreneur productivity and technological advancement, new product development, and market exploration is examined, it becomes evident that there is a statistically significant correlation between these factors. A convincing reason to reject the null hypothesis is suggested by the statistics being more than 1.96 and the p-values being less than the traditional significance level of 0.05. An entrepreneur's productivity is therefore greatly impacted by factors such as market exploration, new product development, and technological advancement, all of which are indicators of innovativeness.

## DISCUSSION

Entrepreneur productivity achieves its maximum impact from new product development activities ( $\beta = 0.384$ ,  $p < 0.001$ ). It helps SMEs that invest in product innovation to gain significant efficiency increases. The systematic development of new offerings as a business process leads to enhanced operational efficiency throughout the entire business system, spanning from resource management to distribution networks. This supports the second hypothesis, which states that market exploration has a significant positive effect on entrepreneurs' productivity (Ibrahim Rauf et al., 2022). The high coefficient value indicates that the function of innovation functions as the most effective form of business innovation, enhancing among the examined SMEs. There is a positive relationship between market exploration and entrepreneur productivity ( $\beta = 0.305$ ,  $p < 0.001$ ). It indicates that SMEs conducting active market research for new customer segments obtain higher productivity levels. This supports the second hypothesis, that high-status market exploration has a significant positive effect on entrepreneurs' productivity (Bardales-Cárdenas et al., 2024). System analysis with adaptation, enables entrepreneurs to photoconductions make market exploration both crucial and indispensable for improving productivity (Gumbi & Twinomurinzi, 2025). The adoption of new technologies by SMEs produces fields results for entrepreneurially ( $\beta = 0.229$ ,  $p = 0.001$ ), which demonstrates al productivities improvement in productivity, although it still detects a noticeable relationship between technological innovation and productivity is still detected, although its effect size is smaller compared to other productivity drivers. This supports the second hypothesis which state that market exploration has significant positive effect entrepreneur's productivity. This is supported by the study of (Adeyemi, 2020; Ojo et al., 2022). It confirms technology improvement as an effective productivity booster by optimizing operational processes and system automation. Smaller enterprises need to adapt technology according to research even when they have limited resources at their disposal.

## CONCLUSION

New product development is important for the productivity of small and medium-sized businesses (SMEs) because it encourages new ideas and ways to work better, which leads to new sources of income and better skills. Exploring the market is important for entrepreneurs because it helps them make better decisions and be more flexible in competitive environments. This connects external orientation to increased productivity. Technological progress gives small and medium-sized businesses a competitive edge by making better use of resources and getting rid of operational barriers, even though it isn't as obvious. Business leaders should set up formal processes for developing new products, encourage employees to be creative, and work with other companies to boost creativity while keeping resources in check. SMEs can find opportunities by using market intelligence systems and keeping an eye on trends. Also, doing technology evaluations and encouraging people to keep learning new digital skills will help them get the most out of their technology and be more productive.

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