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Original Research Article

Contributions of Engagement in Innovative Behavior, Self-Efficacy, and Entrepreneurial Environment Experience to the Entrepreneurial Innovative Capability of University Students

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ABSTRACT

Against the backdrop of global economic growth and technological advancement, China is emerging as a center of innovation. Universities play a pivotal role in cultivating future innovators, a priority underscored by the Chinese Ministry of Education to address graduate employment issues and propel national progress, highlighting the importance of this research area. Based on social cognitive theory and self-efficacy theory, this study develops a conceptual model to explore the impact of entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy on the entrepreneurial innovative capability of university students. Employing quota sampling, data were collected from 400 undergraduate students at both public and private universities in Chongqing. The results of PLS-SEM analysis significantly confirm that entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy notably influence the entrepreneurial innovative capability of university students. This research not only provides insights for educational policymakers but also offers theoretical support for the implementation of innovative educational practices in universities.

Introduction

In the grand context of globalization and information technology, China, as an emerging economy, is rapidly becoming a world center of innovation. According to the 2022 Global Innovation Index (GII, 2022), China ranks first among developing countries and eleventh globally. This status underscores the critical role that higher education institutions play in cultivating future innovators (Cao, 2022). In an era of economic integration and rapid technological development, entrepreneurial innovative capability has become a key indicator of national competitiveness. In response, the Chinese Ministry of Education has issued several policies encouraging higher education institutions to nurture students' spirit of innovation and entrepreneurial skills to meet the challenges and opportunities of the future job market (Website, 2014)

Within this educational and societal context in China, higher education plays an essential role in developing students' entrepreneurial innovative capability. However, university students often face numerous challenges in the entrepreneurial process, such as adaptability to the entrepreneurial environment, the degree of engagement in innovative behavior, and the strength of their self-efficacy, all of which can impact their entrepreneurial success (Bae et al., 2014). Based on social cognitive theory(Bandura, 1986)and self-efficacy theory (Bandura & Adams, 1977), this study explores how entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy collectively influence university students' entrepreneurial innovative capability (Peterman & Kennedy, 2003).

Through a detailed questionnaire survey of 400 university students in Chongqing, coupled with data analysis using the structural equation modeling (PLS-SEM), this research aims to reveal the interactions among these variables and their specific impacts on students' entrepreneurial capabilities. The findings will not only deepen the understanding of the role of higher education in promoting entrepreneurial education but also provide empirical evidence for educational policymakers on how to design and implement entrepreneurial education programs more effectively.

Furthermore, considering the current global economic uncertainty and complexity, the results of this study are also expected to offer strategic recommendations for universities, educators, and individuals to better adapt to the rapid changes in economy and technology, thereby enhancing students' entrepreneurial innovative capability. In summary, this research provides valuable insights into the field of entrepreneurial education and promotes a closer alignment between educational practices and global development trends.

Literature Review and Theoretical Framework

In the context of a globalized economy, innovation and entrepreneurship education is seen as a key pathway for nurturing future entrepreneurs. Higher education institutions are committed to enhancing students' entrepreneurial innovative capability through various educational strategies and courses. Social cognitive theory (Bandura, 1986) provides a framework for understanding and analyzing how individuals develop entrepreneurial skills in their environment through observation, imitation, and other forms of learning. Self-efficacy theory, a broader part of social cognitive theory (Bandura & Adams, 1977), focuses on individuals' beliefs in their own ability to perform specific tasks, which directly affects their motivation levels, behavioral performance, and emotional states (Peterman & Kennedy, 2003).

The research gaps identified in this paper are: First, although current studies extensively focus on the application of these theories in education and psychology, the specific link between innovation and students' entrepreneurial capabilities requires further exploration. Second, while both academic and practical communities recognize the positive impact of an innovative atmosphere on promoting student entrepreneurial behavior, there is still a relative lack of quantitative evidence on how entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy interact and affect entrepreneurial innovative capability. Third, much research focuses on analyzing the impact of external resources in the entrepreneurial environment, such as funding, networks, and support systems on students' entrepreneurial capabilities, often neglecting the role of internal factors such as self-efficacy and the logical relationships among these factors.

Therefore, this study aims to address these research gaps by exploring how entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy interact and collectively enhance university students' entrepreneurial innovative capability. By integrating social cognitive theory and self-efficacy theory, this study will provide a comprehensive analytical framework to deeply understand how an innovative atmosphere enhances students' self-efficacy, thereby increasing their engagement in innovative behaviors and entrepreneurial success rates. This research is expected not only to enrich theoretical perspectives but also to provide empirical support for higher education institutions in formulating more effective entrepreneurial education strategies.

Impact of Entrepreneurial Environment Experience on Entrepreneurial Innovative Capability:

According to the social cognitive theory proposed by Bandura (1986) environmental factors significantly influence individual cognition and behavior. Studies indicate that the entrepreneurial innovative capability of university students is positively affected by environmental factors such as university entrepreneurship policies (Åstebro et al., 2012) and resources (Lüthje & Franke, 2003). A positive entrepreneurial environment, characterized by abundant entrepreneurial resources and practical opportunities, can significantly enhance students' entrepreneurial skills (Pittaway & Cope, 2007). Furthermore, policy support such as tax incentives and low-interest loans, as well as participation in entrepreneurial courses and activities like lectures, workshops, and competitions, contribute to stimulating students' entrepreneurial intent and enhancing their entrepreneurial abilities (Isenberg, 2010). Hence, the following hypothesis is proposed:

H1: Entrepreneurial environment experience at the university has a positive impact on students' entrepreneurial innovative capability.

Impact of Entrepreneurial Environment Experience on Engagement in Innovative Behavior:

Consistent with Bandura (1986) social cognitive theory, environmental factors significantly impact individual behavior. Salancik and Pfeffer (1978) noted that organizations and individuals depend on the external environment for the acquisition and utilization of resources. Research demonstrates that the university entrepreneurial environment, such as policies (Åstebro et al., 2012), resources, and faculty support, positively influences students' engagement in innovative behavior (Maresch et al., 2016). For instance, entrepreneurship courses, practical projects, and financial support can inspire students' innovative actions (Li &

Liu, 2011) Additionally, high-quality faculty guidance, extensive academic exchanges, and collaboration with peers further promote students' engagement in innovation (Lüthje & Franke, 2003). Thus, the following hypothesis is derived:

H2: Entrepreneurial environment experience at the university positively influences students' engagement in innovative behavior.

The Impact of Self-Efficacy on Entrepreneurial Innovative Capability:

Self-efficacy, defined as an individual's confidence in successfully completing specific tasks, is a key internal factor influencing university students' entrepreneurial innovative capability (Lee & Bobko, 1994). Studies have demonstrated a positive relationship between self-efficacy and entrepreneurial innovative capability, with students possessing high self-efficacy more confident in setting and achieving entrepreneurial goals (McGee et al., 2009). Additionally, self-efficacy is associated with university students' resilience in the entrepreneurial process, problem-solving abilities, and resource integration capabilities (Markman et al., 2002; McGee et al., 2009). Emphasizing the development of stable psychological qualities and resilience in education is crucial for entrepreneurial success (McGee et al., 2009). Practical entrepreneurial experiences can enhance university students' self-efficacy, thereby affecting their behavioral intentions and entrepreneurial performance (Kalkan & Kaygusuz, 2012). Therefore, university students' self-efficacy has a significant positive impact on their entrepreneurial innovative capability. Hence, the following hypothesis is proposed:

H3: University students' self-efficacy positively influences their entrepreneurial innovative capability.

Impact of Engagement in Innovative Behavior on Self-Efficacy:

Engagement in innovative behavior can enhance university students' self-efficacy. Hockerts (2017) notes that engagement in innovative behavior includes learning new knowledge and skills, and trying new methods. Studies have shown that through successful practical experiences, university students can boost their confidence when facing challenges and solving problems, thereby enhancing their self-efficacy (Zimmerman, 2000). Students with high self-efficacy are more inclined to participate in challenging innovative activities because they believe they can overcome difficulties (Chen et al., 1998) Furthermore, sustained engagement in innovative behavior encourages students to continuously learn and apply new knowledge and skills, strengthening their ability to adapt to changes and uncertainties (Luthans & Jensen, 2002). Positive feedback and support also help improve students' self-efficacy in the field of innovation and entrepreneurship (Tierney & Farmer, 2002). Therefore, university students' engagement in innovative behavior has a significant positive impact on their self-efficacy, further promoting the development of their entrepreneurial innovative capability. Hence, the following hypothesis is proposed:

H4: University students' engagement in innovative behavior has a significant positive impact on their self-efficacy.

Impact of Engagement in Innovative Behavior on Entrepreneurial Innovative Capability:

University students engaged in innovative behavior can enhance their entrepreneurial innovative capability through accumulated practical experience and improved problem-solving skills. Raza and Khan (2022)pointed out that such engagement not only enhances students'

critical thinking and collaboration awareness but also boosts their competitive edge. The acquisition of knowledge on innovation and entrepreneurship and training in innovative thinking are crucial for enhancing students' capabilities. Harkema and Schout (2008) argue that educational models adapting to socio-economic development needs should emphasize practical ability and skill cultivation. Additionally, participation in innovative practices fosters students' resource integration capabilities, which are vital for entrepreneurial success (Harkema & Schout, 2008). Social cognitive theory provides a framework for understanding these phenomena, highlighting the interactions among individual behaviors, cognitive psychological factors, and environmental factors (Neneh, 2019). Thus, the following hypothesis is derived:

H5: University students' engagement in innovative behavior significantly positively affects their entrepreneurial innovative capability.

Objective

To explore the impact of entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy on the entrepreneurial innovative capability of university students.

Research Methodology

This study aims to explore the entrepreneurial innovative capability and its influencing factors among 526,000 undergraduate students in Chongqing, China. Data collection was conducted through the Wenjuanxing platform, which supports rapid design, distribution, and management of surveys. The survey was launched on December 11, 2023, in collaboration with university student affairs offices and counselors, and was promoted through social media groups to enhance participation. A quantitative approach was employed, and a comprehensive questionnaire was designed that included items on entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy.

As the target audience is Chinese, the questionnaire was developed in Chinese. To ensure the viability of the Chinese version, a back-translation method was used, and a pilot test was conducted before the official distribution. The pilot test results indicated that the reliability of the scales for entrepreneurial environment experience (α=0.816), engagement in innovative behavior (α=0.885), self-efficacy (α=0.890), and entrepreneurial innovative capability (α=0.910) achieved satisfactory Cronbach's alpha values above the general acceptance threshold of 0.7, meeting the criteria for reliability tests. The survey results demonstrated good stability and credibility(Thatcher & Perrewe, 2002).

Table 1 Demographic Background of the Sample

Background Variable	Distribution Ratio
Type of University	Public Universities：232（58.0%）
	Private Universities：168（42.0%）
Gender	male：200（50.0%）
	female：200（50.0%）

Background Variable	Distribution Ratio
Age	Mean：21.27 Standard Deviation：1.23

This study involved a quota sampling of 526,000 undergraduate students in Chongqing, consisting of 305,000 students (58%) from public universities and 221,000 students (42%) from private universities. Using Taro Yamane's formula, it was determined that a minimum of 400 responses was needed, with an error margin of 0.05, comprising 232 from public and 168 from private institutions. By the end of data collection, 437 questionnaires were received, of which 37 were discarded due to being deemed untrustworthy. Table 1 summarizes the demographic characteristics of the respondents.

Measures

All scales used to measure the hypothesized constructs in this study were adapted from previous research. A 7-point Likert scale was used, ranging from 1 (strongly disagree) to 7 (strongly agree). All questionnaires were mandatory, with only one submission allowed per IP address to ensure data accuracy and prevent duplication. Such research design and measurement techniques aid in thoroughly understanding and fostering the entrepreneurial innovative capability of university students in Chongqing, providing valuable support for educational policy-making and academic practice. The scale for measuring entrepreneurial environment experience was adapted from Xiong et al. (2023), consisting of 3 items, and included 2 modified items from Aliedan et al. (2022). Engagement in innovative behavior was adapted from Venkatesh et al., (2003), comprising 5 items. Self-efficacy was measured using a scale adapted from Jiatong et al. (2021), also consisting of 5 items. The scale for entrepreneurial innovative capability, comprising 12 items, was adapted from (Xiaohui, 2015), and includes four dimensions: Leadership Skills, Opportunity Recognition, Innovative Ability, and Resource Integration, each with three items. Gender and age were treated as control variables in this study. Gender was measured as a dummy variable (male = 0; female = 1); age was measured based on actual age in the year 2024.

Statistical Analyses

This study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze data and explore the factors affecting university students' entrepreneurial innovative capability. Structural Equation Modeling (SEM) is an effective method for analyzing relationships between observed variables and latent variables. PLS-SEM is particularly suited for exploratory research and causal relationship analysis, accommodating small samples and non-normal data. Compared to Covariance-Based Structural Equation Modeling (CB-SEM), which focuses more on testing pre-specified relationships and the overall fit of the model suitable for model validation, PLS-SEM emphasizes prediction accuracy and multivariate relationship analysis. It can reveal the impact of latent variables like the perception of innovative atmosphere on entrepreneurial innovative capability. Additionally, PLS-SEM allows for the analysis of moderating effects on variable relationships, aiding in understanding the complex mechanisms influencing university students' entrepreneurial innovative capability.

Results

Before evaluating the structural model, all necessary criteria must be met (Hair et al., 2019). The PLS Algorithm was employed. To test the reliability of indicators, attention was paid to whether the loadings of each indicator were significant and exceeded the threshold of 0.7 (Urbach & Ahlemann, 2010). According to the results presented in Table 21, loadings for variables such as entrepreneurial environment experience, engagement in innovative behavior, self-efficacy, and perception of innovative atmosphere exceeded 0.7. The remaining items were categorized into the dimensions of resource integration, innovative ability, opportunity recognition, and leadership skills within entrepreneurial innovative capability, with loadings also above 0.7. Moreover, cross-loadings were measured, and the results showed that each indicator's loading on its designated construct was greater than on any other construct (Urbach & Ahlemann, 2010). The categorization of items was consistent with the theoretical structure, indicating good structural validity of the questionnaire, as shown in Table 2.

Table 2: Factor Loadings and Cross Loadings for the Indicators

	EEE	.	SE	RI	IA	OR	LS	EIB	SE
EEE1	0.915 (127.960)	0.581	0.514	0.430	0.453	0.407	0.412	0.581	0.514
EEE2	0.842 (43.194)	0.550	0.496	0.369	0.382	0.321	0.366	0.550	0.496
EEE3	0.899 (96.887)	0.604	0.445	0.351	0.377	0.384	0.358	0.604	0.445
EEE4	0.885 (70.583)	0.586	0.447	0.360	0.359	0.340	0.318	0.586	0.447
EEE5	0.849 (54.409)	0.570	0.435	0.347	0.347	0.356	0.297	0.570	0.435
EIB1	0.569	0.857 (39.813)	0.399	0.377	0.413	0.344	0.365	0.857 (39.813)	0.399
EIB2	0.568	0.875 (65.131)	0.409	0.321	0.391	0.288	0.317	0.875 (65.131)	0.409
EIB3	0.615	0.924 (133.305	0.436	0.378	0.433	0.328	0.339	0.924 (133.305)	0.436
EIB4	0.611	0.922 (137.349)	0.446	0.373	0.449	0.322	0.367	0.922 (137.349)	0.446
EIB5	0.574	0.886 (73.578)	0.420	0.364	0.408	0.297	0.323	0.886 (73.578)	0.420
SE1	0.470	0.435	0.872 (76.309)	0.433	0.433	0.434	0.437	0.435	0.872 (76.309)
SE2	0.441	0.404	0.896 (59.362)	0.454	0.440	0.461	0.412	0.404	0.896 (59.362)
SE3	0.383	0.372	0.720 (22.596)	0.351	0.359	0.356	0.372	0.372	0.720 (22.596)
SE4	0.448	0.354	0.802 (41.103)	0.421	0.380	0.420	0.392	0.354	0.802 (41.103)
SE5	0.485	0.415	0.892 (87.709)	0.431	0.447	0.455	0.485	0.415	0.892 (87.709)
RI1	0.391	0.378	0.461	0.924 (112.272)	0.499	0.410	0.413	0.378	0.461
RI2	0.402	0.370	0.464	0.927	0.438	0.457	0.450	0.370	0.464

	EEE	.	SE	RI	IA	OR	LS	EIB	SE
				(156.555)					
RI3	0.381	0.378	0.459	0.920 (133.178)	0.434	0.434	0.436	0.378	0.459
IA1	0.399	0.451	0.435	0.452	0.881 (66.329)	0.487	0.428	0.451	0.435
IA2	0.401	0.421	0.449	0.431	0.900 (74.700)	0.490	0.429	0.421	0.449
IA3	0.369	0.382	0.431	0.440	0.890 (73.701)	0.504	0.410	0.382	0.431
OR1	0.354	0.323	0.461	0.402	0.517	0.895 (83.737)	0.406	0.323	0.461
OR2	0.378	0.295	0.445	0.434	0.489	0.900 (93.722)	0.412	0.295	0.445
OR3	0.389	0.345	0.477	0.440	0.501	0.923 (129.174)	0.421	0.345	0.477
LS1	0.392	0.363	0.487	0.460	0.464	0.431	0.953 (265.102)	0.363	0.487
LS2	0.352	0.327	0.474	0.438	0.427	0.395	0.934 (120.624)	0.327	0.474
LS3	0.382	0.389	0.453	0.423	0.444	0.457	0.9311 (09.955)	0.389	0.453

Note: value within () is T-value. The bold figures in the table denote the factor loadings. Entrepreneurial Environment Experience (EEE); Engagement in Innovative Behavior (EIB);Self-Efficacy (SE);Entrepreneurial Innovative Capability (EIC);Resource Integration (RI);Innovative Ability (IA)；Opportunity Recognition (OR);Leadership Skills (LS)

Secondly, as shown in Table 3, the reliability of the constructs was assessed using Composite Reliability (CR) and Cronbach's Alpha (CA). The results indicated that all values exceeded the threshold of 0.70 (Thatcher & Perrewe, 2002), thus, the reliability of all constructs was considered acceptable according to research standards.

Third, the discriminant validity was evaluated by comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlation coefficients among the constructs. Table 3 reports that the square root of the AVE exceeded the correlations with other constructs, fulfilling the requirements for discriminant validity. Given that indicator loadings might be overestimated, and structural model relationships might be underestimated, a higher boundary criterion known as the heterotrait-monotrait ratio (HTMT) was used to assess discriminant validity according to the Fornell-Larcker criterion (Henseler et al., 2015). All HTMT ratio test results ranged from 0.354 to 0.800, below the threshold of 0.85 (Henseler et al., 2015), indicating that all constructs are distinct; in other words, discriminant validity was satisfactory.

Table 3: Reliabilities and Correlation of Constructs

	CA	CR	AVE	Heterotrait-Monotrait Ratio and Fornell-Larker							
				EEE	EIC	IA	EIB	OR	SE	RI	LS
EEE	0.926	0.944	0.772	**0.879**							
EIC	0.914	0.927	0.514	0.579 (0.533)	**0.717**						
IA	0.869	0.920	0.793	0.487 (0.438)	0.898 (0.800)	**0.891**					
EIB	0.936	0.952	0.798	0.707 (0.658)	0.555 (0.514)	0.520 (0.469)	**0.893**				
OR	0.891	0.932	0.821	0.453 (0.412)	0.874 (0.788)	0.630 (0.554)	0.387 (0.354)	**0.906**			
SE	0.893	0.922	0.704	0.586 (0.532)	0.707 (0.639)	0.559 (0.492)	0.518 (0.473)	0.570 (0.509)	**0.839**		
RI	0.914	0.946	0.853	0.460 (0.423)	0.851 (0.778)	0.555 (0.495)	0.439 (0.406)	0.520 (0.470)	0.553 (0.500)	**0.924**	
LS	0.933	0.957	0.882	0.429 (0.400)	0.833 (0.770)	0.526 (0.474)	0.410 (0.383)	0.500 (0.456)	0.550 (0.502)	0.507 (0.469)	**0.939**

Multicollinearity and Common Method Bias Assessment

Multicollinearity was assessed using Variance Inflation Factor (VIF) statistics. Ideal VIF values should be close to but not exceed 3, confirming that multicollinearity is not an issue (Hair et al., 2019). The study results displayed a complete range of VIFs between 1.302 and 2.563, demonstrating the absence of multicollinearity concerns. Furthermore, common method bias (CMB) was tested using Harman's single-factor test. In the principal component analysis, this study examined all indicators of the model by extracting a fixed number of factors as a single factor. The results indicated that the single-factor solution accounted for only 37.527% of the variance, which is below the 50% threshold (Charoensukmongkol & Phungsoonthorn, 2021). Thus, CMB is not a central issue in the data collection of this study.

Structural Model

The structural model employed the PLS algorithm with a path weighting scheme, along with 300 iterations, to compute the statistics for latent variables. Figure 1 displays the results of the structural model analysis.

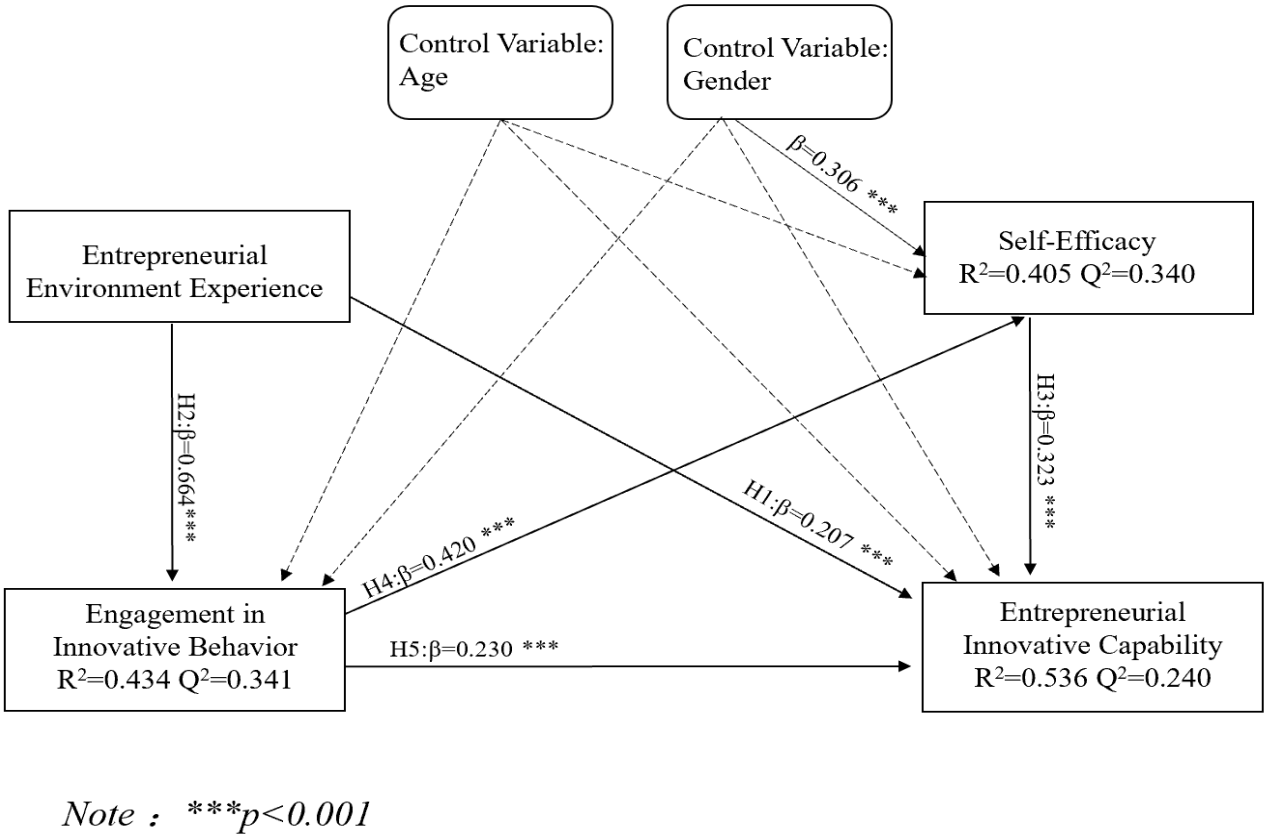

Fig. 1: Structural Model Results

Based on the results of the measurement model assessment, a structural model as shown in Figure 1 was constructed using Smart-PLS 4.0 software to analyze the comprehensive impact relationships among the variables. The model evaluation results indicated that the entrepreneurial environment experience at universities has a significant positive impact on university students' entrepreneurial innovative capability, with a regression coefficient β = 0.207 and a significance level p < 0.001, thereby confirming Hypothesis H1. Furthermore, the entrepreneurial environment experience significantly positively influences university students' engagement in innovative behavior, with a regression coefficient β = 0.664 and a significance level p < 0.001, supporting Hypothesis H2. The positive regression impact of self-efficacy on entrepreneurial innovative capability was also significant, with a regression coefficient β = 0.323 and a significance level p < 0.001, validating Hypothesis H3. The positive influence of engagement in innovative behavior on self-efficacy was also significant, with a regression coefficient β = 0.420 and a significance level p < 0.001, thus confirming Hypothesis H4. Finally, the positive impact of engagement in innovative behavior on entrepreneurial innovative capability also reached a significant level, with a regression coefficient β = 0.230 and a significance level p < 0.001, verifying Hypothesis H5. These results collectively demonstrate that the entrepreneurial environment at universities, along with university students' self-efficacy and engagement in innovative behavior, play a key role in enhancing their entrepreneurial innovative capability.

In this study, statistical analysis was employed to assess the overall explanatory power of the research model, primarily quantified through the R-squared (R^2) and Adjusted R-squared

(Adjusted R^2) metrics. The R-squared value indicates the proportion of variance in the dependent variable that is explained by the independent variables in the model, while the Adjusted R-squared provides a more accurate reflection of the model's explanatory power by accounting for the number of independent variables. Specifically, entrepreneurial environment experience explains 43.4% of the variance in engagement in innovative behavior (R^2=0.434), and engagement in innovative behavior explains 40.5% of the variance in self-efficacy (R^2=0.405). Additionally, the combined predictive explanatory power of entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy on entrepreneurial innovative capability is 53.6%, indicating the model's good predictive validity (Ringle et al., 2012).

Furthermore, the Q^2 value, assessed through the Stone-Geisser Test, was used to evaluate the model's predictive accuracy, validating the model's capability to predict the data. A Q^2 value greater than 0 indicates that the model has predictive relevance, which is crucial for assessing the practical predictive effect of the model and reflects the model's fit and predictive power. These statistical indicators show that the model's predictive validity is above average, suggesting that the model structure is both reasonable and effective.

Discussion

Theoretical Contributions

This study extends the social cognitive theory to the domain of innovation and entrepreneurship and delves into the interplay among university students' entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy, effectively filling the theoretical gaps in the application of these concepts to the innovation and entrepreneurship fields. This research also particularly underscores the importance of innovation self-efficacy (Zimmerman, 2000), providing new theoretical support for the further development of social cognitive theory.

Practical Contributions

The findings demonstrate that higher education institutions play a pivotal role in enhancing students' entrepreneurial innovative capability through the development of an entrepreneurial environment. Educators stimulate students' entrepreneurial interests and self-efficacy effectively by sharing success stories of entrepreneurship, providing professional training and psychological support, and designing practical activities (Isaksen & Ekvall, 2010). By participating in innovative projects and hands-on activities, students not only improve their entrepreneurial skills but also bolster their confidence and capability to face challenges, laying a solid foundation for their future entrepreneurial success.

Limitations

Despite this study's comprehensive application of social cognitive theory and self-efficacy theory deepening the understanding of factors influencing university students' entrepreneurial innovative capability, there are some deficiencies in the theoretical framework, model application, and data collection. Firstly, while relying on social cognitive theory and self-efficacy theory provides a robust theoretical foundation(Bandura & Adams, 1977), social cognitive theory may not fully explain the complex behaviors and psychological changes of individuals in specific entrepreneurial contexts. Future research is suggested to incorporate more dimensional theoretical frameworks, such as the theory of entrepreneurial intentions(Liñán & Fayolle, 2015). Secondly, the current model does not fully reflect the multi-

level interactions between individuals, behaviors, and environments, nor does it adequately consider other potential moderating factors. Finally, as the primary data collection tool, the survey covered students from both private and public universities, limiting the generalizability of the findings. Additionally, the reliance on self-reported data, which might introduce subjective biases potentially leading to distorted perceptions of the entrepreneurial environment and capability assessment (Corno & Mandinach, 1983), should be considered. Care should be taken when interpreting these data to be aware of potential issues arising from such subjectivity.

Conclusion

This study provides robust evidence supporting the significant influence of entrepreneurial environment experience, engagement in innovative behavior, and self-efficacy on the entrepreneurial innovative capability of university students. The findings confirm the following: Entrepreneurial Environment Experience: The positive impact of the entrepreneurial environment at universities on students' entrepreneurial innovative capability was substantiated, with a significant regression coefficient ($\beta = 0.207$, $p < 0.001$). This underscores the importance of a supportive and resource-rich entrepreneurial environment in fostering innovation among students. Engagement in Innovative Behavior: The study found a strong positive relationship between entrepreneurial environment experience and students' engagement in innovative behavior ($\beta = 0.664$, $p < 0.001$). Additionally, engagement in innovative behavior significantly contributed to entrepreneurial innovative capability ($\beta = 0.230$, $p < 0.001$) and self-efficacy ($\beta = 0.420$, $p < 0.001$). These results highlight the critical role of active participation in innovative activities in enhancing students' entrepreneurial skills and confidence. Self-Efficacy: Self-efficacy was shown to have a significant positive effect on entrepreneurial innovative capability ($\beta = 0.323$, $p < 0.001$), indicating that students' belief in their ability to perform entrepreneurial tasks is a key driver of their innovative potential. The model's explanatory power, as indicated by the R-squared values, shows that entrepreneurial environment experience explains 43.4% of the variance in engagement in innovative behavior, and engagement in innovative behavior explains 40.5% of the variance in self-efficacy. The combined influence of these factors explains 53.6% of the variance in entrepreneurial innovative capability, demonstrating the model's good predictive validity. The Q^2 values from the Stone-Geisser Test confirm the model's predictive relevance, indicating that the model is both reasonable and effective in predicting the entrepreneurial innovative capability of university students.

Recommendations

When proposing directions for future research, it is first recommended to expand the boundaries of social cognitive theory and self-efficacy theory to more comprehensively understand and explain the behaviors and psychological changes of university students in specific entrepreneurial contexts. Given that social cognitive theory may have limitations in addressing the complexities of individual-specific entrepreneurial situations (Bandura, 2002), it is suggested to explore more complex theoretical structures, such as the theory of entrepreneurial intentions (Liñán & Fayolle, 2015). This theory can reveal how individuals adapt to the environment and effectively utilize resources and capabilities during the entrepreneurial

process. Secondly, to delve deeper into the multilevel interactions among different variables, future research needs to design more refined models. Insufficient consideration has been given to other potential moderating factors, such as individual entrepreneurial motives, network relationships, and affective events (Shane et al., 2003) whose composite effects may significantly impact university students' entrepreneurial innovative capability. In terms of data collection, future research should employ more comprehensive and diverse methods. The current study mainly relies on self-reported questionnaires, covering data from students at both private and public universities. While this method provides immediate insights, the inherent limitations of self-report methods, such as social desirability bias, may lead to subjective biases in the data. Therefore, it is recommended to use longitudinal tracking methods (Wright et al., 1995) combined with qualitative research techniques, such as in-depth interviews and case studies, to provide a more comprehensive understanding and capture the development of individuals' entrepreneurial capabilities over time.

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