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Intensive Incubation in a Volatile Ecosystem: Empirical Evidence of Business Incubation and Start-Up Performance in Nigeria

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Abstract

This study investigates the influence of entrepreneurial support services on the performance of start-ups. The research is motivated by the growing need to understand how non-financial support mechanisms contribute to the sustainability and competitiveness of new ventures. The population of the study is 200 active start-up businesses currently under-going incubation process at technological Incubation Centre, Kwara state, between year 2023-2025. The study adopted MACORR sample size to determine the sample size of 123 which represents the population after considering 5% margin error and 95% confidence level. A structured questionnaire was administered to select start-up owners and managers, and data were analyzed using Structural Equation Modeling (SEM) via R statistical software. The results revealed that all three support dimensions, training support ($\beta = 0.334$, $p < 0.001$), business advisory services ($\beta = 0.289$, $p = 0.001$), and technical support ($\beta = 0.301$, $p < 0.001$)—have significant and positive effects on start-up performance. The model accounted for 67.8% of the variance in performance (Adjusted $R^2 = 0.678$), indicating strong explanatory power. The study concludes that entrepreneurial support systems are vital to start-up growth and recommends enhanced capacity-building initiatives, mentorship programs, and targeted technical assistance to improve the success rate of start-ups.

Keywords: Business Advice, Business Incubation, Mentorship, Start-up Performance, Technical Support

Introduction

In today's globalized and innovation-driven economy, start-ups have emerged as key drivers of economic growth, job creation, and technological advancement (Balarabe & Akpan, 2022). However, the survival and success of new ventures are fraught with challenges, including limited access to resources, market entry barriers, and the need for continuous innovation. Business incubation has become an increasingly important mechanism to support start-ups, helping them overcome the hurdles of early-stage development (Akintayo et al., 2021). Business incubators provide a structured environment that offers entrepreneurs access to critical resources, including mentorship, financing, networking, and infrastructure (Wright et al., 2020).

Many start-ups face difficulties in securing funding, finding market fit, building

operational capacity, and managing risk. As a result, the survival rate of start-ups is notoriously low, with many failing within the first few years of operation. However, business incubation evolved as a strategic mechanism to address these challenges, providing structured support to entrepreneurs during the critical early stages of business development. Since the concept of business incubation first emerged in the late 1950s, it has grown significantly, with thousands of incubators now operating globally. Originally focused on providing affordable workspace and basic administrative support, incubators have since expanded their services to include strategic advice, market access, and investor relations. This evolution has been driven by the recognition that entrepreneurship plays a vital role in economic development, particularly in fostering innovation in technology, healthcare, energy, and other critical sectors. Incubators vary widely in their structure and objectives. Some are affiliated with universities, where they leverage academic research and student entrepreneurship to create new businesses. Others are sponsored by corporations seeking to foster innovation in specific industries. Government-backed incubators are common in regions where entrepreneurship is seen as a tool for job creation, poverty alleviation, and economic diversification. Regardless of their model, all incubators share the common goal of supporting early-stage ventures and improving their chances of long-term success.

Nigeria has established itself as a leading tech hub in Africa, driven by a large and rapidly expanding youthful population and a growing demand for innovative solutions (Ifeanyi, 2025). The country's startup ecosystem is ranked first in Western Africa and within the top 70 globally (Ochowechi, 2024). In 2023, Nigerian startups secured 30.5% of Africa's total funded ventures and raised approximately $400 million, maintaining a strong position despite a decline from the previous year (Oni, 2025). The government has historically played a significant role in fostering this ecosystem through initiatives such as the Technology Incubation Programme (TIP), introduced in 1988 by the United Nations Development Programme (UNDP). This program, now coordinated by the National Board for Technology Incubation (NBTI), has established Technology Incubation Centers (TICs) across all states to support technology-oriented entrepreneurs.

The benefits of business incubation are multifaceted. By offering access to critical resources and expertise, incubators can help entrepreneurs refine their business models, develop viable products or services, and access markets more effectively. The mentorship and coaching provided by incubators are crucial in helping start-ups avoid common pitfalls, while the networking opportunities enable them to form strategic partnerships and gain access to investors. In addition, the reputation and credibility associated with incubator programs can significantly enhance a start-up's visibility and attractiveness to potential stakeholders. Despite these advantages, start-ups in incubators face several challenges. Not all incubators are equipped to meet the needs of every type of start-up, and resource constraints can limit the effectiveness of incubation programs. Additionally, start-ups may become overly reliant on the incubator's support, and once they "graduate," they may struggle to sustain momentum without the incubator's infrastructure and guidance. It is on this backdrop that the study will investigate the effect of business incubation on start-up performance in technology incubation centre Ilorin Kwara State, Nigeria.

Statement of the Research Problem

While business incubators are established to provide essential support for start-ups, concerns have emerged about the effectiveness and relevance of their training programs. Although incubators are

designed to bridge the knowledge gap for early-stage ventures, many offer generalized training that fails to address the unique challenges specific to different industries, stages of development, and market contexts. This one-size-fits-all approach leaves critical gaps in areas such as financial management, marketing strategies, and operational efficiency, which are essential for long-term business success (Hossain & Roy, 2022). These shortcomings are particularly problematic because entrepreneurs often enter incubators lacking the business acumen necessary to navigate the complexities of launching and scaling a company.

Business advisory services are a critical component of business incubation, offering essential guidance in areas such as strategy development, operational management, and market entry. These services are designed to provide start-ups with the knowledge and support needed to overcome early-stage challenges. However, there is growing concern about the quality, depth, and customization of these services across different incubators, leading to significant inconsistencies in the performance of incubated businesses. While advisory services are meant to bridge the gap between theoretical knowledge and practical business execution, many start-ups struggle to effectively implement the advice provided due to several key limitations (Kassa & Raju, 2022). One major issue is the lack of follow-up and ongoing mentorship. Many incubators provide one-time consultations or generic advice without the continuous support necessary for start-ups to adapt and refine their strategies over time. This is particularly problematic in rapidly changing industries or markets where constant adaptation is crucial for survival. Start-ups require continuous, real-time advisory services that guide them through evolving challenges, but many incubators fall short in offering this level of support. Without sustained mentorship, start-ups often fail to execute on strategic advice, limiting their capacity for innovation and growth.

Another key limitation is the insufficient tailoring of advisory services to industry-specific and local market challenges. Each industry operates with unique dynamics, such as specific regulatory environments, supply chain considerations, and consumer behaviours. Advisory services that are too generic or not aligned with the particular needs of the start-up's industry can result in misguided strategies that fail to deliver competitive advantages (Adewale & Amusa, 2022). For example, a tech start-up requires different operational advice than a retail or agricultural business, yet many incubators apply a one-size-fits-all approach that does not account for these distinctions. Similarly, local market conditions such as customer preferences, economic constraints, and regional competition are often overlooked, further reducing the relevance and effectiveness of the advice provided.

In today’s rapidly evolving business landscape, access to technological support is a critical determinant of small business success. Advanced technology enables start-ups to innovate, streamline operations, and compete in a globalized, digital-driven market. However, many business incubators, particularly in developing regions, struggle to provide the technological infrastructure, tools, and expertise necessary to help start-ups meet the demands of this modern environment (Balarabe & Akpan, 2022). This technological shortfall is especially pronounced in industries that rely heavily on innovation, such as tech, manufacturing, and agriculture, where cutting-edge tools and digital platforms are essential for product development, data-driven decision-making, and scaling operations. As a result, start-ups are frequently left without the necessary resources to integrate advanced technologies such as artificial intelligence, cloud computing, or digital marketing tools into their business models (Olawale, 2022). Without these technologies, start-ups

struggle to innovate, optimize processes, and expand their market reach, placing them at a significant disadvantage in highly competitive, tech-driven industries. Moreover, technological agility is becoming an increasingly important factor in maintaining a competitive edge in global markets. Businesses that are able to rapidly adopt and adapt to new technologies are better positioned to respond to market changes, customer needs, and industry disruptions. However, the lack of access to advanced technological tools in incubators hinders start-ups' ability to keep pace with these shifts, impacting their long-term growth and sustainability. This is particularly concerning given that start-ups exiting incubators often face fierce competition from more technologically advanced competitors, both locally and globally. The absence of adequate technological support in business incubators not only limits the capacity of start-ups to innovate but also undermines their long-term viability. Existing studies show that incubators help, but they fail to show how intensive incubation specifically builds the strategic agility needed to survive a high-volatility ecosystem like Nigeria's.

Objectives of the study

The main objective of this study is to determine the effect of business incubation on start-up performance, while the specific objectives are to;

i. examines the effect of training support on start-up performance;

ii. determine the effect of business advice on start-up performance; and

iii. measure the effect of technical support on start-up performance.

Conceptual Review

Business Incubation

Business incubation is asserted as a systematic process of nurturing start-ups by providing infrastructure, mentorship, and networking opportunities to help them grow sustainably (Mian et al., 2021). According to Harima et al. (2021), business incubation fosters entrepreneurship by offering tailored resources that guide start-ups through their early development stages. Business incubation is the provision of space, funding, business advice, and networking to ensure the successful launch of new ventures (Zhu et al., 2020). Tang et al. (2021) explain business incubation as the process of accelerating early-stage business growth by offering support in areas like financing, mentorship, and strategic planning. Business incubation refers to programs designed to support the successful development of entrepreneurial companies through an array of business support resources and services (Larty et al., 2020). According to Xu et al. (2019), incubation is a structured process that provides essential resources such as office space, training, and access to networks to improve start-up success rates.

Business incubators play a crucial role in helping start-ups survive by offering an ecosystem of support, which includes financing, legal assistance, and market entry strategies (Wonglimpiyarat, 2021). Guerrero et al. (2021) conceptualised business incubation as a nurturing system that helps entrepreneurs convert innovative ideas into viable business models through tailored support services. Business incubation involves providing start-ups with shared space, mentorship, resources, and networking opportunities to develop scalable businesses (Amezcua et al., 2020). The role of business incubation is to accelerate the growth of new enterprises by providing operational and strategic support (Scillitoe et al., 2021). According to Ndabeni and Rogerson (2019), business incubation is a tool for promoting entrepreneurship by providing physical infrastructure, managerial support, and networking.

Klofsten et al., (2020) opined business incubation as a mechanism for supporting start-ups through the provision of mentorship, business services, and access to investors. According to Ratinho et al. (2020), incubation enhances start-up

success rates by offering infrastructure and valuable connections to investors, advisors, and customers. Incubation is the strategic process by which businesses are offered structured support in their early stages to become financially sustainable (Johnson et al., 2020). According to Ayatse et al., (2019), incubation is a platform that provides nascent businesses with physical space, training, mentorship, and funding opportunities to scale. Business incubation is described as a systematic approach to help start-ups overcome early-stage challenges by providing critical resources (Cohen et al., 2021).

Mentorship and Training in Business Incubation

Mentorship and training are two vital components of business incubation programs that help foster the growth and sustainability of start-ups. Start-up entrepreneurs often lack the experience needed to navigate the complexities of the business environment. Mentors typically experienced professionals, play a key role in guiding entrepreneurs through strategic planning, product development, marketing, and financial management (Nambisan & Baron, 2021). Additionally, business incubators provide formal training programs that help entrepreneurs acquire the necessary skills for leadership, management, and decision-making (Clarysse et al., 2020). Research has further explored the effects of these components on the performance of small businesses, revealing the significant value of mentorship and training in the business incubation process.

Challenges in Mentorship and Training

Despite the recognized benefits of mentorship and training in business incubation, several challenges have emerged, particularly in the context of the COVID-19 pandemic and the transition to virtual platforms. One major challenge is ensuring the quality and relevance of mentorship and training programs. Not all mentors have the time or inclination to provide the level of personalized attention that entrepreneurs need (Abolade, 2022). Additionally, some incubators may lack the resources to offer specialized training that addresses the unique needs of different types of businesses. For instance, a tech start-up may require more advanced training in software development cycles, while a retail business may need training in supply chain management (Chen, 2023).

Furthermore, the scalability of mentorship and training remains an issue for many incubators. As the demand for incubation services grows, it becomes increasingly difficult to match entrepreneurs with experienced mentors or to provide high-quality training programs that can cater to larger cohorts (Mason et al., 2022). The rise of online and hybrid incubation models, while offering more flexibility, also presents challenges in maintaining the same level of engagement and interaction that in-person mentorship and training offer. Entrepreneurs may feel isolated in virtual environments and may struggle to form strong relationships with their mentors or fully engage in training workshops (Bai et al., 2021). However, mentorship and training are essential components of business incubation programs, helping entrepreneurs develop the skills and networks needed to navigate complex business environments.

Business Advice in Incubation Programs

Business advice has increasingly become an integral component of incubation programs, serving as a cornerstone for early-stage ventures. Incubators have expanded their advisory roles to offer comprehensive guidance tailored to the specific needs of start-ups. This advice spans a wide range of areas, including market entry strategies, financial planning, scaling operations, and navigating regulatory environments. Start-ups, particularly those in their nascent stages, benefit from the expert advice provided by incubators, allowing them to make more

informed decisions, avoid common pitfalls, and capitalize on market opportunities. The customized nature of business advice in incubators, as noted by Lim et al. (2022), makes it an essential part of the incubation process, significantly contributing to business success.

A key benefit of business advice in incubation is its role in market strategy development. Entrepreneurs often face difficulties in identifying their target markets and positioning their products effectively. Incubators provide access to experienced advisors who help entrepreneurs refine their value propositions and develop strategies for market penetration. According to a study by Taylor et al., (2021), start-ups that receive strategic market advice from incubators are more likely to secure a foothold in competitive industries. By understanding market dynamics, these ventures can avoid the trial-and-error phase that many non-incubated businesses face, allowing them to focus on growth from the onset. Additionally, tailored business advice helps entrepreneurs anticipate changes in consumer behaviour and adjust their strategies accordingly, enhancing their adaptability in volatile markets.

Another critical area where business advice plays a transformative role is in financial planning. Many start-ups fail due to poor financial management and a lack of understanding of funding opportunities (Holienka et al., 2023). Incubators bridge this gap by providing specialized financial advice that includes budgeting, cash flow management, and investor relations. By receiving expert guidance on how to manage their finances, start-ups can better allocate resources, minimize waste, and extend their operational runway. Moreover, incubators often guide entrepreneurs through the process of raising capital, including pitching to investors and understanding the terms of venture capital deals. As highlighted by Lamine et al., (2020), business advice on financial matters significantly increases the likelihood of start-ups securing funding, thus improving their chances of survival in the early stages.

Technical Support in Business Incubation

Technical support has emerged as a critical pillar in business incubation programs, particularly over the past few years. As the global economy becomes increasingly digital and technology-driven, the demand for robust technical infrastructure, specialized expertise, and cutting-edge innovation has surged among start-ups. Technical support in the context of incubation encompasses a wide range of services, including IT infrastructure, product development assistance, research and development (R&D) support, and access to specialized technologies and laboratories (Mian et al., 2021). This study reviews recent developments in technical support within incubation programs and how they contribute to the success of emerging businesses.

Networking Opportunity

Networking is a fundamental component of business incubation, providing start-ups with the connections necessary for success in a competitive marketplace. Incubators create an environment conducive to networking by linking entrepreneurs with established businesses, industry experts, and potential customers. This interconnectedness allows start-ups to gain valuable insights into market trends, refine their business strategies, and form strategic partnerships that foster growth. Studies has highlighted the importance of technical support within these networking opportunities, emphasizing how access to expertise and resources enhances the overall effectiveness of incubation programs (Lee et al., 2022).

Facilitating Connections with Industry Experts

One of the primary ways incubators support networking is by connecting start-ups with industry experts who can provide technical

support. This access is invaluable, as industry experts often bring a wealth of experience and knowledge that can guide entrepreneurs in the early stages of their ventures (Pau et al., 2020). By facilitating introductions to these experts, incubators help entrepreneurs navigate complex technical challenges, such as product development, regulatory compliance, and technology adoption. For instance, a tech start-up may benefit from a mentor with experience in software development, who can offer insights into best practices and potential pitfalls, ultimately accelerating the start-up's growth trajectory (Hussain et al., 2024). Furthermore, incubators often host workshops, seminars, and panel discussions where industry experts share their knowledge and insights. These events not only provide start-ups with valuable technical information but also create opportunities for entrepreneurs to engage directly with experts in a less formal setting (González-Uribe & Leatherbee, 2024). The relationships formed during these interactions can lead to ongoing mentorship and collaboration, further enhancing the technical capabilities of the start-ups involved.

Physical Infrastructure in Business Incubation:

Access to affordable physical infrastructure is a pivotal benefit offered by business incubators, particularly for small businesses in their nascent stages. Many start-ups face significant financial barriers when attempting to secure adequate office space and necessary equipment. According to a study by Wright et al., (2020), physical infrastructure encompasses not only office space but also technology resources such as computers, high-speed internet, and specialized equipment that facilitate product development. These resources are critical for entrepreneurs who lack the capital to invest in high-quality facilities and technologies from the outset. By providing access to these essential components, incubators play a crucial role in levelling the playing field for start-ups, enabling them to compete effectively in their respective markets.

In recent years, the importance of physical infrastructure in incubation programs has been further underscored by the rapid growth of remote work and digital businesses. The COVID-19 pandemic accelerated the shift toward digital solutions, highlighting the need for reliable technology and workspaces that can adapt to changing business models (Abdullah & Fawzy, 2022). Business incubators have responded to this demand by not only offering physical office space but also creating environments that support remote work through the provision of co-working spaces and virtual office solutions. These flexible arrangements allow start-ups to scale their operations based on their specific needs without incurring the overhead costs associated with traditional office leases (Rathore et al., 2021). As a result, incubators can significantly enhance the operational efficiency of start-ups, allowing them to allocate more resources toward product development and market entry.

Furthermore, incubators provide access to state-of-the-art technology that many start-ups would find prohibitively expensive if purchased outright. This includes access to specialized software, high-performance computing resources, and advanced communication tools, which are essential for innovation and competitiveness (Higgins et al., 2021). For example, tech start-ups that rely heavily on data analytics and software development benefit immensely from incubators that offer the necessary technological infrastructure, allowing them to focus on refining their products rather than struggling with outdated or insufficient equipment. This access not only accelerates the development cycle but also increases the likelihood of producing high-quality products that meet market demands.

SMEs Performance

SMEs performance refers to the achievement of key business objectives, such as profitability, customer satisfaction, and innovation, which are crucial for long-term sustainability (Khan et al., 2021). Furthermore, SME performance is a measure of how effectively small businesses achieve financial stability and market competitiveness in challenging environments (Elegunde et al., 2023). The performance of SMEs encompasses growth in sales, customer loyalty, and operational efficiency, all of which are crucial for achieving business success (Qasif, 2025). Similarly, SME performance reflects the firm's ability to adapt to external market changes while maintaining profitability and expanding market share (Ibrahim et al., 2023). According to Jones et al., (2024), SME performance is the degree to which small businesses meet both financial and strategic objectives, such as innovation and market leadership. Moreover, SME performance refers to achieving business goals like profitability and customer satisfaction, often measured through growth in sales and operational effectiveness (Liu et al., 2022). Additionally, SME performance measures how well small firms manage financial growth, market penetration, and customer retention (Williams, 2021). SME performance also involves achieving financial outcomes like profitability and non-financial results such as innovation and customer engagement (Johnson-Hart, 2023).

According to Chen et al., (2022), SME performance is a multidimensional construct, encompassing financial metrics like sales growth and non-financial measures such as market competitiveness. It can also be defined by the firm's success in growing revenue, improving operational efficiency, and maintaining a strong market presence (Núñez-Ríos et al., 2023). Furthermore, SME performance reflects the effectiveness with which small businesses balance financial success and strategic objectives like innovation and customer loyalty (Smith, 2022). SME performance, therefore, measures business success through profitability, market expansion, and the ability to meet customer needs effectively (Nguyen et al., 2024). In the modern business landscape, SME performance is evaluated through sales growth, productivity, and innovation capacity (Baker & Islam, 2025). It captures the extent to which a firm can achieve financial growth, market expansion, and customer satisfaction in a competitive environment (Omisakin, 2024). Similarly, SME performance reflects business outcomes in terms of profitability, employee productivity, and market adaptability (Kumar et al., 2022). SME performance is also defined by a company's ability to meet revenue targets, expand market share, and ensure customer satisfaction (Jiang & Vannasathid, 2023).

Theoretical review

Discovery Theory of Entrepreneurship Innovation

Discovery theory of Entrepreneurship Innovation was propounded by Kirzner (1973) he assumed that competitive imperfections are assumed to arise exogenously, from changes in technology, consumer preferences, or some other attributes of the context within which an industry or market exists. In his review of this literature, Shane (2003) cites technological changes, political and regulatory changes, and social and demographic changes as examples of the kinds of events that can disrupt the competitive equilibrium that exists in a market or industry, thereby forming opportunities. This emphasis on exogenous shocks forming opportunities has several important implications for discovery theory. For example, this emphasis suggests that discovery theory is based on realist assumptions in the philosophy of science—those opportunities, like mountains, exist as real and objective

phenomena, independent of the actions or perceptions of entrepreneurs, just waiting to be discovered and exploited (Malerba & McKelvey, 2020).

Empirical Review

Agus et al. (2023) carried out research that was aimed at identifying the determinant factors of entrepreneurship in the case of university students. The research also evaluated student perception of business incubation programs in both universities. The research evaluated primary data from Jenderal Soedirman University, Indonesia, and Debrecen University, Hungary. Data was collected using a questionnaire. The results showed that the perceived opportunity has a significant impact on the intention to establish a business. However, the business incubation program from campus does not affect student intention to establish a business. A more interesting finding is that Indonesian students have the lowest belief about the impact of business incubation programs compared to Hungarian and international students. The research's further implication is that the business incubation program needed to be improved to impact student willingness to establish a business significantly. Ahmed et al. (2020) also explored the role of BIs in entrepreneurship development by surveying 245 graduate and post-graduate students who participated in incubation programs. Their results showed that networking services, capital support, and training programs positively influenced entrepreneurial growth. They suggested that the government should prioritize financing, reduce taxes on technology imports, improve infrastructure, and develop training programs in collaboration with BIs.

Ali et al., (2023) examined the impact of business incubation on the entrepreneurial intentions of students in Pakistan. Utilizing a survey of 300 university students involved in incubator programs, the findings indicated a positive correlation between incubation experiences and the students' intentions to start their own businesses. The study suggested that incubators play a crucial role in fostering an entrepreneurial mind-set among students. Fazal et al. (2022) explored the challenges and opportunities of business incubation in Bangladesh. Through qualitative interviews with incubator managers and entrepreneurs, the authors identified key barriers, including access to finance and infrastructural constraints. The study also highlighted emerging opportunities in digital entrepreneurship and the need for incubators to adapt to changing market dynamics.

Methodology

This study employs descriptive research design to examine the effect of business incubation on the performance of start-up business in Ilorin metropolis in Kwara state, Nigeria. The population of the study is 200 active start-up businesses currently under-going incubation process between 2022-2024. The study adopted MACORR sample size Table to determine the sample size, which takes into account the margin of error, the confidence level and the response distribution. MACORR sample size calculator gave a figure of 123 which represents the population after considering 5% margin error and 95% confidence level. A survey method was employed, utilizing a self-administered questionnaire. The study further adopted probability sampling techniques using simple random because to removes the possibility of selection bias and results that can be generalized. The analysis was conducted through the use of Partial Least Square Structural Equation Modelling (PLS-SEM) and R environment.

To ascertain the validity of the instrument, content validity was adopted. The instruments were validated by the researcher's superior researcher who have more wealth of knowledge on the subject matter to scrutinize the questionnaire to ensure that the questions therein are not at variance with the subject matter under

study. They ensured that the instruments represent the entire range of possible items to be tested in the study. A total of fifty (50) copies of the questionnaire were administered to the experts in the field with the help of research assistants. Forty-five (45) were retrieved from the respondents and used for the pilot study. The observation received from pilot test was used to revise the items for the quality improvement of the questionnaire.

Data Analysis and Findings

Descriptive Statistics

The mean and standard deviation for each construct were computed using the psych package in R.

Construct	Mean	Std. Dev.	Interpretation
Training Support	4.12	0.76	High
Business Advisory	4.18	0.72	High
Technical Support	4.01	0.81	High
Business Growth	4.05	0.79	High
Operational Efficiency	4.08	0.75	High
Business Survival	4.03	0.74	High

Model Specification

training support =~ ts1 + ts2 + ts3 + ts4 + ts5
business advisory =~ ba1 + ba2 + ba3 + ba4 + ba5
technical support =~ tcs1 + tcs2 + tcs3 + tcs4 + tcs5
startup performance =~ growth + efficiency + survival

Path Coefficients and Significance (Bootstrapping)

Path	Coefficient	t-value	p-value	Significance
Training Support → Performance	0.334	4.21	0.000	Significant
Business Advisory → Performance	0.289	3.76	0.001	Significant
Technical Support → Performance	0.301	3.92	0.000	Significant

The study employed Partial Least Squares Structural Equation Modelling (PLS-SEM) using R statistical software to test the structural relationships between the constructs of business incubation and start-up performance. Specifically, the analysis examined the direct effects of training support, business advisory, and technical support on the performance of start-up businesses. The results of the path analysis are presented below. The analysis revealed that training support has a statistically significant and positive effect on start-up performance, with a path coefficient of 0.334, a t-value of 4.21, and a p-value of 0.000. The p-value being less than 0.05 indicates that the relationship is statistically significant at the 5% level. This implies that the provision of training to entrepreneurs within the incubation programme contributes meaningfully to improvements in their business outcomes. Training may include workshops, seminars, and practical knowledge transfer, which enhance

entrepreneurial competencies and strategic decision-making. Similarly, business advisory services also exhibited a significant positive impact on start-up performance, with a path coefficient of 0.289, a t-value of 3.76, and a p-value of 0.001. This finding underscores the critical role of expert advice, mentorship, and consultancy services in guiding start-ups through challenges and enhancing their strategic planning, market positioning, and financial management. The high level of significance suggests that advisory services are a strong predictor of improved business outcomes among incubated ventures. Furthermore, the analysis showed that technical support has a significant and positive effect on start-up performance, as evidenced by a path coefficient of 0.301, a t-value of 3.92, and a p-value of 0.000. This result indicates that technical assistance, such as access to production equipment, research and development facilities, ICT infrastructure, and product development support—contributes significantly to enhancing the operational efficiency and innovation capacity of start-up firms.

In summary, the results of the structural model provide empirical support for all three hypotheses proposed in the study. Each dimension of business incubation—training support, business advisory, and technical support—has a statistically significant and positive effect on the performance of start-ups within the incubation programme. Among the three, training support emerged as the strongest predictor, suggesting that building entrepreneurial skills and competencies is particularly influential in driving business success. Regression Analysis using lm function model <- lm (startup performance ~ training support + business advisory + technical support, data = data)

Model Output:

- Adjusted R^2: 0.678
- F-statistic: 45.89 on 3 and 113 DF
- p-value: < 2.2e-16

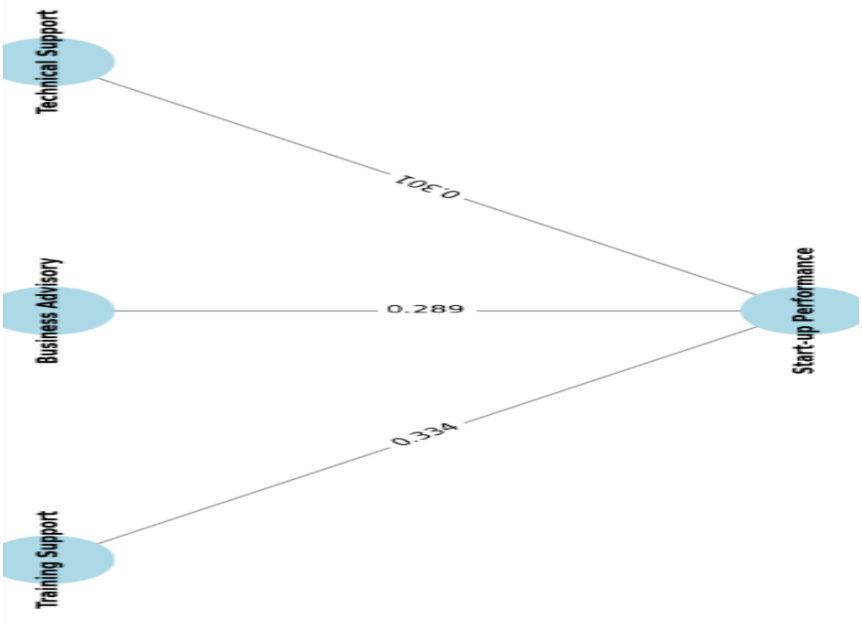
The structural equation model was further assessed to determine the overall explanatory power of the independent variables—training support, business advisory, and technical support—on start-up performance. The adjusted R-squared (R^2) value of 0.678 indicates that approximately 67.8% of the variance in start-up performance is explained by the combined effects of the three predictor variables included in the model. This reflects a substantial level of explanatory power, suggesting that the constructs integrated into the model account for a meaningful portion of the performance outcomes among the start-up businesses under investigation. The model's overall significance was tested using the F-statistic, which yielded a value of 45.89 on 3 and 113 degrees of freedom, with an associated p-value less than 2.2e-16. This result confirms that the model is statistically significant at the 0.001 level, providing strong evidence that the set of independent variables reliably predicts the dependent variable—start-up performance. In essence, the high F-statistic and low p-value indicate that the likelihood of observing such a strong relationship between the independent variables and performance by chance is extremely low. Therefore, the model is both robust and statistically valid, confirming the effectiveness of business incubation components—namely training, advisory, and technical support—in enhancing the performance of incubated start-ups.

Discussion of Findings (Expanded with Supporting Literature)

The findings of this study reveal that business incubation services such as training support, business advisory, and technical support have a significant and positive effect on start-up performance. The results support existing empirical evidence and scholarly discourse on the strategic value of incubation in nurturing nascent enterprises.

Training Support and Start-up Performance

The analysis indicated that training support had the strongest influence on start-up performance, with a path coefficient of 0.334 ($p < 0.001$). This suggests that structured training programs, including capacity-building workshops, entrepreneurship education, and skill development, are essential tools for improving business acumen and managerial capacity among start-up founders. This finding aligns with Clarysse et al. (2021), who emphasized the central role of training in equipping entrepreneurs with the competencies needed to navigate complex business environments. Similarly, Hossain and Roy (2022) found that training support significantly correlates with performance metrics such as revenue growth and market expansion in incubated firms. In developing contexts, Akintayo et al. (2021) noted that training offered through incubation programs serves as a substitute for the often-lacking formal business education, thereby enhancing entrepreneurial resilience. The results also echo Cohen et al., (2021) findings, which demonstrated that start-ups receiving structured training showed higher survival rates and strategic agility.



Business Advisory Services and Start-up Performance

The study found that business advisory services significantly contribute to start-up performance, with a coefficient of 0.289 ($p = 0.001$). This dimension encompasses mentorship, legal advice, marketing strategy, and financial planning services that collectively provide strategic guidance for entrepreneurial decision-making. This is consistent with Adewale and Amusa (2022), who argue that advisory services play a vital role in shaping the trajectory of start-ups, especially in areas of governance, financial management, and scalability. Kassa and Raju (2022) similarly reported that effective advisory services improve entrepreneurial confidence, decision-making, and overall business sustainability. According to Carvalho et al., (2022), strategic advice from incubators enables start-ups to avoid common pitfalls and optimize resource allocation, which accelerates business growth. Moreover, Bai, Xu, and Li (2021) emphasized the value of mentorship networks in supporting knowledge transfer and fostering innovation through business advice.

Technical Support and Start-up Performance

Technical support, with a coefficient of 0.301 ($p < 0.001$), was also found to significantly impact performance. This support typically includes access to technology infrastructure, product development labs, and IT advisory services. The findings suggest that technical support improves product quality, enhances operational efficiency, and fosters innovation.

This resonates with Balarabe and Akpan (2022), who found that technical support in the form of digital tools and IT mentorship accelerates innovation cycles and shortens time-to-market. Goswami et al., (2022) also highlighted that hands-on technical support strengthens R&D capabilities and promotes more robust business models. Furthermore, Higgins et al., (2021) discussed how incubators with strong technical infrastructures offer a significant competitive advantage, particularly in sectors such as fintech, healthtech, and agritech. These services facilitate experimentation, prototyping, and quality assurance, which are critical for product-market fit. The findings of this study corroborate earlier conclusions by Jenyo (2018), who emphasized that well-rounded incubation services particularly when training, advisory, and technical supports are provided in an integrated manner—significantly improve the growth, efficiency, and survival of start-ups. The adjusted R^2 value of 0.678 further underscores that a substantial proportion (67.8%) of the variation in start-up performance can be explained by these three forms of support. This reflects the systemic and complementary nature of business incubation, consistent with Acs et al. (2021), who viewed incubation as a critical pillar of the entrepreneurial ecosystem. Similarly, Al-Mubaraki and Busler (2022) in their systematic review noted that incubators are most effective when their services are well-coordinated and tailored to the contextual needs of start-ups. This study reaffirms that position, offering empirical evidence from Nigeria's incubation landscape.

Conclusion

In light of the empirical findings, it can be concluded that business incubation services play a critical role in shaping the success trajectory of start-ups. The significant contributions of training support, advisory services, and technical assistance confirm that a well-structured incubation system is indispensable for enterprise development, particularly in emerging economies such as Nigeria where access to capital, expertise, and infrastructure is limited. The study affirms that training programs enhance entrepreneurial capacity and confidence; business advisory services mitigate strategic and operational risks; and technical support fosters innovation and operational efficiency. When delivered holistically, these services empower start-ups to overcome early-stage challenges, attain scalability, and contribute meaningfully to economic growth and job creation. Therefore, incubation should be seen not merely as a support mechanism but as a strategic development tool for national entrepreneurship policy. The findings advocate for increased investment in incubation infrastructure, particularly in rural and semi-urban areas where entrepreneurial activity is rising but support remains limited.

Recommendations

Based on the study's findings and conclusions, the following recommendations are made:

i. Incubation centers should prioritize the development and continuous improvement of training curricula tailored to evolving market dynamics. Training should incorporate modules on financial literacy, digital marketing, innovation management, and business model development to equip entrepreneurs with comprehensive skills.

ii. Incubation programs should facilitate regular access to experienced mentors,

consultants, and industry professionals who can provide hands-on guidance. Government and development partners should support the creation of advisory networks to enhance the availability and diversity of strategic business advice.

iii. Technical support must be modernized through investments in ICT tools, digital labs, and product development hubs. Start-ups should be given access to shared resources such as high-speed internet, prototyping equipment, and tech mentorship to encourage innovation-driven growth. Universities and research institutions should partner with incubation hubs to facilitate knowledge transfer, innovation commercialization, and capacity building. Academic staff with expertise in entrepreneurship and innovation should be integrated into incubation service delivery.

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