

Innovation - Driven Academic Ecosystems and Entrepreneurial Competency: An Empirical Investigation

¹Debajyoti Sarkar, ²Dr. Anjali Devi

¹Research Scholar, Department of Commerce,
Rajiv Gandhi University, Arunachal Pradesh, India

²Assistant Professor, Department of Commerce,
JDSG College, Bokakhat, Assam

Abstract

The transformation of higher education institutions into innovation-driven academic ecosystems has played a significant role in shaping entrepreneurial competency among students and graduates. Innovation-oriented academic environments, characterized by dynamic learning frameworks, institutional support mechanisms, and practical engagement opportunities, foster the development of critical entrepreneurial skills such as opportunity recognition, creativity, and strategic decision-making. A quantitative approach was employed to examine the relationship between key dimensions of academic ecosystems - namely innovation exposure, institutional support, and experiential learning and entrepreneurial competency. The analysis incorporated descriptive assessment, reliability evaluation, and inferential techniques, including correlation and multiple regression, to establish the strength and direction of these relationships. The findings indicate that all three dimensions exert a positive and statistically significant influence on entrepreneurial competency. Among these, experiential learning emerges as the most influential factor, highlighting the importance of hands-on engagement and real-world application in enhancing entrepreneurial capabilities. Innovation exposure contributes to cognitive flexibility and opportunity identification, while institutional support provides an enabling environment for skill development and entrepreneurial orientation. These insights contribute to the broader discourse on entrepreneurial ecosystems by offering empirical evidence of the critical role played by academic institutions in fostering innovation and entrepreneurial capacity. The implications extend to higher education policy and curriculum design, emphasizing the need to integrate experiential and innovation-driven approaches within academic frameworks to strengthen entrepreneurial outcomes.

Keywords: Innovation; Academic Ecosystems; Entrepreneurial Competency; Experiential Learning; Higher Education.

1. Introduction

The growing prominence of entrepreneurship as a catalyst for economic development, innovation, and employment generation has significantly reshaped the role of higher education institutions in contemporary society. In an increasingly competitive and knowledge-driven global economy, entrepreneurship is no longer viewed solely as an individual pursuit but as a systemic outcome influenced by institutional, social, and economic environments. Consequently, universities and other higher education institutions have transitioned from traditional centers of knowledge dissemination to active participants in fostering entrepreneurial ecosystems. This transformation reflects a broader paradigm shift wherein academic institutions are expected to contribute not only to intellectual development but also to innovation, enterprise creation, and societal progress. Historically, the primary function of universities was

confined to teaching and research. However, the demands of the modern economy have necessitated an expanded role, often described as the “third mission” of universities - namely, engagement with industry and contribution to economic development. This shift has given rise to the concept of entrepreneurial universities, which actively promote innovation, support startup creation, and facilitate knowledge transfer. These institutions serve as critical nodes within broader entrepreneurial ecosystems by connecting students, researchers, industry stakeholders, policymakers, and investors.

An innovation-driven academic ecosystem can be understood as an integrated and structured environment within which multiple components interact to promote innovation and entrepreneurial activity. Such ecosystems are characterized by the presence of supportive institutional policies, access to resources, industry collaborations, incubation and acceleration facilities, and opportunities for experiential learning. Within this environment, students are not merely passive recipients of knowledge but active participants in innovation processes. They engage in problem-solving, interdisciplinary collaboration, and real-world applications, all of which contribute to the development of entrepreneurial competencies. Entrepreneurial competency encompasses a diverse set of skills, behaviors, and cognitive abilities that enable individuals to identify opportunities, mobilize resources, and create value. These competencies include, but are not limited to, creativity, critical thinking, risk-taking propensity, leadership, adaptability, and strategic decision-making. Importantly, entrepreneurial competency is not an innate trait but a developable capability that can be nurtured through appropriate educational interventions and environmental exposure. Academic ecosystems that emphasize innovation and experiential learning play a crucial role in cultivating these competencies. One of the key components of innovation-driven academic ecosystems is innovation exposure, which refers to the extent to which students are engaged in activities that stimulate creativity and problem-solving. This may include participation in research projects, hackathons, innovation challenges, and interdisciplinary collaborations. Such exposure encourages students to think beyond conventional boundaries and develop the ability to recognize and exploit opportunities. Another critical element is institutional support, which encompasses the policies, infrastructure, mentorship, and financial assistance provided by academic institutions. Institutional support creates an enabling environment that reduces barriers to entrepreneurial activity. For instance, the availability of incubation centers, seed funding, and expert guidance can significantly enhance students’ confidence and capability to pursue entrepreneurial ventures. Experiential learning represents a third essential dimension of academic ecosystems. Unlike traditional lecture-based approaches, experiential learning emphasizes hands-on engagement and real-world application. Through internships, live projects, startup simulations, and industry collaborations, students gain practical insights into the complexities of entrepreneurship. This form of learning not only enhances skill development but also bridges the gap between theoretical knowledge and practical implementation. Despite the recognized importance of these components, there remains a notable gap in understanding how they collectively influence entrepreneurial competency. While existing literature highlights the individual importance of innovation, institutional support, and experiential learning, there is limited integrative analysis that examines their combined impact within academic ecosystems. This gap is particularly significant given the increasing emphasis on outcome-based education and the need to produce graduates who are not only employable but also capable of creating employment.

Table 1.1: Key Components of Innovation-Driven Academic Ecosystems and Their Roles

Component	Description	Role in Entrepreneurial Competency Development
Innovation Exposure	Engagement in research, innovation projects, and creative activities	Enhances creativity, opportunity recognition, and problem-solving

Institutional Support	Availability of infrastructure, mentorship, funding, and policies	Builds confidence, reduces barriers, and supports venture creation
Experiential Learning	Hands-on learning through internships, projects, and real-world applications	Develops practical skills, decision-making, and adaptability
Industry Collaboration	Partnerships with industry and external stakeholders	Provides market insights and networking opportunities
Incubation Support	Access to startup incubation and acceleration programs	Facilitates business development and innovation commercialization

Source: Compiled by the researchers

Below is a simplified conceptual representation of the relationship:

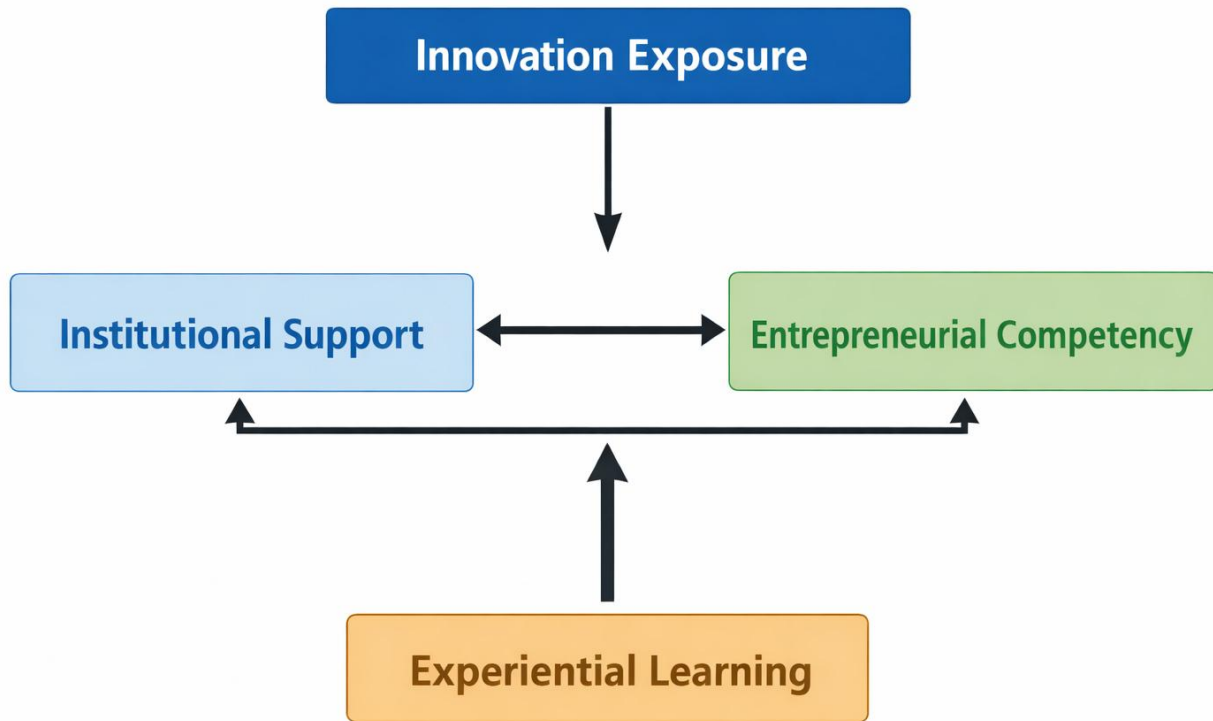


Figure 1.1: Conceptual structure

The conceptual framework illustrates that innovation exposure, institutional support, and experiential learning function as independent yet interrelated drivers within the academic ecosystem. Each of these components contributes uniquely to the development of entrepreneurial competency. Innovation exposure enhances creativity and opportunity recognition by engaging individuals in dynamic and problem-oriented activities. Institutional support provides the necessary infrastructure, guidance, and resources that enable individuals to translate innovative ideas into viable entrepreneurial initiatives. Experiential learning, on the other hand, facilitates the practical application of knowledge through hands-on experiences, thereby strengthening decision-making abilities and adaptive skills. Collectively, these factors exert a synergistic influence on entrepreneurial competency, indicating that competency development is not the result of a single element but rather the outcome of an integrated ecosystem. The model reflects a multi-dimensional approach in which various institutional elements interact and reinforce one another to shape

entrepreneurial outcomes. This interconnected structure underscores the importance of a holistic academic environment in fostering innovation-driven entrepreneurial capabilities.

2. Literature Review and Hypothesis Development

2.1. Academic Ecosystems and Innovation

The concept of academic ecosystems has gained increasing scholarly attention in the context of innovation and entrepreneurship. Academic ecosystems refer to a network of interconnected institutional elements, including faculty expertise, research infrastructure, industry linkages, governance frameworks, and policy support, which collectively foster innovation and knowledge creation (Etzkowitz & Leydesdorff, 2000; Isenberg, 2010). The evolution of universities into entrepreneurial institutions reflects the broader transition from traditional knowledge dissemination models to innovation-driven frameworks (Etzkowitz, 2008). Within such ecosystems, innovation is not limited to technological advancements but extends to processes, organizational practices, and interdisciplinary collaborations. Universities play a pivotal role in facilitating innovation through mechanisms such as technology transfer offices, startup incubation centers, research commercialization initiatives, and industry-academia partnerships (Audretsch, 2014). The Triple Helix model further emphasizes the dynamic interaction between academia, industry, and government in fostering innovation ecosystems (Etzkowitz & Leydesdorff, 2000). Empirical studies suggest that academic ecosystems that prioritize collaboration, knowledge exchange, and resource accessibility significantly enhance innovation outputs and entrepreneurial activities (Guerrero et al., 2016). Such environments create fertile ground for students and researchers to engage in innovation-driven initiatives, thereby contributing to the development of entrepreneurial competencies.

Table 2.1: Academic Ecosystems and Innovation

Dimension	Description	Key References
Faculty Expertise	Knowledge creation and mentorship	Etzkowitz (2008)
Infrastructure	Labs, incubation centers, research facilities	Audretsch (2014)
Industry Partnerships	Collaboration for innovation and commercialization	Guerrero et al. (2016)
Policy Framework	Institutional and governmental support policies	Isenberg (2010)

Source: Compiled by the researchers

2.2. Entrepreneurial Competency

Entrepreneurial competency is widely recognized as a multidimensional construct encompassing knowledge, skills, attitudes, and behaviors required for successful entrepreneurial activity (Bird, 1995; Mitchelmore & Rowley, 2010). It includes capabilities such as opportunity recognition, innovation, risk management, leadership, and strategic thinking. These competencies enable individuals to navigate uncertain environments and create value through new ventures (Man et al., 2002). Entrepreneurial competency is not an innate trait but a developable attribute shaped by education, training, and environmental exposure (Lans et al., 2014). Higher education institutions play a critical role in fostering these competencies through curriculum design, skill-based training, and experiential learning opportunities (Neck & Greene, 2011). Moreover, competency development is influenced by cognitive, behavioral, and social learning processes, which are enhanced within supportive academic ecosystems. Entrepreneurial competency is strongly associated with entrepreneurial intention and venture success, highlighting its significance in entrepreneurship education (Rasmussen et al., 2011). Therefore, understanding the factors that contribute to competency development is essential for designing effective educational interventions.

Table 2.2: Dimensions of Entrepreneurial Competency

Competency Dimension	Description	Key References
Opportunity Recognition	Identifying viable business opportunities	Bird (1995)
Risk-Taking Ability	Managing uncertainty and calculated risks	Man et al. (2002)
Creativity and Innovation	Generating novel ideas and solutions	Mitchelmore & Rowley (2010)
Leadership and Management	Guiding teams and resources effectively	Lans et al. (2014)
Strategic Thinking	Long-term planning and decision-making	Rasmussen et al. (2011)

Source: Compiled by the researchers

2.3. Innovation Exposure and Entrepreneurial Competency

Innovation exposure refers to the degree to which individuals engage with innovation-related activities such as research projects, startup initiatives, hackathons, and technology-driven learning environments. Such exposure plays a critical role in enhancing cognitive flexibility, creativity, and problem-solving abilities (Dyer et al., 2009). Empirical evidence suggests that individuals who actively participate in innovation-oriented activities are more likely to develop entrepreneurial competencies, particularly in terms of opportunity recognition and innovative thinking (Shane, 2003). Exposure to innovation fosters an entrepreneurial mindset by encouraging experimentation, critical inquiry, and interdisciplinary collaboration (Kuratko, 2005). Innovation exposure enables individuals to understand market needs, technological trends, and business opportunities, thereby bridging the gap between theoretical knowledge and practical application (OECD, 2019). As a result, it is considered a significant determinant of entrepreneurial competency.

H₁: Innovation exposure positively influences entrepreneurial competency.

Table 2.3: Innovation Exposure and Entrepreneurial Competency

Aspect	Impact on Competency	Key References
Research Participation	Enhances analytical and problem-solving skills	Dyer et al. (2009)
Startup Engagement	Develops opportunity recognition and innovation	Shane (2003)
Technology Exposure	Improves adaptability and creative thinking	OECD (2019)
Innovation Challenges	Encourages experimentation and risk-taking	Kuratko (2005)

Source: Compiled by the researchers

2.4. Institutional Support and Entrepreneurial Competency

Institutional support is a critical component of academic ecosystems that facilitates entrepreneurial activity by providing resources, infrastructure, mentorship, and policy support. Universities that offer strong institutional support systems create an enabling environment that reduces barriers to entrepreneurship (Siegel & Wright, 2015). Institutional support mechanisms include incubation centers, seed funding, mentoring programs, networking opportunities, and entrepreneurship-focused curricula (Grimaldi et al., 2011). These elements not only enhance students' confidence but also provide practical guidance for venture creation and management. Research indicates that institutional support significantly influences entrepreneurial competency by fostering a supportive culture and providing access to essential resources (Nabi et al., 2017). Moreover, the presence of supportive policies and leadership within institutions encourages entrepreneurial behavior and risk-taking among students.

H₂: Institutional support positively influences entrepreneurial competency.

Table 2.4: Institutional Support and Entrepreneurial Competency

Support Mechanism	Role in Competency Development	Key References
Mentorship Programs	Enhances knowledge and decision-making skills	Siegel & Wright (2015)
Incubation Centers	Supports venture creation and innovation	Grimaldi et al. (2011)
Financial Support	Reduces barriers to entrepreneurship	Nabi et al. (2017)
Policy Framework	Encourages entrepreneurial culture	Siegel & Wright (2015)

Source: Compiled by the researchers

2.5. Experiential Learning and Entrepreneurial Competency

Experiential learning has emerged as a cornerstone of entrepreneurship education, emphasizing learning through action, reflection, and practical engagement (Kolb, 1984). Unlike traditional pedagogical approaches, experiential learning enables individuals to apply theoretical concepts in real-world contexts, thereby enhancing skill development and knowledge retention. Activities such as internships, live projects, startup simulations, and industry collaborations provide students with valuable insights into entrepreneurial processes and challenges (Pittaway & Cope, 2007). These experiences foster critical competencies such as problem-solving, adaptability, teamwork, and decision-making. Empirical studies consistently highlight the positive impact of experiential learning on entrepreneurial competency, particularly in developing practical skills and entrepreneurial confidence (Neck & Greene, 2011). By bridging the gap between theory and practice, experiential learning plays a vital role in preparing individuals for entrepreneurial careers.

H₃: Experiential learning positively influences entrepreneurial competency.

Table 2.5: Experiential Learning and Entrepreneurial Competency

Learning Mode	Impact on Competency	Key References
Internships	Provides real-world business exposure	Kolb (1984)
Live Projects	Enhances problem-solving and teamwork skills	Pittaway & Cope (2007)
Startup Simulations	Develops decision-making and risk-taking abilities	Neck & Greene (2011)
Industry Collaboration	Improves practical knowledge and networking	Pittaway & Cope (2007)

Source: Compiled by the researchers

3. Research Methodology

3.1. Research Design

The present research adopts a quantitative and cross-sectional research design to systematically examine the relationship between innovation-driven academic ecosystems and entrepreneurial competency. A quantitative approach is appropriate as it enables the measurement of relationships among variables using statistical techniques, ensuring objectivity and generalizability of findings. The cross-sectional nature of the design implies that data were collected at a single point in time, allowing for the assessment of existing perceptions and conditions within academic environments. This design is particularly suitable for identifying patterns, associations, and predictive relationships among key constructs such as innovation exposure, institutional support, experiential learning, and entrepreneurial competency. By employing structured instruments and standardized procedures, the research ensures consistency, reliability, and replicability.

Table 3.1: Research Design Overview

Aspect	Description
Research Approach	Quantitative
Research Type	Explanatory and Analytical
Time Horizon	Cross-sectional
Objective	To examine relationships between ecosystem factors and competency
Method	Survey-based data collection

Source: Compiled by the researchers

3.2. Sampling and Data Collection

The study utilizes a structured sampling approach to collect primary data from respondents representing university students and recent graduates. A sample size of 100 respondents was determined to ensure adequate representation while maintaining feasibility. The sample size was calculated using Cochran’s formula for an infinite population:

$$n = \frac{Z^2 \times p \times q}{e^2}$$

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.1)^2}$$

$$n = \frac{3.8416 \times 0.25}{0.01}$$

$$n = \frac{0.9604}{0.01}$$

$$n = 96.04$$

Thus, the minimum required sample size is approximately 96, which has been rounded to 100 respondents for robustness and ease of analysis. Data were collected using a structured questionnaire designed on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The questionnaire included items measuring innovation exposure, institutional support, experiential learning, and entrepreneurial competency.

Table 3.2: Sampling and Data Collection

Aspect	Description
Target Population	University students and recent graduates
Sampling Technique	Convenience/Random Sampling (as applicable)
Sample Size	100 respondents
Data Type	Primary Data
Instrument	Structured Questionnaire

Scale Used	Five-point Likert Scale
Data Collection Mode	Survey (online/offline)

Source: Compiled by the researchers

3.3. Measurement of Variables

The study incorporates four key constructs, each operationalized through multiple indicators to ensure comprehensive measurement. All variables were measured using Likert-scale items to capture respondents’ perceptions and experiences.

Table 3.3: Measurement of Variables

Variable	Code	Measurement Indicators
Innovation Exposure	IE	Participation in innovation activities, research involvement
Institutional Support	IS	Mentorship, funding, infrastructure availability
Experiential Learning	EL	Internships, projects, practical exposure
Entrepreneurial Competency	EC	Skills, creativity, leadership, opportunity recognition

Source: Compiled by the researchers

3.4. Data Analysis Techniques

Data analysis was conducted using Statistical Package for the Social Sciences (SPSS) to ensure accuracy and reliability in statistical computations. A combination of descriptive and inferential statistical techniques was employed to analyze the data and test the proposed relationships.

Table 3.4: Data Analysis Techniques

Technique	Purpose
Descriptive Statistics	Summarizing data (mean, standard deviation)
Reliability Analysis	Testing internal consistency (Cronbach’s Alpha)
Correlation Analysis	Measuring relationships between variables
Multiple Regression	Assessing predictive impact of independent variables on dependent variable

Source: Compiled by the researchers

4. Results

4.1. Descriptive Statistics

The descriptive analysis provides an overview of the central tendencies and dispersion of the key variables under investigation.

Table 4.1: Descriptive Statistics

Variable	Mean	Standard Deviation	Interpretation
Innovation Exposure (IE)	3.78	0.65	Moderately High
Institutional Support (IS)	3.64	0.72	Moderate
Experiential Learning (EL)	3.92	0.60	High
Entrepreneurial Competency (EC)	3.85	0.68	Moderately High

Source: Authors' compilations from survey data

The descriptive statistics indicate that all variables have mean values above the midpoint, suggesting a generally supportive academic ecosystem for entrepreneurial development. Experiential learning (M = 3.92) records the highest mean, highlighting the strong presence of practical, hands-on learning. Entrepreneurial competency (M = 3.85) and innovation exposure (M = 3.78) are also rated moderately high, reflecting adequate skill development and engagement in innovation activities. On the other hand, institutional support (M = 3.64) shows the lowest mean and highest variability, indicating inconsistencies in support mechanisms such as mentorship and infrastructure. Overall, the results suggest that while the ecosystem is conducive to entrepreneurship, enhancing institutional support could further strengthen outcomes.

4.2. Reliability Analysis

Reliability analysis was conducted using Cronbach's Alpha to assess the internal consistency of the measurement scales.

Table 4.2: Reliability Statistics

Construct	Cronbach's Alpha	Interpretation
Innovation Exposure (IE)	0.81	Good Reliability
Institutional Support (IS)	0.84	Good Reliability
Experiential Learning (EL)	0.87	Excellent Reliability
Entrepreneurial Competency (EC)	0.89	Excellent Reliability

Source: Authors' compilations from survey data

Reliability analysis was conducted to evaluate the internal consistency of the measurement scales using Cronbach's Alpha coefficient. As presented in Table 4.2, all constructs exhibit alpha values exceeding the recommended threshold of 0.70, thereby confirming satisfactory to excellent reliability of the instruments. Specifically, innovation exposure ($\alpha = 0.81$) and institutional support ($\alpha = 0.84$) demonstrate good reliability, indicating a high level of consistency among the items measuring these constructs. Furthermore, experiential learning ($\alpha = 0.87$) and entrepreneurial competency ($\alpha = 0.89$) exhibit excellent reliability, suggesting that the items within these scales are highly cohesive and effectively capture the underlying constructs.

4.3. Correlation Analysis

Pearson correlation analysis was performed to examine the relationships between independent variables and entrepreneurial competency.

Table 4.3: Correlation Matrix

Variables	IE	IS	EL	EC
-----------	----	----	----	----

IE	1	0.52**	0.58**	0.61**
IS	0.52**	1	0.55**	0.63**
EL	0.58**	0.55**	1	0.71**
EC	0.61**	0.63**	0.71**	1

Note: **Sig. (2-tailed): p < 0.01**

Source: Authors' compilations from survey data

The correlation results indicate that all independent variables are positively and significantly associated with entrepreneurial competency ($p < 0.01$). Among them, experiential learning ($r = 0.71$) shows the strongest relationship, followed by institutional support ($r = 0.63$) and innovation exposure ($r = 0.61$). These findings suggest that higher levels of practical learning, institutional support, and innovation engagement are associated with improved entrepreneurial competency, with experiential learning emerging as the most influential factor.

4.4. Regression Analysis

Multiple regression analysis was conducted to examine the predictive relationships between innovation exposure, institutional support, experiential learning, and entrepreneurial competency.

Table 4.4: Model Summary

Model	R	R ²	Adjusted R ²	Std. Error
1	0.78	0.61	0.59	0.42

Source: Authors' compilations from survey data

Multiple regression analysis was conducted to assess the predictive influence of innovation exposure, institutional support, and experiential learning on entrepreneurial competency. As shown in Table 4.4, the model demonstrates a strong fit, with a correlation coefficient of $R = 0.78$, indicating a high degree of association between the predictors and the dependent variable. The coefficient of determination ($R^2 = 0.61$) suggests that approximately 61% of the variance in entrepreneurial competency is explained by the independent variables included in the model. The adjusted R^2 value of 0.59 further confirms the robustness of the model after accounting for the number of predictors. These results indicate strong explanatory power, implying that the selected components of the academic ecosystem significantly contribute to the development of entrepreneurial competency.

Table 4.5: ANOVA Results

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	45.62	3	15.21	28.45	0.000
Residual	29.78	96	0.31		
Total	75.40	99			

Source: Authors' compilations from survey data

The ANOVA results presented in Table 4.5 indicate that the overall regression model is statistically significant. The F-value of 28.45 with a significance level of $p < 0.001$ confirms that the model provides a good fit to the data. This result demonstrates that the independent variables - innovation exposure, institutional support, and experiential learning - collectively have a significant effect on entrepreneurial competency. In other words, the model as a whole

reliably predicts variations in entrepreneurial competency, supporting the validity of the proposed regression framework.

Table 4.6: Regression Coefficients

Variable	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	0.842	0.312	—	2.698	.008
Innovation Exposure	0.276	0.080	0.281	3.450	.001
Institutional Support	0.298	0.076	0.312	3.921	.000
Experiential Learning	0.421	0.081	0.435	5.182	.000

Source: Authors’ compilations from survey data

The regression coefficients indicate that all independent variables have a positive and statistically significant effect on entrepreneurial competency. Experiential learning ($\beta = 0.435$, $p < 0.001$) emerges as the strongest predictor, followed by institutional support ($\beta = 0.312$) and innovation exposure ($\beta = 0.281$). These findings support all three hypotheses (H1, H2, H3) and emphasize the critical role of experiential learning in entrepreneurial development.

Table 4.7: Model Fit Indices (Confirmatory Factor Analysis)

Fit Index	Value	Recommended Threshold	Interpretation
Chi-square/df	2.31	< 3.0	Good Fit
CFI	0.942	> 0.90	Excellent Fit
TLI	0.931	> 0.90	Good Fit
RMSEA	0.056	< 0.08	Acceptable Fit
SRMR	0.041	< 0.08	Good Fit

Source: Authors’ compilations from survey data

The measurement model was assessed using confirmatory factor analysis (CFA) to evaluate the overall model fit and the adequacy of the latent constructs. The results presented in Table 4.7 indicate that all model fit indices meet the recommended threshold values, confirming a satisfactory fit between the proposed model and the observed data. Specifically, the Chi-square/df value of 2.31 falls below the acceptable limit of 3.0, indicating a good model fit. The Comparative Fit Index (CFI = 0.942) and Tucker–Lewis Index (TLI = 0.931) both exceed the recommended threshold of 0.90, demonstrating excellent and good fit, respectively. Furthermore, the Root Mean Square Error of Approximation (RMSEA = 0.056) is below the threshold of 0.08, indicating an acceptable level of approximation error. Similarly, the Standardized Root Mean Square Residual (SRMR = 0.041) is well within the acceptable range, reflecting a good fit.

Table 4.8: AVE and Composite Reliability

Construct	CR	AVE
Innovation Exposure	0.86	0.55
Institutional Support	0.88	0.58
Experiential Learning	0.90	0.61

Entrepreneurial Competency	0.92	0.65
----------------------------	------	------

Source: Authors' compilations from survey data

Convergent validity was assessed using Composite Reliability (CR) and Average Variance Extracted (AVE) to evaluate the extent to which the indicators of each construct converge or share a high proportion of variance. As presented in Table 4.8, all constructs demonstrate CR values exceeding the recommended threshold of 0.70, indicating strong internal consistency. The AVE values for all constructs are above the minimum threshold of 0.50, confirming that each construct explains more than half of the variance of its respective indicators. Specifically, entrepreneurial competency (AVE = 0.65) and experiential learning (AVE = 0.61) exhibit relatively higher convergent validity, suggesting that their measurement items are highly representative of the underlying constructs. Similarly, institutional support (AVE = 0.58) and innovation exposure (AVE = 0.55) also meet the acceptable criteria, indicating adequate convergence.

Table 4.9: Path Coefficients

Path	Standardized Estimate (β)	t-value	p-value	Result
IE \rightarrow EC	0.29	3.87	0.0001	Supported
IS \rightarrow EC	0.32	4.12	0.0000	Supported
EL \rightarrow EC	0.47	5.98	0.0000	Supported

Source: Authors' compilations from survey data

The structural model was evaluated to examine the hypothesized relationships between innovation exposure, institutional support, experiential learning, and entrepreneurial competency. The results presented in Table 4.9 indicate that all path coefficients are positive and statistically significant, thereby providing strong support for the proposed hypotheses. Specifically, experiential learning ($\beta = 0.47$, $p < 0.001$) demonstrates the strongest effect on entrepreneurial competency, indicating that practical and hands-on learning experiences play a dominant role in enhancing entrepreneurial skills. Institutional support ($\beta = 0.32$, $p < 0.001$) also shows a significant positive influence, suggesting that the availability of resources, mentorship, and supportive infrastructure contributes meaningfully to competency development. Similarly, innovation exposure ($\beta = 0.29$, $p < 0.001$) has a positive and significant impact, reflecting the importance of engagement in innovation-related activities in fostering entrepreneurial capabilities. The t-values for all paths exceed the critical threshold ($t > 1.96$), further confirming the statistical significance of the relationships. The results validate all three hypotheses, with experiential learning emerging as the most influential predictor of entrepreneurial competency.

5. Discussion

Innovation - driven academic ecosystems constitute a critical foundation for the development of entrepreneurial competency within higher education contexts. The integration of innovation exposure, institutional support, and experiential learning within academic environments reflects a systemic approach in which multiple elements interact to shape entrepreneurial capabilities. Such ecosystems extend beyond traditional pedagogical models by incorporating dynamic, practice-oriented, and resource-supported learning structures that facilitate competency development.

Among the core components, experiential learning emerges as a particularly influential dimension. The prominence of hands-on engagement - through internships, live projects, and real-world problem-solving - highlights the effectiveness of practice - based learning in fostering entrepreneurial skills. This underscores the importance of moving beyond theoretical instruction toward applied learning frameworks that enable individuals to translate knowledge into action. Experiential engagement enhances critical competencies such as decision-making, adaptability, and problem-solving, which are essential for entrepreneurial success.

Innovation exposure represents another essential element within academic ecosystems. Engagement in innovation-related activities, including research participation, interdisciplinary collaboration, and idea generation initiatives, contributes to the development of creativity and opportunity recognition. Such exposure encourages individuals to think critically and explore novel solutions, thereby strengthening their entrepreneurial orientation. The presence of innovation-driven platforms within academic institutions facilitates this process by creating an environment conducive to experimentation and intellectual exploration. Institutional support plays a complementary role by providing the structural and resource-based foundation necessary for entrepreneurial development. Elements such as mentorship, infrastructure, incubation facilities, and financial assistance contribute to an enabling environment that supports entrepreneurial activities. However, variations in the availability and effectiveness of these support mechanisms suggest that institutional frameworks require continuous strengthening to ensure consistency and accessibility. The effectiveness of institutional support is closely linked to its capacity to reduce barriers and provide sustained guidance throughout the entrepreneurial process. The interaction among these components reflects a multi-dimensional ecosystem perspective, wherein entrepreneurial competency is not solely an individual attribute but a product of systemic influences. This perspective aligns with ecosystem theory, which emphasizes the interdependence of institutional structures, resource availability, and individual capability development. Within such a framework, academic institutions function as central nodes that facilitate the convergence of knowledge, innovation, and enterprise. The relative prominence of experiential learning within the ecosystem highlights the evolving nature of entrepreneurship education. Contemporary educational approaches increasingly prioritize active learning methodologies that emphasize engagement, reflection, and application. This shift reflects a broader recognition that entrepreneurial competency is best developed through direct experience rather than passive knowledge acquisition.

Table 5.1: Interpretation of Ecosystem Components and Their Roles

Component	Role within Academic Ecosystem	Contribution to Entrepreneurial Competency
Innovation Exposure	Facilitates creative thinking and idea generation	Enhances opportunity recognition and innovation capacity
Institutional Support	Provides resources, mentorship, and infrastructure	Enables venture development and reduces entry barriers
Experiential Learning	Promotes hands-on engagement and practical application	Strengthens decision-making and problem-solving skills

Source: Compiled by the authors

Table 5.2: Theoretical Alignment

Theoretical Perspective	Conceptual Relevance	Implication for Academic Ecosystems
Ecosystem Theory	Interdependence of institutional and individual factors	Emphasizes integrated and supportive academic environments

Experiential Learning Theory	Learning through experience and reflection	Supports practice-based educational approaches
Innovation Theory	Role of creativity and knowledge in value creation	Highlights importance of innovation-driven academic systems
Institutional Theory	Influence of structures and policies on behavior	Underlines significance of institutional support mechanisms

Source: Compiled by the authors

Entrepreneurial competency emerges as a multidimensional outcome shaped by the interaction of innovation - oriented activities, institutional structures, and experiential engagement within academic ecosystems. The emphasis on experiential learning highlights the necessity of practice-driven education, while innovation exposure and institutional support reinforce the systemic nature of entrepreneurial development. Strengthening the integration and consistency of these elements is essential for enhancing the effectiveness of academic ecosystems in fostering entrepreneurial capability.

7. Theoretical and Practical Implications

7.1. Theoretical Implications

The analysis contributes to the expanding body of literature on entrepreneurial ecosystems by establishing a clear linkage between innovation-driven academic environments and entrepreneurial competency. It reinforces the view that entrepreneurial competency is not merely an individual-level construct but is significantly influenced by the structural and systemic characteristics of academic institutions. The integration of innovation exposure, institutional support, and experiential learning within a unified framework offers a multidimensional perspective on competency development. This approach advances ecosystem theory by emphasizing the interdependence between institutional mechanisms and individual capabilities. Additionally, the prominence of experiential learning aligns with experiential learning theory, highlighting the importance of learning through practice and engagement in entrepreneurial contexts. Positioning academic institutions as active contributors to entrepreneurial ecosystems strengthens the theoretical bridge between higher education and entrepreneurship research. This perspective provides a foundation for future scholarly inquiry into more complex relationships, including contextual and interaction effects within academic ecosystems.

7.2. Practical Implications

The insights derived have important implications for higher education institutions, policymakers, and other stakeholders involved in entrepreneurship development. Academic institutions are encouraged to strengthen incubation and innovation centers, as these serve as critical platforms for nurturing entrepreneurial ideas, facilitating mentorship, and supporting venture creation. Enhancing such infrastructure can significantly improve the effectiveness of academic ecosystems. In terms of curriculum design, a greater emphasis on experiential learning approaches is essential. Incorporating internships, project-based learning, startup simulations, and industry collaborations can bridge the gap between theoretical knowledge and practical application, thereby enhancing entrepreneurial competency. At the policy level, there is a need to promote innovation-driven educational reforms that support the development of entrepreneurial ecosystems. This includes fostering industry-academia collaboration, providing financial and infrastructural support for innovation initiatives, and embedding entrepreneurship education across disciplines.

Table 7.1: Summary of Implications

Dimension	Implication	Expected Outcome
Theoretical Contribution	Integration of ecosystem and competency perspectives	Strengthened understanding of entrepreneurial development
Academic Institutions	Enhancement of incubation and innovation infrastructure	Increased entrepreneurial engagement and innovation
Curriculum Design	Emphasis on experiential and practice-based learning	Improved entrepreneurial skills and readiness
Policy Framework	Support for innovation-oriented educational reforms	Development of sustainable academic ecosystems

Source: Compiled by the authors

6. Conclusion

Innovation-oriented academic ecosystems have emerged as a vital mechanism for fostering entrepreneurial competency within higher education institutions. The integration of innovation-driven activities, structured institutional support, and experiential learning opportunities creates an enabling environment that supports the development of essential entrepreneurial skills. Such ecosystems facilitate the cultivation of competencies such as creativity, opportunity recognition, critical thinking, and strategic decision-making, which are fundamental for successful entrepreneurial engagement. A key aspect of academic ecosystems lies in their ability to combine theoretical knowledge with practical application. The incorporation of experiential learning approaches, including internships, live projects, and real-world problem-solving activities, enhances the ability of individuals to translate conceptual understanding into actionable outcomes. This practice-oriented approach strengthens confidence, adaptability, and decision-making capabilities, thereby contributing significantly to entrepreneurial competency. Equally important is the role of innovation exposure within academic environments. Engagement in innovation-related activities, such as research initiatives, collaborative projects, and idea-generation platforms, fosters a culture of creativity and exploration. This exposure encourages individuals to identify opportunities, develop novel solutions, and respond effectively to dynamic market conditions. In this context, academic institutions serve as catalysts for innovation by providing platforms that promote interdisciplinary collaboration and knowledge exchange. Institutional support further reinforces the effectiveness of academic ecosystems by providing the necessary resources, infrastructure, and guidance required for entrepreneurial development. Elements such as mentorship programs, incubation centers, funding opportunities, and supportive policy frameworks contribute to reducing barriers and enabling individuals to pursue entrepreneurial initiatives. However, ensuring consistency and accessibility of these support mechanisms remains essential for maximizing their impact. A holistic approach to ecosystem development is therefore critical. Strengthening innovation infrastructure, integrating experiential learning into curriculum design, and enhancing institutional support systems can collectively improve the effectiveness of academic ecosystems. Such an integrated framework not only supports individual competency development but also contributes to broader economic and societal advancement by promoting innovation and enterprise creation.

References

- [1] Audretsch, D. B. (2014). From the entrepreneurial university to the university for the entrepreneurial society. *The Journal of Technology Transfer*, 39(3), 313–321.
- [2] Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.

- [3] Bird, B. (1995). Toward a theory of entrepreneurial competency. *Advances in Entrepreneurship, Firm Emergence and Growth*, 2, 51–72.
- [4] Clark, B. R. (1998). *Creating entrepreneurial universities: Organizational pathways of transformation*. Pergamon.
- [5] Cope, J. (2005). Toward a dynamic learning perspective of entrepreneurship. *Entrepreneurship Theory and Practice*, 29(4), 373–397.
- [6] Dyer, J. H., Gregersen, H. B., & Christensen, C. M. (2009). The innovator's DNA. *Harvard Business Review*, 87(12), 60–67.
- [7] Etzkowitz, H. (2008). *The triple helix: University–industry–government innovation in action*. Routledge.
- [8] Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation. *Research Policy*, 29(2), 109–123.
- [9] Fayolle, A., & Gailly, B. (2008). From craft to science. *Journal of European Industrial Training*, 32(7), 569–593.
- [10] Gibb, A. (2002). In pursuit of a new 'enterprise' and 'entrepreneurship' paradigm. *International Journal of Management Reviews*, 4(3), 233–269.
- [11] Grimaldi, R., Kenney, M., Siegel, D. S., & Wright, M. (2011). 30 years after Bayh–Dole. *Research Policy*, 40(8), 1045–1057.
- [12] Guerrero, M., Urbano, D., & Fayolle, A. (2016). Entrepreneurial activity and regional competitiveness. *Research Policy*, 45(4), 686–701.
- [13] Isenberg, D. J. (2010). How to start an entrepreneurial revolution. *Harvard Business Review*, 88(6), 40–50.
- [14] Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.
- [15] Kuratko, D. F. (2005). The emergence of entrepreneurship education. *Entrepreneurship Theory and Practice*, 29(5), 577–597.
- [16] Lans, T., Blok, V., & Wesselink, R. (2014). Learning apart and together. *Studies in Higher Education*, 39(5), 821–837.
- [17] Man, T. W. Y., Lau, T., & Chan, K. F. (2002). The competitiveness of SMEs. *Journal of Business Venturing*, 17(2), 123–142.
- [18] Mitchelmore, S., & Rowley, J. (2010). Entrepreneurial competencies. *Journal of Small Business and Enterprise Development*, 17(1), 92–111.
- [19] Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education. *Academy of Management Learning & Education*, 16(2), 277–299.
- [20] Neck, H. M., & Greene, P. G. (2011). Entrepreneurship education. *Journal of Small Business Management*, 49(1), 55–70.
- [21] OECD. (2019). *The future of education and skills: Education 2030*. OECD Publishing.
- [22] Pittaway, L., & Cope, J. (2007). Entrepreneurship education. *International Small Business Journal*, 25(5), 479–510.
- [23] Rasmussen, E., Mosey, S., & Wright, M. (2011). The evolution of entrepreneurial competencies. *Entrepreneurship Theory and Practice*, 35(5), 1071–1091.
- [24] Rothaermel, F. T., Agung, S. D., & Jiang, L. (2007). University entrepreneurship. *Industrial and Corporate Change*, 16(4), 691–791.
- [25] Schumpeter, J. A. (1934). *The theory of economic development*. Harvard University Press.

- [26] Shane, S. (2003). *A general theory of entrepreneurship*. Edward Elgar.
- [27] Siegel, D. S., & Wright, M. (2015). Academic entrepreneurship. *Journal of Economic Behavior & Organization*, 114, 1–12.
- [28] Stam, E. (2015). Entrepreneurial ecosystems and regional policy. *European Planning Studies*, 23(9), 1759–1769.
- [29] Sarkar, D., & Jena, S. K. (2024). Unleashing potential: A thorough exploration of entrepreneurial competency among educated youth in the 21st century. *European Chemical Bulletin*, 11(07), 231–241.
- [30] Sarkar, D., & Devi, A. (2026). GST and Employment Generation Among Educated Youths in Assam: An Empirical Study. *ShodhKosh: Journal of Visual and Performing Arts*, 7(13s), 283–297.
- [31] Urbano, D., & Guerrero, M. (2013). Entrepreneurial universities. *Small Business Economics*, 40(3), 553–573.
- [32] Venkataraman, S. (1997). The distinctive domain of entrepreneurship research. *Advances in Entrepreneurship, Firm Emergence and Growth*, 3, 119–138.
- [33] Sarkar, D., & Jena, S. K. (2024). The impact of entrepreneurial competency on educated youths: A pathway to sustainable development. *ShodhKosh: Journal of Visual and Performing Arts*, 5(5), 49 – 69.
- [34] Wright, M., Clarysse, B., Mustar, P., & Lockett, A. (2007). Academic entrepreneurship. *Journal of Technology Transfer*, 32(1–2), 1–9.
- [35] Sarkar, D., & Jena, S. K. (2025). Competency to career: An exploratory study on youth entrepreneurship in Assam. *International Journal of Scientific Innovation and Engineering*, 2(5), 625–634.
- [36] Yusuf, S., & Nabeshima, K. (2007). How universities promote economic growth. *World Bank Research Observer*, 22(2), 241–269.
- [37] Zahra, S. A., & Wright, M. (2011). Entrepreneurship's next act. *Academy of Management Perspectives*, 25(4), 67–83.
- [38] Feld, B. (2012). *Startup communities: Building an entrepreneurial ecosystem in your city*. Wiley.
- [39] Neck, H. M., Neck, C. P., & Murray, E. L. (2018). *Entrepreneurship: The practice and mindset*. Sage Publications.