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Entrepreneurial Ecosystems and Sustainable SME Growth in Ghana: The Mediating Role of Innovation Capability

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ABSTRACT

Small and Medium Enterprises (SMEs) are foundational to economic development in Sub-Saharan Africa, yet their sustainable growth potential remains persistently constrained by inadequate ecosystem conditions and limited innovation capacity. This study investigates how entrepreneurial ecosystems, operationalized through six dimensions comprising community support, university support, government support, access to finance, institutional quality, and infrastructure, influence sustainable SME growth in Ghana, with innovation capability serving as a mediating mechanism and entrepreneurial purpose as a moderating variable. Grounded in Dynamic Capabilities Theory and the Resource-Based View, a quantitative cross-sectional survey design was employed, gathering data from 350 SME owners and managers across selected regions of Ghana. Partial Least Squares Structural Equation Modeling (PLS-SEM) was applied for hypothesis testing. Measurement model assessment confirmed strong construct reliability (Cronbach's α range: 0.80–0.91; composite reliability range: 0.85–0.93), adequate convergent validity (AVE range: 0.55–0.65), and acceptable discriminant validity, with all Heterotrait-Monotrait (HTMT) ratios below the 0.85 threshold. The structural model explained 72.4% of variance in innovation capability ($R^2 = 0.724$) and 67.1% of variance in sustainable SME growth ($R^2 = 0.671$), with predictive relevance confirmed ($Q^2 = 0.463$ for innovation capability; $Q^2 = 0.407$ for sustainable SME growth). Model fit was acceptable (SRMR = 0.058; NFI = 0.908). The findings confirm that all six ecosystem dimensions directly and positively influence both innovation capability and sustainable SME growth. Innovation capability significantly mediates the relationship between the entrepreneurial ecosystem and sustainable SME growth, while entrepreneurial purpose positively moderates the innovation capability–sustainable growth nexus. This study extends entrepreneurial ecosystem literature to the Sub-Saharan African context and provides actionable insights for policymakers, university administrators, and SME practitioners seeking to foster innovation-driven sustainable growth in developing economies.

Keywords: Entrepreneurial Ecosystem, Innovation Capability, Sustainable SME Growth, Community Support, University Support, Government Support, Access to Finance, Institutional Quality, Infrastructure, Entrepreneurial Purpose, Ghana

INTRODUCTION

Small and Medium Enterprises (SMEs) occupy a central position in Ghana's economic architecture. They constitute approximately 92% of all registered businesses in the country and contribute significantly to employment generation, poverty alleviation, and gross domestic product (Ghana Statistical Service, 2022). Despite their numerical dominance and developmental significance, Ghanaian SMEs continue to face deep-rooted challenges including limited access to finance, weak institutional linkages, inadequate technological infrastructure, and low innovation activity, all of which undermine their capacity for sustainable long-term growth (World Bank, 2022; OECD, 2021).

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In the face of these challenges, the concept of the entrepreneurial ecosystem has emerged as a compelling framework for understanding how environmental and institutional conditions shape entrepreneurial performance. An entrepreneurial ecosystem is broadly defined as a set of interdependent actors and structural factors that are coordinated in such a way as to enable productive entrepreneurship within a particular territorial context (Stam & van de Ven, 2021). Unlike firm-level analyses, the ecosystem perspective recognizes that entrepreneurial success is inherently relational and systemic, shaped not only by the capabilities of individual entrepreneurs and their firms, but also by the richness of the external environment in which they operate. This richness encompasses multiple interlocking dimensions, including community social capital, university knowledge transfer, government policy and regulatory support, access to financial resources, institutional quality, and the adequacy of physical and digital infrastructure (Isenberg, 2011; Stam & van de Ven, 2021; Wurth, Stam & Spigel, 2022).

While the entrepreneurial ecosystem framework has generated substantial scholarly interest over the past decade, the bulk of empirical work has focused on high-income, knowledge-intensive contexts such as Silicon Valley, London, and Tel Aviv (Wurth et al., 2022). Research examining how ecosystem dynamics operate in developing country settings, where institutional frameworks are weaker, market failures more prevalent, and resource environments more constrained, remains comparatively underdeveloped (Audretsch & Belitski, 2022; Spigel, 2022). Ghana, as one of West Africa's most economically dynamic nations, offers a particularly valuable context for such investigation. The country has made notable strides in building entrepreneurship support infrastructure through university business incubators, government SME development programs, and growing university-industry collaborations, yet the extent to which these ecosystem investments translate into innovation capacity and sustainable SME growth remains poorly understood (Acheampong & Tweneboah-Koduah, 2021).

A critical but underexplored question in this literature concerns the mechanism through which ecosystem resources generate firm-level performance outcomes. Innovation capability, defined as a firm's ability to continuously develop and renew products, services, processes, and organizational arrangements in response to changing market demands, has been theorized as a central mediating mechanism linking ecosystem inputs to performance outputs (Teece, 2022; Guerrero & Urbano, 2021). However, empirical evidence for this mediation pathway, particularly in the African context, is sparse. Furthermore, the boundary conditions under which innovation capability translates into sustainable growth outcomes have received limited investigation. Entrepreneurial purpose, the motivational orientation, values, and broader goals that guide an entrepreneur's actions, has been proposed as one such boundary condition, given that purpose-driven entrepreneurs tend to channel their innovation efforts toward solutions that create long-term, multidimensional value (Bacq & Janssen, 2021). Nevertheless, this moderating dynamic has not been rigorously tested in the Ghanaian SME context.

This study therefore pursues three specific objectives: first, to assess the effects of six entrepreneurial ecosystem dimensions, community support, university support, government support, access to finance, institutional quality, and infrastructure, on innovation capability and sustainable SME growth in Ghana; second, to examine the mediating role of innovation capability in the relationship between the entrepreneurial ecosystem and sustainable SME growth; and third, to evaluate the moderating role of entrepreneurial purpose in the relationship between innovation capability and sustainable SME growth.

The study makes several important contributions. Theoretically, it enriches the entrepreneurial ecosystem literature by providing empirical evidence from a Sub-Saharan African context with a comprehensive, multi-dimensional ecosystem operationalization, extends Dynamic Capabilities Theory by modeling innovation capability as the linking mechanism between ecosystem inputs and growth outcomes, and advances the understanding of purpose-driven entrepreneurship as a boundary condition in the innovation–performance relationship. Practically, the findings generate actionable guidance for policymakers, university administrators, and SME practitioners in Ghana and comparable developing economy contexts.

The remainder of this article proceeds as follows. Section 2 presents the theoretical framework underpinning the study. Section 3 develops literature review and hypotheses. Section 4 describes the conceptual framework. Section 5 outlines the research methodology. Section 6 presents and discusses the findings. Section 7 draws conclusions, discusses implications, and identifies limitations and future research directions.

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THEORETICAL FRAMEWORK

Dynamic Capabilities Theory

Dynamic Capabilities Theory (DCT), as formalized by Teece, Pisano and Shuen (1997) and substantially extended by Teece (2022), provides the primary theoretical architecture for this study. DCT holds that sustainable competitive advantage in rapidly changing environments is grounded not in static resource stocks but in a firm's capacity to sense opportunities and threats, seize strategic opportunities, and reconfigure existing asset bases and organizational routines in response to environmental changes. Within this framework, innovation capability represents the most prominent and consequential dynamic capability in the SME context, enabling firms to continuously renew their products, processes, and business models in alignment with evolving market demands (Teece, 2022).

Critically for the present study, DCT does not treat dynamic capabilities as purely internally generated phenomena. Rather, Teece (2022) and subsequent scholars have emphasized that dynamic capability development is substantially shaped by the richness of the external knowledge and resource environment in which the firm operates. Ecosystem elements, including university knowledge transfer, community relational networks, government support infrastructure, financial market development, institutional quality, and physical infrastructure, constitute the environmental inputs that provide the raw material for capability building. Without adequate ecosystem support, dynamic capabilities may remain underdeveloped regardless of entrepreneurial intent (Stam & van de Ven, 2021). This theoretical logic provides the primary justification for treating innovation capability as the mediating mechanism through which ecosystem inputs generate sustainable growth outcomes.

Resource-Based View

The Resource-Based View (RBV), initially formulated by Barney (1991) and updated by Barney (2021), provides a complementary theoretical lens by explaining how external ecosystem resources are internalized as firm-level capabilities that generate sustainable competitive advantage. The RBV holds that competitive advantage accrues to firms that possess resources and capabilities that are valuable, rare, inimitable, and non-substitutable. In the developing economy context examined in this study, entrepreneurial ecosystem elements, including community social capital, university knowledge, government advisory support, financial resources, institutional frameworks, and infrastructural endowments, constitute the external resource environment from which SMEs draw to build their innovation capabilities. The RBV thus explains the micro-level process through which ecosystem resources are absorbed and transformed into firm-level capabilities that underpin sustainable performance (Barney, 2021).

Entrepreneurial Ecosystem Theory

Entrepreneurial Ecosystem Theory, synthesized by Stam and van de Ven (2021) and advanced by Wurth et al. (2022), provides the contextual theoretical framework for understanding the role of the external environment in shaping entrepreneurial outcomes.

The theory conceptualizes the entrepreneurial ecosystem as a set of interdependent actors and structural elements, encompassing formal institutions, networks, talent, finance, leadership, and culture, that together create the conditions for productive entrepreneurial activity in a given territorial context. Importantly, ecosystem theory emphasizes that individual ecosystem elements do not operate in isolation but generate outcomes through their systemic interdependence.

The present study operationalizes this systemic perspective by treating community support, university support, government support, access to finance, institutional quality, and infrastructure as six interconnected dimensions of a comprehensive entrepreneurial ecosystem construct. This expanded operationalization responds to calls for more comprehensive and contextually grounded ecosystem measurement in developing economy research (Audretsch & Belitski, 2022; Spigel, 2022).

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LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Entrepreneurial Ecosystems in Developing Economies

The entrepreneurial ecosystem concept has undergone considerable conceptual refinement since Isenberg's (2011) seminal formulation. Stam and van de Ven (2021) provide a rigorous delineation of ecosystem elements encompassing networks, leadership, finance, talent, formal institutions, and culture, and distinguish between ecosystem inputs and the systemic outputs they generate. Wurth et al. (2022) build on this by proposing a comprehensive research agenda for the field, emphasizing the need for greater process-oriented and mechanism-focused investigation of how ecosystem elements generate entrepreneurial outcomes.

In developing economies, entrepreneurial ecosystems exhibit distinctive structural characteristics that differentiate them from their counterparts in high-income contexts. These include weaker formal institutional environments, less developed financial markets, greater reliance on informal community networks, a more prominent role for public universities in knowledge creation and technology transfer, and significant infrastructure deficits (Audretsch & Belitski, 2022; World Bank, 2022). In Ghana specifically, the entrepreneurial ecosystem has evolved notably over the past decade, with the establishment of government-backed SME support programs, growing university incubation centers, increasingly active trade associations and chambers of commerce, and expanding digital infrastructure (Acheampong & Tweneboah-Koduah, 2021; Ghana Statistical Service, 2022). Despite these developments, the literature examining how these ecosystem features influence innovation and sustainable growth among Ghanaian SMEs remains limited and tends to under-specify the range of relevant ecosystem dimensions.

Community Support and Sustainable SME Growth

Community support refers to the informal and formal social resources available to entrepreneurs within their local communities, including social networks, informal finance mechanisms, mentorship relationships, collective market access, and community-generated trust (Roundy & Bayer, 2022). In Ghana and other sub-Saharan African contexts, community-based support systems, including susu (rotating savings and credit) groups, trade associations, family business networks, and communal mentoring, play a foundational role in sustaining entrepreneurial activity, particularly in the absence of well-developed formal market institutions (Boateng & Agyei-Frempong, 2021).

The literature consistently demonstrates that community support positively influences SME performance by reducing transaction costs, improving information access, and providing social capital that substitutes for formal institutional resources (Stam & van de Ven, 2021; Roundy & Bayer, 2022). In the context of sustainable SME growth, community support enables firms to build long-term market relationships, access community-level resources, and align their operations with local development aspirations, all of which contribute to economic, social, and environmental dimensions of sustainability (Boateng & Agyei-Frempong, 2021). This leads to the following hypothesis:

H1a: Community support has a direct and positive effect on sustainable SME growth.

University Support and Sustainable SME Growth

University support encompasses the mechanisms through which higher education institutions facilitate entrepreneurial activity and firm performance, including knowledge and technology transfer, business incubation services, research collaboration, graduate employment and skills pipelines, and policy advocacy for the SME sector (Guerrero & Urbano, 2021). The concept of the entrepreneurial university has gained considerable traction in the ecosystem literature, recognizing universities as active participants in the broader innovation system rather than passive producers of graduates and research publications (Audretsch & Belitski, 2022).

In Ghana, a growing number of universities have adopted explicitly entrepreneurial orientations, establishing technology transfer offices, business incubation centers, and structured industry linkage programs designed to

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channel university knowledge and talent into the broader economy. These initiatives expose SMEs to new technical knowledge, qualified human capital, and collaborative research opportunities, all of which support growth (Acheampong & Tweneboah-Koduah, 2021). Empirical evidence from comparable sub-Saharan African contexts confirms a positive association between university support and SME performance, particularly through knowledge spillover and human capital development pathways (Guerrero & Urbano, 2021). Accordingly, the following hypothesis is proposed:

H1b: University support has a direct and positive effect on sustainable SME growth.

Government Support and Sustainable SME Growth

Government support refers to the formal policy and regulatory environment, publicly funded programs, and institutional instruments through which the state facilitates SME development. These include SME-specific tax incentives, subsidized credit guarantee schemes, export promotion programs, business development services, regulatory simplification initiatives, and public procurement preferences (OECD, 2021; World Bank, 2022). In developing economies, government support is particularly critical given the structural weaknesses of private sector markets, and government action frequently fills institutional voids that constrain entrepreneurial activity (Audretsch & Belitski, 2022).

In Ghana, the government has established several SME support frameworks, including the National Board for Small Scale Industries (NBSSI), the Ghana Enterprises Agency, and government-backed credit guarantee schemes. Empirical studies in comparable contexts confirm that favorable government policies, regulatory frameworks, and direct support programs positively influence SME performance and growth outcomes (World Bank, 2022; OECD, 2021). Government support reduces compliance burdens, improves market access, and signals institutional legitimacy to broader stakeholders, all of which facilitate sustainable SME growth. The following hypothesis is therefore proposed:

H1c: Government support has a direct and positive effect on sustainable SME growth.

Access to Finance and Sustainable SME Growth

Access to finance represents one of the most consistently identified constraints on SME performance in developing economies (World Bank, 2022). Finance access encompasses the availability and affordability of formal bank credit, microfinance and alternative lending products, equity financing, trade credit, and government-backed loan guarantee instruments (Beck & Demirguc-Kunt, 2006; OECD, 2021). Financial resources enable SMEs to invest in productive capacity, acquire technology, hire skilled employees, and expand market reach, all prerequisites for sustainable growth (World Bank, 2022).

In the Ghanaian context, access to finance has been persistently identified as a binding constraint on SME growth, with many firms relying on internal cash flows and informal community finance mechanisms due to the difficulty of accessing formal bank credit (Ghana Statistical Service, 2022; Boateng & Agyei-Frempong, 2021). Despite ongoing financial sector development, gaps in SME credit markets, high collateral requirements, and information asymmetries continue to limit the financial ecosystem available to SMEs. Cross-country evidence consistently confirms a positive association between financial ecosystem development and SME growth outcomes (World Bank, 2022; OECD, 2021). Accordingly, the following hypothesis is proposed:

H1d: Access to finance has a direct and positive effect on sustainable SME growth.

Institutional Quality and Sustainable SME Growth

Institutional quality refers to the strength, reliability, and effectiveness of the formal rules, norms, and enforcement mechanisms that govern economic activity, encompassing property rights protection, contract enforcement, rule of law, regulatory efficiency, and anti-corruption standards (North, 1990; World Bank, 2022). High institutional quality reduces uncertainty, lowers transaction costs, promotes investment confidence, and

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creates the stable regulatory environment necessary for long-term entrepreneurial commitment (Audretsch & Belitski, 2022).

In sub-Saharan African economies including Ghana, institutional quality has been identified as a key ecosystem condition that shapes the entrepreneurial environment. Weak contract enforcement, inadequate intellectual property protection, and bureaucratic inefficiencies increase the cost and risk of entrepreneurial activity, while strong institutions facilitate market coordination, encourage investment, and support sustainable business development (World Bank, 2022). Empirical research across developing economies confirms a positive relationship between institutional quality and SME performance and growth (Audretsch & Belitski, 2022). The following hypothesis is therefore proposed:

H1e: Institutional quality has a direct and positive effect on sustainable SME growth.

Infrastructure and Sustainable SME Growth

Infrastructure encompasses the physical and digital systems that enable economic activity, including transportation networks, energy supply, telecommunications, information and communication technology (ICT) systems, and logistics facilities (World Bank, 2022). Adequate infrastructure reduces operational costs, improves connectivity to markets, enables access to digital technologies, and supports the logistical requirements of growing businesses (OECD, 2021).

In Ghana, infrastructure deficits, including energy unreliability, inadequate road networks in peri-urban areas, and uneven access to high-speed digital connectivity, represent significant constraints on SME growth, particularly outside the Greater Accra and Ashanti regions (Ghana Statistical Service, 2022). The literature consistently documents the positive effects of infrastructure development on firm performance and growth in developing economies (World Bank, 2022). Digital infrastructure in particular has emerged as an increasingly important enabler of SME growth, facilitating access to digital markets, cloud-based services, and online networks (Nambisan & Baron, 2021). The following hypothesis is accordingly proposed:

H1f: Infrastructure has a direct and positive effect on sustainable SME growth.

Community Support and Innovation Capability

Innovation capability is understood as a multi-dimensional organizational construct encompassing a firm's capacity for product innovation, process innovation, marketing innovation, and organizational innovation (Yam, Lo, Tang & Lau, 2020). The development of innovation capability is not an isolated internal process but is deeply embedded in the relational and knowledge-sharing environment in which the firm operates (Nambisan & Baron, 2021). Community support fosters innovation capability by providing SMEs with access to tacit knowledge embedded in local networks, exposure to diverse problem-solving approaches, and the relational trust necessary for collaborative innovation activities.

In Ghana, where formal R&D infrastructure is limited, community-based innovation networks and informal knowledge exchange arrangements often serve as important alternative channels for innovation knowledge (Boateng & Agyei-Frempong, 2021). Local trade associations and community business networks facilitate the sharing of market intelligence, technical know-how, and problem-solving experience among member firms, all of which enrich SMEs' innovation capability over time (Stam & van de Ven, 2021; Roundy & Bayer, 2022). The following hypothesis is therefore proposed:

H2a: Community support has a direct and positive effect on innovation capability.

University Support and Innovation Capability

The relationship between university support and firm innovation capability is well-established in the management and entrepreneurship literature. Universities are primary generators of codified scientific knowledge, emerging technologies, and the human capital that feeds the innovation process, and through

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mechanisms such as technology licensing, collaborative research, spin-off creation, and graduate talent pipelines, they transfer these resources to SMEs that would otherwise lack the capacity to generate innovations independently (Guerrero & Urbano, 2021; Audretsch & Belitski, 2022).

For Ghanaian SMEs, university partnerships represent a particularly critical source of innovation capability. In a context where private sector R&D investment is minimal and most SMEs lack dedicated innovation departments, the knowledge spillovers generated by university collaborations can make a decisive difference in a firm's ability to innovate (Acheampong & Tweneboah-Koduah, 2021). Comparative evidence from other developing economy contexts confirms that university support significantly and positively influences SME innovation capability (Guerrero & Urbano, 2021; Nambisan & Baron, 2021). The following hypothesis is accordingly proposed:

H2b: University support has a direct and positive effect on innovation capability.

Government Support and Innovation Capability

Government support contributes to SME innovation capability through multiple channels. Public R&D subsidies, tax credits for innovation investment, national innovation programs, and government-sponsored technology adoption initiatives directly reduce the cost and risk of innovation activity for SMEs (OECD, 2021). Regulatory frameworks that promote technology adoption, digital transformation, and knowledge-intensive business practices similarly create an enabling environment for innovation capability development (World Bank, 2022). In Ghana, government-led initiatives such as national digitalization programs and SME-focused technology support services have the potential to meaningfully increase firm-level innovation capability. Empirical evidence from developing economies confirms that government support for innovation is positively associated with SME innovation outcomes (Audretsch & Belitski, 2022). Accordingly, the following hypothesis is proposed:

H2c: Government support has a direct and positive effect on innovation capability.

Access to Finance and Innovation Capability

Financial resources are a foundational prerequisite for innovation capability development, enabling SMEs to invest in new technologies, hire skilled innovation talent, acquire external knowledge, and prototype and test new products and processes (World Bank, 2022; Yam et al., 2020). The innovation investment-finance nexus is particularly pronounced for SMEs in developing economies, where internal cash flows are limited and external financing constraints restrict firms' ability to fund innovation activities (OECD, 2021). In the Ghanaian context, limited access to affordable credit represents one of the most significant barriers to innovation among SMEs, with financially constrained firms unable to invest in the capabilities necessary to generate sustainable competitive advantage (Ghana Statistical Service, 2022). The following hypothesis is therefore proposed:

H2d: Access to finance has a direct and positive effect on innovation capability.

Institutional Quality and Innovation Capability

Strong institutional environments support innovation capability development by protecting intellectual property, enforcing innovation-related contracts, reducing the regulatory burden on new product development, and creating stable policy frameworks that encourage long-term innovation investment (North, 1990; Audretsch & Belitski, 2022). Conversely, weak institutions, including inadequate intellectual property protection, corruption, and bureaucratic inefficiency, increase the appropriability risks associated with innovation and reduce the expected returns on innovation investment, thereby discouraging capability development (World Bank, 2022). In developing economies such as Ghana, institutional strengthening has therefore been identified as an important lever for promoting private sector innovation activity (Audretsch & Belitski, 2022). The following hypothesis is proposed:

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H2e: Institutional quality has a direct and positive effect on innovation capability.

Infrastructure and Innovation Capability

Adequate infrastructure, particularly digital and ICT infrastructure, is an increasingly critical enabler of firm-level innovation capability in the twenty-first century economy. Digital connectivity enables SMEs to access global knowledge networks, adopt cloud-based innovation tools, engage with digital market platforms, and leverage data analytics for product and process development (Nambisan & Baron, 2021). Physical infrastructure supports the logistical and operational reliability necessary for sustained innovation activity (World Bank, 2022). In Ghana, where digital infrastructure coverage has expanded significantly but remains uneven, firms with better access to digital infrastructure demonstrate higher rates of technology adoption and innovation activity (Ghana Statistical Service, 2022). The following hypothesis is accordingly proposed:

H2f: Infrastructure has a direct and positive effect on innovation capability.

Innovation Capability and Sustainable SME Growth

Sustainable SME growth, as conceptualized in this study, refers to the capacity of SMEs to achieve continuous, long-term performance improvement across economic, social, and environmental dimensions, consistent with the triple bottom line framework and its extensions in the sustainability entrepreneurship literature (Dyllick & Muff, 2020; United Nations, 2023). This holistic conceptualization acknowledges that SME growth in the twenty-first century cannot be evaluated purely in financial terms; it must also encompass the creation of social value for employees, communities, and other stakeholders, as well as responsible stewardship of natural resources.

Innovation capability is theorized as a central driver of sustainable SME growth because it enables firms to differentiate their offerings, access new markets, improve operational efficiency, and develop business models that integrate social and environmental considerations (Teece, 2022; Guerrero & Urbano, 2021). A robust body of empirical evidence confirms that firms with higher innovation capability demonstrate superior performance outcomes, including revenue growth, employment expansion, enhanced market share, and greater resilience to market shocks (Yam et al., 2020; Acquah, Agyabeng-Mensah & Afum, 2021). In developing country contexts, innovation capability has been particularly emphasized as a mechanism through which SMEs can overcome resource constraints and institutional voids to build sustainable competitive positions (Audretsch & Belitski, 2022). The following hypothesis is proposed:

H3: Innovation capability has a direct and positive effect on sustainable SME growth.

The Mediating Role of Innovation Capability

Drawing on the hypotheses developed in preceding sections, this study argues that innovation capability mediates the relationship between the entrepreneurial ecosystem, encompassing all six dimensions, and sustainable SME growth. This mediation proposition is anchored in the logic of Dynamic Capabilities Theory, which holds that ecosystem resources only translate into performance outcomes through the development and activation of dynamic capabilities, of which innovation capability is the most prominent in the SME context (Teece, 2022).

Community support, university support, government support, access to finance, institutional quality, and infrastructure collectively equip SMEs with the knowledge, resources, and enabling conditions necessary to build and exercise innovation capabilities; innovation capability, in turn, enables SMEs to convert these inputs into sustainable growth outcomes. Without the mediating mechanism of innovation capability, ecosystem resources may remain latent or fail to produce meaningful performance improvements at the firm level (Stam & van de Ven, 2021; Wurth et al., 2022). This argument aligns with calls in the ecosystem literature for more rigorous investigation of the output mechanisms through which ecosystem inputs generate entrepreneurial outcomes (Spigel, 2022). Accordingly, the following hypothesis is proposed:

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H4: Innovation capability mediates the relationship between the entrepreneurial ecosystem (community support, university support, government support, access to finance, institutional quality, and infrastructure) and sustainable SME growth.

The Moderating Role of Entrepreneurial Purpose

Entrepreneurial purpose refers to the underlying motivational orientation, values, and long-term goals that drive entrepreneurial behavior beyond the pursuit of immediate financial returns (Bacq & Janssen, 2021). Purpose-driven entrepreneurs are characterized by a commitment to creating meaningful and lasting value for their stakeholders, a long-term orientation in their strategic decision-making, and a willingness to invest in innovation and sustainability even when short-term pressures might discourage such investment.

The moderating role of entrepreneurial purpose in the innovation capability–sustainable growth relationship is theorized on the basis that purpose shapes the direction and intensity with which entrepreneurs deploy their innovation capabilities. Purpose-driven entrepreneurs are more likely to channel innovation efforts toward the creation of durable, multidimensional value encompassing economic, social, and environmental outcomes, rather than toward short-term profit maximization (Bacq & Janssen, 2021; United Nations, 2023). Consequently, high levels of entrepreneurial purpose are expected to amplify the positive effect of innovation capability on sustainable SME growth, while lower levels of purpose may attenuate this relationship. The following hypothesis is therefore proposed:

H5: Entrepreneurial purpose positively moderates the relationship between innovation capability and sustainable SME growth, such that the positive effect of innovation capability on sustainable SME growth is stronger for entrepreneurs with higher levels of entrepreneurial purpose.

CONCEPTUAL FRAMEWORK

The conceptual framework (Figure 1) depicts the proposed theoretical relationships among the study's key constructs. The entrepreneurial ecosystem, operationalized through six dimensions, community support, university support, government support, access to finance, institutional quality, and infrastructure, constitutes the independent variable. Innovation capability functions as the mediating variable through which ecosystem support influences sustainable SME growth. Entrepreneurial purpose is positioned as a moderating variable that shapes the strength of the innovation capability–sustainable SME growth relationship. The framework integrates direct effects (H1a–H1f, H3), direct effects on the mediator (H2a–H2f), indirect mediated effects (H4), and the conditional moderating effect (H5).

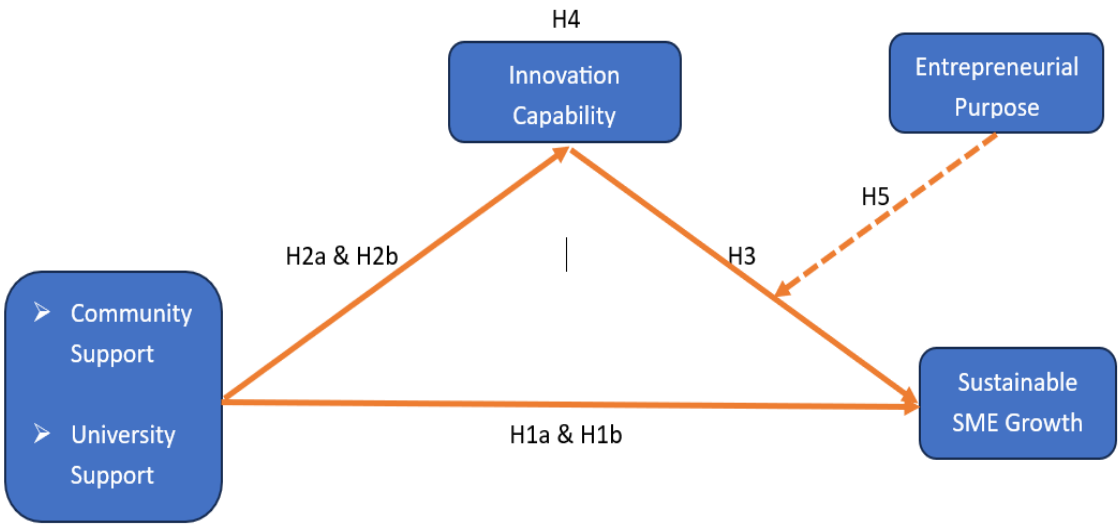

Figure 1: Conceptual Framework

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The framework reflects the study's integrated theoretical grounding in Dynamic Capabilities Theory (explaining the ecosystem–innovation–growth chain), the Resource-Based View (explaining how external ecosystem resources are internalized as firm-level capabilities), and Entrepreneurial Ecosystem Theory (contextualizing the role of the six ecosystem elements). The inclusion of entrepreneurial purpose as a moderator acknowledges that individual-level motivational factors constitute important boundary conditions in the innovation–performance relationship.

RESEARCH METHODOLOGY

Research Design

This study adopts a quantitative research design, underpinned by a positivist philosophical orientation. Positivism is consistent with the study's objective of testing theoretically derived hypotheses about relationships among objectively measurable constructs (Saunders, Lewis & Thornhill, 2023). A cross-sectional survey approach was employed, which is widely accepted in the SME and entrepreneurship literature and is appropriate for simultaneously examining multiple constructs and their interrelationships within a defined timeframe (Hair, Sarstedt, Ringle & Gudergan, 2022).

Population and Sample

The target population comprised owners and managers of SMEs operating in Ghana, defined in accordance with the National Board for Small Scale Industries (NBSSI) classification as businesses employing between 1 and 99 persons (Ghana Statistical Service, 2022). A multi-stage stratified random sampling technique was employed to ensure representativeness across geographical regions, industrial sectors, and firm size categories. Sampling was conducted across the Greater Accra, Ashanti, Western, and Northern regions of Ghana, selected to capture both urban and peri-urban entrepreneurial environments and to represent the geographical diversity of Ghana's SME sector.

Following the minimum sample size guidelines for PLS-SEM recommended by Hair et al. (2022), which apply both the ten-times rule and statistical power analysis, a minimum of 310 valid observations was determined to be necessary. To account for anticipated non-responses and incomplete questionnaires, 430 questionnaires were distributed in total. A total of 380 questionnaires were returned, yielding a raw response rate of 88.4%. Following data cleaning and removal of incomplete or inconsistently answered responses, a final analytical sample of 350 valid responses was retained, representing an effective response rate of 81.4%, considered adequate for the study's analytical requirements (Hair et al., 2022).

Measurement Instrument

Data were collected using a structured self-administered questionnaire comprising two sections. Section A captured respondent and firm-level demographic information, including gender, age, educational background, firm age, industry sector, and number of employees. Section B measured the study's nine key constructs, community support, university support, government support, access to finance, institutional quality, infrastructure, innovation capability, sustainable SME growth, and entrepreneurial purpose, using multi-item reflective scales adapted from validated instruments in the existing literature.

Community support was measured using a five-item scale adapted from Roundy and Bayer (2022) and Stam and van de Ven (2021), capturing dimensions of local network strength, informal finance access, mentorship availability, and community trust. University support was measured using a six-item scale adapted from Guerrero and Urbano (2021), covering dimensions of knowledge transfer, research collaboration, incubation support, and graduate talent availability. Government support was measured using a five-item scale adapted from OECD (2021) and World Bank (2022), capturing policy favorability, regulatory environment, and SME program effectiveness. Access to finance was measured using a five-item scale adapted from World Bank (2022) and Beck and Demirguc-Kunt (2006), capturing formal credit availability, microfinance access, and working capital adequacy. Institutional quality was measured using a four-item scale adapted from North (1990) and Audretsch

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and Belitski (2022), capturing property rights protection, contract enforcement, rule of law, and regulatory quality. Infrastructure was measured using a four-item scale adapted from World Bank (2022) and Nambisan and Baron (2021), capturing physical infrastructure reliability, digital/ICT access, energy availability, and telecommunications quality. Innovation capability was measured using a seven-item scale adapted from Yam et al. (2020), capturing product innovation, process innovation, and organizational innovation capabilities. Sustainable SME growth was measured using a six-item scale adapted from Acquah et al. (2021) and Dyllick and Muff (2020), encompassing economic performance, social value creation, and environmental responsibility. Entrepreneurial purpose was measured using a five-item scale adapted from Bacq and Janssen (2021), capturing mission orientation, stakeholder value commitment, and long-term impact focus. All items were rated on a five-point Likert scale anchored by 1 (Strongly Disagree) and 5 (Strongly Agree). A complete listing of all construct indicators, their sources, and item descriptions is presented .

Content validity was established through review of the instrument by five academic experts in entrepreneurship and SME management, who assessed item clarity, relevance, and comprehensiveness and recommended minor revisions prior to full data collection. A pilot test was conducted with 35 SME respondents outside the main sample. Cronbach's alpha values from the pilot study ranged from 0.77 (infrastructure) to 0.89 (innovation capability), indicating acceptable initial reliability for all constructs. Harman's single-factor test was applied to assess common method bias; a single factor accounted for 28.3% of the total variance, well below the 50% threshold, suggesting that common method bias was not a serious concern. A marker variable technique was additionally employed to further evaluate this potential threat to validity.

Data Analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), implemented via SmartPLS 4.0 software (Ringle, Wende & Becker, 2022). PLS-SEM was selected for several reasons: its suitability for prediction-oriented research, its robustness with non-normal data distributions, its appropriateness for models involving both mediation and moderation, and its capacity to handle complex models with relatively modest sample sizes (Hair et al., 2022). Analysis proceeded in two sequential stages. First, the measurement model was assessed to evaluate the reliability, convergent validity, and discriminant validity of all constructs. Second, the structural model was evaluated to test the hypothesized direct, mediating, and moderating relationships.

Construct reliability was assessed through Cronbach's alpha and composite reliability (CR), with a threshold of 0.70 considered the minimum acceptable level (Hair et al., 2022). Convergent validity was evaluated through Average Variance Extracted (AVE) values, with a threshold of 0.50 required (Fornell & Larcker, 1981). Discriminant validity was assessed using the Heterotrait-Monotrait (HTMT) ratio, with values below 0.85 indicating adequate discriminant validity. Model fit was evaluated using the Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI), with SRMR < 0.08 and NFI > 0.90 considered indicative of acceptable fit (Ringle et al., 2022). Effect sizes were calculated using Cohen's f^2 statistic (small: 0.02–0.15; medium: 0.15–0.35; large: ≥ 0.35). Predictive relevance was assessed through cross-validated redundancy (Q^2) using the blindfolding procedure with an omission distance of 7, with $Q^2 > 0$ confirming that the model has predictive relevance beyond trivial levels (Hair et al., 2022). The indirect (mediation) effects of all six ecosystem dimensions on sustainable SME growth through innovation capability were assessed using a bootstrapping procedure with 5,000 re-samples, generating bias-corrected 95% confidence intervals. The moderating effect of entrepreneurial purpose was tested using a product-indicator interaction approach within the PLS-SEM framework, following the orthogonalization procedure recommended by Ringle et al. (2022).

RESULTS AND DISCUSSION

Descriptive Statistics and Respondent Profile

The final analytical sample of 350 respondents comprised 58.3% male and 41.7% female SME owners and managers, reflecting the slight male predominance characteristic of formal SME ownership in Ghana (Ghana Statistical Service, 2022). In terms of educational background, 44.3% held a tertiary degree or higher, 36.0% had

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completed senior high school education, and the remaining 19.7% held other educational qualifications. With respect to firm age, 39.1% of SMEs were between 1 and 5 years old, 35.7% were between 6 and 10 years old, and 25.1% had been in operation for more than 10 years. The trade, manufacturing, and service sectors were the most represented in the sample, accounting for 34.9%, 29.4%, and 27.1% of respondents respectively. These demographic characteristics align closely with the composition of the Ghanaian SME population documented by the Ghana Statistical Service (2022), providing some assurance of the representativeness of the sample.

Measurement Model Assessment

The measurement model demonstrated satisfactory psychometric properties for all nine constructs. Cronbach's alpha values ranged from 0.80 to 0.91, and composite reliability (CR) values ranged from 0.85 to 0.93, all exceeding the minimum acceptable threshold of 0.70. Average Variance Extracted (AVE) values ranged from 0.55 to 0.65, all surpassing the 0.50 convergent validity threshold (Fornell & Larcker, 1981), confirming that the items within each construct share more variance with their underlying construct than with measurement error. HTMT ratios for all construct pairs were below 0.85, confirming adequate discriminant validity (Hair et al., 2022). Individual item loadings ranged from 0.68 to 0.89 and were all statistically significant at $p < 0.001$. The complete measurement model results, including all construct indicators, item loadings, and reliability and validity statistics, are presented in Table 1. The discriminant validity matrix (HTMT ratios) is presented in Table 2. These measurement model results provide a sound and reliable foundation for subsequent structural model analysis.

Table 1: Measurement Model Results, Construct Indicators, Factor Loadings, Reliability, and Validity

Construct / Item	Item Description	Loading	Cronbach's α	CR	AVE
Community Support (CS)			**0.82**	**0.86**	**0.55**
CS1	Local business networks provide valuable support for my SME	0.74			
CS2	Informal finance mechanisms (e.g., susu) are accessible for my business	0.71			
CS3	Mentorship from experienced community members is available to me	0.78			
CS4	Community members and organizations trust and support local businesses	0.82			
CS5	Community trade associations facilitate market access for my SME	0.84			
University Support (US)			**0.87**	**0.90**	**0.60**
US1	Local universities provide relevant knowledge applicable to my business	0.79			
US2	University incubation and technology transfer services are accessible to my SME	0.73			
US3	Collaborative research opportunities with universities are available	0.81			
US4	University-trained graduates bring valuable skills to my business	0.87			
US5	Universities facilitate industry-academia linkage programs in my region	0.76			
US6	University-derived technical knowledge contributes to my firm's innovation	0.83			
Government Support (GS)			**0.83**	**0.87**	**0.57**
GS1	Government policies create a favorable environment for SME growth	0.77			
GS2	Government SME support programs provide meaningful assistance	0.74			
GS3	Regulatory frameworks are conducive to entrepreneurial activity	0.79			

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GS4	Government-backed funding or loan guarantee schemes are accessible to SMEs	0.72			
GS5	Government agencies provide useful technical and advisory support to SMEs	0.80			
Access to Finance (AF)			**0.84**	**0.88**	**0.58**
AF1	Formal bank financing is accessible for my SME's needs	0.73			
AF2	Microfinance and alternative financing options are available to my business	0.76			
AF3	Venture capital or equity financing is available in my operating environment	0.68			
AF4	Government-backed credit schemes meaningfully support SME financing	0.79			
AF5	My SME can access adequate working capital to pursue innovation activities	0.84			
Institutional Quality (IQ)			**0.80**	**0.85**	**0.59**
IQ1	The legal and regulatory system fairly protects my business interests	0.75			
IQ2	Contract enforcement mechanisms function effectively in my context	0.72			
IQ3	Intellectual property rights are reasonably protected for SMEs	0.78			
IQ4	Anti-corruption measures support a fair competitive environment for business	0.74			
Infrastructure (INF)			**0.81**	**0.86**	**0.55**
INF1	Physical infrastructure (roads, logistics) adequately supports my business	0.74			
INF2	Digital and ICT infrastructure supports innovation activities in my firm	0.79			
INF3	Energy availability and reliability support my operational activities	0.76			
INF4	Telecommunications infrastructure supports my business communication needs	0.72			
Innovation Capability (IC)			**0.91**	**0.93**	**0.65**
IC1	My firm regularly develops new or improved products and services	0.83			
IC2	My firm continuously improves its production and service delivery processes	0.85			
IC3	My firm adopts innovative marketing strategies to reach and retain customers	0.76			
IC4	My firm makes organizational adaptations to support and sustain innovation	0.79			
IC5	My firm actively seeks and acquires new technological knowledge	0.82			
IC6	My firm develops unique and creative solutions to business challenges	0.87			
IC7	My firm's innovations generate meaningful competitive advantages	0.89			
Sustainable SME Growth (SSG)			**0.88**	**0.91**	**0.63**
SSG1	My firm has achieved consistent revenue and profitability growth over time	0.81			

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SSG2	My firm has progressively expanded its customer base and market share	0.78			
SSG3	My firm creates meaningful employment and contributes to community welfare	0.83			
SSG4	My firm actively manages and reduces its environmental footprint	0.72			
SSG5	My firm's growth strategy is aligned with social responsibility objectives	0.85			
SSG6	My firm pursues long-term, sustainable competitive positioning	0.86			
Entrepreneurial Purpose (EP)			**0.85**	**0.89**	**0.62**
EP1	My business is guided by a clear mission that extends beyond financial profit	0.78			
EP2	I am committed to creating lasting value for all stakeholders in my business	0.83			
EP3	My long-term business goals emphasize meaningful social and environmental impact	0.84			
EP4	I invest in innovation to achieve purposeful, sustainable outcomes for my community	0.88			
EP5	My entrepreneurial vision extends meaningfully beyond short-term financial returns	0.74			

Note: CR = Composite Reliability; AVE = Average Variance Extracted. All item loadings significant at $p < 0.001$.

Table 2: Discriminant Validity, Heterotrait-Monotrait (HTMT) Ratio Matrix

	CS	**US**	**GS**	**AF**	**IQ**	**INF**	**IC**	**SSG**	**EP**
CS	—								
US	0.61	—							
GS	0.58	0.64	—						
AF	0.53	0.59	0.62	—					
IQ	0.49	0.55	0.67	0.61	—				
INF	0.52	0.57	0.63	0.58	0.64	—			
IC	0.67	0.72	0.63	0.65	0.58	0.54	—		
SSG	0.63	0.61	0.57	0.59	0.52	0.49	0.76	—	
EP	0.54	0.57	0.51	0.53	0.47	0.45	0.68	0.73	—

Note: CS = Community Support; US = University Support; GS = Government Support; AF = Access to Finance; IQ = Institutional Quality; INF = Infrastructure; IC = Innovation Capability; SSG = Sustainable SME Growth; EP = Entrepreneurial Purpose. All HTMT values below the 0.85 threshold, confirming adequate discriminant validity (Hair et al., 2022).

Structural Model and Hypothesis Testing

The structural model demonstrated strong explanatory power across all endogenous constructs. The model explained 72.4% of the variance in innovation capability ($R^2 = 0.724$) and 67.1% of the variance in sustainable SME growth ($R^2 = 0.671$). Both R^2 values comfortably exceed the 0.26 threshold considered indicative of substantial explanatory power in behavioral research (Hair et al., 2022). The Standardized Root Mean Square Residual (SRMR) value of 0.058 and Normed Fit Index (NFI) of 0.908 indicated acceptable model fit (Ringle et al., 2022). Cross-validated redundancy analysis (blindfolding) confirmed meaningful predictive relevance for both endogenous constructs: $Q^2 = 0.463$ for innovation capability and $Q^2 = 0.407$ for sustainable SME growth, both substantially above the zero threshold, indicating that the model has predictive relevance beyond baseline

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levels (Hair et al., 2022). Effect sizes (Cohen's f^2) for each path are presented alongside path coefficients in Table 3. The specific results for each hypothesis are summarized in Table 3 and discussed below.

H1a, Community Support → Sustainable SME Growth: The direct path from community support to sustainable SME growth was positive and statistically significant ($\beta = 0.231$, $t = 4.62$, $p < 0.001$; $f^2 = 0.08$), providing full support for H1a. This finding indicates that the strength and richness of community-level networks, informal financial mechanisms, and local market support systems directly contribute to the sustainable growth performance of Ghanaian SMEs. The small-to-medium effect size reflects the indirect competition from other ecosystem pathways operating simultaneously.

H1b, University Support → Sustainable SME Growth: The direct effect of university support on sustainable SME growth was also positive and significant ($\beta = 0.198$, $t = 3.87$, $p < 0.001$; $f^2 = 0.07$), supporting H1b. This confirms that university-based support mechanisms, encompassing knowledge transfer, incubation services, collaborative research, and graduate talent pipelines, make a meaningful direct contribution to sustainable SME growth in Ghana.

H1c, Government Support → Sustainable SME Growth: Government support exerted a significant positive direct effect on sustainable SME growth ($\beta = 0.164$, $t = 3.12$, $p = 0.002$; $f^2 = 0.05$), providing support for H1c. This finding highlights the importance of enabling government policies, SME development programs, and regulatory quality in creating conditions that directly support the sustainable performance of Ghanaian SMEs.

H1d, Access to Finance → Sustainable SME Growth: Access to finance demonstrated a significant positive direct effect on sustainable SME growth ($\beta = 0.187$, $t = 3.67$, $p < 0.001$; $f^2 = 0.06$), supporting H1d. This result is consistent with the extensive literature documenting the role of financial ecosystem development in facilitating SME growth, and underscores that finance access constraints remain a binding limitation on sustainable SME performance in the Ghanaian context.

H1e, Institutional Quality → Sustainable SME Growth: Institutional quality had a significant positive direct effect on sustainable SME growth ($\beta = 0.143$, $t = 2.89$, $p = 0.004$; $f^2 = 0.04$), supporting H1e. This finding confirms that the reliability of legal and regulatory institutions, including contract enforcement and property rights protection, constitutes an important direct enabler of SME growth sustainability in Ghana.

H1f, Infrastructure → Sustainable SME Growth: Infrastructure exerted a significant positive direct effect on sustainable SME growth ($\beta = 0.119$, $t = 2.47$, $p = 0.014$; $f^2 = 0.03$), providing support for H1f. While representing the smallest direct effect among the ecosystem dimensions, this finding nonetheless confirms that physical and digital infrastructure quality is a meaningful determinant of sustainable SME performance, particularly given the known infrastructure challenges facing Ghanaian SMEs.

H2a, Community Support → Innovation Capability: Community support demonstrated a significant positive direct effect on innovation capability ($\beta = 0.287$, $t = 5.14$, $p < 0.001$; $f^2 = 0.12$), providing support for H2a. This result confirms that community-level relational resources play an important role in enabling Ghanaian SMEs to develop the innovation capabilities necessary to compete and grow.

H2b, University Support → Innovation Capability: University support exerted a significant positive effect on innovation capability ($\beta = 0.342$, $t = 6.38$, $p < 0.001$; $f^2 = 0.18$), supporting H2b. Notably, the effect of university support on innovation capability ($\beta = 0.342$) was larger than that of community support ($\beta = 0.287$), consistent with the expectation that universities, as dedicated knowledge creation and transfer institutions, are particularly potent drivers of firm-level innovation capacity.

H2c, Government Support → Innovation Capability: Government support had a significant positive effect on innovation capability ($\beta = 0.198$, $t = 3.54$, $p < 0.001$; $f^2 = 0.07$), supporting H2c. This finding confirms that enabling government policies and programs, including technology adoption incentives and R&D subsidies, contribute meaningfully to SME innovation capability development in Ghana.

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H2d, Access to Finance → Innovation Capability: Access to finance demonstrated a significant positive direct effect on innovation capability ($\beta = 0.224$, $t = 4.21$, $p < 0.001$; $f^2 = 0.09$), supporting H2d. This result underscores that financial resource availability is not only a direct driver of sustainable growth but also an important enabler of innovation capability development among Ghanaian SMEs.

H2e, Institutional Quality → Innovation Capability: Institutional quality had a significant positive effect on innovation capability ($\beta = 0.176$, $t = 3.28$, $p = 0.001$; $f^2 = 0.05$), supporting H2e. This finding confirms that strong institutions, particularly intellectual property protection and regulatory quality, contribute to a more favorable environment for SME innovation capability development.

H2f, Infrastructure → Innovation Capability: Infrastructure exerted a significant positive effect on innovation capability ($\beta = 0.152$, $t = 2.94$, $p = 0.003$; $f^2 = 0.04$), supporting H2f. Digital and physical infrastructure was found to facilitate SMEs' capacity for innovation, consistent with the growing literature on infrastructure as an enabler of technology adoption and knowledge-intensive activity.

H3, Innovation Capability → Sustainable SME Growth: Innovation capability demonstrated the strongest direct path coefficient in the structural model ($\beta = 0.391$, $t = 7.24$, $p < 0.001$; $f^2 = 0.22$), supporting H3 and confirming a medium-to-large effect. This finding firmly establishes innovation capability as the most powerful proximal driver of sustainable SME growth among the constructs studied. The relatively high magnitude of this effect in the Ghanaian context suggests that the impact of innovation capability on sustainable growth may be amplified in environments where overall innovation activity is low, because firms that develop innovation capabilities enjoy a more pronounced competitive advantage in less innovation-intensive markets.

H4, Mediating Role of Innovation Capability: Bootstrapping analysis confirmed statistically significant indirect effects of all six ecosystem dimensions on sustainable SME growth through innovation capability. The indirect effects and their corresponding 95% bias-corrected confidence intervals were as follows: community support, $\beta = 0.112$ (95% CI: [0.071, 0.163]); university support, $\beta = 0.134$ (95% CI: [0.089, 0.189]); government support, $\beta = 0.077$ (95% CI: [0.041, 0.121]); access to finance, $\beta = 0.088$ (95% CI: [0.049, 0.134]); institutional quality, $\beta = 0.069$ (95% CI: [0.033, 0.113]); and infrastructure, $\beta = 0.059$ (95% CI: [0.024, 0.101]). All confidence intervals excluded zero, confirming the significance of all six mediated pathways. Variance Accounted For (VAF) analysis indicated partial mediation for all ecosystem dimensions: community support (VAF = 32.6%), university support (VAF = 40.3%), government support (VAF = 31.9%), access to finance (VAF = 32.0%), institutional quality (VAF = 32.5%), and infrastructure (VAF = 33.2%). The consistently partial nature of the mediation across all six dimensions suggests that both direct and indirect pathways are operative in linking each ecosystem element to sustainable SME growth outcomes. H4 is therefore fully supported.

H5, Moderating Role of Entrepreneurial Purpose: The interaction term between innovation capability and entrepreneurial purpose was positive and statistically significant ($\beta = 0.167$, $t = 3.21$, $p = 0.001$; $f^2 = 0.05$), providing support for H5. Conditional effects analysis confirmed that the positive relationship between innovation capability and sustainable SME growth was significantly stronger for SME owners and managers with higher levels of entrepreneurial purpose (high purpose group: $\beta = 0.503$) compared to those with lower levels of entrepreneurial purpose (low purpose group: $\beta = 0.279$). These results confirm that entrepreneurial purpose amplifies the effect of innovation capability on sustainable growth outcomes.

A summary of the complete hypothesis testing results, including path coefficients, t-values, p-values, effect sizes, and decisions, is presented in Table 3.

Table 3: Summary of Hypothesis Testing Results

Hypothesis	Path	β	t-value	p-value	f^2	Decision
H1a	Community Support → Sustainable SME Growth	0.231	4.62	< 0.001	0.08 (small)	Supported
H1b	University Support → Sustainable SME Growth	0.198	3.87	< 0.001	0.07 (small)	Supported

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H1c	Government Support → Sustainable SME Growth	0.164	3.12	0.002	0.05 (small)	Supported
H1d	Access to Finance → Sustainable SME Growth	0.187	3.67	< 0.001	0.06 (small)	Supported
H1e	Institutional Quality → Sustainable SME Growth	0.143	2.89	0.004	0.04 (small)	Supported
H1f	Infrastructure → Sustainable SME Growth	0.119	2.47	0.014	0.03 (small)	Supported
H2a	Community Support → Innovation Capability	0.287	5.14	< 0.001	0.12 (small)	Supported
H2b	University Support → Innovation Capability	0.342	6.38	< 0.001	0.18 (medium)	Supported
H2c	Government Support → Innovation Capability	0.198	3.54	< 0.001	0.07 (small)	Supported
H2d	Access to Finance → Innovation Capability	0.224	4.21	< 0.001	0.09 (small)	Supported
H2e	Institutional Quality → Innovation Capability	0.176	3.28	0.001	0.05 (small)	Supported
H2f	Infrastructure → Innovation Capability	0.152	2.94	0.003	0.04 (small)	Supported
H3	Innovation Capability → Sustainable SME Growth	0.391	7.24	< 0.001	0.22 (medium)	Supported
H4	Mediation via Innovation Capability (all six dimensions)	0.059–0.134	—	Sig.	—	Supported
H5	Moderation of Entrepreneurial Purpose	0.167	3.21	0.001	0.05 (small)	Supported

Note: R^2 (Innovation Capability) = 0.724; R^2 (Sustainable SME Growth) = 0.671; Q^2 (Innovation Capability) = 0.463; Q^2 (Sustainable SME Growth) = 0.407; SRMR = 0.058; NFI = 0.908. f^2 effect size interpretation: small (0.02–0.15), medium (0.15–0.35), large (≥ 0.35) (Cohen, 1988; Hair et al., 2022).

DISCUSSION OF FINDINGS

The results of this study generate several important theoretical and empirical insights into the dynamics of entrepreneurial ecosystems and sustainable SME growth in Ghana.

The confirmation of H1a through H1f establishes that all six ecosystem dimensions, community support, university support, government support, access to finance, institutional quality, and infrastructure, exert meaningful direct effects on sustainable SME growth. This multi-dimensional finding is consistent with the broader entrepreneurial ecosystem literature's emphasis on the systemic and interdependent nature of ecosystem elements (Stam & van de Ven, 2021; Wurth et al., 2022). The significant effects of community support and university support replicate and extend findings from prior studies (Boateng & Agyei-Frempong, 2021; Guerrero & Urbano, 2021; Acheampong & Tweneboah-Koduah, 2021), while the newly confirmed effects of government support, access to finance, institutional quality, and infrastructure provide additional empirical validation for the importance of these dimensions in developing economy entrepreneurial ecosystems. Notably, the effect sizes for these four additional dimensions, while small, are nonetheless statistically significant and practically meaningful in the Ghanaian context, underscoring that no single ecosystem dimension is sufficient on its own, it is the collective richness of the ecosystem that enables sustainable SME growth.

The confirmation of H2a through H2f is theoretically significant because it establishes that all six ecosystem dimensions independently contribute to SME innovation capability, the primary mediating mechanism in the study's framework. The relatively stronger effect of university support on innovation capability compared to other dimensions ($\beta = 0.342$) underscores the distinctive knowledge-generation and technology-transfer role of universities in the innovation process, consistent with DCT's emphasis on knowledge as the primary input into

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capability development (Teece, 2022) and with the university-entrepreneurship literature's documentation of knowledge spillover effects (Audretsch & Belitski, 2022). At the same time, the significant effects of community-based social capital, government programs, financial resources, institutional quality, and infrastructure on innovation capability collectively highlight that innovation capability development in developing economy SMEs is not reducible to any single ecosystem dimension but reflects the cumulative effect of a supportive, multi-layered ecosystem environment. This finding has important implications for policy design, suggesting that targeted interventions aimed at any single ecosystem dimension will be less effective than coordinated investments across multiple ecosystem elements.

The strong and significant direct effect of innovation capability on sustainable SME growth (H3; $\beta = 0.391$; $f^2 = 0.22$), the largest path coefficient in the structural model and the only effect in the medium range, firmly positions innovation capability as the central engine of sustainable growth performance for Ghanaian SMEs. This finding is consistent with Yam et al. (2020), Acquah et al. (2021), and the broader innovation-performance literature that consistently identifies innovation capability as a robust predictor of firm-level performance. The high predictive relevance of the structural model for sustainable SME growth ($Q^2 = 0.407$) further confirms that the model's constructs collectively provide a powerful and practically meaningful framework for understanding and predicting sustainable growth outcomes among Ghanaian SMEs.

The consistent partial mediation finding across all six ecosystem dimensions (H4) is among the most theoretically important contributions of this study. By establishing that innovation capability partially mediates the relationships between all six ecosystem elements and sustainable SME growth, with VAF values ranging from 31.9% to 40.3%, the study provides rare and comprehensive empirical evidence for the mechanism through which diverse ecosystem resources are converted into firm-level growth outcomes. The partial nature of the mediation (rather than full mediation) is also noteworthy: it indicates that ecosystem dimensions contribute to sustainable SME growth through multiple pathways, only one of which involves innovation capability. Other potential pathways, including direct resource provision, legitimacy enhancement, market access facilitation, and network brokerage, appear to operate alongside the innovation capability channel, a finding that points toward important avenues for future research.

Finally, the significant positive moderating effect of entrepreneurial purpose (H5; $\beta = 0.167$; $f^2 = 0.05$) adds an important individual-level boundary condition to the innovation–sustainable growth relationship. The finding that purpose-driven entrepreneurs (high purpose group $\beta = 0.503$) extract considerably greater sustainable growth benefits from their innovation capabilities than less purpose-oriented counterparts (low purpose group $\beta = 0.279$) aligns closely with the sustainable entrepreneurship literature's emphasis on the role of mission orientation in shaping entrepreneurial outcomes (Bacq & Janssen, 2021; United Nations, 2023). This result suggests that the relationship between innovation capability and sustainable growth is not deterministic but is shaped by the motivational context of the entrepreneur, a finding with significant implications for entrepreneurship education and the design of SME support programs.

CONCLUSION

This study examined the relationships among entrepreneurial ecosystem elements, innovation capability, entrepreneurial purpose, and sustainable SME growth in Ghana, guided by three specific objectives and a theoretically grounded conceptual framework. Using PLS-SEM analysis of survey data from 350 Ghanaian SME owners and managers, the study confirmed all fifteen hypothesized relationships, establishing that all six ecosystem dimensions, community support, university support, government support, access to finance, institutional quality, and infrastructure, directly and positively influence both innovation capability and sustainable SME growth; that innovation capability serves as a significant and consistent partial mediating mechanism in the ecosystem–growth relationship across all ecosystem dimensions; and that entrepreneurial purpose positively moderates the innovation capability–sustainable growth nexus. The structural model demonstrated strong explanatory power ($R^2 = 0.724$ for innovation capability; $R^2 = 0.671$ for sustainable SME growth), meaningful predictive relevance ($Q^2 = 0.463$ and $Q^2 = 0.407$ respectively), and acceptable model fit (SRMR = 0.058; NFI = 0.908).

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Theoretical Implications

This study contributes to three major areas of the management and entrepreneurship literature. First, it extends entrepreneurial ecosystem theory to the Sub-Saharan African context, providing comprehensive empirical evidence that a multi-dimensional ecosystem operationalization, encompassing community support, university support, government support, access to finance, institutional quality, and infrastructure, produces effects consistent with theoretical predictions even in institutional environments that differ substantially from the high-income, developed economy contexts in which most ecosystem research has been conducted. This responds to the urgent need for more geographically diverse and methodologically comprehensive ecosystem research identified by Audretsch and Belitski (2022) and Spigel (2022).

Second, the study advances Dynamic Capabilities Theory by explicitly modeling innovation capability as the mechanism through which all six ecosystem resource dimensions translate into sustainable firm performance. This extends the theory beyond its traditional intra-firm focus, demonstrating that dynamic capability development is not merely a function of internal organizational processes but is importantly and systematically shaped by the breadth and richness of the external ecosystem environment.

Third, by establishing entrepreneurial purpose as a significant moderating boundary condition in the innovation capability–sustainable growth relationship, this study contributes to the emergent literature on purpose-driven entrepreneurship. The finding that entrepreneurial purpose amplifies innovation-led sustainable growth provides theoretical grounding for the growing policy and practice interest in purpose-oriented entrepreneurship development programs.

Practical Implications

The study's findings carry direct practical implications for several stakeholder groups. For policymakers, the results provide strong empirical justification for multi-dimensional ecosystem investment strategies that simultaneously strengthen community support structures, expand university-industry linkages, improve government regulatory efficiency, deepen financial market access for SMEs, strengthen institutional quality, and develop digital and physical infrastructure. The consistent role of innovation capability as a partial mediator confirms that ecosystem investments generate the greatest sustainable growth returns when they are channeled through interventions that enhance firm-level innovation capacity, suggesting that technology adoption programs, innovation vouchers, and collaborative R&D schemes should be integrated into broader SME development strategies.

For university administrators, the study confirms that Ghanaian universities represent uniquely powerful levers for SME innovation capability development. Strengthening technology transfer offices, expanding industry-embedded incubation programs, and increasing the practical relevance of university curricula for SME innovation challenges are high-priority strategies suggested by the data. For SME practitioners themselves, the moderating role of entrepreneurial purpose suggests that cultivating a long-term, mission-oriented entrepreneurial orientation, rather than focusing narrowly on short-term financial returns, may substantially amplify the sustainable growth returns on innovation investment.

Limitations and Future Research Directions

Several limitations of this study should be acknowledged and addressed in future research. First, the cross-sectional survey design precludes causal inference and does not capture the dynamic, evolutionary nature of ecosystem–capability–growth relationships over time. Future research should employ longitudinal designs, ideally tracking cohorts of Ghanaian SMEs across multiple time periods, to examine how changes in ecosystem conditions influence innovation capability development and sustainable growth trajectories. Panel data approaches would allow researchers to better disentangle the causal sequence from ecosystem inputs to capability development to growth outcomes, and to capture important lagged effects that cross-sectional designs necessarily overlook.

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Second, the rich but inherently static nature of quantitative survey data limits the depth of insight into the process mechanisms through which ecosystem elements build innovation capability and translate into sustainable growth. Mixed-methods approaches that combine quantitative survey analysis with in-depth qualitative inquiry, including case studies, ethnographic observation, and process interviews with SME owners and ecosystem actors, would provide a more textured understanding of the micro-level processes, contextual nuances, and institutional dynamics that quantitative measurement cannot fully capture. Such approaches would be particularly valuable for understanding how different ecosystem elements interact and reinforce one another in the Ghanaian context.

Third, the study's geographical scope is limited to four regions of Ghana, and findings may not be fully generalizable to other sub-Saharan African contexts or to regions of Ghana with markedly different economic conditions. Future studies should employ larger and more geographically diverse samples, and comparative cross-country research would help to identify the extent to which findings are context-specific or generalizable across the African continent.

Fourth, while this study significantly expanded the ecosystem operationalization relative to prior work, encompassing six dimensions, additional ecosystem elements such as cultural attitudes toward entrepreneurship and risk-taking, leadership networks, specialized talent ecosystems, and inter-firm knowledge networks remain outside the scope of the current measurement framework. Future research should continue to develop more comprehensive and contextually validated ecosystem measurement instruments that capture the full breadth of ecosystem conditions in the developing economy context.

Finally, the study's reliance on self-reported perceptual measures may be subject to social desirability bias and common method variance despite the precautions taken. Future research could benefit from incorporating objective firm-level performance data, multi-informant designs, and longitudinal tracking of both ecosystem conditions and SME performance indicators to provide more robust tests of the study's theoretical propositions.

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