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Entrepreneurial Competencies, Enterprise Support Mechanisms, and Startup Sustainability among Entrepreneurial Students in State University and Colleges (SUCs): Basis for Business Incubation Framework

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Abstract

Student-led ventures require both entrepreneurial capabilities and an enabling support environment to develop toward sustainable operation. This study examined the entrepreneurial competencies, enterprise support mechanisms, and startup sustainability of Bachelor of Science in Entrepreneurship students in State Universities and Colleges in the National Capital Region, Philippines, as a basis for developing a business incubation framework. Using a quantitative descriptive-correlational design, the study surveyed 300 fourth-year students through a validated researcher-developed questionnaire using a four-point Likert scale. Relationships among the study variables were analyzed using Spearman's rank-order correlation. Respondents demonstrated a competent level of entrepreneurial competencies ($M = 3.15$), with digital marketing highest and financial literacy lowest. Enterprise support mechanisms obtained an overall mean of 2.89, with networking and market access highest and training and capacity-building lowest. Startup sustainability was rated high ($M = 3.54$), with sustainability orientation highest and financial resilience lowest. Entrepreneurial competencies were significantly associated with enterprise support mechanisms and all three dimensions of startup sustainability; the strongest relationship was between leadership and financial resilience ($r_s = .542$). Enterprise support mechanisms were significantly associated with financial resilience and market adaptability but not with sustainability orientation. The findings support a business incubation framework that integrates competency development, accessible enterprise support, and explicit sustainability formation while treating the observed relationships as associative rather than causal.

Keywords: *entrepreneurial competencies; enterprise support mechanisms; startup sustainability; student entrepreneurship; State Universities and Colleges; business incubation framework*

1. Introduction

Entrepreneurship contributes to economic development, employment creation, innovation, and the expansion of productive activity. In emerging economies, the sustainability of startups and small enterprises depends not only on opportunity recognition but also on the knowledge and capabilities available to the entrepreneur. Research on startup failure and SME survival consistently identifies innovation, knowledge, and managerial capability as important conditions of continuity under uncertainty (Aminova & Marchi, 2021; Nguyen Thi, 2022).

Higher education therefore has a role that extends beyond teaching how ventures are formed. Entrepreneurship students must also develop capabilities for managing finance, reaching markets, leading teams, responding to change, and converting ideas into viable offerings. Financial and digital literacy are especially relevant because they influence how emerging entrepreneurs evaluate opportunities, communicate value, and manage scarce resources (Iswari, 2022; Setiawati et al., 2022). Entrepreneurial leadership further enables teams to coordinate knowledge and act under uncertainty (Hussain & Li, 2022; Megawaty et al., 2022).

Student entrepreneurs also operate within an institutional environment. Government programs, universities, mentors, networks, and other ecosystem actors may reduce early-stage constraints by providing financing, training, market access, and business-development support. Evidence on entrepreneurial ecosystems emphasizes the importance of mentorship and coordinated support, while studies of public interventions show that the effectiveness of assistance depends on design, accessibility, and alignment with entrepreneurial needs (Nate et al., 2022; Septino, 2024; Tengku Azrul et al., 2024).

A central concern is the difference between the existence of support and its effective reach. Students may know that grants, training, and networking programs are available yet still experience difficulty accessing them or translating them into venture resources. Digital and market-support mechanisms can also be limited by skills gaps, fragmented delivery,

and weak connection to actual customers and partners (Heller et al., 2025; Sudaryana et al., 2025). For university-based entrepreneurship programs, the practical question is therefore not simply whether support exists, but whether students are positioned to identify, access, and use it.

The same distinction applies to startup sustainability. Sustainable venture development is multidimensional. It involves financial continuity, the ability to adapt to market and technological change, and an orientation toward responsible environmental, social, and ethical practice. Literature on startup sustainability shows that these dimensions do not necessarily develop at the same rate and may depend on different combinations of internal capability and external support (Hokmabadi et al., 2024; Mühle et al., 2024; Nunes et al., 2022).

Despite growing attention to entrepreneurship education, startup support, and sustainability, comparatively limited evidence examines entrepreneurial competencies, enterprise support mechanisms, and multiple dimensions of startup sustainability within a single empirical framework among students in Philippine public higher education. This study addresses that gap among fourth-year BS Entrepreneurship students in State Universities and Colleges in the National Capital Region and uses the resulting evidence as the basis for a business incubation framework.

Objectives of the Study

This study aimed to assess the entrepreneurial competencies, enterprise support mechanisms, and startup sustainability of Entrepreneurship students in State Universities and Colleges in the National Capital Region as the basis for developing a business incubation framework. Specifically, it sought to:

1. assess entrepreneurial competencies in terms of financial literacy, digital marketing skills, leadership, and creativity and innovation;
2. determine the extent of enterprise support mechanisms in terms of financial grants and subsidies, networking and market access, and training and capacity-building programs;
3. evaluate startup sustainability in terms of financial resilience, market adaptability, and sustainability orientation, including environmental, social, and governance or corporate social responsibility practices;
4. determine whether significant relationships exist among entrepreneurial competencies, enterprise support mechanisms, and startup sustainability; and
5. develop a business incubation framework anchored on the findings of the study.

2. Review of Related Literature

2.1 Entrepreneurial Competencies and Venture Capability

Entrepreneurial competencies combine knowledge, technical skill, judgment, and behavior that enable an individual to initiate and manage a venture. Among entrepreneurship students, financial literacy and digital literacy are especially relevant because both shape the transition from intention to practical entrepreneurial action (Setiawati et al., 2022). Financial literacy supports budgeting, resource allocation, and financial behavior, and it has been associated with better financial performance among creative-industry startups (Iswari, 2022). In an adjacent Philippine student context, monetary-policy awareness was positively associated with saving and investment behavior, indicating that financial knowledge can correspond with longer-horizon financial choices even outside direct venture settings (Espelita et al., 2025).

Digital capability has become equally central to new venture formation. Startups increasingly depend on social media, analytics, online advertising, digital customer engagement, and electronic commerce. Yet adoption is not automatic: digital marketing can be constrained by complexity, perceived risk, skills gaps, and weak strategic integration (Chakraborti et al., 2022; Handayani et al., 2020). Digital marketing training can strengthen entrepreneurial capacity, while technology acceptance and behavioral intention affect whether aspiring entrepreneurs actually use digital tools strategically (Hendiarto et al., 2021; Phuong Dung et al., 2023).

Leadership, creativity, and innovation extend this competency base beyond technical skill. Entrepreneurial leadership has been linked with SME success and with knowledge-management processes that support entrepreneurial outcomes (Hussain & Li, 2022; Megawaty et al., 2022). Creativity and innovation likewise contribute to startup development when they are translated into workable products, services, and solutions rather than remaining as ideas alone (Ferrante & Chaturvedi, 2025; Munir, 2024). Taken together, these competencies are best viewed as a portfolio: weaknesses in finance, markets, leadership, or innovation can constrain how effectively the other capabilities are used.

2.2 Enterprise Support Mechanisms and Entrepreneurial Ecosystems

Enterprise support mechanisms are external resources and institutional arrangements intended to reduce the disadvantages faced by early-stage ventures. They include financial grants and subsidies, training and mentoring, networking, market access, and policy support. Entrepreneurial ecosystem research emphasizes that these mechanisms are

most useful when they connect entrepreneurs with knowledge, institutions, and other actors rather than functioning as isolated programs (Nate et al., 2022).

Financial assistance can help alleviate capital constraints, but its effectiveness depends on targeting, accessibility, and continuity. Government support has been associated with startup creation and development, while subsidy research indicates that public financial assistance can shape innovation efficiency when implemented appropriately (Tengku Azrul et al., 2024; Zhou et al., 2022). Policy interventions nevertheless operate within institutional constraints, and fragmented or weakly coordinated support can reduce their practical effect (Schüler et al., 2020; Sudaryana et al., 2025).

Networking and market access are also critical because student and early-stage entrepreneurs often lack established customers, partners, and investors. Accelerator evidence shows that structured programs can facilitate international market entry by exposing startups to mentors, networks, and context-specific knowledge (Heller et al., 2025). Training and entrepreneurship education may similarly strengthen venture capability, but results depend on whether programs address actual needs and provide sustained engagement rather than one-time exposure (Septino, 2024; Tetley, 2024).

2.3 Startup Sustainability: Financial Resilience, Market Adaptability, and Sustainability Orientation

Startup sustainability concerns more than immediate survival. It involves maintaining financial capacity, responding to changing conditions, and integrating environmental, social, and ethical considerations into venture decisions. SME survival research in emerging economies highlights the interaction of knowledge and capability, while resilience research emphasizes the importance of digital transformation and marketing capability under disruption (Hokmabadi et al., 2024; Nguyen Thi, 2022).

Financial resilience reflects the capacity to manage limited resources, plan for risk, and continue operating under uncertainty. Market adaptability concerns learning, flexibility, customer responsiveness, and the capacity to modify plans when technologies or demand change. These dimensions are closely connected to the practical demands of venture operation, and they generally require experience as well as knowledge. Entrepreneurial resilience strategies are therefore particularly important under volatile and uncertain conditions (Enwereji et al., 2024).

Sustainability orientation has a different character. It reflects the extent to which entrepreneurs incorporate environmental responsibility, social contribution, ethical judgment, and broader stakeholder considerations into venture decisions. Studies of sustainable startups show that sustainability orientation can shape innovation and growth orientation, but it can also impose trade-offs when resource-constrained ventures attempt to balance mission and performance (Kautonen et al., 2020; Neumann, 2023). Research further indicates that internal dispositions and perceived external conditions can both matter, although the strength of these relationships varies across contexts (Eroglu & Rashid, 2022; Nunes et al., 2022; Olteanu & Fichter, 2022). At the institutional level, Philippine evidence also indicates that sustainability integration in management education can remain selective rather than systemic, reinforcing the need for deliberate curricular and organizational mechanisms for sustainability formation (Atento, 2025).

This multidimensionality is important for empirical analysis. A startup may be financially vulnerable yet highly committed to responsible business practice, or adaptable in markets while lacking financial buffers. Reviews of sustainability in startups therefore caution against treating sustainability as a single undifferentiated outcome (Mühle et al., 2024).

2.4 Business Incubation and Higher-Education Support Systems

Business incubation offers a practical mechanism for connecting entrepreneurial competencies with enterprise support. Within higher education, incubation can bring together mentoring, financial guidance, market exposure, training, networking, and venture-development activities. Its value lies in integration: students can apply classroom knowledge while receiving access to resources and relationships that are difficult to reproduce in purely academic settings. Philippine evidence from entrepreneurship students at a Manila state university likewise identified funding support and financial management as comparatively weak areas while reporting positive associations between ecosystem components and entrepreneurial skills, providing a closely related basis for integrated incubation planning (Delmonte & Mendoza, 2026).

Evidence on entrepreneurial ecosystems suggests that support is most effective when actors and services are connected rather than fragmented (Nate et al., 2022; Sudaryana et al., 2025). Accelerator programs similarly demonstrate the importance of structured mentorship and market connection (Heller et al., 2025). Entrepreneurship education and government support have also been linked with startup growth, although the effect of support depends on program quality and the entrepreneur's ability to use it (Septino, 2024; Tengku Azrul et al., 2024).

For State Universities and Colleges, an incubation framework should therefore address both capability formation and support access. It should strengthen areas where students are least prepared, connect them to usable financial and market resources, and deliberately preserve sustainability-oriented values as ventures move from classroom concepts toward market activity.

2.5 Synthesis and Gaps

The literature indicates that sustainable venture development reflects the interaction of internal entrepreneurial capability and external ecosystem support. Financial, digital, leadership, and innovation competencies help entrepreneurs act on opportunities, while grants, networks, training, and other support mechanisms can reduce resource constraints and extend market access. However, neither capability nor support should be assumed to relate identically to all forms of startup sustainability.

Three gaps are particularly relevant. First, entrepreneurial competencies and institutional support are often examined separately rather than within the same empirical model. Second, financial resilience, market adaptability, and sustainability orientation are conceptually distinct and may display different patterns of association with competencies and external support. Third, comparatively limited evidence examines these relationships among student entrepreneurs in Philippine State Universities and Colleges. The present study addresses these gaps by examining the three constructs together and using the observed pattern as the basis for a data-informed business incubation framework.

3. Methodology

3.1 Research Design

The study employed a quantitative descriptive-correlational research design. The descriptive component assessed the respondents' entrepreneurial competencies, awareness and perceptions of enterprise support mechanisms, and startup-sustainability beliefs and practices. The correlational component examined the direction and strength of relationships among the constructs without manipulating any variable. Accordingly, the design supports interpretation in terms of association rather than causal effect.

3.2 Participants of the Study

The participants were fourth-year Bachelor of Science in Entrepreneurship students enrolled during School Year 2025–2026 in State Universities and Colleges in the National Capital Region. The identified population consisted of approximately 1,349 fourth-year BS Entrepreneurship students across five SUCs. A total of 300 students participated in the study.

3.3 Sampling Technique

The study employed stratified proportionate random sampling, with each participating SUC treated as a stratum. The required sample was determined using Cochran's formula with finite-population correction at a 95% confidence level, a 5% margin of error, and maximum response variability ($p = .50$). The resulting sample of approximately 300 was proportionately distributed across the five participating institutions.

3.4 Research Instrument and Measures

Data were collected using a researcher-developed questionnaire derived from the study literature and adapted to student entrepreneurship in Philippine SUCs. Part I measured entrepreneurial competencies in financial literacy, digital marketing, leadership, and creativity and innovation using a four-point proficiency scale. Part II measured awareness and perceptions of enterprise support mechanisms in financial grants and subsidies, networking and market access, and training and capacity-building programs. Part III measured startup sustainability through financial resilience, market adaptability, and sustainability orientation using four-point agreement scales.

The instrument underwent expert review and pilot testing. Internal consistency was assessed using Cronbach's alpha. The 10 subscales produced coefficients ranging from .835 to .934, indicating good to excellent internal consistency. Creativity and innovation recorded the highest coefficient ($\alpha = .934$), while financial resilience recorded the lowest ($\alpha = .835$).

3.5 Data Gathering Procedure

Data collection proceeded after the required research and ethical clearances had been secured. Respondents selected through the stratified proportionate sampling procedure were informed of the purpose and procedures of the study and provided informed consent. The validated questionnaire was administered to the selected fourth-year students, and the completed responses were organized for statistical analysis. No names, student numbers, or other direct personal identifiers were required in the instrument.

3.6 Data Analysis

The data were analyzed using jamovi. Descriptive statistics summarized entrepreneurial competencies, enterprise support mechanisms, and startup-sustainability dimensions. Relationships among the constructs were examined using Spearman's rank-order correlation coefficient. Spearman's rho was appropriate to the ordinal Likert-based measures and

was used to determine the strength and direction of associations. Correlation results were interpreted as associations, not as evidence of causation or predictive effect.

3.7 Ethical Considerations

Ethical clearance was obtained from the Lyceum of the Philippines University–Batangas Ethics Review Committee before data collection. Participation was voluntary, informed consent was obtained, and respondents were informed of their right to withdraw without penalty. Anonymity and confidentiality were maintained, the survey involved minimal risk, and the researcher declared no conflict of interest associated with the study.

4. Results and Discussion

4.1 Entrepreneurial Competencies

The respondents demonstrated an overall competent level of entrepreneurial competencies, with a composite mean of 3.15. Digital marketing obtained the highest mean, followed by leadership, creativity and innovation, and financial literacy.

Table 1 *Summary of Entrepreneurial Competencies*

Entrepreneurial Competency	Mean	Interpretation	Rank
Digital Marketing	3.37	Competent	1
Leadership	3.27	Competent	2
Creativity and Innovation	3.05	Competent	3
Financial Literacy	2.90	Competent	4
Overall Composite Mean	3.15	Competent	—

The profile is competent but uneven. Digital marketing was the strongest dimension, consistent with the greater exposure of students to digital platforms and online promotional tools. Financial literacy was lowest, with financial projection and forecasting identified in the source results as a specific weakness. The pattern is consistent with literature distinguishing readily acquired digital familiarity from financial capability that requires deliberate instruction and practical application (Iswari, 2022; Setiawati et al., 2022). Leadership also remained a relative strength, supporting the view that coordination and team mobilization are important components of entrepreneurial capability (Hussain & Li, 2022; Megawaty et al., 2022).

4.2 Enterprise Support Mechanisms

Enterprise support mechanisms obtained an overall mean of 2.89, interpreted in the source scale as observed or aware. The questionnaire measured students' awareness, perceived accessibility, and experience of support; the scores should therefore not be interpreted as objective measures of the amount of assistance actually supplied by government or universities.

Table 2. *Summary of Enterprise Support Mechanisms*

Enterprise Support Mechanism	Mean	Interpretation	Rank
Networking and Market Access	2.93	Observed/Aware	1
Financial Grants and Subsidies	2.89	Observed/Aware	2
Training and Capacity-Building Programs	2.84	Observed/Aware	3
Overall Composite Mean	2.89	Observed/Aware	—

Networking and market access ranked highest, while training and capacity-building ranked lowest. The source results repeatedly distinguish awareness from actual reach: students recognized grants and support opportunities, but perceived accessibility and direct participation were lower. This is important because support systems can be visible without being fully usable. Entrepreneurial ecosystem and accelerator research likewise emphasizes that programs become more valuable when they provide sustained mentorship, market linkage, and usable pathways rather than one-time exposure (Heller et al., 2025; Nate et al., 2022; Sudaryana et al., 2025).

4.3 Startup Sustainability

Startup sustainability received an overall composite mean of 3.54. Sustainability orientation was the highest-rated dimension, followed by market adaptability and financial resilience.

Table 3. *Summary of Startup Sustainability*

Startup Sustainability Dimension	Mean	Interpretation	Rank
Sustainability Orientation	3.65	Strongly Agree	1
Market Adaptability	3.55	Strongly Agree	2
Financial Resilience	3.41	Agree	3
Overall Composite Mean	3.54	Strongly Agree	—

The ranking reveals a useful contrast. Students expressed particularly strong sustainability-oriented beliefs and a willingness to learn and adapt, while financial resilience was comparatively weaker. Financial resilience also converges with the competency results: financial literacy was the lowest entrepreneurial competency. Although this descriptive correspondence does not establish causation, it identifies finance as the most consistent developmental concern across the two constructs. Startup sustainability literature similarly treats financial resilience, adaptability, and responsible orientation as related but distinct dimensions that may develop differently (Hokmabadi et al., 2024; Mühle et al., 2024; Nunes et al., 2022).

4.4 Relationships Among Entrepreneurial Competencies, Enterprise Support Mechanisms, and Startup Sustainability

Entrepreneurial Competencies and Enterprise Support Mechanisms

All 12 relationships between entrepreneurial competencies and enterprise support mechanisms were positive and statistically significant at $p < .001$, with Spearman coefficients ranging from .265 to .440.

Table 4. *Relationships Between Entrepreneurial Competencies and Enterprise Support Mechanisms*

Entrepreneurial Competency	Financial Grants and Subsidies	Networking and Market Access	Training and Capacity-Building
Financial Literacy	.433***	.388***	.408***
Digital Marketing	.424***	.386***	.349***
Leadership	.341***	.303***	.265***
Creativity and Innovation	.436***	.440***	.400***

Note. Spearman's rho. *** $p < .001$ for all 12 coefficients.

The strongest association was between creativity and innovation and networking and market access ($r_s = .440$), followed closely by creativity and innovation with financial grants and subsidies ($r_s = .436$) and financial literacy with financial grants and subsidies ($r_s = .433$). The weakest, although still significant, was between leadership and training and capacity-building ($r_s = .265$). The pattern indicates that stronger self-reported competencies tended to coexist with greater awareness, accessibility, or engagement with enterprise support. Direction cannot be established: more capable students may be better able to locate and use support, support exposure may be associated with competency formation, or both may reflect broader engagement.

Entrepreneurial Competencies and Startup Sustainability

Entrepreneurial competencies were positively and significantly associated with all three dimensions of startup sustainability. The coefficients ranged from .123 to .542.

Table 5. *Relationships Between Entrepreneurial Competencies and Startup Sustainability*

Entrepreneurial Competency	Financial Resilience	Market Adaptability	Sustainability Orientation
Financial Literacy	.468	.286	.150
Digital Marketing	.439	.362	.280
Leadership	.542	.483	.349

Entrepreneurial Competency	Financial Resilience	Market Adaptability	Sustainability Orientation
Creativity and Innovation	.487	.330	.123

Note. All 12 relationships were reported as statistically significant in the source analysis. The smallest association, creativity and innovation with sustainability orientation ($r_s = .123$), was described in the manuscript narrative as significant at $p < .05$.

The strongest relationship recorded in the study was between leadership and financial resilience ($r_s = .542$). Leadership was also substantially associated with market adaptability ($r_s = .483$) and sustainability orientation ($r_s = .349$). Financial literacy, digital marketing, and creativity and innovation each showed their largest association with financial resilience. The results therefore indicate broad but non-uniform relationships between entrepreneurial competencies and sustainability. The prominence of leadership is consistent with studies linking entrepreneurial leadership with coordination, knowledge use, and venture success under uncertainty (Hussain & Li, 2022; Megawaty et al., 2022).

Enterprise Support Mechanisms and Startup Sustainability

Enterprise support mechanisms displayed a narrower pattern. All three support mechanisms were significantly associated with financial resilience and market adaptability, but none was significantly associated with sustainability orientation.

Table 6. *Relationships Between Enterprise Support Mechanisms and Startup Sustainability*

Enterprise Support Mechanism	Financial Resilience	Market Adaptability	Sustainability Orientation
Financial Grants and Subsidies	.330	.147	.037 (ns)
Networking and Market Access	.318	.213	.071 (ns)
Training and Capacity-Building Programs	.327	.154	.040 (ns)

Note. Financial-resilience and market-adaptability relationships were reported as statistically significant. Sustainability-orientation relationships were not significant: financial grants and subsidies, $p = .466$; networking and market access, $p = .163$; training and capacity-building, $p = .430$. ns = not significant.

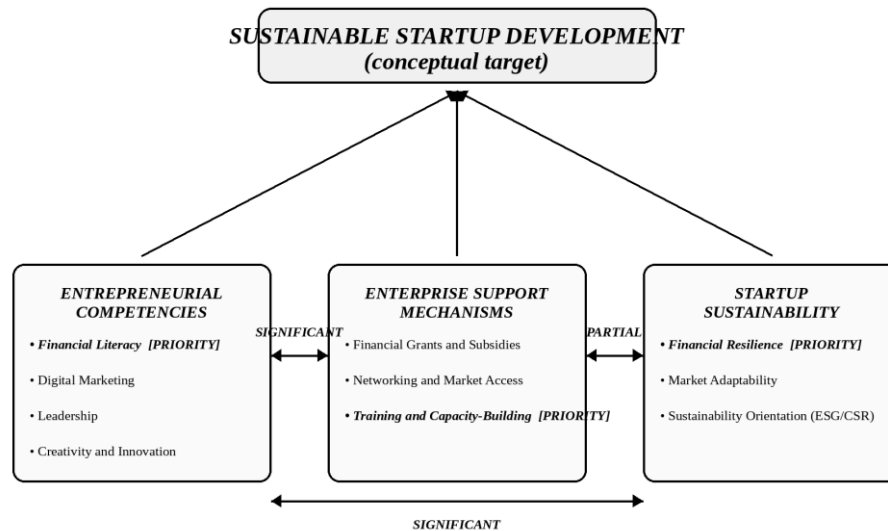
Financial grants and subsidies produced the largest association with financial resilience ($r_s = .330$), followed closely by training and capacity-building ($r_s = .327$) and networking and market access ($r_s = .318$). For market adaptability, networking and market access produced the largest coefficient ($r_s = .213$). In contrast, the sustainability-orientation coefficients were near zero and non-significant. The result supports a selective rather than universal association between perceived enterprise support and startup sustainability. External support was related to the financial and adaptive dimensions but not to the ESG/CSR-oriented beliefs measured in this study.

The non-significant sustainability-orientation results should not be interpreted as proof that these values are exclusively internally generated. The data establish only that the three forms of enterprise support measured in the study were not significantly associated with sustainability orientation. Prior research shows that sustainability orientation can reflect personal convictions, venture purpose, and external conditions in varying combinations (Eroglu & Rashid, 2022; Neumann, 2023; Olteanu & Fichter, 2022).

4.5 Proposed Business Incubation Framework

The descriptive and correlational findings were used as the empirical basis for a proposed business incubation framework. The framework retains three co-equal pillars: entrepreneurial competencies, enterprise support mechanisms, and startup sustainability. Within each pillar, the lowest-rated dimension is identified as a priority area: financial literacy, training and capacity-building, and financial resilience, respectively. The relationship structure is represented as associative rather than causal, consistent with the descriptive-correlational design.

Figure 1. Proposed Business Incubation Framework



Note. Reconstructed from the study's proposed framework. Entrepreneurial competencies and enterprise support mechanisms were significantly associated across all pairings ($r_s = .265-.440$). Entrepreneurial competencies and startup sustainability were significantly associated across all pairings ($r_s = .123-.542$), with leadership and financial resilience the strongest relationship ($r_s = .542$). The enterprise support–startup sustainability relationship was partial: support was significantly associated with financial resilience and market adaptability but not with sustainability orientation. Priority areas correspond to the lowest mean within each pillar. The upward convergence on sustainable startup development is conceptual; the study did not measure that apex as a separate outcome or test causal paths.

The framework is therefore best regarded as a data-informed conceptual basis for incubation design rather than as a statistically validated causal model. The three pillars summarize what students bring to venture development, what the external environment makes available to them, and how they assess sustainability-related capability and orientation. The framework also makes visible the one relationship that is partial: enterprise support is associated with financial resilience and market adaptability but not with sustainability orientation.

4.6 Discussion

Three findings are particularly consequential. First, the students displayed a competent entrepreneurial profile, but financial literacy remained the weakest competency. This matters because finance also reappeared as the weakest sustainability dimension through financial resilience. The convergence suggests that the financial side of entrepreneurship is the most consistent area for development in this sample. This does not mean that low financial literacy caused lower resilience; rather, both measures identify a common area in which respondents expressed less confidence than in digital, leadership, adaptive, or sustainability-oriented domains.

Second, enterprise support was recognized but did not appear uniformly accessible or deeply used. Networking and market access were the most visible forms of support, while training and capacity-building were least evident. This distinction between program existence and program reach is consistent with evidence that entrepreneurial ecosystems function best when entrepreneurs are connected to sustained mentorship, markets, and usable support pathways (Heller et al., 2025; Nate et al., 2022; Sudaryana et al., 2025). For SUCs, the implication is that program counts or event frequency are insufficient indicators of support quality; actual participation and resource access matter.

Third, the correlation pattern differentiates internal capability from external support. Entrepreneurial competencies were associated with all three dimensions of startup sustainability, and leadership produced the strongest coefficient in the study. Enterprise support, by contrast, was associated only with financial resilience and market adaptability. The non-significant sustainability-orientation relationships suggest that conventional support mechanisms may not, by themselves, correspond with students' ESG/CSR-oriented beliefs. This is consistent with literature showing that sustainability orientation can arise from founder values and venture purpose and may interact with external conditions in ways that differ from financial or market capability (Eroglu & Rashid, 2022; Neumann, 2023; Nunes et al., 2022).

Taken together, the findings support an incubation approach in which competency development and enterprise support are complementary but functionally differentiated. Financial capability requires deliberate strengthening; training requires improved reach; networking should move beyond exposure toward substantive market connection; and

sustainability orientation should be cultivated explicitly through curriculum, mentoring, venture assessment, and ethical decision-making rather than being assumed to emerge automatically from grants or general business support.

5. Conclusions, Recommendations, and Implications

5.1 Conclusions

The respondents demonstrated a generally competent entrepreneurial profile, but the four competencies were not equally developed. Digital marketing was strongest and financial literacy weakest, with financial projection and forecasting representing a specific developmental need.

Enterprise support mechanisms were visible to the respondents but not uniformly strong in perceived accessibility or participation. Networking and market access ranked highest, while training and capacity-building ranked lowest. The findings therefore support characterizing support as recognized but incompletely reached or utilized rather than fully accessible.

Startup sustainability was rated highly overall. Sustainability orientation was strongest, followed by market adaptability, while financial resilience was lowest. The repeated weakness of financial literacy and financial resilience identifies finance as the most consistent developmental concern across the study.

Entrepreneurial competencies were significantly associated with all measured enterprise support mechanisms and all three dimensions of startup sustainability. Leadership and financial resilience produced the strongest relationship in the study. Enterprise support mechanisms displayed a more selective relationship with startup sustainability: they were significantly associated with financial resilience and market adaptability but not with sustainability orientation.

The findings support a business incubation framework organized around entrepreneurial competencies, enterprise support mechanisms, and startup sustainability. The framework identifies financial literacy, training and capacity-building, and financial resilience as priority areas and treats sustainability orientation as a dimension requiring explicit formation. The framework is a data-informed conceptual basis for program design rather than a causally validated intervention model.

5.2 Recommendations

State Universities and Colleges may strengthen applied financial learning in entrepreneurship programs, particularly financial projection, cash-flow forecasting, contingency planning, resource allocation, and financial decision-making under uncertainty. These areas directly respond to the weakest competency and sustainability dimension identified in the study.

Universities and government agencies may shift emphasis from the mere availability of enterprise-support programs toward actual reach and usability. Training and mentoring should have clear participation pathways, while financial-support programs should provide understandable application guidance. Networking initiatives should move beyond events toward substantive connections with customers, mentors, investors, industry partners, and markets.

Leadership development should remain a core component of entrepreneurship preparation because leadership demonstrated the strongest association with financial resilience and substantial relationships with the other sustainability dimensions. Incubation activities may integrate team leadership, entrepreneurial decision-making, accountability, resource coordination, and crisis-management exercises with venture-development training.

Sustainability education should be incorporated deliberately into incubation and entrepreneurship programs. Because the three enterprise-support mechanisms were not significantly associated with sustainability orientation, institutions should not assume that grants, networking, or general training will automatically reinforce ESG/CSR-oriented practice. Ethical, environmental, social, and governance considerations may be embedded explicitly in business-model development, mentoring, and venture assessment.

The proposed business incubation framework may be piloted and evaluated in SUCs. Monitoring should determine whether interventions based on the framework subsequently improve financial capability, participation in support programs, market linkage, financial resilience, and the integration of sustainability practices.

Future studies may extend the research beyond the NCR, track students longitudinally into actual venture creation, and distinguish perceived support from documented participation and objectively measured institutional support. Further research may also examine the antecedents of sustainability orientation and test the proposed framework using longitudinal, quasi-experimental, or structural-modeling approaches where appropriate.

5.3 Implications of the Study

Theoretically, the findings support an integrated but differentiated view of student entrepreneurship. Internal competencies and external support are related, but they do not display identical associations with startup sustainability. Competencies were associated with financial resilience, market adaptability, and sustainability orientation, whereas

enterprise support was associated only with the first two dimensions. Startup sustainability should therefore not be treated as a unitary outcome to which all forms of capability and support relate in the same manner.

Institutionally, effective incubation requires more than entrepreneurship courses or awareness of available programs. A coherent system should connect competency development, access to external resources, practical market engagement, financial resilience, and explicit sustainability formation. The weakest areas identified by the data provide a basis for prioritizing institutional resources.

For policymakers and enterprise-support agencies, the findings emphasize the distinction between program availability and beneficiary reach. Evaluation should consider awareness, accessibility, participation, continuity, and whether assistance results in usable financing, training, networks, and market opportunities for student entrepreneurs.

Finally, the study suggests that sustainability-oriented entrepreneurship may require a developmental pathway distinct from conventional financial and market support. Incubation systems seeking sustainable startup development should combine enterprise support with deliberate formation in ethical, environmental, social, and governance considerations.

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