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Review Article

Entrepreneurial Competencies and Business Sustainability: A Systematic Review of the Mediating Role of Innovation

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Abstract: Research on entrepreneurial competencies and business sustainability has grown rapidly, yet existing insights remain scattered and lack an integrated perspective. This study addresses that gap by conducting a Systematic Literature Review (SLR) to examine how entrepreneurial competencies influence business sustainability through the mediating role of innovation. Using a transparent, replicable protocol, 171 Scopus-indexed publications were screened, resulting in 15 eligible studies published between 2022 and 2025. A thematic synthesis approach was applied to compare and integrate recurring concepts across the selected literature. The review reveals that entrepreneurial competencies, particularly opportunity recognition, creativity, strategic decision-making, and resilience, primarily influence sustainability outcomes through innovation pathways. Innovation acts as a key mechanism that converts these competencies into sustainable practices, such as product and process improvements or environmentally oriented initiatives. The synthesis also highlights theoretical linkages grounded in dynamic capabilities, the resource-based view, and competence-based perspectives. The findings demonstrate that competencies alone are insufficient unless supported by innovation processes that operationalize them into tangible sustainability performance. The review provides theoretical clarification of the nexus between competency innovation and sustainability, and offers practical guidance for entrepreneurs, educators, and policymakers seeking to strengthen sustainability through competency development and innovation capability building.

Keywords: Entrepreneurial competencies; Innovation; Business sustainability; Systematic Literature Review; Qualitative synthesis.



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1. Introduction

The contemporary business landscape is increasingly shaped by volatility, technological disruption, and evolving market expectations, placing considerable pressure on micro, small, and medium-sized enterprises (MSMEs) to sustain long-term viability. As sustainability shifts from a voluntary initiative to a strategic necessity, firms are expected not only to remain economically competitive but also to integrate social responsibility and environmental stewardship into their operations. However, achieving sustainable performance in such conditions remains challenging, particularly for enterprises facing resource constraints, capability limitations, and rapidly shifting customer demands. A central issue limiting MSMEs' ability to adapt involves gaps in entrepreneurial competencies, an integrated set of knowledge, skills,

and personal attributes that enable opportunity recognition, strategic judgment, and effective business management. Insufficient competencies often manifest as weak problem-solving capacity, limited opportunity exploration, inadequate digital literacy, and inconsistent innovation behavior, all of which hinder firms from responding effectively to sustainability demands.

At the same time, embedding sustainability within organizational processes adds further complexity. Many enterprises, especially in emerging economies, struggle to institutionalize sustainability principles because they lack the strategic frameworks, tools, and innovative capabilities needed to balance immediate financial needs with long-term value creation. Consequently, sustainability remains difficult to operationalize without sufficient competence and the ability to innovate. Innovation acts as a key mechanism enabling this transition. Firms with strong innovation capabilities, whether technological, managerial, or process-based, are generally more resilient and better positioned to achieve sustainable outcomes. Yet innovation capacity is not autonomous; it depends heavily on the competencies entrepreneurs possess, including their strategic insight, opportunity recognition, and ability to develop knowledge systematically. Limited competencies can therefore weaken innovation pathways and diminish sustainability performance.

Existing research has examined these constructs, often demonstrating that entrepreneurial competencies support innovation (Polat et al., 2025) and enhance sustainability-oriented business practices (Ho & Yoon, 2022). Other studies highlight the role of innovation in strengthening resilience, environmental responsiveness, and competitive positioning (Xu et al., 2025; Ha et al., 2021). Research on sustainability highlights that achieving long-term performance necessitates structured processes, organizational learning, stakeholder engagement, and adaptive capabilities (Laing et al., 2025; Frare & Beuren, 2022). Studies on competencies also affirm their influence on business outcomes through strategic, opportunity, relational, and learning dimensions (Gu et al., 2025; Tu, 2025). Although these studies contribute valuable insights, they tend to examine entrepreneurial competencies, innovation, and sustainability either independently or in pairwise combinations. What remains underexplored is a systematic synthesis that explains how entrepreneurial competencies influence business sustainability when innovation is explicitly treated as the mediating mechanism. This gap limits the development of an integrated conceptual understanding of how these constructs interact in MSME contexts.

Theoretical perspectives strengthen the need for such integration. The Resource-Based View (RBV) posits that entrepreneurial competencies serve as strategic internal resources that shape innovation behavior and sustainability-oriented strategies (Qalati et al., 2022). Innovation Capability Theory similarly emphasizes that firms require dynamic abilities to transform knowledge into new products, processes, and models that support long-term sustainability (Shu et al., 2025). Together, these perspectives suggest that competencies and innovation must be examined jointly to provide a more comprehensive understanding of sustainability outcomes. To address this research gap, the present study conducts a Systematic Literature Review (SLR) to synthesize current evidence on the interrelationships among entrepreneurial competencies, innovation, and business sustainability. This review aims to map existing knowledge, identify theoretical pathways, and highlight conceptual gaps that require further empirical exploration. Guided by two research questions (1) How entrepreneurial competencies influence sustainability when mediated by innovation, and (2) What conceptual mechanisms connect these constructs the study provides a more integrated understanding of the competency–innovation–sustainability relationship within the contemporary business environment.

2. Materials and Methods

Entrepreneurial competencies, innovation, and business sustainability have emerged as increasingly prominent constructs in contemporary management research, particularly within dynamic and uncertain business environments. Entrepreneurial competencies, including opportunity recognition, strategic thinking, creativity, and adaptability, have been identified as essential foundations that enable entrepreneurs to navigate uncertainty, allocate resources effectively, and make informed decisions (Paricahua et al., 2022). At the same time, sustainability requires firms to balance economic, social, and environmental objectives (Zhao et al., 2021), a goal that is difficult to achieve without adequate innovation capabilities. Innovation, whether at the product, process, or technological level, serves as a key mechanism that translates competencies into sustainable business practices (Ooi et al., 2025), allowing firms to enhance efficiency, adopt environmentally friendly technologies, and develop new business models that support long-term sustainability.

Theoretically, the Resource-Based View (RBV) posits that competencies are strategic internal resources that drive innovation and long-term competitive advantage (Qalati et al., 2022). In contrast, Innovation Capability Theory emphasizes the need for dynamic capabilities to transform knowledge into innovative solutions that support sustainability (Hossain et al., 2025). Empirical findings suggest that competencies enhance innovation (Bourdeau et al., 2021) and that innovation improves sustainability (Hermawan et al., 2021). However, most studies examine these relationships in only two-way configurations. There remains a limited amount of integrative research explaining how competencies influence sustainability through innovation as a mediating mechanism. Therefore, a Systematic Literature

Review (SLR) is essential to consolidate scientific evidence, map conceptual pathways, and clarify the mechanisms connecting competencies, innovation, and sustainability in the context of MSMEs.

This study employs a Systematic Literature Review (SLR) methodology, rigorously aligned with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol, to examine how entrepreneurial competencies contribute to business sustainability through the mediating mechanism of innovation. The review relies exclusively on peer-reviewed journal articles indexed in the Scopus database and does not incorporate empirical field methods such as interviews, surveys, observations, or focus group discussions. By limiting the evidence base to published academic studies, this review ensures methodological transparency, theoretical consistency, and reproducibility in accordance with internationally recognized scholarly standards. The SLR procedure followed the sequential stages of identification, screening, eligibility, and inclusion, each of which progressively narrowed the dataset to produce the final body of literature analyzed in this study, as summarized in Figure 1.

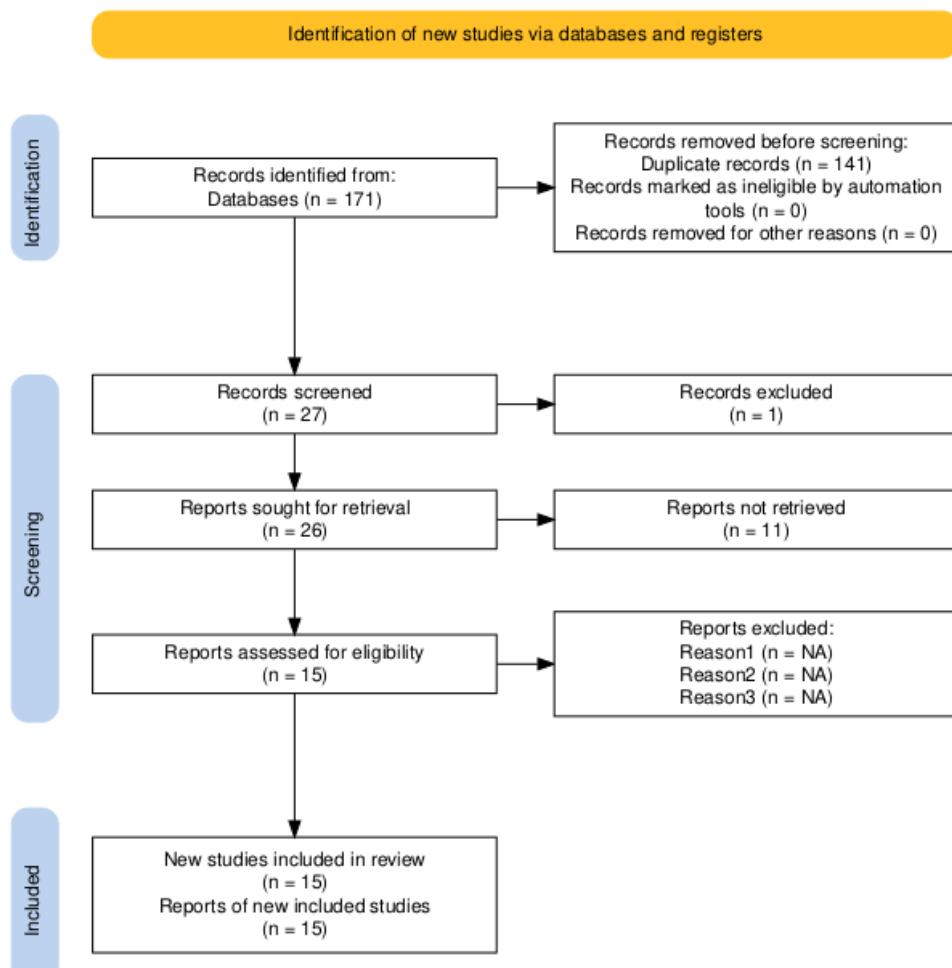


Figure 1. Systematic Literature Review Process Based on the PRISMA Protocol

Figure 1 presents the structured pathway through which studies were located, evaluated, and selected for inclusion. The identification stage began with a broad search in the Scopus database using the keyword string "entrepreneurship AND sustainability," which yielded 171 publications. To enhance conceptual precision and ensure alignment with the review's analytical focus, the search was refined with a more targeted Boolean expression combining terms related to entrepreneurial competencies, business sustainability, innovation, and mediation mechanisms, the search was refined using the Boolean expression: ("entrepreneurial competencies" OR "entrepreneurial capability" OR "entrepreneurial skills" OR "entrepreneurial orientation" OR "entrepreneurial behavior" OR "entrepreneurial mindset" OR "entrepreneurial traits" OR "entrepreneurial potential") AND ("business sustainability" OR "sustainable performance" OR "sustainable business" OR "firm sustainability" OR "organizational sustainability" OR "corporate sustainability") AND ("innovation" OR "innovation capability" OR "innovation performance" OR "innovative behavior" OR "innovation practices" OR "innovation management") AND ("mediating role" OR "mediation effect" OR "mediator mechanism" OR "mediating effect" OR "indirect effect"). This refinement resulted in the exclusion of 144 articles that did not match the thematic scope of the review, leaving 27 potentially relevant studies.

During the screening stage, a publication-year filter was applied to include only recent and post-pandemic scholarly work published between 2022 and 2025. The period was selected because entrepreneurial behavior, innovation practices, and sustainability strategies underwent substantial reshaping after the COVID-19 pandemic, prompting scholars to re-examine these constructs within new economic, technological, and organizational realities. Research published from 2022 onward reflects this renewed context, incorporating shifts in digital adoption, resilience-building, resource management, and sustainability transitions that were accelerated during the recovery period. This criterion removed one article that fell outside the selected timeline, reducing the dataset to 26 records. The eligibility stage then introduced an accessibility requirement, in which only open-access and open-archive articles were retained to ensure full-text availability and analytical transparency. This step excluded 11 additional studies, resulting in a final dataset of 15 peer-reviewed articles that satisfied all inclusion criteria and formed the empirical foundation of this review. All selected studies were systematically organized using a reference management system that facilitated accurate citation tracking, metadata management, and structured categorization of the literature. The final corpus of 15 articles provides the evidentiary base to explore how entrepreneurial competencies shape business sustainability outcomes, and how innovation functions as an intervening mechanism within this relationship. This consolidated synthesis enables the identification of conceptual patterns, methodological tendencies, and research gaps, thereby offering new insights and informing future directions for sustainability-driven entrepreneurship research.

3. Results

The systematic review of 15 eligible studies revealed several descriptive patterns related to entrepreneurial competencies, innovation processes, and business sustainability outcomes across various organizational contexts. To present the findings transparently, the extracted data were organized into a synthesis table summarizing the authors, research focus, and major empirical results. The table functioned as the core dataset from which descriptive themes were derived. The descriptive synthesis below outlines the distribution of constructs, methodological tendencies, mediating variables, and sustainability outcomes reported in the selected publications.

Table 1. Summary of Empirical Findings from the Included Studies

No.	Author / Year	Title	Results
1.	Gul, R.; Cao, X.; Mohammad, R. A.; Rauf, A. (2025)	Sustainable entrepreneurial dynamics in manufacturing: Innovative business models and social value creation in Chinese enterprises	Sustainable entrepreneurial orientation has been shown to enhance organizational performance in Chinese manufacturing firms through value-based mechanisms such as eco-opportunism and customer value creation. This effect is further strengthened by entrepreneurs' self-efficacy, indicating that sustainability-oriented strategies supported by individual capabilities can reinforce organizational resilience and competitive advantage.
2.	Yang, X.; Yan, L.; Arshad, D. (2025)	From green orientation to sustainable outcomes: Exploring employee creativity and AI-driven psychological mechanisms	Green entrepreneurial orientation in Malaysian SMEs has been shown to enhance sustainable performance by strengthening employees' green creative behavior, while AI-driven workplace support further amplifies this effect. These findings suggest that green strategies, employee creativity, and AI technologies work in complementary ways to advance sustainability in Industry 4.0 SMEs.
3	Atobishi, T.; Podruzsk, S. (2025)	Ethical Entrepreneurial Leadership and Corporate Sustainable Development: A Resource-Based View of Competitive Advantage in Small	Entrepreneurial leadership capabilities have been shown to strengthen ethical entrepreneurial leadership and corporate sustainability development in SMEs, with ethical leadership partially mediating this relationship. The resulting improvement in sustainability subsequently enhances competitive advantage, indicating that the combination of entrepreneurial competencies and ethical leadership is essential for driving sustainable growth in resource-constrained SMEs.

and Medium Enterprises		
4	Van, I. N. (2025)	Impact of Entrepreneurial Competencies and Coopetition Strategy on Sustainable Performance: A Moderated Mediation Model
5	Seow, A. N.; Chan, M. S.; Tan, C. H.; Yap, Y. Y. (2025)	Sustainable business performance of small and medium-sized enterprises in green hotels: the mediating role of competitive advantage
6	Pham, D. N. (2025)	Linking strategic orientations and open innovation of Vietnamese ICT firms with sustainable business advantage: The role of green HRM practices
7	Jallad, M. N.; Karadas, G. (2024)	Entrepreneurial Orientation and Performance Outcomes in Palestinian SMEs: The Role of Absorptive Capacity and Industry Type
8	Zhang, X.; Zhang, X. E.; Yang, L. (2024)	Does Green Entrepreneurial Orientation Improve the Sustainable Performance of Agribusiness? Evidence from China
9	Zhang, Q.; Zhu, X.; Lee, M. J. (2024)	Exploring Institutional Pressures, Green Innovation, and Sustainable Performance:

		Examining the Mediated Moderation Role of Entrepreneurial Orientation	role in promoting innovation while potentially elevating risk when innovation capability is limited.
10	Baquero, A. (2024)	Linking green entrepreneurial orientation and ambidextrous green innovation to stimulate green performance: a moderated mediation approach	Green entrepreneurial orientation enhances green performance in UAE manufacturing firms through the mediating role of ambidextrous green innovation, including both exploratory and exploitative forms. Resource orchestration capability strengthens the relationships between GEO, exploitative green innovation, and environmental performance, highlighting the importance of resource management strategies for achieving stronger sustainability outcomes.
11	Antara, M. E. Y.; Sugianingrat, I. A. P. W.; Martini, I. A. O. (2024)	Leadership strategy as the driver of achieving sustainable business: A case of endek weaving SMEs in Indonesia	Green entrepreneurial orientation and sustainable leadership enhance the sustainable performance of Balinese Endek weaving SMEs, with green digital innovation serving as a mediator of these effects. The integration of sustainable leadership, green entrepreneurship, and digital innovation strengthens both performance and business sustainability.
12	Novianty, R.; Hermanto, Y. B. (2024)	Improving SME performance through entrepreneurial orientation and green innovation: The mediating role of green knowledge sharing	Entrepreneurial orientation and green innovation enhance the performance of wood waste SMEs in Ngawi, with green knowledge sharing serving as a mediator in these relationships. This knowledge-sharing mechanism strengthens the role of entrepreneurial orientation and green innovation in supporting sustainable business growth.
13	Okreglicka, M.; Mittal, P.; Navickas, V. (2023)	Exploring the Mechanisms Linking Perceived Organizational Support, Autonomy, Risk Taking, Competitive Aggressiveness and Corporate Sustainability: The Mediating Role of Innovativeness	The dimensions of entrepreneurial orientation, particularly innovativeness, enhance corporate sustainability in SMEs, with perceived organizational support also contributing to these sustainability outcomes. Enterprise type moderates the POS–Sustainability relationship, underscoring the central role of innovation in achieving sustainable performance.
14	Ingram, T.; Bratnicka-Myśliwiec, K.; Kraśnicka, T.; Steinerowska-Streb, I. (2022)	Entrepreneurial Orientation as a Determinant of Sustainable Performance in Polish Family and Non-Family Organizations	Entrepreneurial orientation enhances sustainable performance in both family and non-family firms in Poland, with innovation output acting as a key mediator. The proactiveness dimension plays a critical role in driving long-term performance, underscoring the importance of proactive entrepreneurial orientation in achieving sustainability.
15	Yu, Q.; Aslam, S.; Murad, M.; Jiatong, W.; Syed, N. (2022)	The Impact of Knowledge Management	Knowledge management and intellectual capital enhance innovation in Pakistani IT firms, with entrepreneurial orientation partially mediating these relationships. The

Process and Intellectual Capital on Entrepreneurial Orientation and Innovation	leader's education level moderates the effect of knowledge management on innovation but does not moderate the impact of intellectual capital, highlighting the differing roles these factors play in shaping innovative capability.
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Table 1 shows that 15 studies reviewed present a consistent pattern in which entrepreneurial competencies and related orientations feature prominently as essential antecedents in sustainability-related outcomes. Across all included articles, entrepreneurial competencies expressed in forms such as entrepreneurial orientation, green entrepreneurial orientation, entrepreneurial leadership skills, or open innovation capability appear as primary variables shaping organizational performance indicators. The table shows that these competencies function either directly or through intermediary organizational capabilities that support value creation, competitive advantage, or innovation behavior. A descriptive review of the table indicates that sustainability outcomes are broadly conceptualized across three recurring dimensions: environmental performance, economic sustainability, and organizational resilience. Most studies adopt composite sustainability measures rather than single performance metrics, with several incorporating multi-layered constructs such as sustainable business advantage, corporate sustainable development, or sustainable performance. The table also shows that the studies employ a variety of mediating variables, such as green creativity, ambidextrous innovation, absorptive capacity, ethical leadership, and knowledge-sharing, suggesting that entrepreneurial competencies influence sustainability indirectly through capability-building processes within firms.

Another descriptive pattern is the frequent integration of innovation-related constructs. Twelve of the fifteen studies reference innovation either as a mediating, moderating, or outcome variable. Innovation appears in various forms, including green innovation, digital innovation, business model innovation, innovation output, exploratory innovation, and exploitative innovation. This prevalence highlights a repeated empirical association within the reviewed literature between innovation pathways and sustainability outcomes. The table highlights that innovation variables tend to mediate the relationship more than they moderate it, with mediation being reported in the majority of studies. Only a few studies include moderation effects, such as digitalisation capability or resource orchestration capability. Industry and regional distributions also show a descriptive pattern. Many studies have been conducted in emerging economies, such as China, Vietnam, Malaysia, Indonesia, Pakistan, and the UAE, reflecting a growing interest in sustainable entrepreneurship research in rapidly developing industrial contexts. Most of these industries involve SMEs (e.g., hospitality, agribusiness, ICT firms, weaving SMEs, wood waste SMEs), while others focus on manufacturing sectors. The predominance of SMEs suggests that entrepreneurial competencies are especially relevant for smaller enterprises facing sustainability pressures in dynamic environments.

The table also shows that several studies incorporate organizational support mechanisms as part of their empirical models. For example, perceived organizational support, AI-driven workplace support, green HRM practices, and resource orchestration capabilities appear as contextual variables that strengthen the pathways between entrepreneurial competencies, innovation mechanisms, and sustainability outcomes. Their inclusion reflects an emphasis on organizational preparedness and structural enablers in supporting sustainability initiatives. Based on cross-study comparison, four major descriptive themes emerged:

Theme 1: Entrepreneurial Competencies as Foundational Drivers of Sustainable Outcomes

All studies identified entrepreneurial competencies, whether expressed through orientation, leadership skills, or innovative capability, as primary components associated with sustainability. The dataset consistently reports positive associations across various business environments. The table highlights that competencies such as proactiveness, innovativeness, risk-taking, knowledge orientation, and green entrepreneurial orientation are recurrently measured as antecedents to sustainability, competitive advantage, or performance.

Theme 2: Innovation as a Central Mediating Mechanism

Innovation appears as the most frequently tested mediating variable in the reviewed studies. The table illustrates that innovation-related constructs mediate the influence of entrepreneurial competencies in multiple models. These include green innovation, business model innovation, ambidextrous innovation, digital innovation, innovation output, and exploratory exploitative innovation. Across studies, innovation operates as a bridging mechanism that connects entrepreneurial inputs with sustainability outputs. This pattern is descriptive rather than interpretive, reflecting the frequent use of innovation constructs as intermediary pathways.

Theme 3: Organizational Capabilities and Support Systems as Secondary Mediators or Moderators

Several studies incorporate mediating and moderating variables beyond innovation. These include absorptive capacity, green HRM, ethical leadership, green knowledge sharing, perceived organizational support, digitalization capability, and resource orchestration capability. These variables appear in contexts where sustainability outcomes are influenced not only by entrepreneurial characteristics but also by supporting systems that facilitate capability development and value creation.

Theme 4: Sustainability Outcomes Measured Through Diverse Multi-Dimensional Constructs

Sustainability performance across the reviewed literature is operationalized in different ways. The table indicates the use of constructs such as sustainable business performance, corporate sustainable development, sustainable competitive advantage, sustainable business advantage, and green performance. This diversity highlights that sustainability in entrepreneurial settings is not confined to environmental indicators but often includes economic and social components.

The results of this systematic review indicate several consistent descriptive patterns across the included studies. Entrepreneurial competencies are repeatedly reported as key antecedents to sustainability-related outcomes. Innovation mechanisms emerge as the most common mediators, linking entrepreneurial inputs with sustainable performance. Organizational support systems, leadership capabilities, and knowledge-based resources serve as additional mediators or moderators. Sustainability outcomes themselves are measured through diverse constructs reflecting environmental, economic, and competitive dimensions. These descriptive findings provide a comprehensive overview of empirical trends in the literature that connect entrepreneurial competencies, innovation processes, and business sustainability.

4. Discussion

This section synthesizes the findings of the systematic literature review to address the two research questions concerning the relationships between entrepreneurial competencies, innovation, and business sustainability. By reviewing and integrating insights from fifteen peer-reviewed studies published between 2022 and 2025, the analysis highlights how entrepreneurial competencies function as antecedents to sustainability performance and how innovation acts as the primary mediating mechanism. The discussion also explores the conceptual pathways and theoretical mechanisms emphasized within the reviewed literature.

4.1. Entrepreneurial Competencies as Foundations for Business Sustainability

The literature demonstrates a strong consensus that entrepreneurial competencies represent essential foundations for achieving sustained business performance. Competencies such as opportunity recognition, problem-solving ability, strategic decision-making, creativity, and resilience appear repeatedly as core factors shaping entrepreneurs' capacity to align their firms with long-term sustainability objectives. These competencies support the identification of sustainability-related opportunities, guide the formulation of appropriate strategies, and facilitate informed decision-making under uncertainty (Zhang et al., 2025). A central insight from the reviewed studies is that opportunity recognition competence plays a crucial role in the adoption of sustainability. Entrepreneurs who actively scan their environment and identify emerging sustainability trends, such as consumer demand for eco-friendly products or the rising importance of social responsibility, are more capable of embedding sustainability principles into their business models. Such competence enables early adoption of green practices, which often leads to improved competitive positioning and long-term value creation. Without this competence, sustainability initiatives tend to be reactive rather than strategic, reducing their overall impact (Dias & Silva, 2021).

Moreover, creativity and problem-solving competencies facilitate the development of novel approaches to sustainability challenges. Studies have highlighted that entrepreneurs with strong creative orientations are more likely to design resource-efficient business processes, develop environmentally conscious product offerings, and explore non-traditional business models that incorporate circular economy principles. These creative competencies support strategic differentiation and strengthen the firm's ability to meet market expectations regarding environmental and social performance (Rathee et al., 2025). Another competency emphasized in literature is resilience. Entrepreneurs with resilience competence demonstrate persistence, adaptability, and psychological stability when navigating the complexities associated with sustainability transitions. Sustainability often requires long-term investments, regulatory adjustments, and cultural shifts that challenge existing routines. Resilient entrepreneurs are better positioned to overcome these pressures and maintain momentum toward sustainability goals.

Collectively, the reviewed literature indicates that entrepreneurial competencies do not directly guarantee business sustainability, but rather function as essential building blocks that shape entrepreneurs' ability to interpret and act upon

sustainability-related information. Competencies influence the mindset, behavior, and strategic orientation of entrepreneurs, establishing a foundation upon which sustainability initiatives can be designed and implemented (Kumari, 2025).

4.2. Innovation as a Mediating Mechanism in the Competency Sustainability Relationship

The most consistent theme across the included studies concerns the mediating role of innovation. Entrepreneurial competencies have a significant impact on business sustainability, primarily when channeled through innovative activities. Several studies argue that competencies, while necessary, remain dormant unless activated through innovation processes that convert cognitive and behavioral capabilities into tangible organizational outcomes (Mao et al., 2021). Innovation emerges in various forms within the reviewed literature, including product, process, organizational, eco-innovation, and digital innovation. Each type represents a unique mechanism through which competencies are transformed into sustainability performance. Product innovation enables entrepreneurs to develop goods with reduced environmental footprints or enhanced social value, supported by competencies related to creativity, technical understanding, and market insight. Process innovation, which involves modifying operational workflows, stems from competencies in problem-solving, resource management, and continuous improvement, collectively promoting more efficient and sustainable production systems (Suasana et al., 2025). Eco-innovation receives notable attention as a mediator, reflecting the increasing global emphasis on environmental sustainability. Entrepreneurs with heightened environmental awareness and ethical competence tend to initiate eco-innovation projects such as waste reduction, energy efficiency, and sustainable material sourcing. These innovations contribute directly to environmental sustainability while also improving operational cost structures and enhancing reputation, thereby reinforcing economic sustainability (Mondal et al., 2024).

Literature also underscores that innovation mediates at relational and cultural levels. Entrepreneurial competencies, such as social competence, communication ability, and collaborative orientation, facilitate stakeholder engagement and the co-creation of sustainability-driven innovations. Firms that adopt participatory innovation practices often develop more socially inclusive and environmentally responsible solutions, as they integrate insights from employees, customers, suppliers, and community partners. A consistent finding is that innovation enables firms to translate competencies into practical strategies that produce measurable sustainability outcomes. Competency rarely has a direct impact on sustainability; instead, innovation serves as the mechanism that operationalizes competencies into implemented practices, technologies, and business transformations. This reinforces the argument that entrepreneurial competencies must be complemented by innovation management to generate sustainable competitive advantage (Zeigermann, 2021).

4.3. Conceptual Pathways Linking Entrepreneurial Competencies, Innovation, and Sustainability

The reviewed studies highlight several conceptual pathways that explain how entrepreneurial competencies influence sustainability through innovation. These pathways draw from well-established theoretical frameworks, including the competence-based view, resource-based view, and dynamic capabilities theory.

1. Competence-Based View Pathway - From the competence-based view, entrepreneurial competencies represent the knowledge structures and skill sets that shape innovative behavior. This pathway asserts that competencies directly influence the entrepreneur's ability to envision innovative solutions to sustainability challenges (Raman et al., 2024). For example, opportunity recognition competence facilitates the identification of unsolved sustainability problems, while creativity competence informs the development of innovative responses. This pathway suggests that competencies act as internal drivers of sustainability-oriented innovation, reinforcing the idea that capability building is crucial for advancing sustainability.
2. Resource-Based View Pathway - Under the resource-based view pathway, competencies shape the entrepreneur's ability to acquire, allocate, and orchestrate resources that support innovation. High-competency entrepreneurs are more capable of securing financial capital, strengthening their networks, adopting technology infrastructure, and cultivating learning-oriented organizational cultures, all of which are necessary for implementing innovation. Innovation arises from the effective deployment of these resources, while sustainability emerges as an outcome of resource-efficient and socially responsible innovations (Cai, 2023). This pathway highlights that competencies and resources operate synergistically to produce sustainability impacts.
3. Dynamic Capabilities Pathway - Dynamic capabilities theory offers another influential pathway linking competencies to innovation and sustainability. According to this pathway, entrepreneurial competencies underpin the firm's capacity to sense opportunities, seize innovation possibilities, and transform organizational

structures to align with long-term sustainability requirements. Opportunity recognition and strategic foresight competencies enhance sensing capability, while decision-making and risk-management competencies strengthen seizing capability. Resilience and learning competencies support transformation capability, enabling firms to revise routines, update technologies, and adjust cultures in response to sustainability imperatives (Ooi et al., 2025). This pathway captures the adaptive nature of sustainability-oriented innovation.

4. Integrated Multi-Level Pathway - Several studies propose integrative models that combine elements from the three frameworks. In such models, entrepreneurial competencies stimulate innovation through cognitive, resource, and adaptive mechanisms simultaneously. Innovation then serves as the conduit through which sustainability is achieved at economic, environmental, and social levels. The integrated pathway emphasizes reciprocal feedback loops, suggesting that sustainability achievements strengthen entrepreneurial competencies through learning, experiential refinement, and increased strategic clarity (Bhatti et al., 2023). This integrative understanding offers a comprehensive perspective on the relationships among competencies, innovation, and sustainability.

4.4. Theoretical Mechanisms Underlying the Competency Innovation Sustainability Link (RQ2)

Beyond high-level pathways, literature identifies specific mechanisms that explain how entrepreneurial competencies shape sustainability outcomes through innovation. One mechanism is cognitive flexibility, which allows entrepreneurs to reframe sustainability challenges, evaluate diverse solution pathways, and pursue innovation under uncertainty (Tajpour et al., 2025). Entrepreneurs with high cognitive flexibility are better equipped to integrate sustainability considerations into their strategic decisions, resulting in more innovative and responsible business models. Another mechanism involves motivational and value-based orientations. Studies show that competencies related to ethical reasoning, sustainability values, and social responsibility create motivational conditions for pursuing sustainability-oriented innovation (Danarahmanto et al., 2020). Entrepreneurs who internalize sustainability values are more likely to invest in eco-friendly technologies, adopt responsible sourcing practices, and design community-oriented business initiatives. A third mechanism is environmental scanning. Entrepreneurs with scanning competence systematically monitor market signals, regulatory shifts, and technological trajectories related to sustainability. This mechanism supports anticipatory innovation, enabling firms to stay ahead of sustainability trends and maintain a competitive advantage.

Environmental scanning competence enhances the likelihood of early engagement with sustainability practices, thereby reinforcing the quality and relevance of innovation (Nazir et al., 2025). Together, these mechanisms demonstrate that entrepreneurial competencies shape innovation dynamics through psychological, strategic, and operational channels. Innovation then transforms these competencies into measurable sustainability outcomes. This review offers several theoretical and practical implications. Theoretically, it clarifies that entrepreneurial competencies function not as direct determinants but as foundational enablers of sustainability, whose influence materializes primarily through innovation. This emphasizes the need for more nuanced models that explicitly position innovation as a mediator in entrepreneurial sustainability frameworks. For practitioners, the findings suggest that developing competencies, particularly in opportunity recognition, strategic decision-making, creativity, environmental scanning, and resilience, should be a priority for entrepreneurs seeking long-term sustainability. Training programs, incubation initiatives, and policy interventions should therefore focus on enhancing competencies and developing innovation capabilities.

Policymakers may use these insights to design targeted entrepreneurship support systems that integrate sustainability education, innovation funding, and capability development mechanisms. Future research should expand the conceptual models identified in this review by examining context-specific variations across industry sectors, testing additional mediators such as digital transformation or organizational culture, and exploring longitudinal evidence to capture how the interactions between competency and innovation shape sustainability trajectories over time.

5. Conclusions

This systematic literature review integrates findings from fifteen studies published between 2022 and 2025 to explain how entrepreneurial competencies influence business sustainability through the mediating role of innovation. The review demonstrates that entrepreneurial competencies serve as essential cognitive and behavioral foundations; however, their impact on sustainability materializes only when activated through innovation processes. Competencies such as opportunity recognition, creative problem-solving, strategic decision-making, and resilience enable entrepreneurs to identify sustainability issues and develop effective strategies. Their influence becomes most significant when expressed through product, process, organizational, or eco-innovation. Through innovation, entrepreneurial capabilities are transformed into sustainable business models, resource efficiency, and organizational resilience. Theoretically, this review advances understanding by demonstrating that competencies affect sustainability not directly, but through cognitive, resource-based, and adaptive innovation pathways, as described in the competence-based view,

resource-based view, and dynamic capabilities perspectives. This integrated perspective addresses the research gap, as prior studies have examined these constructs separately rather than as an interconnected system.

Practically, the findings emphasize the need for entrepreneurs and SMEs to strengthen their competencies in opportunity recognition, strategic evaluation, creativity, and environmental scanning, while simultaneously enhancing innovation management. For policymakers, the review emphasizes the importance of entrepreneurship support policies, such as training, green innovation incentives, and digital capability programs, that align with sustainability goals. This review has limitations, including the narrow publication window (2022–2025) and reliance on Scopus-indexed articles, which may exclude relevant studies from other periods or databases. Future research should investigate additional mediators, such as digital transformation or organizational culture, and adopt longitudinal designs to capture the long-term dynamics of the competency innovation–sustainability relationship. Overall, this review contributes methodologically through a transparent and replicable SLR approach and conceptually through an integrated framework demonstrating how entrepreneurial competencies activated through innovation drive sustainability outcomes. This framework offers valuable guidance for scholars and practitioners seeking to strengthen the intersection of entrepreneurship, innovation, and sustainability.

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