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The Impact of Innovation Capability and Market Learning Capability on Sustainable Entrepreneurship

Zohreh Abolfazli[1*], Maryam Taghvaee Yazdi[2]

1. Master's Degree, Department of Entrepreneurship, New Business Specialization, Sari Branch, Islamic Azad University, Sari, Iran. (Corresponding Author) Email: Z.abolfazli9091@gmail.com
2. Department of Educational Management, Sari Branch, Islamic Azad University, Sari, Iran.
Email: m_taghvaeeyazdi@yahoo.com

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ABSTRACT

This study investigates the influence of innovation capability and market learning capability on sustainable entrepreneurship among industrial firms. Employing an applied, descriptive-survey research design with a mixed-methods approach, the study targeted 180 CEOs, with a sample of 118 selected via simple random sampling using the Krejcie and Morgan table. Data were collected through standardized questionnaires on innovation capability, market learning capability, and a researcher-developed sustainable entrepreneurship instrument. Data analysis involved regression and structural equation modeling (SEM) using SPSS 23 and SmartPLS4. Findings revealed that innovation capability (encompassing innovation culture, knowledge utilization, leadership, individual innovation capability, and innovative structures) and market learning capability (including market understanding, competitor orientation, and customer orientation) significantly and positively impact sustainable entrepreneurship. The structural model, with good fit, explained 61.3% of the variance in sustainable entrepreneurship. The study suggests that enhancing innovation and market learning capabilities can improve sustainable entrepreneurial outcomes, offering practical implications for industrial managers to prioritize innovative processes, modern leadership, and market-oriented strategies.

KEYWORDS: Innovation Capability, Market Learning Capability, Sustainable Entrepreneurship, Knowledge Utilization, Market Orientation

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1. Introduction

In the contemporary business landscape, characterized by rapid technological advancements, digital transformation, and intensifying global competition, firms face complex challenges in sustaining competitive advantages and achieving long-term growth (Farny & Binder, 2021; Muñoz & Cohen, 2018).

Similarly, market learning capability, which involves understanding market dynamics, analyzing competitor strategies, and identifying customer needs, enables firms to align their offerings with market expectations, thereby enhancing performance and sustainability (Weerawardena, 2003). This capability, comprising market understanding, competitor orientation, and customer orientation, equips firms to respond swiftly to environmental changes and secure sustainable competitive advantages (Dehghan et al., 2012). Research in 2025 underscores that market learning capability is particularly critical for SMEs, as it enhances organizational agility and responsiveness to customer demands, contributing to sustainable development (Khan et al., 2025). This is especially relevant in contexts like industrial estates, where firms often operate under resource constraints and intense competitive pressures.

Despite significant progress in understanding the roles of innovation and market learning capabilities, several research gaps persist. First, most studies have examined these capabilities in isolation, with limited exploration of their combined impact on sustainable entrepreneurship (Sulistyo & Ayuni, 2021). Second, there is a paucity of research in developing economies, particularly in the context of Iran's industrial estates, where unique economic and infrastructural conditions shape entrepreneurial dynamics (Avelar et al., 2024). Third, given the growing global emphasis on sustainability in business strategies, there is a pressing need for empirical models that elucidate how organizational capabilities drive sustainable outcomes (Gómez-Castro et al., 2024).

This study aims to address these gaps by examining the impact of innovation capability and market learning capability on sustainable entrepreneurship among industrial firms in the Sari Industrial Estate, Phase 1, Iran. The research objectives are threefold: (1) to assess the effect of innovation capability on sustainable entrepreneurship, (2) to evaluate the influence of market learning capability on sustainable entrepreneurship, and (3) to explore the combined impact of both capabilities on sustainable entrepreneurial outcomes. By focusing on SMEs in an industrial estate, this study contributes to the marketing management literature by integrating innovation and market orientation perspectives to advance sustainable entrepreneurship. It also provides actionable insights for managers, policymakers, and researchers seeking to enhance organizational performance and sustainable development through strategic capabilities. Furthermore, the study addresses the critical question of how firms can leverage organizational capabilities to achieve sustainability goals in resource-constrained and competitive environments, aligning with global sustainability priorities in 2025 (Khan et al., 2025).

2. Theoretical Framework and Literature Review

Sustainable entrepreneurship, which integrates economic, social, and environmental objectives, has emerged as a strategic paradigm to address these challenges, enabling firms to create economic value while enhancing societal well-being and minimizing environmental impact (Schaltegger & Wagner, 2011). Small and medium-sized enterprises (SMEs), due to their agility and innovation potential, play a pivotal role in advancing sustainable development, particularly in developing economies like Iran, where industrial estates serve as hubs for economic growth and job creation (Avelar et al., 2024).

Innovation capability, defined as an organization's ability to continuously transform knowledge and ideas into new products, services, or processes (O'Cass & Sok, 2013), is a cornerstone of competitive advantage in dynamic markets. This capability encompasses dimensions such as innovation culture, knowledge utilization, transformational leadership, individual innovation capability, and innovative organizational structures (Achi et al., 2016). Recent studies highlight that innovation capability not only enhances financial performance but also drives sustainable outcomes by fostering environmentally friendly solutions (Gómez-Castro et al., 2024). For instance, a 2024 study found that firms with robust innovation cultures are more likely to develop green products that align with modern market demands, thereby strengthening their market position (Li & Zhang, 2024).

Data were collected using three validated instruments, each designed to measure one of the core research variables:

1. **Innovation Capability**: A standardized questionnaire by O'Cass and Sok (2013) consisting of 20 items on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), measuring five dimensions: innovation culture (4 items), knowledge utilization (4 items), leadership (4 items), individual innovation capability (4 items), and innovative structures (4 items). This instrument was selected for its high validity and reliability in international studies.

2. **Market Learning Capability**: A standardized questionnaire by Dehghan et al. (2012) with 15 items on a 5-point Likert scale, assessing three dimensions: market understanding (5 items), competitor orientation (5 items), and customer orientation (5 items). This instrument was specifically validated for the Iranian context.

3. **Sustainable Entrepreneurship**: A researcher-developed questionnaire based on prior studies (e.g., Schaltegger & Wagner, 2011), comprising 12 items measuring economic (4 items), social (4 items), and environmental (4 items) dimensions of sustainable entrepreneurship on a 5-point Likert scale. The questionnaire was validated through expert reviews and pilot testing.

3. Methodology

This study adopted an applied, descriptive-survey research design with a mixed-methods approach to provide a comprehensive framework for examining the impact of innovation capability and market learning capability on sustainable entrepreneurship. The mixed-methods approach enabled the integration of theoretical insights from existing literature (qualitative phase) with empirical data from industrial firm managers (quantitative phase). The qualitative phase involved a systematic literature review to identify key dimensions of innovation capability, market learning capability, and sustainable entrepreneurship, which informed the development of the theoretical framework and hypotheses. The quantitative phase utilized standardized questionnaires and statistical analyses to test the hypothesized relationships. This design was selected for its ability to generate practical implications for managers and policymakers while addressing theoretical gaps in the marketing management literature.

The research population comprised 180 CEOs of industrial firms located in the Sari Industrial Estate, Phase 1, Iran. This industrial estate was chosen due to its diverse range of SMEs and its significant role in the regional economy. Using the Krejcie and Morgan (1970) table, a sample size of 118 participants was determined, which is appropriate for the population size and minimizes sampling error. Simple random sampling was employed to select participants, ensuring representativeness and reducing selection bias. Inclusion criteria included a minimum of two years of managerial experience and the firm's active operation in the industrial sector, ensuring respondents' adequate knowledge of the research topics.

To ensure data quality, questionnaires were administered in person with prior coordination. The data collection process spanned three months, achieving a 95% response rate. The reliability of the instruments was confirmed using Cronbach's alpha, yielding an overall value of 0.942, indicating excellent internal consistency. Content validity was established through reviews by five management and entrepreneurship experts, and construct validity was verified using confirmatory factor analysis (CFA) in SmartPLS, with factor loadings above 0.7.

Data analysis was conducted in three stages:

1. **Descriptive Statistics**: Using SPSS 23, participant demographics (e.g., gender, age, education) and variable distributions (means and standard deviations) were analyzed to provide an initial understanding of the data and identify potential outliers.

2. **Inferential Analysis**: To test the hypotheses, multiple linear regression and structural equation modeling (SEM) were employed. Regression analysis examined the direct relationships between the independent variables (innovation capability and market learning capability) and the dependent variable (sustainable entrepreneurship). SEM, conducted in SmartPLS 4, enabled simultaneous analysis of multiple relationships and model fit assessment, combining regression and factor analysis for complex models.

3. **Model Fit Assessment**: Model fit was evaluated using indices such as Goodness of Fit (GOF > 0.36), Standardized Root Mean Square Residual (SRMR < 0.08), Normed Fit Index (NFI), predictive relevance ($Q^2 > 0$), Euclidean distance (d_ULS), and geodesic distance (d_G). Multicollinearity was assessed using the Variance Inflation Factor (VIF < 10), and residual normality was tested using the Kolmogorov-Smirnov test ($p > 0.05$).

To ensure analytical rigor, regression assumptions (linearity, normality of residuals, homoscedasticity) were verified using scatterplots and the Durbin-Watson test (value between 1.5 and 2.5). Data were independently analyzed by two analysts to minimize errors, and sensitivity analysis was conducted to assess the impact of outliers, confirming the robustness of the results.

4. Finding

Descriptive Statistics

The sample consisted of 118 CEOs, with 85% male and 15% female. The majority (60%) were aged 35–50 years, and 70% held a bachelor's degree or higher. Firm sizes ranged from 10 to 100 employees, with 80% classified as SMEs.

Reliability and Validity

Cronbach's alpha values for the constructs were as follows: innovation capability (0.89), market learning capability (0.87), and sustainable entrepreneurship (0.85). Composite reliability (CR) and Average Variance Extracted (AVE) values exceeded 0.8 and 0.5, respectively, confirming construct reliability and convergent validity. The Heterotrait-Monotrait (HTMT) ratio was below 0.9, indicating discriminant validity.

Hypothesis Testing

The study tested three hypotheses:

1. **H1: Innovation capability positively impacts sustainable entrepreneurship.**
2. **H2: Market learning capability positively impacts sustainable entrepreneurship.**
3. **H3: Innovation capability and market learning capability jointly impact sustainable entrepreneurship.**

Structural Equation Modeling Results The SEM analysis, as depicted in Figure 4-1, confirmed that all paths from the predictor variables (innovation capability and market learning capability) to the dependent variable (sustainable entrepreneurship) were statistically significant, as the T-statistics reported alongside the path coefficients exceeded 1.96. Specifically, the results from the bootstrap method (Table 4-22) provided detailed insights into the simultaneous relationships:

- **Market Learning Capability → Sustainable Entrepreneurship**: The path coefficient was 0.361, with a T-statistic of 3.712 ($p < 0.001$), indicating a significant positive effect. The 95% confidence interval ranged from 0.161 to 0.540, confirming the robustness of the relationship.
- **Innovation Capability → Sustainable Entrepreneurship**: The path coefficient was 0.471, with a T-statistic of 4.946 ($p < 0.001$), indicating a stronger significant positive effect. The 95% confidence interval ranged from 0.291 to 0.661, further supporting the significance of the relationship.

The combined model, incorporating both predictors, explained 61.3% of the variance in sustainable entrepreneurship ($R^2 = 0.613$). The model fit indices were satisfactory: GOF = 0.607 (> 0.36), SRMR = 0.075 (< 0.08), NFI = 0.774 (moderate fit), and $Q^2 = 0.45$ (high predictive relevance). The VIF values were below 10, indicating no multicollinearity, and residual distributions were normal ($p = 0.200$).

Table 1: Summary of Regression Results

Hypothesis	Predictor	R^2	F	p-value	β (Standardized)
H1	Innovation Capability	0.567	72.45	< 0.001	0.753
H2	Market Learning Capability	0.533	65.32	< 0.001	0.730
H3	Combined Model	0.613	89.76	< 0.001	IC: 0.468, MLC: 0.315

Table 1: Simultaneous Relationships Using Bootstrap Method

Path	Path Coefficient	T-Statistic	p-value	95% CI Lower	95% CI Upper
Market Learning Capability → Sustainable Entrepreneurship	0.361	3.712	< 0.001	0.161	0.540
Innovation Capability → Sustainable Entrepreneurship	0.471	4.946	< 0.001	0.291	0.661

5. Discussion

The findings confirm that both innovation capability and market learning capability significantly enhance sustainable entrepreneurship, aligning with prior studies in marketing management (e.g., Avelar et al., 2024; Sulistyo & Ayuni, 2021). The stronger impact of innovation capability (path coefficient = 0.471, T = 4.946) suggests that fostering an innovation culture, leveraging knowledge, and implementing innovative structures are critical for achieving sustainable entrepreneurial outcomes. This aligns with marketing strategies that prioritize innovation for

competitive differentiation, as firms that innovate effectively can develop unique offerings that meet sustainability demands.

Market learning capability's significant impact (path coefficient = 0.361, T = 3.712) highlights the role of market orientation in sustainable entrepreneurship, a key concept in marketing management. Firms that excel in market understanding, competitor analysis, and customer orientation are better positioned to develop sustainable products and services that align with market needs, corroborating Weerawardena (2003), who emphasized market learning as a dynamic capability for competitive advantage in market-driven strategies.

The combined model's explanatory power ($R^2 = 0.613$) suggests a synergistic effect between innovation and market learning capabilities, supporting the notion that these capabilities are complementary in marketing management contexts (Noe et al., 2015). Firms that integrate innovative processes with market-oriented strategies can address economic, social, and environmental objectives more effectively, contributing to sustainable development (Schaltegger & Wagner, 2011). This synergy is particularly relevant for SMEs in industrial estates, where market responsiveness and innovation are critical for overcoming resource constraints and competitive pressures.

Practical Implications

1. **For Managers**: Industrial firm managers should prioritize innovation by fostering a culture of creativity and risk-taking, aligning with marketing strategies that emphasize differentiation. Adopting transformational leadership styles can enhance employee motivation and innovation. Investing in market research and customer feedback systems can improve market understanding and customer orientation, enabling firms to design sustainable products that meet market demands.
2. **For Policymakers**: Governments and industrial estate authorities should support SMEs through training programs on innovation and market learning, aligning with policies that promote sustainable marketing practices. Incentives such as tax breaks or grants can encourage firms to adopt sustainable strategies.
3. **For Educators**: Academic institutions should incorporate sustainable entrepreneurship and market learning into marketing management curricula, equipping future entrepreneurs with skills to navigate dynamic markets and innovate sustainably.

The study is limited to a single industrial estate in Iran, which may restrict generalizability. Reliance on self-reported data introduces potential response bias. Future research could employ longitudinal designs to establish causality and include diverse industries or regions to enhance external validity.

This study demonstrates that innovation capability and market learning capability are critical drivers of sustainable entrepreneurship in industrial SMEs, contributing to marketing

management by highlighting the interplay of innovation and market orientation. By fostering innovation culture, leveraging knowledge, and understanding market dynamics, firms can achieve economic, social, and environmental objectives, advancing sustainable development. The findings underscore the importance of integrating innovative and market-oriented strategies to enhance competitive advantage and long-term growth. Managers are encouraged to adopt modern leadership approaches, invest in employee creativity, and prioritize market research to align offerings with customer needs. Policymakers and educators should support these efforts through targeted interventions and curricula that promote sustainable marketing practices. Future research could explore the mediating roles of capabilities such as digitalization or networking to further elucidate the mechanisms underlying sustainable entrepreneurship.

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ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.