DEVELOPING AN ENTREPRENEURIAL SKILLS ENHANCEMENT MODEL FOR STUDENTS AT APPLICATION-ORIENTED UNIVERSITIES IN CENTRAL CHINA

KANG YA QI
6319000022

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Educational Administration Innovation

Graduate School of Education

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Researcher	Kang Ya Qi
Advisor	Associate Professor Dr. Boonmee Nenyod
Co-advisor	Dr. LeeHsing Lu

Graduate School of Education, Siam University approved to accept this Dissertation as part of Doctoral of Philosophy Program in Educational Administration Innovation.

.....Dean of Graduate School of Education
(Professor Emeritus Dr. Chanita Rukspollmuang)

Dissertation Committee

..... Committee Chairperson
(Assistant Professor Dr. Yan Ye)

..... Committee
(Dr. Sarun Widtayakornbundit)

..... Committee
(Associate Professor Dr. Jomphong Mongkhonvanit)

..... Advisor
(Associate Professor Dr. Boonmee Nenyod)

..... Co-advisor
(Dr. LeeHsing Lu)

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Abstract

Title Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China

Researcher Kang Ya Qi

Degree Doctor of Philosophy

Major Educational Administration Innovation

Dissertation Advisor

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(Associate Professor Dr. Boonmee Nenyod) (Dr. LeeHsing Lu)

With the rise of the entrepreneurial boom, enhancing entrepreneurial skills among students in application-oriented universities in Central China has gained increasing attention. However, students in this region exhibit significant deficiencies in entrepreneurial knowledge, practical operations, and innovative thinking. Given this, this study conducted an in-depth analysis to examine the root causes of these issues. Subsequently, based on the actual situation in Central China and the characteristics of the application-oriented universities, an innovative model for enhancing entrepreneurial skills was proposed, incorporating multi-dimensional initiatives. The study employed a questionnaire survey of graduates from five application-oriented universities in the central region, as well as interviews with teachers, students, entrepreneurs, and HR professionals. Employing a mixed-methods approach, the study combined stratified and purposive sampling to select a representative sample of 12 universities, including Hunan University, Central South University, Wuhan University, Zhengzhou University, and Henan University.

This study examined the effectiveness of the entrepreneurial skills enhancement model in application-oriented universities in Central China, aiming to align educational outcomes with labor market demands. The research examined the specific entrepreneurial skills enhancement that students require and the skills employers expect, aiming to develop a tailored operational model that meets these needs.

The findings reveal that business planning and strategizing provide a comprehensive guide for entrepreneurial actions, serving as a crucial basis for investment decisions and acting as the driving force behind the joint efforts of entrepreneurial teams and collaborators, offering essential support for business operations. A more conservative mindset prevails here compared to the more progressive southern regions. The study emphasizes the importance of transforming attitudes towards entrepreneurial education by cultivating a culture of innovation and risk-taking. The developed model provides practical recommendations for enhancing entrepreneurial education, promoting regional economic growth, and aligning with national development policies.

This study offers valuable insights for policymakers, educators, and stakeholders, proposing a comprehensive and practical approach to entrepreneurship education in Central China, ultimately empowering a new generation of entrepreneurs.

Keyword: entrepreneurial skills enhancement, Central China, application-oriented universities

Approved By

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Associate Professor Dr. Boonmee Nenyod
Advisor

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Kang Ya Qi

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CHAPTER 1

INTRODUCTION

Entrepreneurship education has evolved significantly, reflecting changes in economic landscapes, educational philosophies, and the growing importance of fostering entrepreneurial competencies. As the global economy becomes increasingly interconnected, the role of entrepreneurship in driving economic growth, job creation, and societal development has never been more critical. Recognizing this, the Chinese government has prioritized the promotion of entrepreneurship and innovation as integral components of its national agenda, with a particular focus on the central provinces of China. These regions have been identified as critical areas for development under the "13th Five-Year Plan" (2016) and the latest "14th Five-Year Plan" (2021), which emphasize enhancing education quality and fostering entrepreneurship as key drivers of regional and national progress. To ensure that the sample schools accurately reflect the overall characteristics of higher education institutions in the central region, this study adopted a representativeness-based selection approach. Specifically, schools were chosen based on two key criteria: the number of students and the specifications of the schools. The number of students indicates the scale and reach of the institution, which reflects the extent of educational resource coverage. The specifications of the schools—such as their academic level, program offerings, and institutional type—represent the diversity and quality of education provided. This selection strategy aligns with national policy goals and ensures that the findings of this study are both generalizable and scientifically robust.

Historically, the evolution of entrepreneurship education has mirrored the broader shifts in economies and educational paradigms. The Industrial Revolution fundamentally reshaped global economies, creating a growing need for individuals with innovative ideas and strong business acumen. In response to this need, the early 20th century witnessed the formalization of entrepreneurship education, with pioneering courses introduced at institutions such as Harvard University (Kuratko, 2005). This period laid the groundwork for expanding entrepreneurship as an academic discipline.

By the mid-20th century, establishing entrepreneurship centers and programs, such as the Small Business Development Centers (SBDCs), underscored a growing emphasis on small business development and entrepreneurship support (Chrisman & Katrishen, 1994). These centers provided crucial resources and training for budding entrepreneurs, reflecting a shift towards recognizing entrepreneurship as a vital component of economic growth. The late 20th century saw a surge in global interest in entrepreneurship education, with universities worldwide beginning to offer dedicated degrees in entrepreneurship and establishing specialized entrepreneurship centers. Notably, the founding of Babson College's Arthur M. Blank Center for Entrepreneurship in 1998 set a benchmark for similar initiatives globally (Brush, 2021). This period marked the emergence of entrepreneurship as a distinct academic discipline, focusing on nurturing the entrepreneurial mindset and skills necessary for success in the modern economy.

As the world became more interconnected, entrepreneurship education evolved to address the complexities of global markets and the rise of technology-driven entrepreneurship (Moustaghfir & Secundo, 2016). Technology integration into entrepreneurship education has been a key development in recent years, with virtual incubators and online entrepreneurship courses gaining popularity. These innovations have demonstrated the critical role of technology in shaping the future of entrepreneurship education, making it more accessible and relevant in a rapidly changing business environment. Furthermore, cross-disciplinary collaboration has become increasingly important, as entrepreneurship is now recognized as a skill set that transcends traditional business disciplines, influencing areas such as technology, social innovation, and sustainability.

In China, the rapid economic growth and transition to a market-oriented economy in the late 20th century further underscored the need for robust entrepreneurship education. The Chinese government, recognizing the pivotal role of entrepreneurship in driving economic development, launched several initiatives to nurture entrepreneurship and innovation. One such initiative, the "Torch Program", was specifically designed to support technology entrepreneurship and has fostered innovation across various sectors (Heilmann et al., 2013). Universities across China began incorporating entrepreneurship programs into their curricula, aligning with national goals of economic modernization and global competitiveness.

In the 21st century, entrepreneurship education has expanded, transcending traditional business schools to encompass a range of disciplines. The focus has shifted towards a more holistic approach to entrepreneurship, acknowledging that entrepreneurial skills enhancement is valuable across all fields of study. Social entrepreneurship and sustainability have gained prominence, reflecting global concerns about social equity, environmental sustainability, and the need for inclusive economic growth. The increasing availability of entrepreneurship education through Massive Open Online Courses (MOOCs) and other online platforms has further democratized access to this vital field of study, enabling students from diverse backgrounds to acquire the skills necessary for entrepreneurial success (Al-Atabi & DeBoer, 2014).

Despite these global advancements, Central China presents unique challenges and opportunities. The region's strategic importance has been recognized in national development plans; yet, it remains culturally conservative compared to more entrepreneurial regions, such as South China. Many students in Central China traditionally aspire to secure stable employment, such as becoming civil servants, rather than pursuing entrepreneurial ventures. This conservative mindset poses a significant barrier to fostering an entrepreneurial spirit among students in the region. Promoting a cultural shift that encourages innovation, risk-taking, and entrepreneurship as viable and rewarding career paths is crucial to address this challenge.

Universities in Central China are uniquely positioned to drive this transformation. These institutions focus on providing specialized education and training that aligns with the needs of local industries and the regional economy. By integrating entrepreneurship education into their curricula, these universities can equip students with the entrepreneurial mindset, knowledge, and skills needed to succeed in an increasingly competitive and innovation-driven market. This integration is critical in

Central China, where the region's development goals hinge on cultivating a skilled and entrepreneurial workforce capable of driving economic growth and innovation.

However, existing research on entrepreneurship education in China often focuses on institutional mechanisms, policy environments, and curriculum design, neglecting the sustained development of entrepreneurial competencies among university students. This oversight is particularly evident in universities in Central China, where students face unique challenges and have specific educational needs that differ from those in more traditional academic environments. There is a noticeable gap in the literature regarding the specific Entrepreneurial Skills Enhancement and qualities that contribute to the long-term success of university graduates as entrepreneurs. Addressing this gap is essential for developing an effective entrepreneurship education model that meets the needs of students in Central China.

1.1 Cultural and Regional Context of Central China

In developing the Entrepreneurial Skills Enhancement Model, it is crucial to consider Central China's unique cultural and regional context. With its rich historical background and diverse economic landscape, this region presents opportunities and challenges for entrepreneurship education. Central China's economic policies and educational frameworks are deeply influenced by its cultural attitudes towards entrepreneurship and innovation. Historically, the region has been characterized by a blend of traditional industries and emerging sectors, necessitating a tailored approach to entrepreneurship education.

Universities in Central China are increasingly aligning their educational strategies with regional development goals. This alignment is crucial as entrepreneurship education enhances students' skills and contributes to local economic development. For instance, local industries often partner with universities to provide students with practical experiences directly relevant to the region's economic needs. This collaboration fosters an environment where students can apply their Entrepreneurial Skills Enhancement in real-world settings, addressing local challenges and seizing opportunities unique to Central China. Furthermore, regional policies supporting innovation and industry collaboration significantly shape the educational landscape, highlighting the need for effective models that integrate these elements.

1.2 Research Significance

While the integration of entrepreneurship education has undoubtedly created a conducive environment for nurturing entrepreneurial mindsets and fostering innovation, it is essential to acknowledge the challenges that still need to be addressed to enhance the effectiveness of these programs. One significant challenge is the scarcity of experienced entrepreneurship educators with practical business experience. Although universities focus on practical education, the availability of educators who have direct experience in starting and managing businesses is limited (Sun & Zhang, 2019). The gap in practical knowledge among educators can impact the effectiveness of entrepreneurship education programs and limit students' ability to learn from real-world examples (Henry et al., 2005).

Moreover, despite the government's efforts, some universities face funding constraints that hinder the effective implementation of comprehensive entrepreneurship

education initiatives. Limited financial resources can pose challenges, such as developing and maintaining practical curricula, establishing entrepreneurship centers or incubators, and organizing mentorship programs or events. Without adequate funding, universities may struggle to offer experiential learning opportunities and access industry partnerships for students to turn their entrepreneurial ideas into viable ventures.

Another challenge lies in balancing the integration of theoretical knowledge and practical skills within entrepreneurship education. While emphasizing practical training is crucial, ensuring students have a solid theoretical foundation to understand and navigate the entrepreneurial landscape effectively is equally important. Developing well-designed curricula that seamlessly blend theoretical frameworks with experiential learning opportunities, case studies, and real-world projects is essential for achieving this balance (Bentley et al., 2015).

Given the above context, researching entrepreneurship education in universities in Central China holds significant importance for several reasons. Firstly, these universities are uniquely positioned within China's education system, offering students invaluable opportunities to acquire practical skills and knowledge for initiating and managing businesses. By examining the effectiveness of entrepreneurship education in these institutions, valuable insights can be gained, leading to the identification of best practices and recommendations for enhancing entrepreneurship education programs. Such research can inform and empower educators, policymakers, and administrators in decision-making.

Secondly, research findings can help address students' challenges and barriers while developing Entrepreneurial Skills Enhancement. Applying-oriented universities can better equip students for entrepreneurial endeavors by proactively exploring these challenges.

Lastly, understanding the effectiveness of entrepreneurship education in universities is crucial for the overall development of China's economy. With the Chinese government's ambitious aspirations to become a global leader in innovation and entrepreneurship, universities play a pivotal role in achieving these objectives. Insights gained from this research can guide policymakers in making informed decisions and allocating resources to support entrepreneurship education initiatives that stimulate economic growth and development.

The need for a specialized entrepreneurship education model tailored to the needs of university students in Central China is evident. Traditional research universities may not fully cater to these students' practical and industry-focused needs, necessitating the development of a model that leverages the unique strengths of universities to meet their needs better. These institutions often have close industry partnerships, practical teaching methods, and cooperative education programs that can provide students with relevant skills and experiences for entrepreneurship.

However, existing entrepreneurship education models in China have not thoroughly addressed the specific needs and challenges faced by university students in Central China. The region's policies, economic priorities, and industry demands are constantly evolving, and entrepreneurship education models must be updated to keep pace with them. As a result, students may not receive the practical and industry-focused

education necessary to succeed as entrepreneurs in their respective fields (Zhang & Chen, 2023).

One key concern with existing models is that they may place too much emphasis on theoretical knowledge while neglecting the development of practical skills required for entrepreneurship. Application-oriented universities strive to equip students with hands-on experience and practical problem-solving skills. However, if the existing model does not prioritize practical skills training, it may hinder students' ability to apply their knowledge effectively in entrepreneurial endeavors.

Integrating entrepreneurship education into the curriculum is both a strategic and necessary response to the Chinese government's broader objectives of fostering economic growth and innovation. Recognizing the critical role that entrepreneurship plays in national development, the Chinese government has launched several initiatives over the years to embed entrepreneurial principles into the nation's educational fabric. These initiatives are well reflected in the "13th Five-Year" and "14th Five-Year" plans, which not only prioritize the development of Central China but also place a strong emphasis on entrepreneurship education as a catalyst for innovation and a driving force for creating a favorable environment for entrepreneurial activities (Zhang & Ye, 2022).

The Chinese government has taken a multi-faceted approach to ensure the effective implementation of these initiatives. One significant measure includes establishing entrepreneurship centers, innovation hubs, and incubators within application-oriented universities. These institutions serve as vital platforms where students can develop entrepreneurial ideas, receive mentorship from seasoned entrepreneurs, and access essential resources and funding to launch their ventures (Xue & Li, 2020). Financial support from the government, in the form of grants and funding programs dedicated explicitly to entrepreneurship education, has also been instrumental in fostering this entrepreneurial ecosystem within higher education institutions (Kang & Xiong, 2021).

Another critical aspect of the government's strategy is promoting collaboration between academia and industry. Application-oriented universities in Central China have partnered with local industries and businesses to provide students with real-world exposure and experiential learning opportunities. Through internships, co-op programs, and industry projects, students gain practical insights and develop the skills directly applicable to entrepreneurship (Wang et al., 2020). This collaboration ensures that the education students receive is theoretical and aligned with the demands and challenges of the current business environment.

In line with the government's objectives, application-oriented universities have developed specialized courses and programs focused on entrepreneurship. These programs equip students with the essential knowledge, skills, and attitudes necessary for starting and managing businesses. For example, courses in Strategizing, marketing, financial management, innovation, creativity, and entrepreneurial leadership are offered to students (Zhong et al., 2013). Some universities have even introduced interdisciplinary programs that combine business with other fields such as technology or design, allowing students to explore innovative solutions at the intersection of different disciplines (Long et al., 2021).

Furthermore, entrepreneurship education thrives when there is close collaboration between academia and industry. The new model must foster such collaborations and provide opportunities for students to engage with industry experts, mentors, and entrepreneurs. A lack of interaction with the business community can restrict students' exposure to real-life entrepreneurial experiences and networks, limiting their ability to develop practical Entrepreneurial Skills.

Another critical issue with the existing models is the lack of a robust system for monitoring and evaluating the effectiveness of entrepreneurship education programs. Monitoring and evaluation are crucial to any educational program as they provide valuable insights into its strengths, weaknesses, and overall impact (Evans, 2013). Without regular assessment and feedback mechanisms, it becomes challenging to identify areas for improvement and make necessary adjustments to enhance the quality and effectiveness of entrepreneurship education programs. A comprehensive monitoring and evaluation system will ensure accountability, transparency, and continuous improvement in educational initiatives (Kusek, 2010; Neumann et al., 2018).

In conclusion, developing a new entrepreneurship education model tailored to the needs of application-oriented university students in Central China is both timely and necessary. By addressing the specific challenges and gaps in existing models, such as the emphasis on practical skills, fostering industry collaboration, and implementing robust monitoring and evaluation systems, this new model aims to provide a more relevant, practical, and effective framework for entrepreneurship education. This framework will better equip students for entrepreneurial success in their respective fields, contributing to Central China's economic growth and development and aligning with the broader objectives of the Chinese government.

1.3 Research Questions

1. How is the entrepreneurial skill enhancement model currently implemented in application-oriented universities in Central China?

2. What are the relationships among all skills within the entrepreneurial skill enhancement model?

3. What are the potential areas for improvement in the current entrepreneurial skill enhancement model at these universities?

1.4 Research Objectives

1. To examine the operational model for entrepreneurial skills enhancement in application-oriented universities in Central China.

2. To identify the relationships among all skills within the entrepreneurial skill enhancement model.

3. To develop and validate an entrepreneurial skill enhancement model in application-oriented universities in Central China.

1.5 Definition of Terms

(1) Inventiveness

In this study, inventiveness refers to an individual's capability, when confronted with entrepreneurial scenarios or tasks, to proactively identify problems, generate novel ideas, propose alternative solutions, and possess the ability to transform creative concepts into tangible outcomes based on their existing knowledge and experience. This ability manifests as the individual's adeptness in flexibly employing divergent and critical thinking in academic, project-based, or actual entrepreneurial endeavors, driving problem-solving and value creation through continuous experimentation and exploration. This dimension underscores the individual's comprehensive performance across cognitive (thinking ability), behavioral (participation in practice), and situational (environmental perception) levels, serving as a core element in measuring creative capabilities within entrepreneurial skills.

(2) Opportunity Identification

Opportunity identification, as defined in this study, pertains to an individual's ability to actively discover, analyze, and evaluate potential entrepreneurial opportunities within their daily learning and living environments, based on their knowledge base, observational skills, and market sensitivity. This ability encompasses not only a keen perception of environmental changes, industry trends, and societal needs but also the capacity to translate external information into concrete business concepts. In the context of applied higher education institutions, opportunity identification is not only a crucial antecedent variable for students' entrepreneurial intentions but also a key indicator for assessing their entrepreneurial potential.

(3) Market Analysis

In this research, market analysis refers to an individual's ability to systematically collect, organize, and interpret market-related information during entrepreneurial activities or project practices, thereby identifying customer needs, assessing industry trends, discerning competitive landscapes, and uncovering market gaps. This ability encompasses the use of methodologies such as surveys, interviews, and data analysis for information acquisition, as well as the logical analysis and interpretation of data to inform business decisions.

(4) Decision-making

Decision-making, in this study, refers to an individual's capacity to comprehensively analyze information, weigh multiple options, and make sound judgments in complex, dynamic, or uncertain entrepreneurial contexts. This ability encompasses two core aspects: first, the ability to identify and resolve problems, demonstrated by insight into the essence of issues and the generation of coping strategies; second, the ability to formulate decisions, involving the selection of the optimal choice among multiple alternatives and assuming responsibility for the consequences. As a convenient cognitive-behavioral dimension within the entrepreneurial capability framework, decision-making ability serves as a vital safeguard for promoting the execution, adaptability, and sustainability of entrepreneurial projects, with its maturity directly influencing the effectiveness and success rate of entrepreneurial endeavors.

(5) Connectivity

Connectivity, in this study, pertains to an individual's ability to acquire resources, information, and support through familial, educational, and external social networks during the entrepreneurial process, and to establish collaborative relationships and generate synergistic effects based on these connections. This ability reflects the student's awareness and practical capability in leveraging interpersonal networks to integrate external resources, their ability to expand their social circles in diverse scenarios effectively, and their capacity to achieve co-creation and win-win outcomes in multi-party collaborations toward entrepreneurial goals. In the entrepreneurial skill enhancement model, Connectivity functions as a connective and supportive element, playing a pivotal role in facilitating the practical transformation of students' entrepreneurial capabilities.

(6) Strategizing

Strategizing, in this research, refers to an individual's ability to contemplate and formulate feasible business models systematically, define development objectives, and outline implementation pathways during the planning and execution stages of entrepreneurial concepts. This ability not only includes the skill of drafting business plans but also encompasses the capacity to set measurable goals, devise resource allocation schemes, assess feasibility and risks, and align market strategies—key elements in translating entrepreneurial ideas into executable plans. Within the entrepreneurial skill model, this dimension belongs to the category of strategic planning capabilities, serving as the foundation for entrepreneurial execution and sustained development, and playing a pivotal role in bridging the gap between conceptualization and implementation in students' entrepreneurial journeys.

(7) Entrepreneurial Skills

Entrepreneurial skills encompass a comprehensive set of capabilities required by students in entrepreneurial activities, spanning the entire process from idea generation and opportunity identification to market analysis, problem-solving, strategic planning, and collaborative networking. These skills not only encompass cognitive and operational knowledge and abilities but also manifest as students' integrated performance in resource integration and decision-making under uncertain and complex environments.

To effectively cultivate students' entrepreneurial skills, higher education institutions should develop interdisciplinary entrepreneurial curricula that integrate project-based learning (PBL), case studies, entrepreneurial training, and business competitions into their daily instruction. Through incubation platforms, simulated corporate operations, and entrepreneurial mentorship systems, students' entrepreneurial awareness and agency can be stimulated. Industry-academia collaboration plays a bridging role in this process, with enterprises contributing real-world cases, internship opportunities, joint research and development initiatives, and co-organized innovation and entrepreneurship events to introduce authentic market and industrial demands into the campus environment, enabling students' entrepreneurial skills to be honed and enhanced in real-world contexts.

1.6 Research Limitation

Recognizing the scope and constraints of the study is essential in any research endeavor. Acknowledging these limitations provides a clear understanding of the research's boundaries. Firstly, regarding sample selection, while this study focused on the Central China region, covering all applied universities and student groups in the area was challenging, which may affect the universality of the conclusions. Secondly, concerning research methods, this study primarily relied on questionnaire surveys and interviews, which introduced subjective biases, and the capture of dynamic influencing factors was neither timely nor comprehensive enough. Thirdly, constrained by practical conditions, the proposed improvement model may not fully achieve the expected results when implemented, due to differences in university resources and changes in the external environment.

1.7 Research Contributions

Research on entrepreneurship education in Central China can benefit academia, guide policy development, and improve educational practices.

One of this research's foremost contributions is its potential to shape policy development. China's central region has been earmarked as a focal point in the nation's developmental plans, notably the "13th Five-Year" and "14th Five-Year" plans. The emphasis on innovation education within these plans underscores the importance of entrepreneurship education in cultivating a skilled and adaptable workforce.

This research can provide policymakers with valuable insights through a comprehensive study of entrepreneurship education in Central China. It can identify strengths and weaknesses in the current educational landscape, informing and guiding decisions on resource allocation and curriculum enhancement strategies. Ultimately, this can lead to the formulation of evidence-based policies that optimize entrepreneurship education, thereby supporting the broader objectives of regional and national development.

Education is a dynamic field that constantly evolves to meet the changing needs of students and society. Entrepreneurship education is no exception. The findings of this research can significantly contribute to educational practices in several ways. Exploring the strategies, pedagogies, and outcomes of entrepreneurship education programs provides insight for educators and institutions. For example, if the research identifies specific teaching methods or curricular components that are particularly effective in nurturing Entrepreneurial Skills Enhancement, these can be shared and replicated across educational institutions. Evidence-based recommendations can guide educators in designing curricula that better prepare students for the challenges and opportunities of entrepreneurship. Furthermore, it informs the inclusion of co-curricular activities, mentorship programs, and real-world experiences, all of which are integral to entrepreneurship education.

Central China occupies a unique position in the nation's development landscape. It represents a region with immense potential for growth and transformation. However, it is also marked by disparities, with educational opportunities and outcomes varying across provinces. Entrepreneurship education can bridge these disparities by providing students with the necessary skills and mindset to succeed in a rapidly

changing economy. This research can contribute to regional development by identifying how entrepreneurship education can be utilized strategically to achieve balanced growth. It can highlight best practices in promoting entrepreneurship in less-developed areas and offer guidance on resource allocation. Doing so can help level the playing field and ensure that all students, regardless of their geographic location, have access to high-quality entrepreneurship education.

More importantly, one of the most direct contributions of this research is its potential to enhance student outcomes. Entrepreneurship education is not solely about imparting knowledge; it also involves shaping attitudes, nurturing skills, and influencing career choices. By assessing the impact of entrepreneurship education on students' skills, attitudes, and intentions, this research can provide valuable insights into the effectiveness of entrepreneurship education. For example, it can help educators understand which aspects of entrepreneurship education have a significant impact on students' decisions to pursue entrepreneurial ventures. This knowledge can inform the development of more effective programs, ensuring that students are better equipped to face their entrepreneurial challenges. It can also support career counselors in providing informed guidance to students, aligning their education with their aspirations.

Lastly, entrepreneurship serves as a vital driver of economic growth. By equipping students with the essential skills and mindset for entrepreneurship, this research directly bolsters economic development in Central China. Entrepreneurship education fosters the creation of new businesses, the expansion of existing ones, and the creation of job opportunities. In a region like Central China, with immense economic potential, the effects of effective entrepreneurship education can be trans formative. It can spur innovation, encourage investment, and promote economic diversification. The findings of this research can help stakeholders utilize entrepreneurship education as a powerful tool for regional development and economic prosperity. If the research uncovers successful practices or models within Central China's entrepreneurship education landscape, these can serve as examples for other regions or countries. The findings can be disseminated globally, enriching the international discourse on entrepreneurship education.

CHAPTER 2

LITERATURE REVIEW

entrepreneurial skills among students in Chinese universities have become a topic of growing interest and significance as the country continues to foster entrepreneurship and innovation within its education system. This section examines the research and findings on students' entrepreneurial skills in Chinese universities, focusing on their development, impact, and challenges.

Various studies have examined the development of entrepreneurial skills among students at Chinese universities. Researchers have found that entrepreneurship education is essential for nurturing these skills (Handayati et al., 2020; Zhong et al., 2022). Entrepreneurship courses and experiential learning opportunities have been recognized as effective methods for enhancing students' creative thinking, problem-solving abilities, and business planning and strategizing skills (Zhang et al., 2002). Integrating practical learning experiences, such as internships and industry projects, has significantly contributed to cultivating students' entrepreneurial mindset and skills (Li & Hu, 2023).

Possessing entrepreneurial skills has been linked to positive outcomes for students in Chinese universities. Research has shown that students with substantial entrepreneurial skills are more likely to have higher intentions to start their businesses (Handayati et al., 2020). These skills also correlate positively with students' self-efficacy and confidence in their ability to succeed as entrepreneurs (Zhong et al., 2022). Additionally, students with entrepreneurial skills are more adaptable to changes in the job Market analysis and more willing to take on leadership roles (Zhang et al., 2002).

Despite progress, challenges persist in developing students' entrepreneurial skills in Chinese universities. One significant challenge is the lack of experienced entrepreneurship educators (Long et al., 2021). Many current educators may possess academic qualifications but lack direct experience in starting and managing businesses, which limits their ability to effectively guide and mentor students in entrepreneurial endeavors. Additionally, there is a shortage of vocational teachers specializing in entrepreneurship education (He et al., 2022).

Research has highlighted regional disparities in the development of students' entrepreneurial skills in Chinese universities. Students in top-tier universities and those located in economically developed regions often have better access to resources and opportunities for entrepreneurship education compared to their counterparts in less developed areas (Wang et al., 2022). This disparity will undoubtedly impact students' exposure to entrepreneurial experiences and mentorship, potentially influencing their skill development and entrepreneurial intentions.

In conclusion, the literature on students' entrepreneurial skills in Chinese universities highlights the significance of entrepreneurship education in nurturing students' creativity, problem-solving abilities, and entrepreneurial mindset. While progress has been made, challenges persist in ensuring the availability of experienced entrepreneurship educators and addressing cultural and regional disparities.

Recognizing these factors can inform the development of effective strategies and policies to enhance students' entrepreneurial skills and foster entrepreneurial ventures among Chinese university students.

2.1 Entrepreneurship Education Theory

Entrepreneurship Education Theory encompasses the frameworks and methodologies used to impart entrepreneurial skills, knowledge, and attitudes to students. This theory is crucial for understanding how educational programs are designed and implemented to foster an entrepreneurial mindset and capabilities among students. The emphasis on entrepreneurial skills is particularly relevant to this study, which investigates the effectiveness of an entrepreneurship education development model in Central China. This literature review focuses on curriculum design and the impact of entrepreneurship education programs, specifically on students' entrepreneurial skills.

Curriculum design in entrepreneurship education is critical in shaping students' entrepreneurial skills and attitudes. Effective entrepreneurship education programs incorporate a range of components, including theoretical knowledge, practical skills, and experiential learning opportunities.

Successful entrepreneurship education programs strike a balance between theoretical instruction and practical application. According to Kuratko (2005), integrating theory with real-world practice allows students to understand the complexities of starting and managing a business. Courses often include Strategizing, financial management, marketing, and innovation, combined with practical activities like business simulations, internships, and project-based learning.

Entrepreneurship education often benefits from an interdisciplinary approach, incorporating insights from economics, management, psychology, and sociology (Fayolle & Gailly, 2008). This approach enables students to understand the entrepreneurial process and the various factors that influence entrepreneurial success. Additionally, customizing the curriculum to meet the needs and interests of students is crucial. Nabi et al. (2017) emphasize the importance of offering flexible learning paths that cater to diverse student backgrounds and career aspirations, including elective courses, specialized tracks, and opportunities for independent study.

The ultimate goal of entrepreneurship education is to foster entrepreneurial intentions and capabilities among students. Research has shown that well-designed entrepreneurship education programs can significantly influence students' entrepreneurial attitudes, intentions, and behaviors. Additionally, entrepreneurship education can boost students' confidence in managing a business. According to Wilson et al. (2007), increased entrepreneurial self-efficacy is linked to higher entrepreneurial intentions and a greater likelihood of entrepreneurial action.

Programs that emphasize practical skills development, such as opportunity identification, Strategizing, and resource management, prepare students to navigate the challenges of entrepreneurship (Pittaway & Cope, 2007). These skills are essential for entrepreneurial success and can be applied in various business contexts. Numerous studies have found that entrepreneurship education has a positive impact on students' intentions to pursue entrepreneurial careers (Souitaris et al., 2007). By exposing

students to entrepreneurial concepts and providing them with the tools to succeed, these programs inspire and motivate students to consider entrepreneurship a viable career option. Beyond skills and intentions, entrepreneurship education aims to cultivate an entrepreneurial mindset characterized by innovation, resilience, and a proactive approach to opportunities and challenges (Rae, 2007). This mindset is valuable not only for entrepreneurs but also for individuals in various professional roles.

Entrepreneurship Education Theory provides a comprehensive framework for understanding how educational programs can effectively develop Entrepreneurial Skills, attitudes, and intentions among students. By examining curriculum design, pedagogical methods, and their impact on students, researchers and educators can refine these programs to meet students' needs and demands, as well as inform labor market analysis. As entrepreneurship education continues to evolve, it will play a crucial role in fostering innovation, economic growth, and a culture of entrepreneurship.

2.1.1 Entrepreneurship Education in Universities Abroad

Researchers like Gibb (2011) and Vanevenhoven (2013) identified significant milestones in this evolution. In the 1980s and 1990s, college students were increasingly aware of the need to foster entrepreneurial mindsets and skills (Jack & Anderson, 1999). As a result, entrepreneurship education began to be integrated into various academic disciplines, moving beyond the confines of business schools. The interdisciplinary approach aimed to instill an entrepreneurial mindset that could be applied across diverse fields, encouraging students to identify opportunities and take calculated risks.

In the early 2000s, the focus on experiential learning gained traction. Colleges started incorporating practical experiences, such as Strategizing competitions, startup internships, and engagement with local entrepreneurial ecosystems (Bischoff et al., 2018). Experiential learning provides students with real-world exposure, enabling them to apply theoretical concepts in practical scenarios. The shift recognized that entrepreneurship is about learning theories and developing the ability to navigate uncertainties and complexities inherent in the entrepreneurial journey.

Another significant development has been the establishment of incubation programs and entrepreneurship centers on college campuses, which provide students with dedicated spaces and resources to explore and develop their business ideas. Incubators offer mentorship, networking opportunities, access to funding, and co-working spaces, fostering a supportive environment for aspiring entrepreneurs (Fuzi, 2015). These programs have proven effective in nurturing student startups and scaling up successful ventures. Moreover, mento reship has emerged as a crucial aspect of entrepreneurship education. Collaborating with experienced entrepreneurs and industry experts allows students to gain insights into real-world challenges and best practices. Mentorship initiatives create a valuable bridge between academia and industry (Lei, 2023), facilitating the transfer of knowledge, expertise, and networks to the next generation of entrepreneurs.

Colleges aim to empower students to become agile and innovative entrepreneurs by exposing them to real-world challenges and opportunities. This evolution reflects a deeper understanding of the multidimensional nature of entrepreneurship, which encompasses creativity, adaptability, and a mindset of continuous learning and growth. The emphasis on practical experiences, incubation programs, and mentorship initiatives

highlights the importance of nurturing entrepreneurial mindsets and skills. This shift aligns with the demands of the ever-changing global economy, preparing students to thrive as innovative and proactive entrepreneurs.

On the other hand, the impact and effectiveness of entrepreneurship education in colleges outside of China have been subjects of extensive research and evaluation. Scholars have sought to understand how entrepreneurship education influences students' attitudes, behaviors, and outcomes related to entrepreneurship and innovation. Bhat and Singh (2018) and Naveed et al. (2021) showed that entrepreneurship education plays a vital role in shaping students' entrepreneurial intentions. Entrepreneurship education cultivates an entrepreneurial mindset by exposing students to entrepreneurial concepts, case studies, and real-life success stories, igniting the desire to create and explore new ventures. Students who undergo entrepreneurship education programs often exhibit higher levels of self-efficacy and confidence in their ability to pursue entrepreneurial endeavors (Piperopoulos & Dimov, 2015).

One of the significant outcomes of entrepreneurship education is its impact on actual venture creation and startup activity. Studies conducted by Kirkwood et al. (2014) and Dou et al. (2019) have found that students who participate in comprehensive entrepreneurship education programs are more likely to start their businesses. They tend to leverage the knowledge, skills, and networks gained through education to transform their innovative ideas into viable business ventures. Entrepreneurship education also fosters a culture of innovation and creativity among students. Research by Guerrero et al. (2014) and Fayolle et al. (2021) highlights the importance of experiential learning and problem-solving activities in promoting students' creativity and generating innovative solutions. By providing opportunities to work on real-world projects and challenges, entrepreneurship education encourages students to think creatively and develop innovative approaches to problem-solving.

Furthermore, entrepreneurship education equips students with various entrepreneurial skills and competencies. Studies by Solomon (2008) and Neck and Greene (2011) demonstrate that students enrolled in entrepreneurship programs gain valuable skills, including strategizing, Market analysis, research, financial management, negotiation, and leadership. These practical skills are essential for navigating the complexities of starting and running a successful business. The impact of entrepreneurship education often extends beyond immediate outcomes. Researchers such as Rae (2010) and Maritz et al. (2020) observed that students who have undergone entrepreneurship education are more likely to demonstrate resilience, adaptability, and a willingness to embrace failure as a learning opportunity. These long-term effects shape students into more innovative, proactive, and resourceful individuals—precious qualities in the rapidly changing global economy.

Entrepreneurship education empowers students with the knowledge, skills, and mindset necessary to pursue entrepreneurial opportunities and contribute to economic growth and job creation. The evidence presented in these studies emphasizes the value of integrating entrepreneurship education into college curricula worldwide, positioning it as a vital catalyst for fostering a culture of innovation and entrepreneurial success.

Addressing the challenges and barriers faced in entrepreneurship education, researchers such as Hannon (2006) and Lamine et al. (2014) identified issues including

faculty resistance, a lack of resources, and the need for continuous support structures. One of the primary challenges colleges face is faculty resistance to integrating entrepreneurship education into their curricula. Some faculty members may perceive entrepreneurship as a departure from traditional academic disciplines or lack the necessary expertise to effectively teach entrepreneurial concepts (Fayolle et al., 2021). Such resistance can hinder the adoption and implementation of entrepreneurship education initiatives, making faculty development programs and incentives necessary to encourage faculty engagement in entrepreneurship-related activities.

Building robust support structures is essential to sustaining entrepreneurship education initiatives. However, some colleges may lack the necessary infrastructure and administrative support to create a conducive environment for entrepreneurial activities (Fayolle et al., 2008). Without appropriate support systems, students may face difficulties accessing mentorship and practical learning experiences (Nora & Crisp, 2007), limiting the effectiveness of entrepreneurship education. Proper assessment and evaluation mechanisms are significant for measuring the outcomes and impact of entrepreneurship education programs. However, some colleges may struggle to develop appropriate evaluation tools and metrics to gauge the effectiveness of their initiatives (Fayolle et al., 2006). Without robust evaluation processes, colleges may face challenges in identifying areas for improvement and making data-driven decisions to enhance entrepreneurship education.

Addressing these challenges is a collaborative effort that involves college administrators, faculty members, students, and external stakeholders. By recognizing and surmounting these challenges, colleges can better equip their students with the skills and mindset needed to thrive in the ever-evolving global economy.

Drawing insights from the works of Jones et al. (2014) and Byrne et al. (2014), this section will showcase best practices and innovative pedagogical approaches in entrepreneurship education worldwide. Various universities and colleges in different countries have developed diverse practices and approaches to integrating entrepreneurship education into their curricula to foster entrepreneurial skills and mindsets among students.

For example, the University of Waterloo's "Velocity" program in Canada offers internships with startup companies to provide students with practical experiences in the entrepreneurial ecosystem (Ensign & Farlow, 2016). The "Startup Garage" at Stanford University in the United States offers a comprehensive experiential learning program instead (Nelson, 2014), where student-led startups receive guidance from experienced mentors, engage in workshops, and pitch their ideas to potential investors and industry experts. Startup projects, business Planning, and Strategy competitions offer students a platform to apply inventiveness to real business scenarios. These experiences encourage students to think critically and develop viable business ideas. Moreover, engaging in the competitive environment of Strategizing competitions nurtures students' presentation and pitching skills, essential attributes for aspiring entrepreneurs seeking funding and partnerships (Solomon et al., 2003).

The benefits of experiential learning extend beyond acquiring entrepreneurial skills. Students who engage in hands-on experiences often develop a greater sense of self-efficacy and confidence in their ability to navigate the challenges of

entrepreneurship (Baluku et al., 2019). Moreover, experiential learning enhances students' entrepreneurial intentions, shaping their aspirations toward starting their ventures or joining entrepreneurial teams (Sansone et al., 2021). Several universities organize entrepreneurship study tours, taking students to innovation hubs and startup ecosystems worldwide. These tours expose students to different cultures, business practices, and entrepreneurial environments. For example, the "Silicon Valley Experience" organized by Arizona State University takes students to Silicon Valley to meet with entrepreneurs, venture capitalists, and industry leaders (Phillips, 2019). Incorporating experiential learning in entrepreneurship education equips students with the practical tools and experiences to become successful and socially responsible entrepreneurs.

On the other hand, entrepreneurship is a multidisciplinary field, and universities recognize the importance of integrating entrepreneurship education across various disciplines (Wilson, 2008). Some institutions have adopted an interdisciplinary approach, offering entrepreneurship courses open to students from different faculties and academic backgrounds (Gibb, 2002). Babson College's FME program is designed for all first-year students, regardless of their intended major (Fetters et al., 2010). The program integrates business, liberal arts, and science disciplines to give students a holistic understanding of entrepreneurship. During the program, students form small teams and create their ventures, applying principles from various fields to develop and run their businesses (Brush, 2021). This interdisciplinary experience nurtures entrepreneurial skills and mindsets early in students' academic journeys. Stanford University's Hasso Plattner Institute of Design is also a prime example of an interdisciplinary hub for entrepreneurship education. The institute offers design thinking and innovation courses open to students from various disciplines, including engineering, business, humanities, and social sciences (Dominik & Graham, 2018). Students collaborate in teams through project-based learning to identify real-world problems and develop innovative solutions, preparing them to become entrepreneurial leaders in various industries (Zidulka et al., 2015).

The interdisciplinary approach facilitates the integration of various skill sets essential for entrepreneurial success. For instance, business students may contribute their knowledge of marketing and financial planning, while engineering students may bring technical expertise for product development (Baum & Friel, 2017). The Massachusetts Institute of Technology's Media Lab is renowned for its interdisciplinary research and innovation in media, technology, and design (Wonglimpiyarat, 2023). Although not solely focused on entrepreneurship, the lab provides an environment where students from various disciplines collaborate to develop cutting-edge technologies and creative solutions (Capuano & Ranieri, 2016). Its interdisciplinary ethos has led to numerous successful spin-off companies and startups centered on innovation and entrepreneurship. Institutions foster an environment encouraging collaboration, creativity, and innovation by offering entrepreneurship courses to students from diverse academic backgrounds.

Successful entrepreneurship education programs often create supportive ecosystems that extend beyond the classroom. These ecosystems encompass partnerships with industry, government agencies, and local communities (Neck & Greene, 2011). Entrepreneurship education programs embedded within ecosystems

offer students ample opportunities for connectivity. Interactions with entrepreneurs, industry leaders, and fellow students facilitate the exchange of ideas, knowledge, and resources (Youtie & Shapira, 2008). Networking events, workshops, and pitch competitions offer platforms for students to showcase their ventures, attract potential partners, and expand their professional connections. Entrepreneurship ecosystems encourage students to engage in research and innovation, leading to the development of cutting-edge products, services, and technologies (Etzkowitz, 2003). Universities and colleges within these ecosystems typically offer research centers, innovation labs, and technology transfer programs that enable students to translate their academic knowledge into practical applications.

In conclusion, entrepreneurship education programs in universities and colleges worldwide exhibit diverse practices and approaches. The literature reveals that successful initiatives often emphasize experiential learning, interdisciplinary collaboration, and the development of entrepreneurship ecosystems. By understanding and learning from these practices, institutions can continuously refine their entrepreneurship education programs to prepare students for the dynamic challenges of the entrepreneurial world.

The evolution of entrepreneurship education in Chinese colleges has been a dynamic process driven by the recognition of entrepreneurship's vital role in promoting economic development and fostering innovation. The Chinese government's commitment to advancing entrepreneurship education is evident in its formulation of policies and strategic plans to support its growth (Moustaghfir & Secundo, 2016). These initiatives have contributed to establishing entrepreneurship education as an essential component of the higher education system.

In the early 2000s, China undertook a reform initiative to modernize its education system, aligning it with the demands of a rapidly evolving economy (Zhang et al., 2002). This transformation aimed to equip students with practical skills and knowledge aligned with the country's economic and industrial needs. As part of this reform, entrepreneurship education emerged as a strategic imperative, promoting students' entrepreneurial mindsets, creativity, and problem-solving abilities (Dou et al., 2019). Meanwhile, application-oriented universities have played a pivotal role in this transformation, emphasizing the practical aspects of education and integrating real-life business scenarios into their curricula (Wang et al., 2020). These universities have been at the forefront of offering entrepreneurship-related courses, workshops, and extracurricular activities that facilitate hands-on learning experiences for students.

It is important to note that the integration of entrepreneurship education into Chinese colleges has not been limited to business-related disciplines. Instead, it has extended across various fields, recognizing the importance of entrepreneurial skills in diverse industries. For instance, students in technology, engineering, and science are encouraged to think innovatively and develop entrepreneurial mindsets that can drive technological advancements and commercialization (Qiu et al., 2023). As China advances toward the "14th Five-Year" plan, entrepreneurship education will evolve to address emerging challenges and opportunities. The focus will likely expand to include sustainable entrepreneurship, social entrepreneurship, and technology-driven innovation (Zhou & Xu, 2012). There is also a growing emphasis on experiential

learning, collaborative projects with industry partners, and incubation programs to nurture student startups (Yu, 2018).

Moreover, the integration of technology in entrepreneurship education is gaining traction, providing new avenues for students to engage with entrepreneurial concepts and connect with global entrepreneurship ecosystems (Donaldson, 2021). Online platforms and virtual entrepreneurship events have emerged as valuable tools in broadening access to entrepreneurship education, especially for students in remote areas.

Overall, the evolution of entrepreneurship education in Chinese colleges reflects the country's commitment to nurturing a new generation of innovative and entrepreneurial talent. By equipping students with practical skills, encouraging creative thinking, and providing exposure to real-world business scenarios, entrepreneurship education plays a crucial role in shaping China's economic landscape and driving innovation in the years to come. Studies have shown that entrepreneurship education has a positive influence on students' attitudes, intentions, and behaviors toward entrepreneurship (Handayati et al., 2020; Hassan et al., 2021). Students who are exposed to entrepreneurship courses are likely to develop an entrepreneurial mindset, creativity, and problem-solving skills (Ozgen & Minsky, 2013; Ghafar, 2020). Moreover, successful entrepreneurs who have emerged from Chinese colleges have made significant contributions to the country's economic growth and development (Shan et al., 2018).

Despite the progress made, entrepreneurship education in Chinese colleges faces several challenges. While educators may possess strong academic qualifications, their lack of direct entrepreneurial experience can limit their ability to provide students with real-world insights and examples. Practical knowledge gained from hands-on experiences is invaluable for aspiring entrepreneurs, as it helps bridge the gap between theory and practice, preparing students for the challenges they will face in the entrepreneurial world (Cheung, 2008). Without experienced educators to share their entrepreneurial journeys, students may miss out on valuable lessons and fail to grasp the intricacies of entrepreneurship.

As China advances towards the "14th Five-Year" plan, entrepreneurship education will remain a crucial focus in colleges. There is a growing emphasis on innovative pedagogies such as experiential learning, industry partnerships, and other creative methods to bridge the gap between theoretical knowledge and practical application (Beard & Wilson, 2018). Integrating technology and online platforms is also emerging as a potential avenue to enhance accessibility and engagement in entrepreneurship education, sparking curiosity and interest in these evolving methods.

2.1.2 Entrepreneurship Education in Chinese Universities

Entrepreneurship education in Chinese universities has undergone significant evolution in recent years, reflecting the country's growing emphasis on fostering innovation and entrepreneurship. Various practices and approaches have been implemented to equip students with the necessary knowledge and skills to become successful entrepreneurs. This section examines the essential entrepreneurship education practices and approaches in Chinese universities, highlighting their

significant impact on student entrepreneurship and innovation, and inspiring hope and optimism about the future of entrepreneurship education.

One of the prominent practices in Chinese universities' entrepreneurship education is experiential learning, where students learn through hands-on experiences and real-world projects. For instance, the Innovation-Based Entrepreneurship (IBE) program at Zhejiang University offers an innovative course called "Start Your Business in University" (Mei & Symaco, 2022). It allows students to form startup teams, develop business ideas, and receive guidance from experienced entrepreneurs and mentors. Through this experiential learning approach, students gain practical skills in Strategizing, Market analysis research, and networking (Hu & Ye, 2017). Entrepreneurship competitions and incubation programs are popular methods to encourage student entrepreneurship and innovation. Examples include the China College Students' "Internet+" Innovation and Entrepreneurship Competition, which attracts thousands of student teams nationwide. Winning teams receive financial support, mentorship, and access to incubation resources to turn their ideas into successful ventures (Mei & Symaco, 2022).

Meanwhile, many Chinese universities have established partnerships and collaborations with industry and startups to provide students with real-world exposure and opportunities. Tsinghua University, for instance, collaborates with various startups through its "Tsinghua x-lab," allowing students to work on real startup projects and gain insights from industry experts (Zhong et al., 2022). Such collaborations enable students to experience the challenges and dynamics of entrepreneurship in a practical setting. Another critical approach is to integrate entrepreneurial thinking and mindset across various academic disciplines. Peking University's Guanghua School of Management operates a mentorship program that pairs students with successful alum entrepreneurs. These mentors provide valuable advice, share experiences, and offer networking opportunities for aspiring student entrepreneurs (Zou, 2003).

On the other hand, the Chinese government has played a significant role in promoting entrepreneurship education through supportive policies and initiatives. Specifically, the "Double First-Class" initiative aims to strengthen entrepreneurship education and innovation in universities nationwide (Liu et al., 2019). Its support has increased resources and funding for entrepreneurship-related programs and research. Chinese universities have incorporated these aspects into their entrepreneurship education in response to the growing demand for social entrepreneurship and sustainability. For instance, Shanghai Jiao Tong University offers "Social Innovation and Sustainable Entrepreneurship" courses to cultivate socially responsible entrepreneurs who can address societal challenges (Du et al., 2011).

In summary, entrepreneurship education in Chinese universities has seen significant advancements, with various innovative practices and approaches implemented to cultivate a new generation of entrepreneurs. Experiential learning, competitions, collaborations with industry, and mentorship programs are just a few examples of the country's diverse and dynamic landscape of entrepreneurship education. As Chinese universities continue to nurture a culture of innovation and creativity, these practices will play a pivotal role in shaping the future of entrepreneurship and driving economic growth and social impact.

2.1.3 Application-Oriented Universities (AOU) in China

In recent years, application-oriented universities (AOUs) have emerged as a significant and innovative category within China's higher education system. AOUs, with their unique focus on providing practical and applied learning experiences, play a crucial role in preparing students for the workforce and specific industries. This section reviews and explores the background of AOUs in China, highlighting their importance, innovative practices, and the government's role in their development.

First, Application-Oriented Universities, also known as Applied Undergraduate Universities or Applied Technology Universities, stand out as a specialized category within China's diverse higher education landscape, each with distinct characteristics and educational purposes (Bentley et al., 2015). Wang et al. (2020) clarified the critical connections between entrepreneurial education and application-oriented universities in China. Due to pressure from governmental policy reform focusing on entrepreneurship education and innovation, Chinese higher educational institutions had to change drastically and transform from convergent universities to those with specific characteristics. Hence, the Ministry of Education of China (2017) established a plan to classify higher education institutions into four main types, based on the production of graduate talent and research, which includes academic research, applied research, applied technology, and applied skilled research. There are three main types of universities in China: research-based, application-oriented, and vocational and technical (Ji & Yue, 2019). Each educational purpose and method is different. Research universities offer Bachelor's, Master's, and Doctorate degrees. AOUs provide certificates, Bachelor's degrees, and Master's degrees, while vocational and technical universities issue certificates or Bachelor's degrees only (Zhang & Chen, 2022). The teaching practices for universities focus on fostering students' independent thinking through high-quality scientific research and teaching. However, AOUs emphasize cooperative education and practical teaching through industry-university research institutions (Zhang & Chen, 2022). Lastly, vocational and technical universities address companies' needs and solve practical problems (Shi, 2013). For entrepreneurship education to proceed successfully, Wang et al. (2020) developed a conceptual framework based on the idea that all stakeholders, including government, lecturers, students, and enterprises, must share common goals, content, teaching methods, and practices.

Unlike traditional research-focused universities emphasizing academic research and theoretical knowledge, AOUs prioritize practical and hands-on learning experiences. These universities offer programs tailored to the specific needs of various industries, aiming to produce job-ready graduates with specialized skills and knowledge relevant to the workforce (Wang et al., 2020). These institutions have evolved to meet China's rapidly changing economy and workforce needs.

AOUs design their academic programs in close collaboration with industries and employers (Etzkowitz et al., 2000). They identify the specific skill sets and knowledge required by various sectors and tailor their curricula to meet these needs. By offering industry-focused programs, AOUs aim to ensure that graduates are well-prepared to enter the job Market and contribute effectively to the growth and development of their respective industries. A key aspect of AOUs' approach is the emphasis on practical and hands-on learning experiences: Students participate in

internships, cooperative education programs, and real-world projects to apply their knowledge and skills in practical settings (Cooper et al., 2011), which helps them gain valuable insights into industry practices, problem-solving, and teamwork.

On the other hand, AOUs foster strong partnerships with businesses, industries, and local communities. These collaborations offer students opportunities for networking, mentorship, and exposure to real-world challenges (Awasthy et al., 2020). Industry professionals often serve as guest lecturers, mentors, or advisors, enriching students' learning experiences and providing valuable industry insights (Jixiang & Yuezhou, 2019). Many AOUs incorporate entrepreneurship education and innovation into their curricula to encourage students to think creatively, identify opportunities, and develop innovative solutions to problems. Entrepreneurship programs and incubators at AOUs support students aspiring to start their businesses, fostering a culture of innovation and self-reliance.

Application-oriented universities in China offer a unique and innovative approach to education, focusing on hands-on learning and specialized training that aligns directly with industry needs. These universities have played a crucial role in addressing the skills gap and meeting the demands of a rapidly evolving economy (Zhang, 2018). One of the critical innovations of AOUs is their curriculum design, which emphasizes the application of skills and practical knowledge in a hands-on approach. Unlike traditional universities, which may offer more general and theoretical programs, AOUs provide specialized courses tailored to specific industries and sectors (Cheng et al., 2023). AOUs often have programs in fields such as engineering, technology, agriculture, hospitality, and healthcare, designed in close collaboration with industry partners to ensure students receive relevant and up-to-date training.

Moreover, AOUs often incorporate internships, industry projects, and experiential learning opportunities into their curriculum (Li & Hu, 2023). These hands-on experiences allow students to apply their theoretical knowledge in real-world settings, gaining valuable practical skills and industry insights (Li & Hu, 2023). For example, students studying hospitality at an AOU have opportunities to work in hotels or restaurants during their studies, providing them with a taste of the actual working environment and preparing them for future careers. This has led to another significant innovation of AOUs: their close ties with industries and businesses. These universities actively collaborate with companies and organizations to develop internship and job placement opportunities for their students (He et al., 2022). Through such partnerships, students can access mentorship, networking events, and even potential job offers upon graduation. These connections between AOUs and industries facilitate a seamless transition for students from academia to the workplace, making them attractive candidates for employers seeking skilled and job-ready graduates.

Moreover, AOUs foster a culture of innovation and entrepreneurship among their students (Beiping et al., 2019). With a strong emphasis on practical problem-solving and critical thinking, these universities cultivate an entrepreneurial mindset. They motivate students to devise innovative solutions to real-world challenges and provide support for those interested in launching their businesses. Specifically, AOUs generally offer entrepreneurship courses, incubation centers, and funding opportunities to assist students in kick-starting their entrepreneurial ventures (Bo, 2017).

To sum up, Application-Oriented Universities in China play a vital role in addressing the skills gap and meeting the demands of a dynamic and evolving economy. Their emphasis on practical and specialized education, industry partnerships, and promoting innovation and entrepreneurship positions them as a driving force in producing job-ready graduates while fueling economic growth and innovation. As China emphasizes the importance of practical education and skills development, AOUs will continue to shape the nation's future workforce and drive progress in critical industries.

The development of AOUs in China has been driven by the government's recognition of the importance of vocational and applied education in the nation's development strategy. As part of its comprehensive efforts to build a skilled and innovative workforce, the Chinese government has prioritized establishing and expanding AOUs nationwide (Li & Hu, 2023). The "Double First-Class" initiative, launched in 2015, is one of the key policies that support the development of AOUs; the initiative aims to enhance the quality and competitiveness of Chinese higher education institutions, focusing on improving the capabilities of universities in specific disciplines and areas (Wang et al., 2020). Consequently, AOUs have received significant attention and support, leading to increased funding, infrastructure development, and collaboration with industry partners (State Council of China, 2017).

The government's efforts to promote AOUs align with its broader goals of fostering innovation, entrepreneurship, and economic growth. By investing in practical education and specialized training, China aims to build a highly skilled and adaptable workforce capable of driving technological advancements and economic development in key sectors (Wang et al., 2020). Application-Oriented Universities (AOUs) in China represent a vital and innovative component of the nation's higher education system. These universities prioritize practical and applied learning experiences, equipping students with specialized skills and industry-relevant knowledge that prepares them for the workforce. The government's support and policy initiatives have played a pivotal role in developing AOUs, reinforcing broader objectives of fostering innovation and economic growth. As China continues to emphasize practical education and vocational training, AOUs will play a crucial role in shaping the nation's future workforce and driving economic development and technological advancements.

Although entrepreneurship education is touted as a solution to employment difficulties in the Chinese economy, Wang et al. (2020) noted that only 5% of Chinese university students successfully start their businesses compared to their peers in the United States. Chinese application-oriented university students may lack entrepreneurial skills for several reasons. Firstly, the traditional education system in China has emphasized academic achievement and exam scores rather than practical skills and experience (Liu et al., 2019). Sun and Zhang (2019) conducted a study comparing the understanding of intelligence among American and Chinese university students. They discovered that the two countries have different understandings of intelligence; American students endorsed it, while Chinese students had a growth mindset, viewing it based on academic achievements. Students lacking practical business knowledge may not have had opportunities to develop hands-on skills and practical experience in starting and running a business. Secondly, students in China often come from low-income families and may lack the financial resources to start their

businesses. This circumstance may discourage them from pursuing entrepreneurial ventures and limit their exposure to entrepreneurship (Sansone et al., 2021). Thirdly, the application-oriented university curriculum lacks exposure to entrepreneurship and innovation. Many application-oriented universities in China focus narrowly on technical skills and may not prioritize entrepreneurship education or experiential learning opportunities (Beiping et al., 2019; Zhang & Ye, 2022). Fourthly, there may be a lack of role models and mentors for application-oriented university students interested in entrepreneurship (Li & Hu, 2023). Unlike students at top universities, those at application-oriented, vocational, and technical universities may not have access to successful entrepreneurs or business leaders who can provide guidance and inspiration. Finally, the cultural emphasis on stability and security may discourage some students from taking risks and pursuing entrepreneurial ventures. This pressure often arises from family expectations, where relatives prefer that their children pursue government-related careers, such as teaching or the civil service. In Chinese culture, there is often a preference for stable, secure employment over entrepreneurship, which may limit students' motivation to pursue entrepreneurial endeavors (Wang et al., 2020).

2.2 Entrepreneurial Skills

This section provides a theoretical foundation for enhancing students' entrepreneurial skills. It synthesizes existing literature on students' entrepreneurial skills in general university settings and specific studies conducted on Chinese students, aiming to establish a comprehensive understanding of students' entrepreneurial capabilities.

Entrepreneurial skills have become increasingly vital in today's rapidly changing and competitive world. As the global economy evolves, universities worldwide have recognized the importance of cultivating entrepreneurial mindsets and skill sets in their students. This research aimed to explore and understand the various dimensions of students' entrepreneurial skills at universities, highlighting the approaches, challenges, and impacts of entrepreneurship education.

Entrepreneurial skills encompass a range of competencies that empower individuals to identify opportunities, take calculated risks, innovate, and turn ideas into actionable plans. These skills extend beyond traditional academic knowledge and are essential for students to thrive in the modern job market, as well as to analyze and create their ventures. Developing entrepreneurial skills in universities equips students with the capacity to adapt to dynamic environments, think critically, and contribute to economic growth and innovation.

Entrepreneurship education in universities takes various forms, ranging from standalone courses and workshops to embedded curricula and experiential learning programs. Some universities integrate entrepreneurship across disciplines, enabling students from diverse fields to benefit from entrepreneurial training and education. Experiential learning, including internships, business simulations, and startup incubators, has gained prominence for providing practical, hands-on experiences that foster entrepreneurial mindsets and skills. Research suggests that entrepreneurship education has a positive influence on students' entrepreneurial intentions and actions. Graduates with entrepreneurial skills are more likely to pursue entrepreneurial careers or start their ventures. Entrepreneurship education has also been associated with higher

levels of innovation, problem-solving ability, and adaptability among students. Moreover, entrepreneurship education contributes to developing a culture of innovation and creativity within universities and their communities.

2.3 Human Capital Theory

Human Capital Theory (HCT) posits that investments in education, training, and other forms of personal development enhance individuals' productivity and economic value, similar to investments in physical capital (Becker, 1964). Originating from the works of economists such as Theodore Schultz and Gary Becker, the theory emphasizes the role of human capabilities in driving economic growth and development.

Gary Becker's seminal work, Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education (1964), fundamentally shaped the understanding of human capital. Becker argued that education and training are critical investments that increase an individual's productivity and earnings. He articulated that human capital is similar to physical capital, where investments yield returns over time, enhancing individual and societal economic outcomes. Schultz (1961) further elaborated on this by highlighting the essential role of education in improving agricultural productivity and economic development, particularly in developing countries.

HCT emphasizes that education enhances skills, knowledge, and competencies, making individuals more productive and innovative (Becker, 1993). This increased productivity benefits individuals and the broader economy, as a more skilled workforce contributes to higher economic output and innovation (Mincer, 1974). The theory has been extensively applied to understand the relationship between education, economic growth, and labor Market analysis outcomes.

The relevance of HCT to entrepreneurship education lies in the theory's emphasis on skill development and productivity enhancement through education and training. Entrepreneurship education aims to equip students with specific skills and competencies that foster entrepreneurial thinking and innovation (Kuratko, 2005). By viewing entrepreneurship education as an investment in human capital, the benefits extend beyond individual career success to broader economic development and innovation.

Entrepreneurship education programs focus on developing creativity, opportunity identification, market analysis, problem-solving, networking, and Strategizing (Rae, 2007). These skills are crucial for establishing and growing new ventures, contributing to job creation and economic dynamism (Volery & Mazzarol, 2015). Investing in entrepreneurship education can be viewed as a strategic initiative to enhance the entrepreneurial capabilities of the workforce, thereby driving regional economic development, particularly in areas such as Central China, where industrial transformation is a key policy objective (Wu & Si, 2018).

The proposed research aims to investigate the effectiveness of an entrepreneurship education development model at application-oriented universities in Central China. The goal is to align the entrepreneurial skills imparted through education with the labor market's needs, enhancing graduates' employability and entrepreneurial

potential. It aligns with the principles of HCT, which emphasize the role of education in enhancing human capital and, consequently, economic productivity. By identifying and fostering the entrepreneurial skills required by educational institutions and the labor market, the study aims to bridge the gap between theoretical knowledge and practical application. This alignment is crucial for ensuring graduates are well-equipped to meet the demands of a dynamic and evolving economy (Hitt et al., 2001).

2.4 Theoretical Model

This research analysed several existing frameworks for entrepreneurship education. Each framework provides unique insights into the development of entrepreneurial skills, focusing on aspects such as entrepreneurial competencies, an educational framework for building these skills, and a framework for entrepreneurial education. By examining these frameworks, this research aimed to develop a comprehensive model that addresses the specific needs of application-oriented universities in Central China. This approach incorporates best practices from globally recognized frameworks. It adapts them to the local context, ensuring that the proposed model is relevant and effective in fostering entrepreneurial competencies among students.

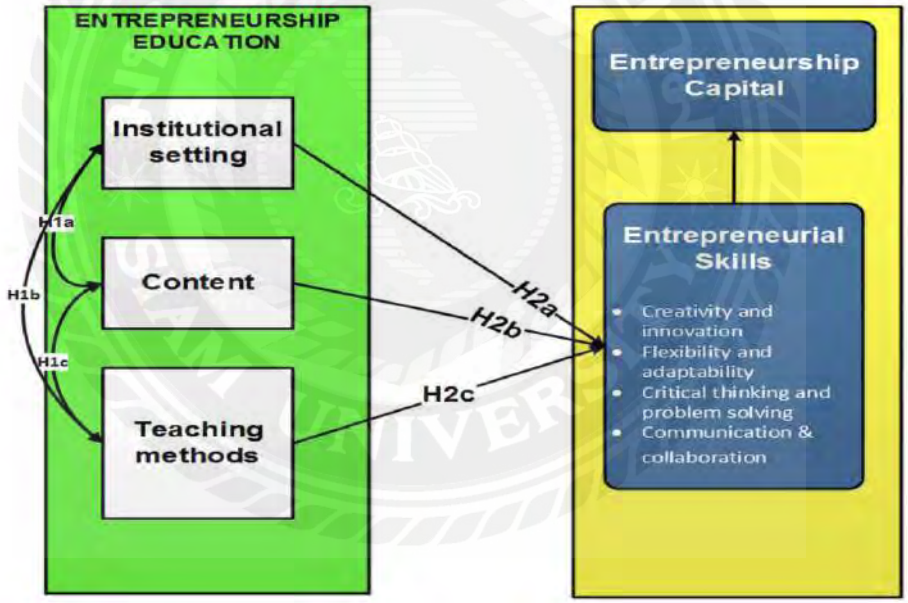


Figure 2.1 Entrepreneurship Education Framework for Building Entrepreneurship Skills

Schneider, K., & Albornoz, C. (2018). Theoretical model of fundamental entrepreneurial competencies. *Science Journal of Education*, *6*(1), 8–16.

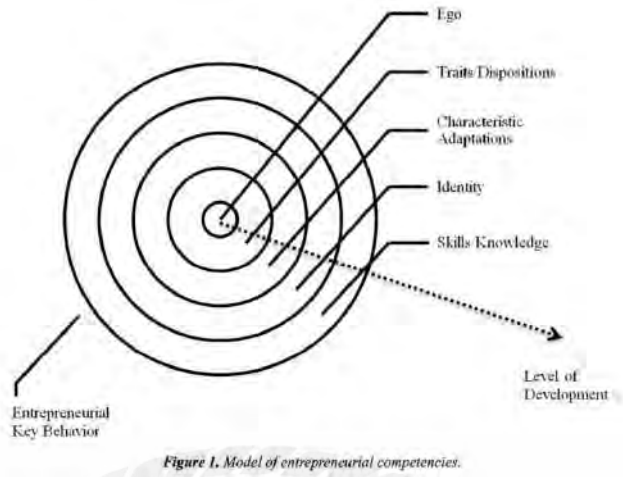


Figure 2.2 Model of Entrepreneurial Competencies

Arafeh, L. (2016). An entrepreneurial key competencies model. *Journal of Innovation and Entrepreneurship*, *5*, 1–26.

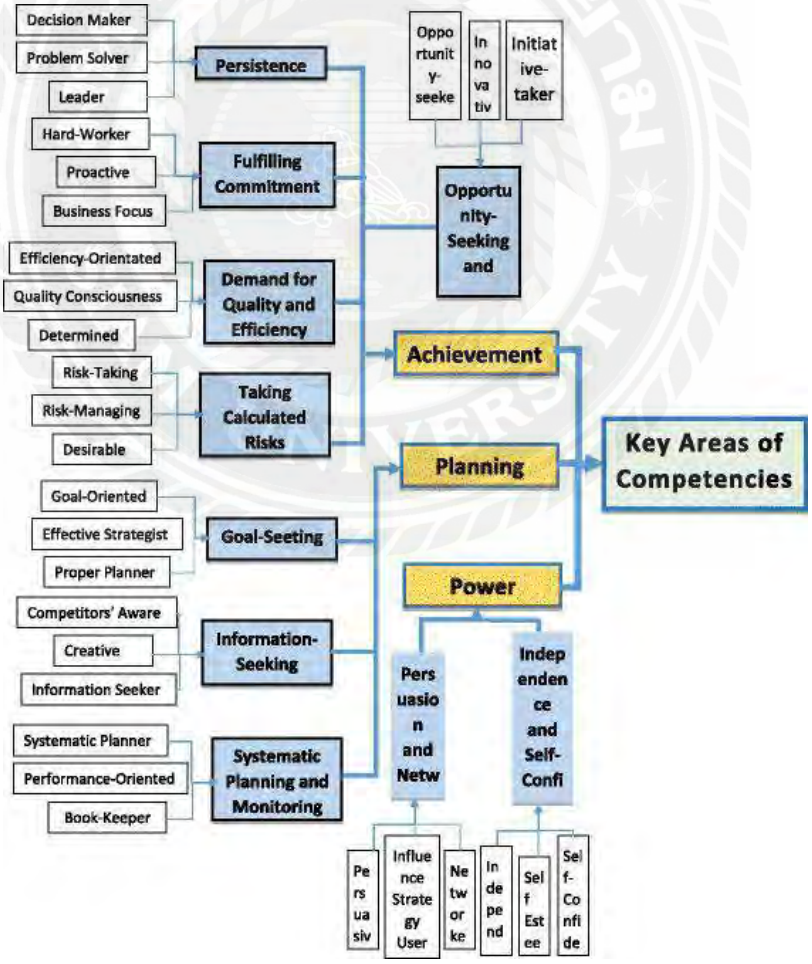


Figure 2.3 Three-Cluster Entrepreneur Competencies' Block Diagram

Jardim, J. (2021). entrepreneurial skills to be successful in the global and digital world: Proposal for a frame of reference for entrepreneurial education. *Education Sciences*, *11*(7), 356.

Table 2.1 Reference Framework for Global Entrepreneurial Skills

Focus and Openness to No-Velty	Value Creation	Effective Communication
Creativity and innovation	Strategic planning and evaluation	Clear and visual communication
Spirit of initiative	Problem-solving and decision-making	Teamwork and networking
Self-efficacy and resilience	Transformational leadership	Digital communication

Although college students at local application-oriented universities need to develop six entrepreneurial skills—inventiveness, opportunity identification, market analysis, decision-making, connectivity, and strategizing—these skills are not of the same dimension or equally important, nor are they unrelated to each other. Colleges in the central region of China offer courses such as "Fundamentals of College Students' Innovation and Entrepreneurship" or "Entrepreneurship Training," which aim to cultivate students' abilities in innovation and entrepreneurship. Interviews with teachers of these local entrepreneurship courses reveal that the final assessment requires students to complete a fully structured Strategizing (reflecting strategizing). Before this, students first need to have a foundation in innovation and entrepreneurship (Inventiveness), be able to identify entrepreneurial opportunities (Opportunity Identification), and possess decision-making abilities (Decision-making). They must also develop Market analysis (Market) and coordinate multiple resources (Connectivity). This analysis constructs an entrepreneurial skill enhancement model with Inventiveness, Opportunity Identification, Problem-solving, and Decision-Making as independent variables, Market analysis, Connectivity as mediating variables, and strategizing as the dependent variable. The theoretical framework, illustrated in Figure 5 below, serves as the intellectual foundation for exploring and understanding entrepreneurship education, particularly in the context of international and Chinese universities.

Entrepreneurship education is not just about theory but about practical application. It has two main dimensions: enterprise skills and an entrepreneurial thinking mindset. Entrepreneurial thinking encompasses practical academic knowledge, skills, techniques, and the ability to seize opportunities. Moreover, enterprise skills encompass business skills, knowledge, attitude, initiative, independence, creativity, problem-solving, leadership, and flexibility toward change. These are concepts to be understood and skills to be honed and applied (Dou et al. 2019). The synthesis of entrepreneurial skills drawn from various sources, including research papers, articles, and books on entrepreneurship education, includes (1) inventiveness; (2) opportunity identification; (3) market analysis ; (4) decision-making; (5) connectivity; (6) strategizing; (7) financial management and accounting; (8) marketing and sales; (9) leadership; (10) risk assessment; (11) resilience and adaptability; (12) time management; and (13) ethical and social responsibility. Due to limited time and space, this research will only focus on the following six constructs:

(1) Inventiveness

Creativity involves generating new and original ideas, concepts, and solutions to problems. It requires thinking outside the box and developing novel approaches to address challenges.

On the other hand, innovation refers to implementing creative ideas and transforming them into tangible and valuable outcomes. It involves taking risks, testing and refining concepts, and creating something new that has a positive impact on society, the environment, or the economy.

Under entrepreneurship education, inventiveness is not merely a tool but a catalyst for change. They are essential components for developing successful businesses and ventures. Students are encouraged to cultivate their creative and innovative skills and leverage them to disrupt existing markets and create new ones. This involves teaching students how to identify problems, generate novel ideas, and develop solutions that address Market analysis needs and opportunities. By fostering inventiveness, entrepreneurship education can help students develop an entrepreneurial mindset, enabling them to transform their ideas into successful ventures. (Maritz et al., 2020; Rae, 2007).

(2) Opportunity Identification

Opportunity identification is a crucial aspect of entrepreneurship education that involves recognizing and evaluating potential business opportunities. It requires students to develop the ability to identify Market analysis gaps, emerging trends, and unmet customer needs while devising innovative solutions that can lead to the creation of successful businesses.

Entrepreneurship education programs aim to teach students how to identify, evaluate, and capitalize on potential opportunities through a combination of theoretical knowledge, practical experience, and critical thinking skills. (Kuratko, 2005). This involves developing skills such as market analysis research, customer discovery, and value proposition development, which are essential for identifying and validating potential business opportunities. By instructing students on identifying and exploiting opportunities, entrepreneurship education can foster innovation, economic growth, and job creation (Shan et al., 2018).

(3) Market Analysis

Market analysis skills are essential components of entrepreneurship education. They involve gathering and analyzing information about target markets, customers, and competitors. These skills include data collection, analysis, and market analysis segmentation, which are crucial for making informed decisions and creating effective marketing strategies.

According to Moustaghfir and Secundo (2016), research and analysis skills are critical for identifying Market analysis opportunities and developing competitive advantages. Entrepreneurship education programs aim to teach students how to conduct market analysis through a combination of theoretical knowledge, practical experience, and critical thinking skills (Kuratko, 2005). This includes developing skills such as survey design, focus group facilitation, and statistical analysis, which are crucial for collecting and analyzing data effectively. By teaching students how to conduct Market analysis, entrepreneurship education can help increase the likelihood of success for new ventures and reduce the risk of failure (Zou, 2003).

(4) Decision-Making

Decision-making skills are essential components of entrepreneurship education. These skills involve identifying and addressing business challenges while making informed decisions to achieve business goals. This decision-making process involves critical thinking, analysis, and strategic skills, which are crucial for developing practical solutions and effective strategies.

Shi (2013) stated that decision-making skills are critical for entrepreneurs to succeed in uncertain and dynamic environments. Entrepreneurship education programs aim to teach students how to develop these skills through a combination of theoretical knowledge, practical experience, and critical thinking exercises (Kuratko, 2005). This includes developing skills in problem identification, idea generation, and alternative evaluation to address complex business challenges.

(5) Connectivity

Connectivity involves soft skills students use to create and maintain relationships with individuals and communities. These skills include communication, relationship building, and teamwork, which are essential for business success.

According to Hitt et al. (2001), collaboration skills are critical for entrepreneurs to access resources, information, and support from others. Entrepreneurship education programs aim to teach students how to develop these skills through a combination of theoretical knowledge, practical experience, and networking events (Kuratko, 2005). This includes developing skills such as relationship building, effective communication, and negotiation, which are essential for creating partnerships and collaborations.

Moreover, connectivity is essential for innovation and knowledge sharing (Yong, 2019)). By bringing together individuals with diverse perspectives and expertise, entrepreneurs can generate new ideas, create synergies, and develop innovative solutions to complex problems.

(6) Strategizing

Strategic skills are essential components of entrepreneurship education. They involve creating a roadmap to achieve business goals and developing a plan to allocate resources effectively.

According to Bauman and Lucy (2021), strategizing skills are critical for entrepreneurs to create a vision and mission for their business. These skills are essential for developing and translating a vision and mission into actionable plans. Entrepreneurship education programs aim to teach students how to develop business planning, strategizing, and strategy development skills through a combination of theoretical knowledge, practical experience, and case studies (Kuratko, 2005). This includes skills such as Market analysis research, SWOT analysis, and scenario planning, which are crucial for creating effective business plans and strategies. By teaching students how to develop these skills, entrepreneurship education can increase the likelihood of success for new ventures and enable entrepreneurs to make informed decisions about resource allocation and risk management (Bauman & Lucy, 2021). Moreover, business planning, strategizing, and strategy development are essential for adapting to changes in the business environment and gaining a competitive advantage

(Pittaway & Cope, 2007). By developing effective business strategies, entrepreneurs can position their businesses for success and achieve their long-term goals.

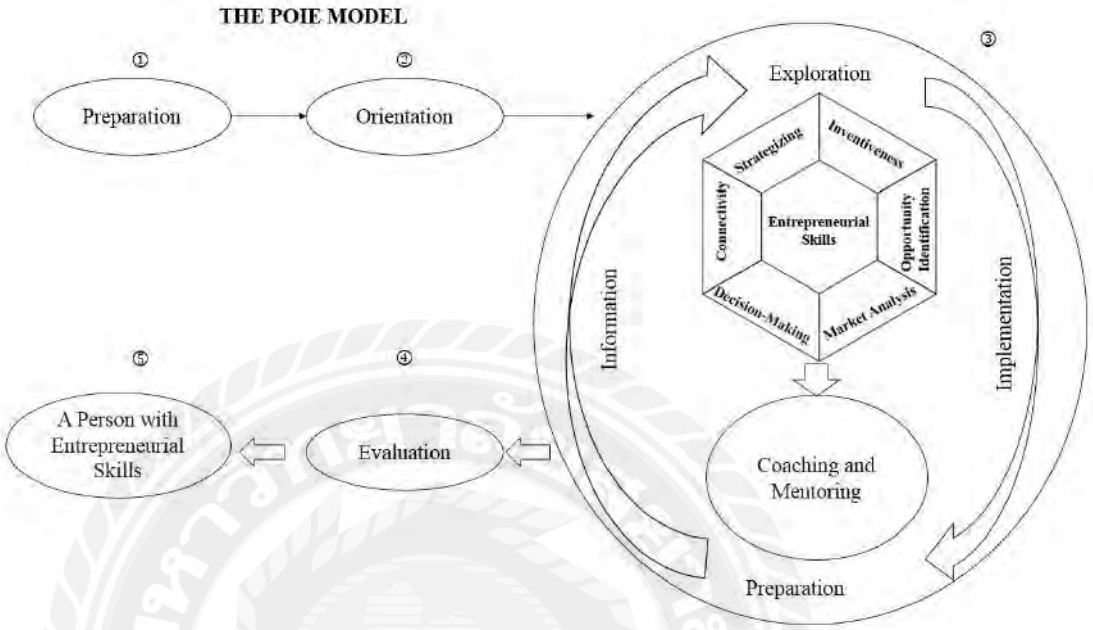


Figure 2.4 Theoretical Framework

Source: Researcher

China's entrepreneurship education policy can be further explained by the strategies outlined in the "14th Five-Year" Plan (2021), which includes:

(1) Opening New Horizons for the Rise of Central China Central China is committed to creating significant advanced manufacturing bases, enhancing independent innovation capabilities in critical sectors, establishing itself as an open hub in inland regions, and reinforcing an ecologically sustainable development pattern. These efforts aim to accelerate the region's growth in Central China.

(2) Igniting Innovation Vitality in Talent

It includes deepening the reform of talent development systems and mechanisms, fostering talent comprehensively through education, recruitment, and effective utilization, and fully leveraging talent as the primary resource.

(3) Promoting In-Depth Development of Innovation, Entrepreneurship, and Creation

It fosters a culture of innovation and entrepreneurship that values dedication, precision, focus, and tolerance for failure. Additionally, it emphasizes promoting the spirit of science and craftsmanship, conducting widespread scientific dissemination activities, strengthening guidance and cultivating scientific interests among young people, fostering a society that loves science and champions innovation, and enhancing the overall scientific literacy of the population.

The economists Theodore Schultz and Gary Becker noted in the 1960s that investing in education and training may increase productivity (Teixeira, 2014). Gary

Becker published his monograph Human Capital in 1964, which was essentially an extension of the papers he had written in 1960 and 1962 (Sobel, 1978), the latter of which contained most of the theoretical framework and provided a thorough overview of what was already being referred to as “Human Capital Theory.” He defined human capital as “activities that influence future monetary and psychic income by increasing resources in people” (Becker, 2009), and its primary principal forms were schooling and on-the-job training.

The opportunity cost of attending school decreased as the world's physical capital increased. Workforce diversity has become increasingly crucial as the world's physical capital has become more dependent on education (Becker, 2009). The human capital theory views schooling as an investment in skills, which contributes to improvements in productivity (Schultz, 1972).

The Human Capital Theory provides a theoretical foundation for understanding how entrepreneurship education in Central China can contribute to regional development. Becker and Schultz’s theories emphasize that education and training are investments in human capital, enhancing students' skills and productivity. Entrepreneurship education will likely improve productivity and foster regional economic growth by equipping individuals with Entrepreneurial Skills and knowledge. Meanwhile, as mentioned, the opportunity cost of attending school decreases as physical capital increases. In China, particularly within the evolving financial landscape of Central China, the opportunity cost of entrepreneurship education may change. Considering how these changing opportunity costs influence students’ choices regarding entrepreneurship education and starting their businesses is essential.

Moreover, the theories also highlight the increasing dependence of workforce diversity on education. In the context of Central China’s push for innovation and entrepreneurship, understanding how education, particularly entrepreneurship education, influences the diversity and skills of the regional workforce is crucial. The Human Capital Theory views schooling as an investment in skills that improve productivity.

Table 2.2 Summary of the Six Entrepreneurial Skills in Literature

Thesis	**Author(s)**	**Year**	**Skill**					
			(1) Creativity and Innovation	**(2) Opportunity Identification**	**(3) Market Research and Analysis**	**(4) Problem-solving and Decision-making**	**(5) Networking and Collaboration**	**(6) Business Planning and Strategy**
Experiential learning in entrepreneurship education: A systematic literature review	Motta & Galina	2023	√	√	-	√	√	√
Entrepreneurship Education: The Effects of Challenge-Based Learning on the Entrepreneurial Mindset of University Students	Colombelli et al.	2022	√	-	√	√	-	√
Entrepreneurship education: Time for a change in research direction?	Ratten & Usmanij	2021	√	√	√	-	-	√
Entrepreneurship Education through Successful Entrepreneurial Models in Higher Education Institutions	Boldureanu et al.	2020	√	√	√	√	-	√
From Offline to Online: Challenges and Opportunities for Entrepreneurship Education Following the COVID-19 Pandemic	Liguori & Winkler	2020	-	√	√	√	√	√
Enhancing entrepreneurial education: Developing competencies for success	Bauman & Lucy	2021	-	-	-	√	√	-

Thesis	Author(s)	Year	Skill					
			(1) Creativity and Innovation	(2) Opportunity Identification	(3) Market Research and Analysis	(4) Problem-solving and Decision-making	(5) Networking and Collaboration	(6) Business Planning and Strategy
A review paper on entrepreneurship education and entrepreneurs' skills	Almahry et al.	2018	√	√	√	√	√	√
Entrepreneurial intention among engineering students: The role of entrepreneurship education	Barba-Sánchez & Atienza-Sahuquillo	2018	√	√	-	√	-	-
Entrepreneurship Education for a Sustainable Future	Lindner	2018	√	√	-	√	√	√
Entrepreneurship Education: An Experimental Study with Information and Communication Technology	Wu et al.	2018	√	-	-	√	-	√
Insights for Shaping Entrepreneurship Education: Evidence from the European Entrepreneurship Centers	Ndou et al.	2018	√	√	-	√	√	-

Table 2.3 Research on the Six Entrepreneurial Skills within the Past Five Years, 2018 to 2023

Entrepreneurial Skill	Research	Author (Year)
Inventiveness	Entrepreneurial intention: Creativity, entrepreneurship, and university support. Journal of Open Innovation: Technology, Market analysis, and Complexity, 7(1), 11. Entrepreneurial self-efficacy and intention: Do entrepreneurial creativity and education matter? International Journal of Entrepreneurial Behavior & Research, 25(2), 259-280. Factors affecting "entrepreneurial culture": the mediating role of creativity. Journal of Innovation and Entrepreneurship, 8(1), 1-12. Entrepreneurship education enhances entrepreneurial creativity: The mediating role of entrepreneurial inspiration—The International Journal of Management Education, 20(2), 100570. Adaptive creativity and innovative creativity. In Encyclopedia of creativity, invention, innovation, and entrepreneurship (pp. 36-39). Cham: Springer International Publishing.	Anjum, T., Farrukh, M., Heidler, P., & Díaz Tautiva, J. A. (2020). Shahab, Y., Chengang, Y., Arbizu, A. D., & Haider, M. J. (2019). Danish, R. Q., Asghar, J., Ahmad, Z., & Ali, H. F. (2019). Wang, C., Mundorf, N., & Salzarulo-McGuigan, A. (2022). Kim, K. H., & Williams, N. (2020).
Opportunity Identification	Building networks into discovery: The link between entrepreneur network capability and entrepreneurial opportunity discovery. Journal of Business Research, 85, 197-208. Exploring the relation between individual moral antecedents and entrepreneurial opportunity identification for sustainable development. Journal of Cleaner Production, 172, 1582-1591. Entrepreneurship as a career choice: The impact of locus of control on aspiring entrepreneurs' opportunity identification. Journal of Business Research, 98, 227-235.	Shu, R., Ren, S., & Zheng, Y. (2018). Ploum, L., Blok, V., Lans, T., & Omta, O. (2018). Asante, E. A., & Affum-Osei, E. (2019).
Market analysis	Entrepreneurial marketing: Between entrepreneurial personality traits and business performance. Entrepreneurial Business and	Sarwoko, E., & Nurfarida, I. N. (2021).

Entrepreneurial Skill	Research	Author (Year)
	Economics Review, 9(2), 105-118. Acquisition of entrepreneurial skills and competencies: Curriculum development and evaluation for higher education. Journal of Entrepreneurship Education, 22(1), 1-12. entrepreneurial skills to be successful in the global and digital world: Proposal for a frame of reference for entrepreneurial education. Education Sciences, 11(7), 356.	Akhmetshin, E. M., Mueller, J. E., Yumashev, A. V., Kozachek, A. V., Prikhodko, A. N., & Safonova, E. E. (2019). Jardim, J. (2021).
Decision-making	Prioritizing successful entrepreneurial skills: An emphasis on the perspectives of entrepreneurs versus aspiring entrepreneurs. Thinking Skills and Creativity, 34, 100603. Identifying and understanding entrepreneurial decision-making logic in entrepreneurship education. International Journal of Entrepreneurial Behavior & Research, 24(1), 59-80. Assessing Students' Entrepreneurial Skills: Enhancement Needed in the Knowledge Economy. Management & Marketing, 13(3), 1119-1132.	Hatthakijphong, P., & Ting, H. I. (2019). Ilonen, S., Heinonen, J., & Stenholm, P. (2018). Bejinaru, R. (2018).
Connectivity	The Importance of Networking in Entrepreneurship: Montreal's Artificial Intelligence Cluster and Its Born-Global Firm, Element AI. Journal of Small Business & Entrepreneurship, 30(1), 1-8. Enhancing entrepreneurial education: Developing competencies for success. The International Journal of Management Education, 19(1), 100293. University-based education and the formation of entrepreneurial capabilities. Entrepreneurship Education and Pedagogy, 1(4), 304-329.	Turkina, E. (2018). Bauman, A., & Lucy, C. (2021). Lee, Y., Kreiser, P. M., Wrede, A. H., & Kogelen, S. (2018).
Strategizing	Business education students require entrepreneurial planning and organizational skills, which are essential for those in the Southeast states. Students in public universities	Ezeabii, I. C. (2018). Ferreras-Garcia, R., Hernández-Lara, A. B., & Serradell-

Entrepreneurial Skill	Research	Author (Year)
	in the Southeastern states of Nigeria require entrepreneurial planning and organizational skills for self-employment. Nigerian Journal of Business Education (NIGJBED), 4(2), 216-226. Entrepreneurial competencies are a set of competencies in a higher education Strategy course. Education+ Training, 61(7/8), 850-869. Comparing effectuation to discovery-driven planning, prescriptive entrepreneurship, Business Planning, strategizing, lean startup, and design thinking. Small Business Economics, 54, 791-818.	López, E. (2019). Mansoori, Y., & Lackéus, M. (2020).

2.5 Selection of the Six Entrepreneurial Skills

The selection of entrepreneurial skills constitutes a foundational step in this research. This section clarifies the meticulous process of compiling a synthesized list of skills from a comprehensive literature review. It outlines the specific skills chosen for in-depth examination, highlighting the importance of this selection in aligning with the research objectives.

2.5.1 Compilation of Synthesized Skills

A meticulous synthesis was conducted to create a comprehensive list of entrepreneurial skills, merging insights from various sources in entrepreneurship education. The synthesized list covers various skills entrepreneurs need for success, as illustrated in Table 1 below.

Table 2.4 Synthesized List of Entrepreneurial Skills

Entrepreneurial Skill	Definition	Reference
1. Inventiveness	The ability to think creatively and generate innovative ideas, products, or services.	Baluku (2019)
2. Opportunity Identification	We are recognizing and capitalizing on opportunities for new ventures or improvements.	Shan et al. (2018); Fayolle (2021)
3. Market	We gather, interpret, and apply Market analysis information to make business decisions.	Wilson et al. (2007)
4. Decision-making	They are effectively addressing challenges and making sound decisions in various entrepreneurial contexts.	Fetters et al. (2010)
5. Connectivity	We are building and maintaining relationships, leveraging social networks, and collaborating with others for mutual benefit.	Shan et al. (2018)

Entrepreneurial Skill	Definition	Reference
6. Strategizing	It develops comprehensive Strategizing to guide the venture toward its goals.	Ji & Yue (2019)
7. Financial Management and Accounting	We effectively manage financial resources and maintain accurate financial records.	Kassean et al. (2015)
8. Marketing and Sales	Understanding Market analysis needs, promoting products or services effectively, and closing sales.	Hitt et al. (2001)
9. Leadership	Providing vision, direction, and guidance to a team or organization.	Kuratko & Hodgetts (2004)
10. Risk Assessment	We identify, evaluate, and mitigate potential risks associated with entrepreneurial activities.	Kuratko & Hodgetts (2004)
11. Resilience and Adaptability	I could bounce back from setbacks and adapt to changing circumstances.	Cooper et al. (2011)
12. Time Management	It effectively allocates and utilizes time to achieve goals and meet deadlines.	Ensign & Farlow (2016)
13. Ethical and Social Responsibility	We conduct our business ethically and consider the social impact of our entrepreneurial activities.	Capoano & Ranieri (2016)

2.5.2 Identifying Entrepreneurial Skills

An extensive literature review establishes the foundation for selecting entrepreneurial skills for this research, ensuring a strong understanding of the range and significance of skills essential in entrepreneurship education.

Below, a synthesis table was created to organize and systematically compare the identified entrepreneurial skills. Table 2.2 includes columns for each skill, its definition, and the frequency of mention. The table acts as a comprehensive reference point for the final selection of six skills that will be the primary focus of the research.

Table 2.5 Identified Entrepreneurial Skills

Entrepreneurial Skill	Definition
Inventiveness	The ability to generate novel ideas and solutions fosters a culture of innovation within entrepreneurial endeavors (Sansone et al., 2021).
Opportunity Identification	The capacities to recognize and capitalize on Market analysis opportunities, anticipate trends, and align ventures with emerging needs (Fayolle et al., 2006; Shan et al., 2008).
Market	Skills in comprehending Market analysis dynamics, consumer behavior, and industry trends enable informed decision-making in business strategy (Wilson et al., 2007).
Decision-making	Cognitive abilities are crucial for addressing challenges effectively and making informed decisions that contribute to business success (Zhang, 2018; Fayolle & Gailly, 2008).

Entrepreneurial Skill	Definition
Connectivity	Interpersonal skills aimed at building valuable connections and fostering collaborations with stakeholders, contributing to overall venture growth (Sansone et al., 2021; Gibb, 2002).
Strategizing	Precise Business Planning and Strategies, goal-setting, and strategic development are essential for sustainable growth and success (Piperopoulos & Dimov, 2015; Hannon, 2006).

Ismail and Sawang's comprehensive exploration of the significance of inventiveness in entrepreneurship underscores this concept (Sansone et al., 2021). Studies published in renowned journals such as the Journal of Business Venturing (Dominik & Graham, 2018) and Entrepreneurship Theory and Practice (Baum & Friel, 2017) further reinforce this idea, emphasizing the pivotal role of creativity in the entrepreneurial process.

Literature sources, such as "Opportunity Identification and Pursuit: Does an Entrepreneur's Human Capital Matter?" (Fayolle et al., 2006), contribute to understanding that identifying opportunities is a critical entrepreneurial skill. These insights align with the seminal work of Shan et al. (2018), which has had a significant influence on the field.

The importance of Market analysis as an entrepreneurial skill is well established. Journals like the International Journal of Entrepreneurship and Small Business (Wilson et al., 2007) delve into the intricacies of Market analysis research, emphasizing its role in shaping successful entrepreneurial ventures.

The foundational skills of decision-making in entrepreneurship are recurring themes in seminal works, such as "The Art of Problem Solving" by Zhang (2018) and "Decision Making in the Entrepreneurial Process" by Fayolle & Gailly (2008). These sources provide valuable insights into the cognitive processes that contribute to effective decision-making.

Entrepreneurship is inherently social, and the importance of connectivity is emphasized in works like "Social Networks and Entrepreneurship" by Sansone et al., (2021) and "The Strength of Weak Ties" by Gibb (2002). These studies underscore the importance of interpersonal skills in attaining entrepreneurial success.

Literature, including the work of Piperopoulos and Dimov (2015) on The Corporate Strategy Process, emphasizes the necessity of effective strategizing formulation. This aligns with the broader discourse on strategy in entrepreneurship (Hannon, 2006).

The comprehensive literature review establishes the foundation for the subsequent steps in the selection process, ensuring that the selected entrepreneurial skills is theoretically grounded and backed by empirical evidence from various sources in the field.

Table 2.6 Comparison of the Six Entrepreneurial Skills Taught in University Programs and Company Requirements

Entrepreneurial Skill	Manifestation in University Programs	Companies' Required Skills
Inventiveness	- Design and Innovation Courses - Entrepreneurship Competitions -Research and Development Programs	- Technology Startups -Creative Agencies Product Development Firms
Opportunity Identification	- Entrepreneurship Courses: Strategizing -Competitions, Case Studies, and Workshops	- Market analysis Research -Firms Venture Capital -Firms Strategic Planning -Units
Market	- Marketing Courses, Business Analytics Programs -Market analysis Research Projects	- Market analysis, Firms - Consulting Companies - Consumer Insights Teams
Decision-making	- Problem-solving Workshops - Business Strategy Courses - Case Studies and Simulation Exercises	- Management Consulting Firms - Operations Management Teams - Risk Management Departments
Connectivity	- Networking Events and Clubs - Collaborative Projects and Teams - Guest Speaker Lectures	- Business Development Teams - Sales and Marketing Units - Entrepreneurial Ecosystems
Strategizing	- Entrepreneurial Finance Courses - strategizing Projects - Strategy and Innovation Programs	- Startup Incubators - Strategic Planning Units - Business Accelerators

Table 2.6 outlines where the six entrepreneurial skills typically manifest within university programs, and 18 types of companies require these skills.

2.6 Operational Definition of Entrepreneurial Skills

Entrepreneurial skills are considered essential for promoting innovation and driving economic growth. Many universities have recognized the importance of developing these skills among their students and have established models and programs to enhance students' entrepreneurial competencies. This section will explore existing university models that aim to enhance students' entrepreneurial skills.

Undoubtedly, entrepreneurship education models play a crucial role in shaping students' entrepreneurial development. These models provide a framework for integrating entrepreneurship education into the curriculum and co-curricular activities. The "Models for Entrepreneurship Education in Higher Education Institutions" issued by the Ministry of Education in China emphasizes experiential learning, innovative thinking, and practical skill development (Ministry of Education China, 2017). Implementing such models can increase exposure to real-world business scenarios, hands-on experiences, and mentorship, enhancing students' Entrepreneurial Skills and readiness for the business world.

2.6.1 Types of Operational Model

Operational models for enhancing entrepreneurial skills vary in their approaches. Some emphasize experiential learning, exposing students to real-world business scenarios and challenges. Others may adopt a more theoretical foundation, blending classroom instruction with practical applications. Hybrid models often combine mentorship, industry collaborations, and immersive projects to provide a comprehensive learning experience.

In Central China, several universities have implemented various models and programs to cultivate entrepreneurial skills among their students. Hubei University, for example, is dedicated to fostering entrepreneurship through a multifaceted approach. One notable initiative is the operation of a startup incubator that serves as a hub for aspiring student entrepreneurs. The incubator provides essential resources, including workspace, mentorship, and access to funding opportunities (China Daily, 2020). The university also offers entrepreneurship courses covering vital topics, including Strategizing and financial management (Hubei University, 2023). Additionally, it hosts annual Strategizing competitions, providing students with a platform to pitch their ideas and secure seed funding for their ventures (Hubei University, 2023).

Hunan Normal University has adopted a practical entrepreneurship framework to bridge the gap between academic knowledge and real-world business challenges. This framework includes partnerships with local industries, allowing students to engage in industry-specific projects. Students are encouraged to undertake startup internships, gaining valuable hands-on experience (Wang et al., 2020). The university has also established innovation labs equipped with modern technology, enabling students to prototype innovative ideas and develop market-ready products (Wu, 2023).

Anhui University's approach to enhancing entrepreneurial skills includes a comprehensive set of models and initiatives. The university offers various entrepreneurship electives, enabling students to select courses that align with their interests and career aspirations. Students are paired with experienced entrepreneurs who serve as mentors, offering practical guidance. Additionally, Anhui University supports student startups by providing access to seed funding and following well-defined application and selection procedures.

Wuhan University is distinguished by its emphasis on cross-disciplinary collaboration in entrepreneurship education (Zhou & Xu, 2012). Students from diverse academic backgrounds are encouraged to form interdisciplinary teams, fostering creativity and the integration of various skill sets (Wuhan University, 2023).

Central South University has introduced a Student Entrepreneurship Association for its students. The association organizes innovation and entrepreneurship activities to help students connect with like-minded partners through a comprehensive team-building platform. It assists them in forming project teams with one-on-one guidance from professional mentors and a comprehensive project incubation process (Ceng, 2015). In summary, universities in Central China are actively investing in entrepreneurship education by implementing various models and programs.

In addition to entrepreneurship-specific models, universities often offer broader models that promote student innovation and creativity. These models encourage

students to think critically, challenge conventions, and generate innovative ideas across various disciplines. In addition to the universities in Central China, there are also universities abroad. For example, Stanford University's "Design Thinking Bootcamp" provides students with a structured process for creative problem-solving and encourages entrepreneurial thinking (Shi, 2013). Such initiatives equip students with valuable skills for identifying opportunities, generating ideas, and solving complex problems, which are essential to entrepreneurial skill development.

Models for enhancing entrepreneurial skills could also encompass the development of soft skills and leadership qualities. These skills are crucial for effective communication, teamwork, and project management, which are fundamental in entrepreneurial ventures. For instance, the "Leadership Development Framework" at the University of Oxford focuses on cultivating students' leadership potential by providing mentorship, workshops, and experiential learning opportunities (Rae, 2007). The "Leadership Development Framework" is based on leadership competency models widely utilized in educational and professional settings to cultivate leadership skills. It is a structured model emphasizing mentorship, skill-building workshops, and experiential learning as essential components. This framework highlights its mentorship programs, workshops, and experiential learning opportunities. These aspects align with fostering soft skills and leadership qualities in students, such as effective communication, teamwork, and navigating entrepreneurial challenges. By developing these competencies, students can better navigate challenges, inspire teams, and lead successful ventures.

Some models emphasize industry collaboration and networking opportunities to enrich students' entrepreneurial experiences. Collaborations with local businesses, startups, and established entrepreneurs offer students practical insights into real-world entrepreneurship. The university-based "Entrepreneurship Ecosystem" at Babson College facilitates networking with alumni entrepreneurs, venture capitalists, and industry experts, providing students with valuable connections and mentorship (Solomon, 2008). Exposure to such networks and resources can significantly enhance students' entrepreneurial skills and increase their chances of success in the entrepreneurial landscape.

2.6.2 Definition of Entrepreneurial Skill Enhancement Model

The entrepreneurial skill enhancement model is fundamentally a strategic framework designed to facilitate the development and enhancement of individuals' entrepreneurial competencies. It is a structured guide for educational institutions, providing a road map for integrating entrepreneurial skills into curricula and programs. This definition encompasses various approaches, methodologies, and techniques that systematically foster an entrepreneurial mindset and capabilities.

Studies have consistently highlighted the value of incorporating entrepreneurship education into university curricula to foster students' entrepreneurial intentions and outcomes. Research conducted by Handayati et al. (2020) underlines the significant positive relationship between the learning environment of entrepreneurship education and students' entrepreneurial intentions in higher education institutions. The environment plays a crucial role in shaping students' perceptions and attitudes toward entrepreneurship. Students are more likely to develop a positive entrepreneurial

mindset when universities create a supportive and stimulating atmosphere that encourages creativity, risk-taking, and problem-solving. Access to specialized courses, workshops, and practical experiences in entrepreneurship equips students with the knowledge and skills to confidently venture into entrepreneurship. Moreover, Zhang and Ye (2022) emphasize the pivotal role of practical experiences and mentorship in enhancing students' entrepreneurial skills. Real-world exposure and hands-on experiences give students a deeper understanding of the challenges and opportunities associated with entrepreneurship. Students gain valuable insights into various business operations, including product development, marketing, and financial management, by engaging in internships, startup incubators, or entrepreneurial competitions.

2.6.3 Operational Definition of Entrepreneurial Skills

The entrepreneurial skill enhancement model proposed in this research represents a strategic framework designed to systematically enhance and develop students' entrepreneurial competencies at application-oriented universities in Central China. This model encompasses a comprehensive approach to integrating entrepreneurial skills into educational programs, ensuring that students are well-prepared to meet the demands of the labor market.

This model's core focuses on enhancing essential entrepreneurial skills, including opportunity identification, risk management, connectivity, business planning and strategizing, innovation, creativity, leadership, and teamwork. These competencies are critical for navigating the complexities of the modern business environment and are integral to the overall framework. The curriculum design aspect of the model emphasizes integrating theoretical knowledge with practical applications, employing an interdisciplinary approach, and tailoring it to cater to the diverse needs of students. This ensures the educational content is relevant and adaptable to different entrepreneurial contexts.

Table 2.7 Operational Definition of Entrepreneurial Skills

Variable	Definition	Item	Reference	Option
Inventiveness	An individual's psychological tendency to start a business is shaped by entrepreneurial self-efficacy, influenced by university support, entrepreneurship education, and entrepreneurial creativity.	I typically propose various solutions or creative ideas when faced with an entrepreneurial project.	Awasthy et al. (2020).	1 (Strongly Disagree) - 5 (Strongly Agree)
		My university encourages inventiveness in its programs and activities.	Shi (2013)	1 (Strongly Disagree) - 5 (Strongly Agree)
		I often participate in various creative competitions and innovation and entrepreneurship activities.	Dominik & Graham (2018).	1 (Strongly Disagree) - 5 (Strongly Agree)

Variable	Definition	Item	Reference	Option
		I can think creatively to solve problems in academic or personal projects.	Wang et al. (2020).	1 (Strongly Disagree) - 5 (Strongly Agree)
Opportunity Identification	The ability of individuals to identify and evaluate potential business opportunities is influenced by their networking capabilities, moral foundations, and internal locus of control.	I can easily identify and evaluate potential entrepreneurial opportunities.	Sansone et al. (2021).	1 (Strongly Disagree) - 5 (Strongly Agree)
		My university provides adequate resources to help me identify entrepreneurial opportunities.	Phillips (2019)	1 (Strongly Disagree) - 5 (Strongly Agree)
		I actively identify opportunities in my environment (e.g., Market analysis gaps, business ideas).	Al-Atabi & DeBoer (2014)	1 (Strongly Disagree) - 5 (Strongly Agree)
Market Analysis	Competencies and personal traits—including creativity, risk-taking, innovation, and strategic thinking—acquired through education and experience, enabling individuals to effectively recognize opportunities, implement entrepreneurial marketing, and achieve business success in a global and digital context.	I feel confident conducting Market analysis research to analyze customer needs and Market analysis trends.	Secundo et al. (2021).	1 (Strongly Disagree) - 5 (Strongly Agree)
		My university has equipped me with the skills necessary for market analysis.	Almahry et al. (2020)	1 (Strongly Disagree) - 5 (Strongly Agree)
		I frequently apply market analysis skills to my projects.	Sansone et al. (2021)	1 (Strongly Disagree) - 5 (Strongly Agree)
Decision-Making	Decision-making： The cognitive and analytical skills to identify challenges, evaluate alternatives, and make timely, effective decisions to drive business innovation and overcome uncertainty.	I am confident in my ability to solve complex problems and make decisions.	Handayati et al. (2020)	1 (Strongly Disagree) - 5 (Strongly Agree)
		My university provides practical training to develop my problem-solving skills.	Fuzi (2015)	1 (Strongly Disagree) - 5 (Strongly Agree)
		I can compare multiple options and make the optimal choice.	Fuzi (2015)	1 (Strongly Disagree) - 5 (Strongly Agree)

Variable	Definition	Item	Reference	Option
		I can effectively analyze information to make decisions under uncertainty.	Bellotti et al. (2014).	1 (Strongly Disagree) - 5 (Strongly Agree)
Connectivity	Connectivity： The ability to build, maintain, and leverage relationships with stakeholders, partners, and peers to access resources, share knowledge, and co-create value in entrepreneurial contexts.	My family can provide me with the network of resources needed to start a business.	Teixeira (2014).	1 (Strongly Disagree) - 5 (Strongly Agree)
		My university facilitates networking opportunities with professionals and entrepreneurs.	Bauman & Lucy (2021).	1 (Strongly Disagree) - 5 (Strongly Agree)
		I believe collaboration is essential for entrepreneurial success.	Lei (2023)	1 (Strongly Disagree) - 5 (Strongly Agree)
Strategizing	Strategizing： The capability to set business goals, allocate resources, and formulate actionable plans using structured frameworks to guide entrepreneurial ventures toward success.	I am familiar with creating business plans and Strategies.	Ensign & Farlow (2016)	1 (Strongly Disagree) - 5 (Strongly Agree)
		My university teaches practical strategies for Business Planning, Strategy, and execution.	Fetters et al. (2010)	1 (Strongly Disagree) - 5 (Strongly Agree)
		I believe that learning to strategize is very helpful for future career development.	Maritz et al. (2020)	1 (Strongly Disagree) - 5 (Strongly Agree)
		I feel confident in defining goals and strategies for Strategizing.	Fetters et al. (2010)	1 (Strongly Disagree) - 5 (Strongly Agree)

2.7 Conceptual Framework and Hypothesis

The research conceptual Framework was applied from the literature review in Chapter 2. The hypotheses were derived from the model reviewed above.

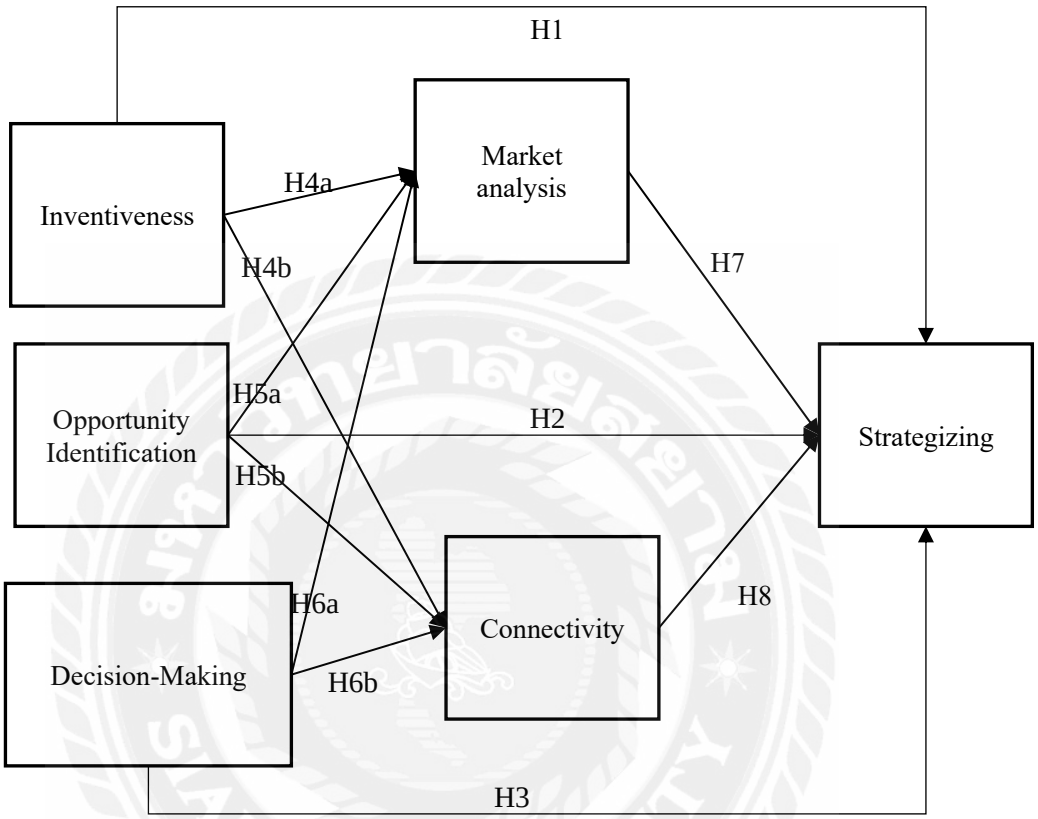


Figure 2.5 Conceptual Framework
Source: Researcher

H1: Inventiveness has a positive impact on strategizing.

H2: Opportunity identification has a positive impact on strategizing.

H3: Decision-making has a positive impact on strategizing.

H4a: Inventiveness has a positive impact on market analysis.

H4b: Inventiveness has a positive impact on connectivity.

H5a: Opportunity identification has a positive impact on market analysis.

H5b: Opportunity identification has a positive impact on connectivity.

H6a: Decision-making has a positive impact on market analysis.

H6b: Decision-making has a positive impact on connectivity.

H7: Market analysis has a positive impact on strategizing.

H8: Connectivity has a positive impact on strategizing.

This study takes strategizing as the core outcome variable to explore how entrepreneurial core competence affects individuals' strategy formulation and actions through direct or indirect paths.

The proposed framework conceptualizes strategic behavior as the outcome of both direct and mediated effects of entrepreneurial capabilities.

Specifically, creativity, opportunity recognition, and decision-making ability exert direct influences on strategic behavior, market insight and resource integration.

This framework advances understanding of the dynamic linkage between entrepreneurial capability structures and strategic behavior.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research Design

This chapter delineates the comprehensive research methodology employed to investigate the effectiveness of an entrepreneurship education development model in the Central Provinces of China. The primary objective is to develop an entrepreneurial skill enhancement model tailored for application-oriented universities in this region. The study seeks to identify the entrepreneurial skills enhancement essential for higher education students and align them with the skills demanded by the labor market. The research methodology combines qualitative and quantitative approaches to comprehensively analyze the entrepreneurial skills enhancement required by technological companies in Central China. The research employed a mixed-methods approach to capture in-depth insights and statistically significant patterns, providing a robust understanding of the entrepreneurial skill landscape.

A mixed-methods approach, combining quantitative and qualitative methods, was adopted to address the complexity of the research question and enhance the study's theoretical rigor and practical relevance. To adequately address the complexity of the research question and enhance both theoretical rigor and practical relevance, this study adopted a mixed-methods research design, specifically a sequential explanatory approach, which integrated quantitative and qualitative methods in a structured and purposeful manner. The rationale for employing a mixed-methods design was rooted in the multifaceted nature of entrepreneurial competencies, which were not only measurable constructs but also profoundly influenced by contextual and experiential factors.

In the first phase, quantitative data were collected through structured questionnaires and analyzed using Structural Equation Modeling (SEM) via the AMOS software. This allowed for the testing of hypothesized relationships among key dimensions of entrepreneurial skills and their direct or mediated effects on strategic behavior (i.e., Strategizing). The use of SEM enhanced the statistical rigor of the study by validating causal paths among variables.

However, entrepreneurial competencies are also highly context-sensitive and embedded in social, educational, and organizational realities. Therefore, a second qualitative phase was conducted to provide deeper insight into how these skills are perceived, developed, and applied in real-world settings. Semi-structured interviews were carried out with a purposive sample of educators, students, entrepreneurs, and HR professionals to explore implicit expectations, such as technical adaptability, communication, and teamwork elements that may not be fully captured in standardized questionnaires.

Moreover, the qualitative findings informed the development and contextual refinement of the survey instrument, ensuring that it reflected culturally relevant dimensions and the practical realities of Central China’s educational and labor market contexts. Triangulation of data sources and methods enhanced the validity and

reliability of the findings, enabling a more comprehensive understanding of entrepreneurial skills development. This mixed-methods approach aligns with international best practices in entrepreneurship education research and responds to the need for evidence-based policy and curriculum design in the regional context.

The design of the questionnaire was essential for data collection in this study. The process began with defining clear research objectives and questions. Next, a logical structure was developed, consisting of an opening, main body, and conclusion. Various question types were carefully selected, and attention was given to wording and sequencing. A pre-test was conducted to refine it, and finally, the finalized version was distributed through appropriate channels to gather relevant data efficiently.

The questionnaires were distributed to the students to understand the current situation of entrepreneurial skills enhancement education in application-oriented universities in Central China. The aim was to propose a new and improved model based on students' feedback.

3.2 Population and Sampling

3.2.1 Population and Sampling of Quantitative Research

In the study design, clarifying the study population and selecting the appropriate sampling method are key to ensuring the validity and reliability of the study results. The overall goal of this study was to establish the entrepreneurial skills enhancement model for applied students in central China, as this group was selected for its uniqueness and representativeness within the entire study. This study employed stratified random sampling to obtain representative samples within limited resources, effectively controlling for potential bias and ensuring that samples are evenly distributed across different levels. This approach enhances the universality of results and provides a solid foundation for subsequent analysis.

The study employed the Krejcie & Morgan (1970) estimation to determine the sample size. With the population of more than 25,000 respondents, a margin error of 5% and a confidence interval of 95%, the research needed at least 378 responses. Hence, to gather accurate data and address issues such as incompleteness, the study increased the sample size to 400 respondents from universities in Central China. Accordingly, the researcher divided the sample size into three clusters based on Central China's different universities through the stratified sampling technique. The estimation technique for the sample size, as suggested by Krejcie & Morgan (1970), is presented in the equation as follows:

$$S.Z = \frac{(X)^2(p)(1-p)(n)}{(X)^2(p)(1-p) + (n)(ME)^2}$$

Such that: S.Z (sample size), X^2 represents the chi-square at a 1%-degree confidence level, n denotes the population size, P implies the population proportion, and ME outlines the desired margin of error represented as a proportion of the sample size.

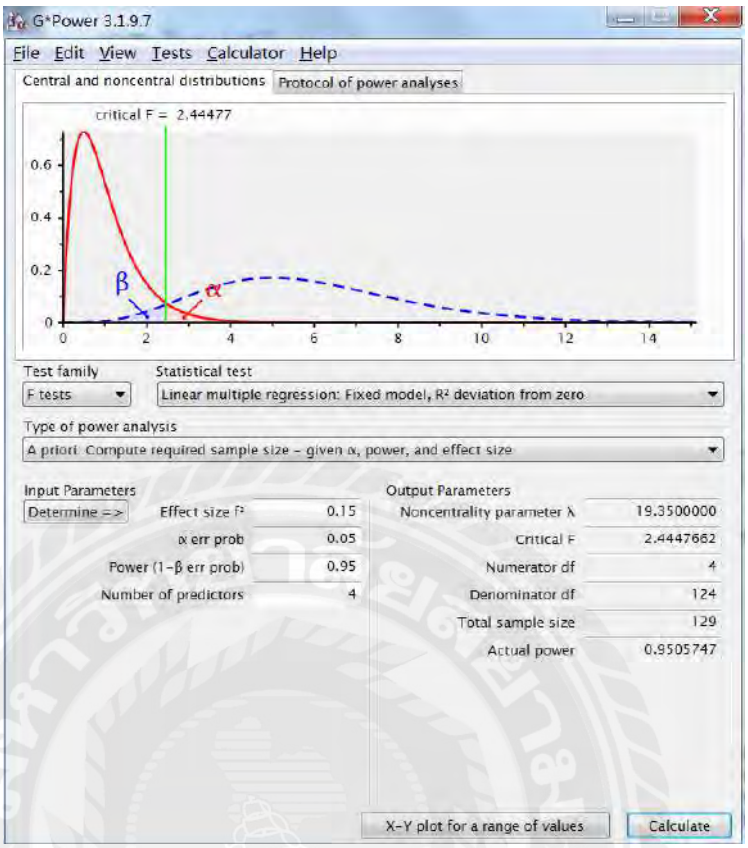


Figure 3.1 Calculation of Sample Size Sufficiency

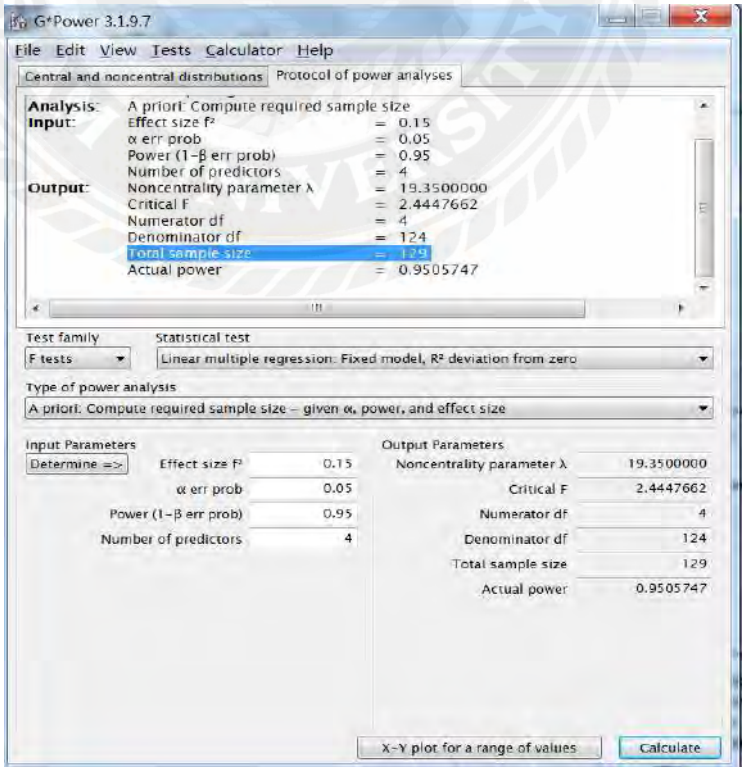


Figure 3.2 Sample Size Sufficiency

For the results of any study about a population to be generalized, the sufficiency of the sample size should be able to explain the main population under study. Therefore, to meet the required sample size for this study, the researcher used the G*power analysis software, which is generally utilized in behavioral and social sciences studies. The figure provides information on how to apply this software in calculating the sufficiency of a sample size of a population. The G*power software provides power analysis with the determinant set to F-tests with an effect size of 0.15, an error probability of 0.05, and a confidence interval set at 0.95. The software requires the researcher to input the number of predictors. The statistical approach used for estimation is regression, with a fixed model, and an R-squared value of 0. The software provides a graphical representation of the X-Y plot of the range of values for determining the sample size. The estimates from the G*power software indicate that, based on the number of predictors in this study, the minimum number of samples required is 129 observations.

The research focused on companies near the selected application-oriented universities in Central China. The criteria for selecting companies were refined to ensure that the sample was representative and the data obtained was reliable. Specifically, the chosen companies came from similar industry categories and were of comparable size to facilitate meaningful comparisons and insights.

The universities of interest for this research consisted of twelve application-oriented universities in Central China. From this diverse population, a representative sample of five universities—Hunan University, Wuhan University, Zhengzhou University, Henan University, and Xi'an University—was selected for an in-depth study of Entrepreneurial Skills Enhancement.

An in-depth study required significant resources, including time, workforce, and funding. Limiting the sample size to five universities allowed for a more manageable allocation of resources while still providing meaningful insights. Despite having twelve universities in the population, selecting a smaller subset of universities could still provide a representative sample of the broader population. By strategically choosing universities that varied in location, size, and the presence of entrepreneurship programs, the selected sample could capture the diversity within the population.

A smaller sample size enabled researchers to delve deeper into each selected university's entrepreneurial ecosystem. It enabled more comprehensive data collection, analysis, and interpretation, leading to richer insights into the factors influencing the development of entrepreneurial skills enhancement. Limiting the number of universities simplified data collection, making it more feasible to gather detailed information from each selected institution.

Selection Criteria Included the Following:

Companies were selected from similar industry sectors to ensure the data on entrepreneurial skill requirements were comparable. For example, all selected companies should have operated within the technology sector if their focus was on technology.

The sample included companies of similar sizes (e.g., small to medium-sized enterprises) to avoid disparities that might have affected the comparison of skill requirements.

Companies were chosen based on their willingness to participate in the research and provide relevant insights into their entrepreneurial skill needs.

The sample comprised five companies, including established enterprises and emerging ventures, as listed in Table 3.1 below.

Table 3.1 List of Company Sample

Application-Oriented Universities in Central China	**Technological Companies in the Vicinity**
Hunan University	Hunan ZTE Software Co., Ltd.
Wuhan University	Wuhan Fiber Home Networks Co., Ltd
Zhengzhou University	Zhengzhou Yutong Bus Co., Ltd.
Henan University	Henan Liyuan Information Technology Co., Ltd.
Xi'an University	Xi'an New Building Materials Co., Ltd.

The selected companies are situated in the geographic vicinity of the chosen universities in Central China, facilitating data collection and promoting potential collaboration between academia and industry. These companies represent a broad spectrum of the technology sector, including software development, high-tech manufacturing, information technology, and renewable energy. This strategic selection aimed to capture a comprehensive range of entrepreneurial skill requirements relevant to technological fields.

All selected companies are well-established and recognized for their significant contributions to technological advancements. For example, Wuhan Fiber Home Networks Co., Ltd. is known for its expertise in optical communication, while Zhengzhou Yutong Bus Co., Ltd. is a leader in electric vehicle manufacturing. This diversity within the technological category ensures that the research captures varied insights while focusing on a single industry sector.

The companies were selected based on their willingness to participate and provide insights into their entrepreneurial skill needs, enhancing the study's feasibility and relevance. The selection process also considered accessibility for data collection and alignment with the university's focus on technological education and industry collaboration.

The sample includes companies from distinct but relevant sectors, such as technology. Each university is now paired with a company from a specific industry sector, which allows for a more targeted examination of entrepreneurial skills enhancement within that sector. This alignment facilitates a more precise comparison of data related to industry-specific skill requirements.

By selecting companies within the same industry or sector, the research can achieve more consistent and comparable data, addressing the mentor's concern about the suitability and comparability of the sample.

To ensure the validity of the sample, the stratified sampling technique was applied to select university samples. Stratified sampling is a systematic approach used

in research to ensure that each distinct subgroup, or stratum, within a population is adequately represented in the final sample. The sampling method is beneficial when the population under study exhibits significant internal diversity, and researchers want to accurately capture this diversity. In stratified sampling, the population is first divided into mutually exclusive strata based on specific characteristics or attributes, such as age, gender, location, or other relevant factors. Each stratum represents a subset of the overall population that shares similar characteristics. Once the population is stratified, researchers can randomly select samples from each stratum. The sample size within each stratum is determined in proportion to the size or significance of that stratum within the entire population. The proportional representation ensures that no subgroup is over- or underrepresented in the final sample, making the results more reflective of the population as a whole.

Table 3.2 Process of Stratified Sampling

University	Location	Size	Dedicated Entrepreneurship
Wuhan University	Central	Very Large	Yes
Hunan University	Central	Large	Yes
Nanchang University	Central	Large	Yes
Central South University	Central	Large	Yes
Zhengzhou University	Central	Large	Yes
Hubei University	Central	Large	No
Changzhou University	Central	Medium	No
Henan University	Central	Medium	Yes
Wuhan Technology University	Central	Medium	No
Xi'an University	Central	Small	No
Changsha University	Central	Small	Yes
Zhengzhou Technology University	Central	Small	No

The twelve universities were categorized into strata based on specific criteria, including location, size, and the presence of dedicated entrepreneurship programs, as shown in Table 3.2 above. Stratified sampling ensured that each stratum was proportionally represented in the final sample, accounting for the diversity within the group of application-oriented universities. After stratification, five universities-Hunan University, Wuhan University, Zhengzhou University, Henan University, and Xi’an University-were randomly selected from the strata, ensuring balanced representation across the various characteristics of these institutions.

3.2.2 Interview Participants

The research targeted several educators and students for interviews at the five selected universities with application-oriented programs. The following sampling method was used for interview participants at these universities.

For educators, a purposive sampling method was applied to identify and select them. Purposive sampling, also known as purposeful or judgmental sampling, is a strategic, non-random technique used in research to select participants or elements based on predefined criteria. Unlike purely random methods, such as stratified or simple random sampling, purposive sampling aims to identify specific individuals or groups that possessed the desired characteristics or knowledge relevant to the research objectives. The method is commonly employed when researchers seeks a deeper understanding of a particular phenomenon, required expert insights, or wished to investigate a specific subgroup within a larger population. The decision to use purposive sampling relied on the assumption that participants possessed valuable information, expertise, or experiences that could significantly contribute to the research. The researcher established explicit criteria or attributes relevant to their study and actively chose participants who met them. Consequently, this sampling technique was characterized by intentionality and a targeted approach.

This technique involved selecting individuals with extensive experience in entrepreneurship education who could provide valuable insights into the topic. Moreover, these five institutions varied in scale and profile, providing a diverse perspective. A purposive sampling approach was applied to select HR representatives involved in hiring processes, who could offer insights into the skills sought in potential employees. Selection criteria included the educators' length of service and willingness to participate in the research. Educators from the five universities were interviewed, along with selected HR representatives and entrepreneurs.

At the same time, students were selected based on their academic year, targeting those in their senior year to ensure that the study captured individuals more likely to engage in entrepreneurial activities influenced by recent entrepreneurship education. Like educators, students were identified through purposive sampling, focusing on those actively participating in entrepreneurship courses or programs.

The combination of stratified sampling for universities and purposive sampling for educators, students, entrepreneurs, and HR representatives aimed to ensure that the research captured a representative and diverse set of perspectives related to entrepreneurship education and the application of entrepreneurial skills development in the region. The careful selection of participants with relevant expertise and experiences ensured that the research garnered rich and insightful data from individuals best positioned to provide valuable insights, thereby demonstrating the thoroughness of the research.

To ensure a comprehensive and representative collection of data, the following sample size for interviews was determined:

Table 3.3 Sample Size for Interviews

Category	**Total Number (5 Universities)**
Educators	2
Students	2
HR Representatives	2
Entrepreneur	2

Interviewing two educators per university ensured that diverse perspectives were captured from various departments and levels of involvement in entrepreneurship education. Educators with different lengths of service and roles within the entrepreneurship programs can provide a comprehensive understanding of the educational strategies and challenges. By interviewing a sufficient number of educators, the research could gather detailed insights into curriculum design, pedagogical methods, and the overall impact of entrepreneurship education programs on students' entrepreneurial intentions and capabilities.

Interviewing two students from the university, particularly those in their senior year, ensured that the sample included individuals with substantial exposure to entrepreneurship education and who are likely to engage in entrepreneurial activities. This approach provided a well-rounded view of students' experiences and intentions to pursue entrepreneurial ventures upon graduation. Focusing on students actively participating in entrepreneurship courses or programs ensured that the data collected were relevant and insightful.

Interviewing two HR representatives and two entrepreneur representatives from companies surrounding the universities provided targeted insights into the specific entrepreneurial skills and competencies employers seek in the local job market. It ensures that the research is grounded in the actual needs and expectations of the labor market, making the findings practical and applicable. The selected companies varied in size, industry, and profile, providing a diverse perspective on the skills demanded by different sectors.

Combining two HR interviews and two representative interviews from entrepreneurs ensures a balanced and thorough data collection process. The sampling provided a deep understanding of the entrepreneurial skills developed through education and its alignment with labor market analysis demands. The stratified and purposive sampling techniques enhanced the representativeness and richness of the data, making the research findings robust and actionable.

3.3 Research Tools

3.3.1 Questionnaire Design

The design of this questionnaire went through the following five stages:

1. Literature reading and field investigation. The researcher reviewed over 500 articles, both domestic and international, related to this topic. Simultaneously, the researcher conducted research at more than 10 local universities in Henan, Hubei, Shanxi, and Hunan that are application-oriented, engaging in multiple exchanges with university and industry educators responsible for developing innovative and entrepreneurial courses. The exchanges primarily focused on students' foundational knowledge, course content, assessment methods, and teaching effectiveness.

2. Engaged in in-depth exchanges with university teachers of innovative and entrepreneurial education and over 10 entrepreneurship training instructors. These discussions covered the main objectives, key content, skills focus, and expected outcomes of delivering SIYB and online entrepreneurship training for college students.

3. Exchanges and discussions with university seniors and recent graduates. After forming the initial draft of the questionnaire, the researcher first discussed it with the academic team, which included experts, postdoctoral researchers, doctoral students, and master's students. The researcher actively listened to the members' feedback and made improvements to the questionnaire accordingly. Simultaneously, the researcher communicated with innovative and entrepreneurial education experts at application-oriented universities, making modifications and enhancements based on suggestions regarding potential disagreements, misunderstandings, leading questions, and wording.

4. Seeking opinions from corporate representatives and managers of university science parks, the research maintained good relationships with many corporate executives during the research process. After forming the questionnaire, the research communicated with five corporate leaders, five HR professionals, and five managers of university science parks to gather opinions on the overall understanding of the questionnaire and the clarity of the item design, making modifications accordingly.

5. Pre-testing. Before the formal distribution, the research conducted pre-tests with universities, enterprises, college students, and corporate HR professionals, who were surveyed, resulting in the collection of 80 valid questionnaires and the invitation of eight individuals to provide feedback. This process led to appropriate modifications to the wording, ultimately resulting in the final version of the questionnaire.

The questionnaire consists of two parts: the introductory section contains the basic information of the respondents, including gender, location, and age, among others; the main part of the questionnaire measures the constructs, where respondents are asked to rate their level of agreement with the presented statements, with 1 indicating strong disagreement, 2 indicating some disagreement, 3 indicating uncertainty, 4 indicating some agreement, and 5 indicating strong agreement.

Inventiveness: four questions focusing on new solutions and solutions that primarily meet Market analysis demands.

Opportunity identification: three questions on identifying and evaluating business opportunities.

Problem Solving and Decision Making: four questions on cognitive abilities.

Market Analysis: three questions on the skills to grasp market analysis dynamics and business trends.

Network and Collaboration: three questions.

Strategizing: Four questions reflect the comprehensive ability to enhance entrepreneurial skills. When students possess this capability, their six entrepreneurial skills are improved and specifically demonstrated.

3.3.2 Interview Design

To address the research objectives, interviews were conducted with university teachers, entrepreneurs, and HR professionals. The interview outlines are provided in Appendices 2, 3, and 4.

Table 3.4 Interview Protocol for University Teachers

Introduction
Briefly introduce the purpose of the interview and its significance.
Ensure participants are comfortable and aware of the interview's confidentiality.
Section 1: Participant Background
Gather basic information about the participant (name, position, experience).
For students: Major, academic year, and any previous entrepreneurial experiences.
For professors: Field of expertise, years of teaching experience, and involvement in entrepreneurship education.
Section 2: Entrepreneurial Skills Enhancement
How would you define Entrepreneurial Skills Enhancement in the context of education and business?
From your perspective, what are the most crucial Entrepreneurial Skills Enhancement?
For students: How do you perceive the development of Entrepreneurial Skills Enhancement in the academic environment?
For professors: What strategies or methods do you use to foster Entrepreneurial Skills Enhancement in students?
Section 3: Educational Processes
How effective do you think the current educational processes are in nurturing Entrepreneurial Skills Enhancement?
Are there specific courses, programs, or initiatives that you believe contribute significantly?
How can practical, hands-on experience be integrated into the curriculum to enhance Entrepreneurial Skills?
Can you share examples of successful instances where theoretical knowledge has been applied in real-world situations?
Section 4: Industry Perspective

What Entrepreneurial Skills Enhancement do you think companies in the industry expect from graduates?
How well do you think the current educational processes align with industry expectations?
Section 5: Suggestions and Improvements
Based on your experience, what improvements or changes would you suggest for nurturing Entrepreneurial Skills Enhancement?
Are there specific areas where you see potential for enhancement in the current educational processes?
Conclusion
Is there anything else you want to share regarding Entrepreneurial Skills Enhancement and education?
Closing
Express gratitude for their time and valuable insights.
Reiterate the importance of their contribution to improving entrepreneurship education.

Table 3.5 Interview Protocol for Companies

Introduction	Question
Introduction and Background	1. What industry does your company primarily operate in?
Entrepreneurial Skills Prioritization	2. In your opinion, what Entrepreneurial Skills Enhancement are most crucial for employees in your industry?
Recruitment Criteria	3. How do these skills contribute to the success and growth of your company?
Adaptability and Innovation	4. How important is adaptability and innovation in your company's success?
Collaboration and Networking	5. Are there specific collaborative projects or networks that have proven beneficial?
Strategic Planning	6. How critical is strategic planning in achieving the long-term goals of your company?
Market analysis Awareness	7. Are there specific strategies or tools your company employs for Market analysis research?
Financial Management	8. In your opinion, how crucial are financial management skills for employees in your company?

Introduction	Question
Leadership and Decision-making	9. What leadership qualities do you value in your employees?
Expectations from Graduates	10. When hiring recent graduates, what Entrepreneurial Skills Enhancement do you expect them to possess? 11. How can universities better prepare students with these skills for the job market?

Table 3.5 presents the questions for the online interviews with key representatives from the selected companies. The interviews are audio-recorded with consent and transcribed for further analysis. The data collection process utilizes online platforms to facilitate interviews with key representatives from the selected companies. A detailed schedule will be established prior to the interviews, ensuring a systematic and efficient interaction with the participants. Through voice calls, human resource professionals from each company are engaged in structured discussions. The interviews will be conducted with utmost respect for the participants' time and organized around the provided interview protocol.

3.4 Quality of Measurement Tools

The questionnaire is divided into two parts:

Part 1: General information about the respondent, including gender, age, and education level.

Part 2: Based on the entrepreneurial skills enhancement model concept, the analysis of six entrepreneurial skills enhancement's mastery and desired state (5-point rating scale). The scoring criteria of the scale are as follows:

Scoring Criteria in Box "Current situation / Desired situation ":

5 means that the current situation / the desired situation is at the highest level.

4 indicates that the current situation / the desired situation is at a high level.

3 indicates that the current situation / the desired situation is at a moderate level.

2 means that the current situation / the desired situation is at a low level.

1 means that the current situation / the desired situation is at the lowest level.

The steps to design and check the quality of the questionnaire used in this study are as follows:

1. Based on the entrepreneurial skills enhancement model concept, the mastery of six entrepreneurial skills and the desired state were analyzed.

2. The researcher submitted the draft questionnaire to the adviser to review and provide suggestions regarding the accuracy of language, coverage of questions, validity of content, appropriateness of questions, etc. Then, the questionnaire was revised based on the advisor's suggestions.

3. The researcher submitted the revised draft of the questionnaire to 5 experts to check the content validity and the appropriateness of the questions. The qualified experts were divided into two categories: entrepreneurs and HR.

4. The researcher calculated content validity based on the experts' consideration results, considering the consistency index between the question and the goal (Item Objective Congruence: IOC) and the criteria for judging validity. Brown (2005) mentioned that if the IOC index is between 0.5 and 1.0, the item is acceptable; however, if the IOC falls below 0.5, it indicates that the item does not fit and must be removed or revised. Problem-to-objective alignment is calculated using an IOC value of 0.5 or higher according to the following formula: IOC = Σr/N.

IOC represents the consensus index, with a value between -1 and +1, Σr represents the sum of expert opinion scores, and N represents the number of experts.

The scoring criteria are as follows:

+1 indicates agreement with the use of the question.

0 indicates uncertainty about the use of the question.

-1 indicates disagreement with the use of the question.

From the results of the content validity check of the test questions, the IOC value of each test question is greater than 0.5, which meets the question selection standards, demonstrates content validity, and is suitable for use in this study.

5. The researcher adopted and refined the questionnaire that had been tested for content validity by experts.

6. The researcher selected 60 people for a pre-test to assess their understanding of the language, to answer each question in the questionnaire, and to analyze the reliability of the data obtained. The reliability coefficient was calculated using the Cronbach's alpha coefficient method (Cronbach, 1951). The specific calculation formula is as follows:

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum S_i^2}{S_x^2}\right)$$

In the formula, α is the reliability coefficient, k is the number of test questions, represents the score variation of all subjects on the question, and is the variance of the total score of all subjects.

Generally speaking, the higher the coefficient, the higher the instrument's reliability. In basic research, a reliability of at least 0.80 is considered acceptable. In exploratory research, the reliability is acceptable if it reaches 0.70. A reliability value between 0.70 and 0.98 is considered high, while a value less than 0.35 is considered low and must be rejected.

This study used the IBM SPSS/AMOS software to conduct reliability and validity tests. In AMOS, the validity and reliability of a scale are verified through convergent validity and discriminant validity, a method particularly suitable for non-normally distributed data (i.e., data with skewness). All the composite reliabilities of the latent variables in this scale exceed 0.8, far surpassing the minimum requirement of 0.70, and the average variance extracted (AVE) values are all above 0.6, significantly exceeding the minimum limit of 0.4. Moreover, the T-values (T-statistics) of all observed variables are greater than 2.56, indicating that all estimates of observed

variables pass the test at the 0.01 significance level, thus demonstrating high convergent validity for this scale.

3.5 Data Collection

To ensure accuracy and comprehensive coverage, the interviews were recorded with the explicit consent of the participants. This step was crucial for capturing the nuances of their responses and preserving the authenticity of the data. Interviews were conducted with college teachers, entrepreneurs, and 8 HR professionals. Following the interviews, the recorded sessions were transcribed verbatim. The transcription process aimed to convert spoken language into written form, allowing for a detailed and accurate representation of the participants' insights. Transcriptions served as the foundation for subsequent qualitative analysis.

Quantitative data were gathered from the surveys conducted with the selected companies. Four hundred online and offline questionnaires were distributed to students, and 400 completed questionnaires were collected.

3.6 Data Analysis

3.6.1 Interview Data Analysis

Content analysis systematically examined and extracted meaningful patterns and themes from the textual data collected through surveys and interviews. This method allowed for a structured qualitative and quantitative data analysis, providing a well-rounded perspective on entrepreneurial skills enhancement and education.

The data analysis procedure followed a systematic path to ensure comprehensive and insightful results. Initially, all collected data, including survey responses and interview transcripts, underwent thorough organization and cleaning to prepare for analysis. A coding scheme was meticulously devised to align with the research objectives. This scheme encompassed various categories and subcategories related to entrepreneurial skills enhancement, educational practices, and other pertinent themes.

Next, the actual coding process began, with textual data systematically categorized and labeled according to the predefined coding scheme. This phase involved identifying emerging patterns and themes and providing structure and context to the data.

The coded data then underwent comprehensive summarization and analysis, focusing on identifying recurring patterns and themes across the responses from various universities and respondents. This comparative analysis revealed commonalities and distinctions in entrepreneurial skills enhancement and educational practices.

Ultimately, interpreting the content analysis results formed the cornerstone of this process. This interpretative phase was crucial in deriving a deeper understanding of the entrepreneurial skills enhancement emphasized within application-oriented universities in Central China and the effectiveness of current educational practices. These insights contributed collectively to the research's goals of enhancing regional entrepreneurship education.

3.6.2 Questionnaire Data Analysis

The data were analyzed using SPSS for descriptive statistics and AMOS for structural equation modeling. This research used descriptive statistical analysis to examine the sample demographic characteristics and whether the data followed a normal distribution. The questionnaire was next assessed for reliability and validity. In this case, the validity investigation was conducted using confirmatory factor analysis (CFA), which assessed the average variance extracted (AVE) and composite reliability (CR) for each dimension. The data were examined to assess discrimination and dependability. Furthermore, the variables were checked for correlation coefficients to ensure that the variables used to build the model were correlated and had no covariance. When the data obtained fit the criteria of a normal distribution and the absence of covariance, as determined by Confirmatory Factor Analysis (CFA), the hypotheses in this study were explored using structural equation modeling with AMOS.

CHAPTER 4

RESEARCH RESULTS

This chapter examines the data analysis results presented as follows:

4.1 Description of Sample Characteristics

4.2 Data Normal Distribution Test

4.3 Reliability Test, Confirmatory Factor Analysis and Correlation Analysis

4.4 Structural Equation Models and Hypothesis Testing

4.5 Interview Data Analysis

4.6 Development of Entrepreneurial Skills Enhancement Model

4.7 Validation of Research Outcomes

4.1 Description of Sample Characteristics

The data presents the demographic characteristics of students from application-oriented universities in central China, encompassing gender, major, year of enrollment, and type of study.

In terms of gender, the sample includes 186 male students, accounting for 48.3% of the total, and 199 female students, constituting 51.7%. The gender ratio is relatively balanced, with females slightly outnumbering males. Regarding the distribution of majors, students hail from diverse academic fields, with engineering being the most represented, comprising 66 individuals (17.1%), followed by Chinese language and literature with 64 students (16.6%), computer science with 58 students (15.1%), economics with 52 students (13.5%), medicine with 50 students (13.0%), and management with 49 students (12.7%). Additionally, students from other majors total 46, accounting for 11.9% of the sample. This data reflect a broad spectrum of disciplines covered in the sample, with engineering, Chinese language and literature, and computer science majors constituting a significant proportion.

From the perspective of the year of enrollment, the sample comprises students who enrolled between 2021 and 2024. Notably, the number of students who enrolled in 2022 and 2023 is identical, with 101 students each, representing 26.2% of the sample. This is followed by 94 students who enrolled in 2021 (24.4%) and 89 in 2024 (23.1%). This indicates a relatively balanced distribution of the sample across different years of enrollment, with a slight preponderance of students who enrolled in 2022 and 2023. In terms of the study type, the sample comprises three groups: undergraduates, graduates, and doctoral candidates. Among them, graduates constitute the largest group with 137 individuals, accounting for 35.6% of the sample; undergraduates follow with 126 students, representing 32.7%; and doctoral candidates, slightly fewer, with a total of

122, comprising 31.7% of the sample. This distribution suggests that the sample of this study is not confined to undergraduate students but also includes a significant number of advanced-level students, providing a multifaceted perspective for the research. With a total of 385 participants, the sample exhibits a reasonably balanced distribution across gender, major, year of enrollment, and academic stage, offering extensive representativeness and valuable insights for the research.

Table 4.1 Sample Characteristics

Variable	Option	Frequency	Percent%
Gender	Male	186	48.3
	Female	199	51.7
Major	Chinese	64	16.6
	Computer Science	58	15.1
	Management	49	12.7
	Economics	52	13.5
	Medicine	50	13.0
	Engineering	66	17.1
	Others	46	11.9
Year of Enrollment	2021	94	24.4
	2022	101	26.2
	2023	101	26.2
	2024	89	23.1
Type of Study	Undergraduate	126	32.7
	Postgraduate	137	35.6
	PhD Candidate	122	31.7
Total		385	100.0

4.2 Data Normal Distribution Test

The descriptive statistics for the 21 questions (Q1-Q21) encompass means, standard deviations, skewness, and kurtosis, providing insights into the data's central tendency, dispersion, and distributional characteristics. In terms of means, scores for each question range from 3.4 to 3.97, indicating a generally above-average level of performance. Notably, Q20 boasts the highest mean of 3.97, suggesting relatively high scores for this question, whereas Q1 exhibits the lowest mean of 3.43, indicating somewhat lower scores. Overall, the means for the various questions are relatively close, indicating a balanced evaluation of the questions by the sample.

Standard deviations, reflecting the degree of dispersion in the data, range from 0.91 to 1.33 across all questions, suggesting some variability in responses among respondents but with overall limited fluctuation. Specifically, Q19 has a standard deviation of 0.912, indicating a relatively concentrated response distribution, whereas Q18 has a standard deviation of 1.33, indicating a more dispersed response distribution with significant individual differences. Skewness measures the symmetry of the data

distribution, and all questions exhibit negative skewness values, indicating a left-skewed distribution with a relative preponderance of higher scores. Among them, Q15 has the highest skewness (-1.029), indicating the most asymmetric score distribution, which tends towards higher ratings, while Q19 has the lowest skewness (-0.046), suggesting a relatively symmetric distribution.

Kurtosis measures the steepness of the data distribution, and most questions exhibit negative kurtosis values, indicating a flatter distribution than the normal distribution with fewer extreme values. Notably, Q15 has the highest kurtosis (0.500), suggesting a relatively steep distribution, while Q10 has the lowest kurtosis (-0.857), indicating the flattest distribution. The data indicates a relatively concentrated response with higher scores for most questions and an overall left-skewed distribution, suggesting a generally positive attitude among respondents towards the survey questions.

Table 4.2 Descriptive Statistics of Variables

	Mean	**Std. Deviation**	**Skewness**	**Kurtosis**
Q1	3.430	1.199	-0.700	-0.399
Q2	3.690	1.140	-0.602	-0.333
Q3	3.600	1.190	-0.608	-0.515
Q4	3.520	1.203	-0.499	-0.699
Q5	3.650	1.122	-0.517	-0.559
Q6	3.590	1.213	-0.571	-0.595
Q7	3.750	1.016	-0.324	-0.762
Q8	3.620	1.180	-0.527	-0.610
Q9	3.740	1.157	-0.535	-0.754
Q10	3.580	1.267	-0.540	-0.857
Q11	3.710	1.257	-0.683	-0.649
Q12	3.600	1.049	-0.647	0.227
Q13	3.580	1.131	-0.650	-0.054
Q14	3.640	1.135	-0.807	0.117
Q15	3.760	1.121	-1.029	0.500
Q16	3.740	1.035	-0.729	0.104
Q17	3.730	1.118	-0.659	-0.177
Q18	3.840	1.330	-0.722	-0.766
Q19	3.730	0.912	-0.046	-0.861
Q20	3.970	1.171	-0.766	-0.503
Q21	3.620	1.052	-0.497	-0.500

4.3 Reliability Test, Confirmatory Factor Analysis and Correlation Analysis

In this study, 385 valid questionnaires were gathered, and the collected data were checked for reliability and validity. Cronbach's Alpha and Corrected Item-Total Correlation (CICT) were employed to assess dependability. The validity test was conducted using primary confirmatory factor analysis (CFA), which included path coefficients, composite reliability (CR), and average variance extracted (AVE). The appropriateness of the model was also evaluated using structural equation modeling.

4.3.1 Reliability Test

The study's variables were collected via a questionnaire, and reliability checks were required on the collected data. SPSS was used to conduct a reliability analysis of the Cronbach's Alpha (if items were eliminated) to indicate the overall dependability of the questionnaire. The questionnaire variables included 21 questions, and the Cronbach's Alpha was 0.911, indicating strong reliability and meeting the standards, as shown in Table 4.3.

Table 4.3 Reliability Test

Cronbach's Alpha	No of Items
0.911	21

Table 4.4 presents the reliability analysis results of the scale, encompassing the Corrected Item-Total Correlation (CITC) for each item, the Cronbach’s Alpha value if the item is deleted (Cronbach’s Alpha if Item Deleted), and the overall Cronbach’s Alpha coefficient. The CITC reflects the correlation between each item and the overall scale, with a value greater than 0.4, which is generally considered indicative of good discrimination for the item. The table shows that all items exhibit CITC values exceeding 0.6, demonstrating strong correlations with the overall scale. Among them, Q1 boasts the highest correlation coefficient (0.754), suggesting a substantial contribution to the overall scale, while Q15 has the lowest correlation coefficient (0.609), yet still within an acceptable range. Changes in Cronbach’s Alpha upon deleting any item can be used to assess its impact on overall reliability. The table reveals that deleting any item results in insignificant changes to Cronbach’s Alpha, indicating that all items contribute evenly to the scale's overall reliability, with no item significantly compromising it.

Four distinct overall Cronbach’s Alpha values are provided in the data, namely 0.878, 0.841, 0.860, and 0.809, corresponding to reliability coefficients for different combinations of items. Specifically, 0.878 represents the highest overall reliability for a particular set of items (including Q1). In contrast, 0.809 (including Q15) represents the relatively lowest reliability, still exceeding 0.8, indicating a high level of internal consistency reliability for the entire scale. The excellent reliability of the scale used in the study, with high internal consistency among items and no need for eliminating any low-correlation items, effectively measures the research variables.

Table 4.4 Scale Reliability Analysis

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Q1	0.754	0.837	
Q2	0.714	0.853	
Q3	0.730	0.847	
Q4	0.749	0.839	0.878
Q5	0.690	0.794	
Q6	0.726	0.764	
Q7	0.713	0.778	0.841
Q8	0.708	0.821	
Q9	0.699	0.824	
Q10	0.708	0.821	
Q11	0.709	0.820	0.860
Q12	0.655	0.742	
Q13	0.677	0.717	
Q14	0.642	0.754	0.809
Q15	0.609	0.768	
Q16	0.665	0.711	
Q17	0.668	0.704	0.801
Q18	0.713	0.824	
Q19	0.692	0.831	
Q20	0.728	0.809	
Q21	0.723	0.813	0.858

4.3.2 Confirmatory Factor Analysis

The study performed factor analysis to test the scale's validity. The mean variance extracted, composite, and discriminant validity must be considered in structural equation modeling. In this regard, the average variance extracted (AVE) is used to determine the convergent validity of the measurement scale. In contrast, Composite Reliability (CR) is used to assess the consistency of variable measurement. The link between the square root of the AVE value and the standardization coefficient serves as the foundation for discriminant validity.

According to relevant studies and standards, the minimum AVE value is 0.5 (Handayati et al., 2020). In contrast, the minimum CR value is 0.7, showing good convergent validity and combinatorial reliability. This study used structural equation modeling. AMOS and SPSS software were used throughout the study. First, the model fitness test was carried out, and all key indicators met the requirements. Second, parameter estimation was used to determine the proper research results.

The calculation results for the Model Fit indices include the Chi-square value, degrees of freedom (df), Chi-square to degrees of freedom ratio (Chi-square/df),

Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). According to the results, the Chi-square value is 186.645, with 174 degrees of freedom, resulting in a Chi-square to degrees of freedom ratio of 1.073. A ratio less than three generally indicates good model fit; thus, this model meets this criterion. The GFI (0.957) and AGFI (0.943) are close to 1, suggesting an excellent absolute fit of the model. The CFI (0.997) and TLI (0.996) are also very close to 1, indicating a high relative fit of the model. The RMSEA value is 0.014, well below 0.05, further demonstrating the exceptional fit of the model. The model performs well across all fit indices, indicating a close match between the theoretical model and the data and effectively explaining the relationships among the study variables.

Table 4.5 Model Fit

Indicators	**Chi-square**	**df**	**Chi-square/df**	**GFI**	**AGFI**	**CFI**	**TLI**	**RMSEA**
Results	186.645	174	1.073	0.957	0.943	0.997	0.996	0.014

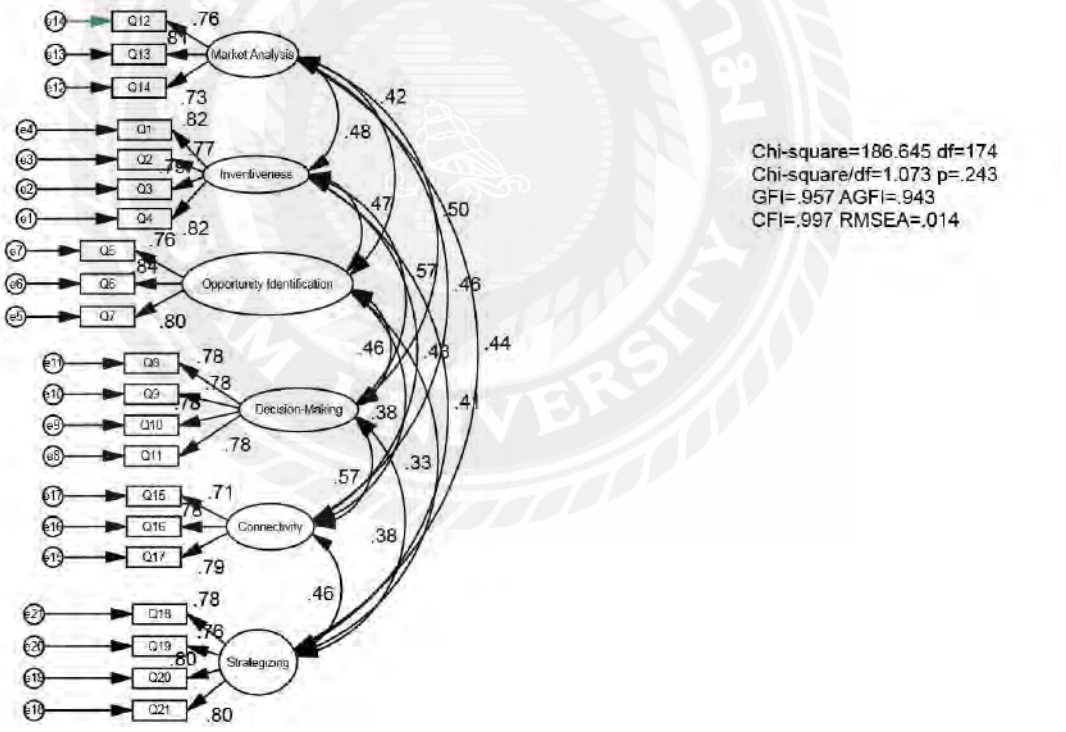


Figure 4.1 Confirmatory Factor Analysis

In the estimated values of path relationships, all paths exhibit optimistic estimates, with the majority being significant (all P-values denoted as ***, i.e., $p < 0.001$), indicating that the relationships among the factors are notable and valid. The path relationship estimate from Q3 to inventiveness is 0.958, with a CR of 17.074, demonstrating a statistically significant path relationship. Factor Loading signifies the contribution of each observed variable to its corresponding latent variable. The high

factor loading values across all paths indicate that the observed variables have strong explanatory power over their latent variables. Specifically, Q4's factor loading on inventiveness is 0.821, Q7's factor loading on opportunity identification is 0.800, and Q10's factor loading on decision-making is 0.778, all indicating robust contributions of these observed variables to their respective latent variables. The AVE (Average Variance Extracted) values, which measure the convergent validity of latent variables, must be greater than 0.5. All latent variables have AVE values exceeding 0.5, indicating good convergent validity of the scale. The AVE values for inventiveness, opportunity identification, decision-making, market analysis, connectivity, and strategizing are 0.644, 0.643, 0.607, 0.586, 0.578, and 0.616, respectively, all of which meet the standard for convergent validity. The CR (Composite Reliability) values, which assess the internal consistency of latent variables, typically require CR values above 0.7. All latent variables have CR values exceeding 0.7, indicating high internal consistency. The CR values for inventiveness, opportunity identification, decision-making, market analysis, connectivity, and strategizing are 0.878, 0.844, 0.860, 0.809, 0.804, and 0.865, respectively, all of which conform to good reliability standards. The data suggest that the scale possesses high validity and reliability in measuring various latent variables, with significant path relationships reflecting the underlying relationships among the study variables.

Table 4.6 AVE and CR

Path Relationship			**Estimate**	**S.E.**	**C.R.**	**P**	**Factor Loading**	**AVE**	**CR**
Q4	<---	Inventiveness	1.000				0.821		
Q3	<---	Inventiveness	0.958	0.056	17.074	***	0.795		
Q2	<---	Inventiveness	0.885	0.054	16.318	***	0.767		
Q1	<---	Inventiveness	1.001	0.056	17.860	***	0.825	0.644	0.878
Q7	<---	Opportunity Identification	1.000				0.800		
Q6	<---	Opportunity Identification	1.259	0.079	15.957	***	0.844		
Q5	<---	Opportunity Identification	1.049	0.071	14.852	***	0.760	0.643	0.844
Q11	<---	Decision-Making	1.000				0.778		
Q10	<---	Decision-Making	1.007	0.066	15.306	***	0.778		
Q9	<---	Decision-Making	0.917	0.060	15.252	***	0.775		
Q8	<---	Decision-Making	0.946	0.061	15.434	***	0.784	0.607	0.86
Q14	<---	Market Analysis	1.000				0.726		
Q13	<---	Market Analysis	1.110	0.083	13.355	***	0.809	0.586	0.809

Path Relationship			Estimate	S.E.	C.R.	P	Factor Loading	AVE	CR
Q12	<---	Market Analysis	0.967	0.075	12.941	***	0.760		
Q17	<---	Connectivity	1.000				0.791		
Q16	<---	Connectivity	0.913	0.066	13.871	***	0.780		
Q15	<---	Connectivity	0.895	0.070	12.874	***	0.706	0.578	0.804
Q21	<---	Strategizing	1.000				0.796		
Q20	<---	Strategizing	1.117	0.069	16.087	***	0.799		
Q19	<---	Strategizing	0.829	0.054	15.260	***	0.761		
Q18	<---	Strategizing	1.244	0.079	15.754	***	0.783	0.616	0.865

NOTE: * p<0.05, ** p<0.01, *** p<0.001

4.3.3 Correlation Analysis

In this study, the dimensions of the variables were associated using correlation analysis. The structure of the dimensions and the related questions was determined through validity and reliability assessments. The average score of the dimension's questions was then computed to represent the dimension's score, followed by correlation analysis. Correlation analysis investigates the correlation between variables, with correlation coefficients ranging from -1 to 1. The higher the absolute value, the greater the correlation between variables.

The correlation analysis results among various dimensions reveal the correlation and statistical significance of each variable with the others. The √AVE column represents the square root of the Average Variance Extracted for each dimension, reflecting the convergent validity of the latent variables. All dimensions have √AVE values exceeding 0.7, indicating good convergent validity.

The correlation coefficients in the correlation analysis section illustrate the strength and direction of the relationships among the dimensions. All correlation coefficients are positive, with most statistically significant correlations ($p < 0.01$ or $p < 0.001$). The correlation coefficient between inventiveness and opportunity identification is 0.401, indicating a moderate positive relationship. The correlation between inventiveness, problem-solving, and decision-making is strong, with a coefficient of 0.497.

Market analysis exhibits significant positive correlations with other dimensions, including inventiveness, opportunity identification, decision-making, market analysis, and connectivity, with correlation coefficients typically ranging from 0.3 to 0.4, indicating moderate to strong correlations. Connectivity also demonstrates significant correlations with various dimensions, particularly with a coefficient of 0.481 for decision-making, suggesting a strong positive relationship between these two dimensions.

Strategizing has positive and statistically significant correlation coefficients with all other dimensions, indicating a degree of positive correlation with them. The correlation coefficients with inventiveness and decision-making are 0.357 and 0.330, respectively, indicating strong positive relationships between strategizing and these two dimensions.

The correlation analysis results show significant positive correlations among the dimensions, with balanced strengths in these relationships. This suggests that the dimensions have strong intrinsic connections, supporting each other and jointly influencing the enhancement of students' entrepreneurial capabilities.

Table 4.7 Results of Correlation Analysis of Variables

Variable	√AVE	Inventiveness	Opportunity Identification	Decision-Making	Market Analysis	Connectivity	Strategizing
Inventiveness	0.802	0.802					
Opportunity Identification	0.802	.401**	0.802				
Decision-Making	0.779	.497**	.390**	0.779			
Market Analysis	0.766	.406**	.346**	.411**	0.766		
Connectivity	0.760	.401**	.314**	.481**	.372**	0.760	
Strategizing	0.785	.357**	.280**	.330**	.363**	.381**	0.785

NOTE: * p<0.05, ** p<0.01, *** p<0.001

4.4 Structural Equation Models and Hypothesis Testing

The relationship between the variables was explained using structural equation modeling. Reliability analysis, validity analysis, and correlation analysis confirmed that the data met the requirements for structural equation modeling. The study employed AMOS and utilized maximum likelihood fit modeling to analyze the hypotheses.

The various indices and their observed values for the model fit are as follows: The chi-square value is 192.903, with 175 degrees of freedom, resulting in a chi-square to degrees of freedom ratio (Chi-square/df) of 1.102, which meets the criterion of being less than 3, indicating a good model fit. The Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI) are 0.955 and 0.941, respectively, both exceeding 0.90, indicating an excellent fit. The Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) both have values of 0.995, far exceeding the recommended threshold of 0.9, indicating a good model fit. The Root Mean Square Error of Approximation (RMSEA) value is 0.016, which is substantially below the recommended threshold of 0.08, indicating an outstanding model fit. The model performs well across all fit indices, possessing a high degree of fit.

Table 4.8 Model Fit Intercept (N=385)

Model fit indicator	Threshold Range	Observed Value
Chi-square	-	192.903
df	-	175
Chi-square/df	Below 5, best below 3	1.102
GFI	Above 0.9	0.955
AGFI	Above 0.9	0.941
CFI	Above 0.9	0.995
TLI	Above 0.9	0.995
RMSEA	Below 0.08	0.016

The path analysis results of the Structural Equation Model (SEM) encompass the estimates, standard errors (SE), critical ratios (CR), significance levels (P-values), and factor loadings of various pathway relationships.

In Table 4.9, in terms of path estimates, inventiveness exhibits significant positive impacts on market analysis and connectivity, with estimates of 0.196 ($p = 0.001$) and 0.174 ($p = 0.006$), respectively, indicating statistically significant influences of connectivity on these two variables. The influence of opportunity identification on market analysis also reaches a statistically significant level, with an estimated coefficient of 0.177 ($p = 0.008$). However, its impact on connectivity is insignificant ($p = 0.112$), suggesting a weaker influence of opportunity identification on connectivity.

Decision-making has the most significant impacts on market analysis and connectivity, with estimates of 0.249 ($p < 0.001$) and 0.383 ($p < 0.001$), respectively, demonstrating decision-making's strong role in enhancing market analysis capabilities and collaboration abilities. In influencing strategizing, both market analysis (estimate = 0.229, $p = 0.001$) and connectivity (estimate = 0.252, $p < 0.001$) exhibit significant positive impacts. The influences of inventiveness, opportunity identification, and decision-making on strategizing reach significant levels, indicating that market analysis capabilities and collaboration abilities play crucial roles in Strategizing. In contrast, creativity, opportunity identification, and problem-solving abilities exhibit direct influences.

Regarding factor loadings, decision-making impacts connectivity ($r = 0.421$), suggesting a role for decision-making abilities in facilitating connectivity. The factor loadings of market analysis and connectivity on strategizing are 0.227 and 0.269, respectively, indicating significant impacts of these two factors on business planning. The factor loadings of opportunity identification on connectivity (0.112) and decision-making on strategizing (0.201) are low, suggesting weaker influences of these pathways.

The structural equation model analysis reveals hierarchical relationships among the various factors. Creativity, opportunity identification, and problem-solving abilities impact market analysis and collaboration networks. Market analysis and collaboration networks, in turn, influence strategizing, indicating that enhancing Entrepreneurial

Skills necessitates a multi-layered influence mechanism.

Table 4.9 Results of Structural Equation Modeling

Path Relationship			Estimate	S.E.	C.R.	P	Factor Loading
Market Analysis	<---	Inventiveness	0.196	0.060	3.249	0.001	0.235
Connectivity	<---	Inventiveness	0.174	0.064	2.734	0.006	0.193
Market Analysis	<---	Opportunity Identification	0.177	0.067	2.639	0.008	0.174
Connectivity	<---	Opportunity Identification	0.112	0.071	1.591	0.012	0.103
Market Analysis	<---	Decision-Making	0.249	0.062	3.995	***	0.294
Connectivity	<---	Decision-Making	0.383	0.068	5.676	***	0.421
Strategizing	<---	Inventiveness	0.117	0.062	1.986	0.049	0.138
Strategizing	<---	Opportunity Identification	0.168	0.068	1.988	0.030	0.166
Strategizing	<---	Decision-Making	0.201	0.070	2.086	0.010	0.199
Strategizing	<---	Market Analysis	0.229	0.072	3.195	0.001	0.227
Strategizing	<---	Connectivity	0.252	0.070	3.589	***	0.269

NOTE: * $p<0.05$, ** $p<0.01$, *** $p<0.001$

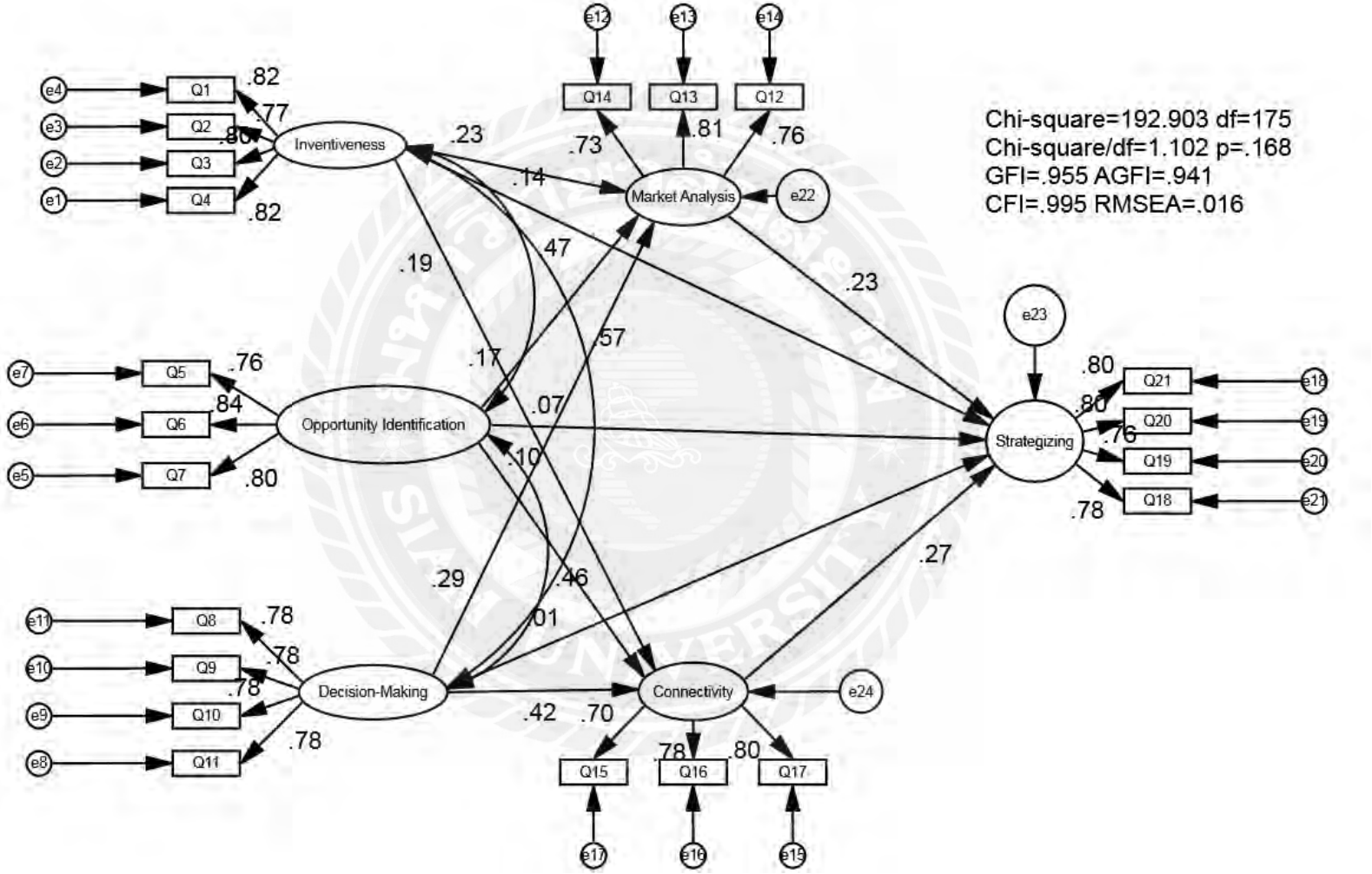


Figure 4.2 Modified Structural Equation Model

Table 4.10 Hypothesis Test Results

NO.	Hypothesis	Result
H1	H1: Inventiveness has a positive impact on strategizing.	Supported
H2	H2: Opportunity identification has a positive impact on strategizing.	Supported
H3	H3: Decision-making has a positive impact on strategizing.	Supported
H4a:	H4a: Inventiveness has a positive impact on market analysis.	Supported
H4b:	H4b: Inventiveness has a positive impact on connectivity.	Supported
H5a:	H5a: Opportunity identification has a positive impact on market analysis.	Supported
H5b:	H5b: Opportunity identification has a positive impact on connectivity.	Supported
H6a:	H6a: Decision-making has a positive impact on Market analysis.	Supported
H6b:	H6b: Decision-making has a positive impact on connectivity.	Supported
H7	H7: Market analysis has a positive impact on strategizing.	Supported
H8	H8: Connectivity has a positive impact on strategizing.	Supported

4.5 Interview Data Analysis

This study employed a qualitative research approach, focusing on the alignment between entrepreneurial skills cultivated in education and those demanded in the labor market. A semi-structured interview guide was designed, and in-depth interviews were conducted with eight representative participants from diverse fields, including university students, educators, entrepreneurs, and human resource experts. Interview data were first collected and organized during the research process, followed by open coding, axial coding, and selective coding analysis of the interview content using NVivo 14 software. Key themes and interrelated structures were extracted, systematically presenting the cognitive discrepancies and practical integration pathways between educational cultivation and enterprise demands. This approach provides theoretical underpinnings and practical recommendations for optimizing entrepreneurship education.

Table 4.11 Characteristics of Interview Participants

No	Status	Gender	Age	Positions	Experience
1	Student A	Female	21	Marketing	Junior, experience in e-commerce startups
2	Student B	Male	22	Computer Science	Senior, participated in a programming startup program
3	Professor A	Male	50	Economic Management	30 years of teaching experience, mentoring

No	Status	Gender	Age	Positions	Experience
					multiple startup competitions
4	Professor B	Female	42	Innovation and Entrepreneurship Education	Background in startups, current faculty position
5	Entrepreneur A	Male	38	Technology Company Founder	Serial entrepreneur, focused on university cooperation
6	Entrepreneur B	Female	35	CEO of Cultural and Creative Company	Experienced in multinational programs, with a focus on youth entrepreneurship
7	HR representative A	Male	45	Associate Professor of Human Resources	Experience in education and corporate counseling
8	HR Representative B	Male	39	Corporate HR Director	14 years of HR experience, involved in entrepreneurial endeavors

Table 4.12 Interview Text Analysis Category System

No	Select Coding	Axial Coding	Open Coding	Reference Code Point	Description
1	Skill Awareness	Student Cognitive Differences	Understanding and Preferences	Entrepreneurial Awareness > Skill Understanding	Students' definitions of Entrepreneurial Skills Enhancement tend to favor soft skills and personal interests over technical skills.
2	Skill Acquisition	Curriculum Engagement	Self-Driven	Educational Experience > Hands-on Participation	Emphasizes the importance of hands-on skills in entrepreneurial programs
3	Teachers' pedagogy	Teaching Strategies	Course Design	Education Provision > Education Content Design	Focuses on developing students' integration skills and business thinking
4	Educational Assessment	Education-Industry Docking	Course Evaluation	Feedback Mechanism > Teaching Feedback	Suggests that there is a disconnect between university education and Market analysis demand
5	Industry Expectations	Business Skills Needs	Candidate Performance	Market analysis Orientation > Enterprise Perspective	Businesses emphasize practical skills and innovative execution
6	Entrepreneurial Experience	Female Entrepreneurship Perspective	Cross-Cultural Management	Practice Stories > Entrepreneurial Cases	Emphasized the influence of culture and gender in the entrepreneurial process.
7	HR Evaluation Criteria	Recruitment Dimension	Skill Modeling	Employment Criteria > Competency Model	HR emphasizes students' executive and collaborative abilities.
8	Corporate Collaboration Education	Industry-Teaching Integration	Corporate Project Participation	Education Cooperation > School-Enterprise Collaboration	Suggested to enhance students' practical ability through real projects in enterprises.

The interview's outcome reveals that differences exist within the current process of connecting entrepreneurship education with the labor market, yet a gradual convergence in understanding and expectations of entrepreneurial skills enhancement among different groups. Students focusing on their personal growth emphasize enhancing practical experience and hands-on abilities through on-campus courses and activities, with a particular emphasis on exposure to and experience in real entrepreneurial scenarios. They generally perceive existing courses as overly theoretical, lacking opportunities for practical application. Teachers, from the perspective of educational provision, focus on designing teaching content and renewing methodologies, emphasizing the cultivation of students' comprehensive abilities through project-based learning, interdisciplinary integration, and training in innovative thinking. Some professors point out that there is still room for improvement in universities' resource integration and evaluation mechanisms, which makes it difficult to stimulate students' entrepreneurial potential fully.

Entrepreneurs and human resource representatives, from the perspectives of employment and talent cultivation, clearly express their expectations for the entrepreneurial abilities that graduates should possess, such as result-oriented execution, excellent communication and teamwork skills, and an understanding and willingness to take risks. They generally believe that while graduates are relatively mature in theoretical expression, they remain immature in addressing complex problems, integrating resources, and driving projects. During the interview, corporate representatives suggested that deep collaboration between universities and enterprises, introducing real-world corporate problems into classroom teaching, could profoundly integrate ability-oriented and market-oriented approaches.

Through systematic coding of interview content using NVivo 14, the research further identified several core themes, including the multidimensional connotations of entrepreneurial skills, structural disparities between educational provision and industrial demand, and the practical impetus of industry-education integration on skill cultivation. From open coding to axial coding and selective coding, the final theoretical framework reveals that entrepreneurial skills enhancement is not merely an instrumental ability but some comprehensive qualities that bridge education and industry across situations and roles. Overall, the interview results provide systematic empirical support for a deeper understanding of the bottlenecks and breakthrough paths in entrepreneurship education and also point the way for future reforms in higher education curricula and the optimization of university-enterprise collaborative education mechanisms.

The data presents the evaluation results of the assessment items assessed by experts. This study includes 21 assessment items (Q1–Q21), each rated by five experts on a 5-point scale. The mean scores for all items were generally high, ranging from 4.0 to 4.6, indicating that the experts recognized the questions proposed in this questionnaire with an overall positive evaluation. Among these, Q17 achieved the highest average score ($M = 4.6$), reflecting its strong rationality or critical significance in the eyes of the experts.

Items Q6, Q7, Q8, Q9, and Q20 received the lowest average scores ($M = 4.0–4.1$) but still maintained a relatively high level. In terms of standard deviation (SD), most items showed an SD between 0.1 and 0.3, suggesting minimal fluctuation and a high degree of consensus among the experts, with the scores clustering closely together. Items

Q6, Q7, Q8, Q9, and Q16 had an SD of 0.1, indicating that despite their relatively lower scores, there was strong agreement among the experts regarding these items. Q3, Q4, Q5, and Q12 had a slightly higher SD of 0.3, reflecting some divergence in expert opinions on these items. These results suggest that while there is a general consensus, certain items may require further consideration or refinement.

The overall evaluation results from Table 4.13 support the scientific and logical nature of the conceptual framework. The concentration and consistency of the scores indicate high content validity. The expert assessments provide a solid foundation for reliability and offer strong support for the continued development of the research. Meanwhile, items with slightly lower scores or higher SDs could serve as areas for future revisions, improving the overall systematic and operational robustness of the framework.

Table 4.13 Expert Evaluation of Variables

Items	E1	E2	E3	E 4	E 5	Mean	SD
Q1	4	5	4	5	4	4.3	0.2
Q2	5	5	4	4	4	4.3	0.2
Q3	5	5	4	5	4	4.4	0.3
Q4	5	5	4	4	4	4.4	0.3
Q5	5	4	4	5	4	4.4	0.3
Q6	4	5	4	4	4	4.1	0.1
Q7	4	4	4	5	4	4.1	0.1
Q8	4	4	4	4	4	4.0	0.1
Q9	4	4	4	5	4	4.1	0.1
Q10	4	4	5	4	4	4.1	0.1
Q11	4	5	4	5	4	4.3	0.2
Q12	4	5	4	4	4	4.4	0.3
Q13	4	5	4	5	4	4.3	0.2
Q14	4	5	4	5	4	4.3	0.2
Q15	5	4	5	4	4	4.4	0.3
Q16	5	5	4	4	4	4.4	0.3
Q17	5	4	4	5	4	4.4	0.3
Q18	4	5	4	4	4	4.1	0.1
Q19	4	4	4	5	4	4.1	0.1
Q20	4	4	4	4	4	4.0	0.1
Q21	5	5	4	4	4	4.4	0.3

Table 4.14 presents the results of the expert consensus analysis, employing the Interquartile Range (IQR) to gauge the degree of consistency in expert ratings and thereby delineate the consensus level. The findings reveal that for all 21 questions, the first quartile (Q1) is uniformly 4, and the third quartile (Q3) is consistently 5, with an IQR value of 1 across the board, corresponding to a "Moderate Consensus" level. The IQR, a pivotal metric for assessing data dispersion, indicates that a smaller IQR value denotes a greater concentration of expert ratings and less divergence, reflecting a higher degree of agreement among the experts. The IQR for all items is 1, despite variations in expert ratings, the overall evaluations remain relatively concentrated within the "4–5" score range. This implies that experts have reached a fundamental consensus on the importance, rationality, or feasibility of each item's content.

If the IQR could be further reduced to 0, it would signify a complete unanimity in expert ratings for a particular item, representing a "High Consensus" level. Consequently, the table reflects a state of expert opinion consistency that is relatively stable yet leaves room for improvement. In practical terms, this "Moderate Consensus" is sufficient to demonstrate that the conceptual framework possesses a basic level of professional recognition and assessment consistency, serving as a theoretical foundation for subsequent research or practical applications. The results indicate that experts' opinions on the evaluation items are aligned mainly, with no significant discrepancies, thereby supporting the acceptability of the conceptual framework in terms of its structural configuration, logical rigor, and applicability. However, to enhance the model's rigor and authority, subsequent efforts could focus on refining the definitions of indicators or optimizing their expressions to promote greater consensus among experts.

Table 4.14 Expert Consensus Analysis (IQR)

Items	Q1	Q3	IQR	Consensus Level
Q1	4	5	1	Moderate Consensus
Q2	4	5	1	Moderate Consensus
Q3	4	5	1	Moderate Consensus
Q4	4	5	1	Moderate Consensus
Q5	4	5	1	Moderate Consensus
Q6	4	5	1	Moderate Consensus
Q7	4	5	1	Moderate Consensus
Q8	4	5	1	Moderate Consensus
Q9	4	5	1	Moderate Consensus
Q10	4	5	1	Moderate Consensus
Q11	4	5	1	Moderate Consensus
Q12	4	5	1	Moderate Consensus
Q13	4	5	1	Moderate Consensus
Q14	4	5	1	Moderate Consensus
Q15	4	5	1	Moderate Consensus
Q16	4	5	1	Moderate Consensus
Q17	4	5	1	Moderate Consensus
Q18	4	5	1	Moderate Consensus
Q19	4	5	1	Moderate Consensus
Q20	4	5	1	Moderate Consensus
Q21	4	5	1	Moderate Consensus

4.6 Development of Entrepreneurial Skills Enhancement Model

The findings summarized in this section demonstrate how the integration of academic theory and industrial practice created a systematic framework for cultivating students' entrepreneurial competence. The model was established upon four guiding principles and operationalized through five interrelated components, which collectively formed a dynamic and iterative process. Through this collaboration, both educational

institutions and enterprises contributed their respective strengths to ensure that entrepreneurial training was both relevant and effective.

1) Principles

The model was grounded in four core principles, which provided the foundational framework for enhancing entrepreneurial education compose of awareness, information, exploration, and evaluation. These principles guided both universities and enterprises in developing collaborative strategies aimed at supporting the growth and development of entrepreneurial skills. The principles helped shape the direction of the collaboration, ensuring that both educational and business institutions were aligned in their goals and approaches.

2) Components

The model comprised four key components, each representing a distinct phase in the collaboration process between universities and enterprises:

Preparation Stage: In this initial phase, both universities and enterprises made the necessary preparations. Universities focused on curriculum development, ensuring that teaching staff were adequately prepared and that the curriculum was tailored to meet the evolving needs of entrepreneurship education. Enterprises prepared by providing the necessary resources, setting expectations, and defining the scope of collaboration. This stage laid the groundwork for a productive partnership.

Orientation Strategy: During this phase, both universities and enterprises-oriented students toward entrepreneurial thinking. They collaborated to introduce students to real-world entrepreneurial scenarios and practical knowledge. The goal was to foster a mindset focused on entrepreneurship, which was achieved through joint efforts in the classroom and through interactions with industry professionals.

Implementation: The implementation phase marked the actual execution of the entrepreneurial training program. Universities and enterprises worked closely together to ensure that students were actively engaged in real-world entrepreneurial activities, such as internships, project-based learning, and collaborative ventures. This phase emphasized practical, hands-on experiences that would prepare students for entrepreneurial challenges.

Coaching: Continuous support through coaching was provided during this phase. Both universities and enterprises contributed by offering guidance and mentorship to students. University professors and industry mentors helped students refine their entrepreneurial skills and knowledge, ensuring that they had the necessary tools to succeed in the field.

Evaluation: The final phase involved the evaluation of the collaborative program. Universities and enterprises assessed student progress, the overall success of the program, and identified areas for further improvement. This stage provided valuable feedback that helped to refine the educational approach and strengthen the university-enterprise collaboration.

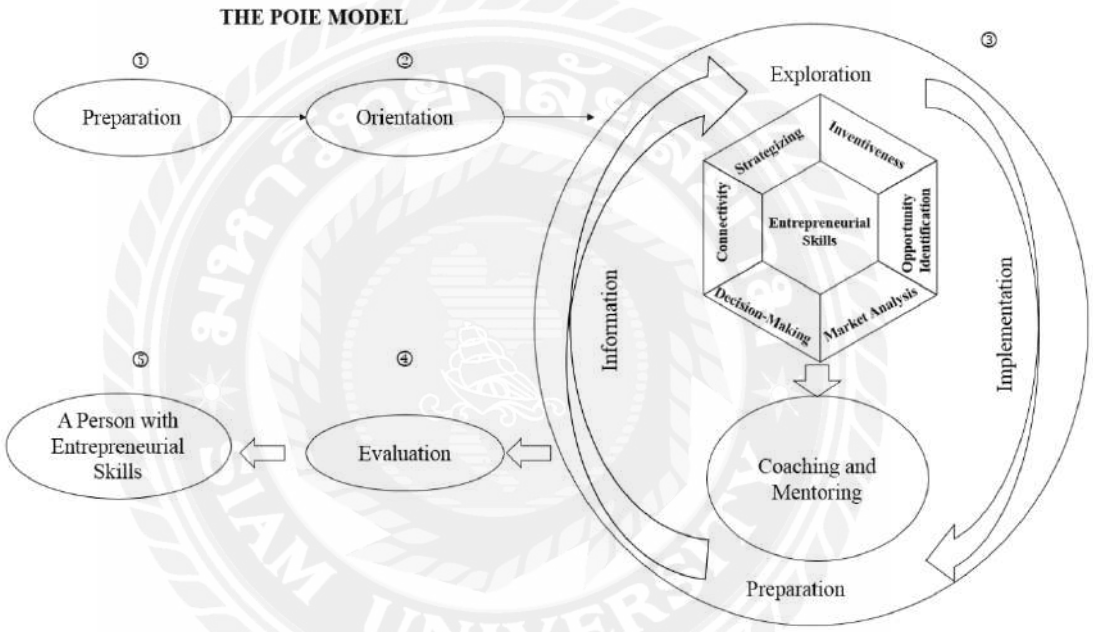
3) Process

The overall process followed the sequence of steps outlined in the components, ensuring that universities and enterprises worked in tandem throughout each phase,

from preparation to evaluation. This collaborative process was crucial in creating an effective entrepreneurial education environment, where both institutions contributed to the development of students' entrepreneurial skills.

4) Production

The outcome of this process was the development of entrepreneurial skills and knowledge among students. These competencies were the direct result of the systematic and strategic steps taken by both educational institutions and business partners throughout the entire collaboration. The production phase highlighted the successful transformation of students into skilled and knowledgeable individuals ready to enter the entrepreneurial workforce.



4.7 Validation of Research Outcomes

4.7.1 Expert Review Committee Information

Table 4.15 presents the basic information of the five experts invited to this study to validate the research outcomes. The information encompasses their identity backgrounds, fields of expertise, experience characteristics, and modes of participation. The participants included students, professors, entrepreneurs, and representatives from human resources. The research involves both the academic and industrial sectors, thereby ensuring the comprehensiveness and objectivity of the research outcomes.

E1 and E2 are student representatives, hailing from marketing and computer science, respectively. They possess experience in e-commerce startups and programming-based entrepreneurial projects, representing the authentic voices of the "user end" among the target population. E3 and E4 are professors with extensive experience in teaching and entrepreneurship education. E3 boasts over three decades of teaching experience and has long been a mentor for entrepreneurship competitions. E4, with a practical entrepreneurial background, is currently a scholar in innovation and

entrepreneurship education. Their inclusion enhances the validation dimension that combines theory with practice.

E5 and E6 represent the voices from the realm of entrepreneurial practice. E5 is the founder of a technology company and has been committed to collaborations with universities for a long time. E6 is the CEO of a cultural and creative enterprise, with experience in operating cross-border projects and a particular focus on the growth paths of young entrepreneurs. Their evaluations offer practical references for the feasibility and sustainability of the model.

E7 and E8 are professionals in human resources. The former has experience in higher education and corporate consulting. At the same time, the latter is a corporate executive with 14 years of experience in HR and has participated in multiple entrepreneurship-related projects. The participation of these two experts provides professional support for aligning the model with labor market demands and corporate hiring standards.

In summary, the participants have a reasonable composition and diverse backgrounds, enabling them to comprehensively evaluate the research outcomes from multiple dimensions such as education, entrepreneurship, industry, and human resource management. All experts participated in interviews or provided feedback online, ensuring the consistency and timeliness of data collection. Through a multi-domain and multi-level validation mechanism, the research findings have garnered recognition from theoretical experts and received positive feedback from practitioners, thereby enhancing the credibility and applicability of the model. This validation process fully embodies the scientific and forward-looking nature of the "industry-university-research-application" collaborative evaluation.

Table 4.15 Validation of Research Outcomes

No	Status	Positions	Experience.	Participation
E1	Student A	Marketing	Junior, experience in e-commerce startups	online
E2	Student B	Computer Science	Senior, participated in a programming startup program	online
E3	Professor A	Economic Management	30 years of teaching experience, mentoring multiple startup competitions	online
E4	Professor B	Innovation and Entrepreneurship Education	Background in startups, current faculty position	online
E5	Entrepreneur A	Technology Company Founder	Serial entrepreneur, focused on university cooperation	online
E6	Entrepreneur	CEO of Cultural and	Experienced in	online

No	Status	Positions	Experience.	Participation
	B	Creative Company	multinational programs, with a focus on youth entrepreneurship	
E7	HR representative A	Associate Professor of Human Resources	Experience in education and corporate counseling	online
E8	HR representative B	Corporate HR Director	14 years of HR experience, involved in entrepreneurial endeavors	online

Experts evaluated the research model as having good value for use and as a guide for practice.

4.7.2 Evaluation Scores

Scoring Guidelines: Rate each indicator on a 5-point scale (1=Strongly Disagree, 5=Strongly Agree)

Expert1:

Expert Evaluation of the Model

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities		√			
	P2*	Logical consistency between theoretical frameworks and empirical analysis		√			
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy		√			
	P4	Operational feasibility of policy recommendations		√			
	P5	Consider cultural differences when designing leadership style improvement strategies.		√			
Feasibility 0.4	F1*	Cost control capability of developed programs		√			
	F2	Accessibility of continuing learning cooperation resources		√			
	F3	Implementation challenges of promoting situational leadership			√		
	F4	The possibility of a policy culture of mutual support among colleagues		√			
	F5	Sustainability of dynamic evaluation mechanisms		√			
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy		√			
	U2	The promotion of leadership style optimization		√			

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
	U3	The overall harmony of the school has been improved.		√			
	U4	The efficiency of transforming teachers' ability into actual benefits		√			
	U5	Effectiveness of long-term career development support systems		√			

Expert2:

Expert Evaluation of the Model

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities	✓				
	P2*	Logical consistency between theoretical frameworks and empirical analysis	✓				
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy	✓				
	P4	Operational feasibility of policy recommendations	✓				
	P5	Consider cultural differences when designing leadership style improvement strategies.		✓			
Feasibility 0.4	F1*	Cost control capability of developed programs	✓				
	F2	Accessibility of continuing learning cooperation resources		✓			
	F3	Implementation challenges of promoting situational leadership		✓			
	F4	The possibility of a policy culture of mutual support among colleagues		✓			
	F5	Sustainability of dynamic evaluation mechanisms		✓			
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy	✓				
	U2	The promotion of leadership style optimization	✓				
	U3	The overall harmony of the school has been improved.	✓				
	U4	The efficiency of transforming teachers' ability into actual benefits	✓				
	U5	Effectiveness of long-term career development support systems	✓				

Expert3:

Expert Evaluation of the Model

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities		✓			
	P2*	Logical consistency between theoretical frameworks and empirical analysis		✓			
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy		✓			
	P4	Operational feasibility of policy recommendations		✓			
	P5	Consider cultural differences when designing leadership style improvement strategies.		✓			
Feasibility 0.4	F1*	Cost control capability of developed programs		✓			
	F2	Accessibility of continuing learning cooperation resources		✓			
	F3	Implementation challenges of promoting situational leadership		✓			
	F4	The possibility of a policy culture of mutual support among colleagues		✓			
	F5	Sustainability of dynamic evaluation mechanisms	✓				
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy		✓			
	U2	The promotion of leadership style optimization		✓			
	U3	The overall harmony of the school has been improved.		✓			
	U4	The efficiency of transforming teachers' ability into actual benefits		✓			
	U5	Effectiveness of long-term career development support systems	✓				

Expert4:

Expert Evaluation of the Model

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities	✓				
	P2*	Logical consistency between theoretical frameworks and empirical analysis		✓			
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy	✓				
	P4	Operational feasibility of policy recommendations		✓			

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
	P5	Consider cultural differences when designing leadership style improvement strategies.	✓				
Feasibility 0.4	F1*	Cost control capability of developed programs		✓			
	F2	Accessibility of continuing learning cooperation resources	✓				
	F3	Implementation challenges of promoting situational leadership		✓			
	F4	The possibility of a policy culture of mutual support among colleagues	✓				
	F5	Sustainability of dynamic evaluation mechanisms		✓			
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy	✓				
	U2	The promotion of leadership style optimization	✓				
	U3	The overall harmony of the school has been improved.		✓			
	U4	The efficiency of transforming teachers' ability into actual benefits		✓			
	U5	Effectiveness of long-term career development support systems	✓				

Expert5:

Expert Evaluation of the Model

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities		✓			
	P2*	Logical consistency between theoretical frameworks and empirical analysis		✓			
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy		✓			
	P4	Operational feasibility of policy recommendations		✓			
	P5	Consider cultural differences when designing leadership style improvement strategies.		✓			
Feasibility 0.4	F1*	Cost control capability of developed programs		✓			
	F2	Accessibility of continuing learning cooperation resources		✓			
	F3	Implementation challenges of promoting situational leadership		✓			
	F4	The possibility of a policy culture of		✓			

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
		mutual support among colleagues					
	F5	Sustainability of dynamic evaluation mechanisms		✓			
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy		✓			
	U2	The promotion of leadership style optimization		✓			
	U3	The overall harmony of the school has been improved.		✓			
	U4	The efficiency of transforming teachers' ability into actual benefits		✓			
	U5	Effectiveness of long-term career development support systems		✓			

Expert Review Committee Overall Evaluation:

Expert Evaluation of the Model

No	Evaluation Indicator	E1	E2	E3	E4	E5	Mean
P1*	Alignment with the development needs of private universities	4	5	4	5	4	4.3
P2*	Logical consistency between theoretical frameworks and empirical analysis	5	5	4	4	4	4.3
P3*	Applicability of research methods to the cultivation of teachers' self-efficacy	5	5	4	5	4	4.4
P4	Operational feasibility of policy recommendations	5	5	4	4	4	4.4
P5	Consider cultural differences in the design of leadership style improvement strategies	5	4	4	5	4	4.4
F1*	Cost control capability of developed programs	4	5	4	4	4	4.1
F2	Accessibility of continuing learning cooperation resources	4	4	4	5	4	4.1
F3	Implementation challenges of promoting situational leadership	4	4	4	4	4	4.0
F4	The possibility of a policy culture of mutual support among colleagues	4	4	4	5	4	4.1
F5	Sustainability of dynamic evaluation mechanisms	4	4	5	4	4	4.1
U1*	Enhancement effects on teachers' self-efficacy	4	5	4	5	4	4.3
U2	The promotion of leadership style optimization	4	5	4	4	4	4.4
U3	The overall harmony of the school has been improved	4	5	4	5	4	4.3
U4	The efficiency of transforming	4	5	4	5	4	4.3

No	Evaluation Indicator	E1	E2	E3	E4	E5	Mean
	teachers' ability into actual benefits						
U5	Effectiveness of long-term career development support systems	5	4	5	4	4	4.4

4.7.3 Expert Validation Results

Dimension	Total Score	Mean	S.D.	Conclusion
Propriety	20-70	4.4	0.2	Highly Appropriate
Feasibility	25-100	4.3	0.3	Fully Feasible
Utility	25-75	4.4	0.2	Significant Utility

4.7.4 Expert Comments (Excerpts)

1. Professor A (E3): “The study’s model is pedagogically sound and provides an actionable framework for nurturing entrepreneurship in higher education.”

2. Professor B (E4): “This research bridges the gap between entrepreneurship theory and practice, particularly for application-oriented universities.”

3. Entrepreneur A (E5): “The model captures the core competencies needed by young entrepreneurs and reflects real-world entrepreneurial pathways.”

4. Entrepreneur B (E6): “I see strong alignment between the model and current trends in youth-led innovation across cultural and international contexts.”

5. HR Representative A (E7): “The study successfully addresses the skill mismatch we observe between graduates and industry demands.”

4.7.5 Validation Conclusion

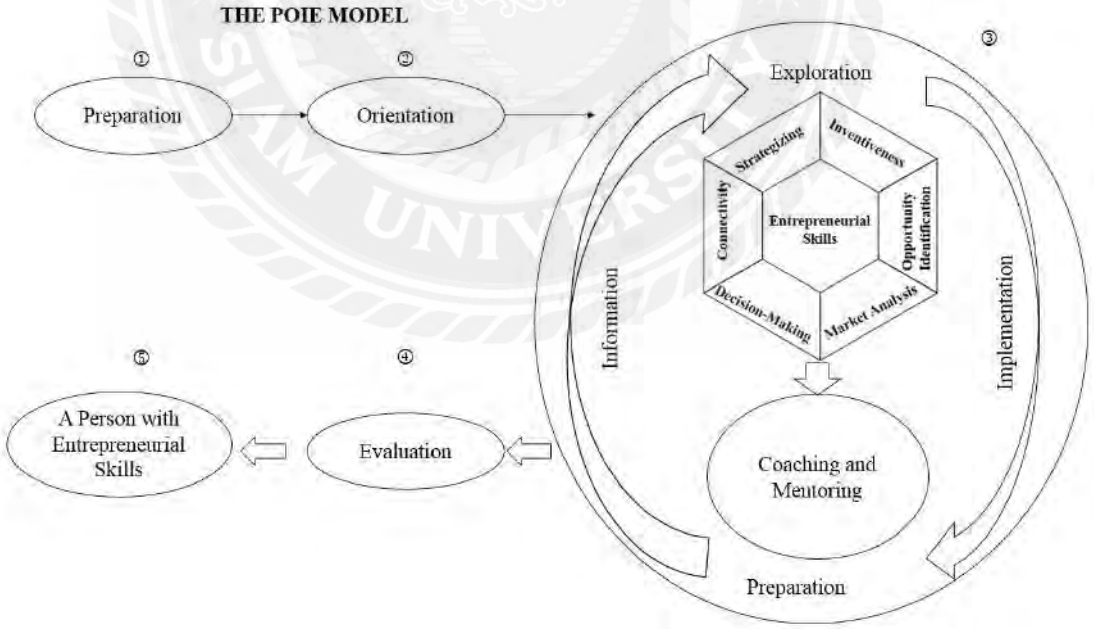
The developed model shows high validity across key areas of propriety, feasibility, and utility, with average scores over 4.3 and low standard deviations, indicating strong scientific rigor and practical relevance. Expert feedback further supports the model’s value from different perspectives: students recognize its alignment with entrepreneurial challenges and learning needs in today’s digital economy; educators emphasize its pedagogical soundness and actionable framework for fostering entrepreneurship in higher education; entrepreneurs see its accurate reflection of core competencies and real-world entrepreneurial pathways; and HR professionals highlight its effectiveness in addressing the skills gap between graduates and industry demands. This model provides theoretical guidance and bridges the gap between academic entrepreneurship education and practical industry needs, making it a solid and useful tool with significant potential for wider adoption and impact.

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATION

This study significantly contributes to the theoretical and practical understanding of entrepreneurship education. The Entrepreneurial Skills Enhancement Model provides a structured framework integrating core competencies, curriculum design, assessment strategies, and implementation mechanisms. This holistic approach addresses the multidimensional nature of entrepreneurship and offers a roadmap for designing effective and impactful programs. From a practical perspective, the model provides actionable insights for university administrators, policymakers, and educators. By adopting the model, application-oriented universities can enhance the quality and relevance of their entrepreneurship programs, better preparing students to succeed in the competitive global economy. Furthermore, the model's emphasis on stakeholder engagement and collaboration ensures that programs are tailored to the specific needs of regional economies and industries, fostering innovation and economic development.

This chapter presents the conclusion of the study based on the findings, which have been analyzed and interpreted. It explains the study results, then analyzes and summarizes the structural equation modeling (SEM) and path analysis. The final part presents the study's discussion and conclusion of research findings, policy recommendation, and future research recommendation.



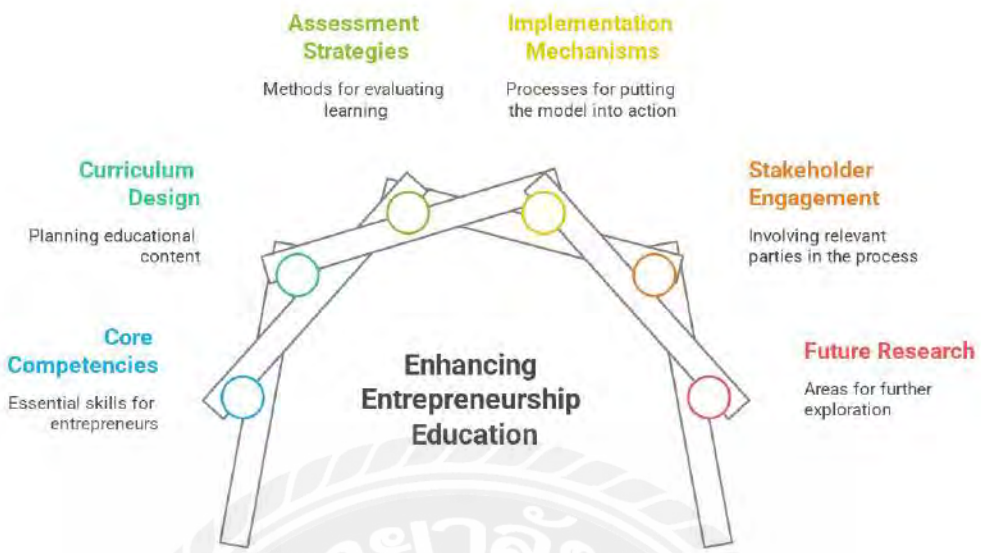


Figure 5.1 POIE Model

5.1 Discussion

1. How is the entrepreneurial skill enhancement model development currently implemented in application-oriented universities in Central China?

In recent years, China's application-oriented universities' entrepreneurial skill cultivation model has received robust policy support and achieved notable progress in practical implementation. The innovation-driven development strategy has propelled the transformation of the education system towards quality education, emphasizing the cultivation of university students' social responsibility, innovative spirit, and practical abilities. These policies have provided institutional safeguards for entrepreneurial education and prompted universities to continuously optimize their cultivation models to meet the demands of economic development in the new era.

Against this backdrop, China's application-oriented universities' entrepreneurial skill cultivation model primarily revolves around deepening comprehensive reforms in higher education, stimulating students' innovative capabilities, and promoting the transformation of scientific research achievements. Driven by the "mass entrepreneurship and innovation" policy, innovation and entrepreneurship education have become vital to university talent cultivation. The China International "Internet+" College Students' Innovation and Entrepreneurship Competition provides an opportunity to showcase innovative achievements. More importantly, it uses competition as a platform to drive reforms in university entrepreneurial education, integrating classroom teaching with practice and allowing students to hone their business thinking, team collaboration, and market analysis judgment abilities in real entrepreneurial environments.

Application-oriented universities are also exploring diversified pathways in the entrepreneurial skill cultivation model, including collaborating with enterprises to establish innovation and entrepreneurship practice bases, encouraging teachers to guide

students in launching entrepreneurial projects, and promoting an online integrated entrepreneurial curriculum system. These initiatives have enhanced university students' entrepreneurial skills and market analysis adaptability, enabling them to face future career challenges better. Currently, the entrepreneurial skill cultivation model of China's application-oriented universities is developing in the direction of policy support, practice-driven competition guidance, and multi-party collaboration, which not only improves university students' innovation and entrepreneurship abilities but also plays a positive role in promoting economic transformation and upgrading and social innovation.

2. What are the relationships among all skills within the entrepreneurial skill model?

This study delves deeply into the dynamic relationships among variables within the Entrepreneurial Skills Enhancement model, emphasizing that the formation of Entrepreneurial Skills Enhancement is a hierarchical, progressive, and structurally interconnected process, rather than being directly determined by a single ability. Inventiveness, opportunity identification, and decision-making abilities, as individual-level entrepreneurial qualities, do not directly influence strategizing capabilities. Instead, they exert their effects indirectly through two pivotal mediating variables: market analysis and connectivity capabilities. This structural pathway configuration suggests that the enhancement of entrepreneurial skills hinges on the activation and integration of intermediate capabilities, rather than merely possessing creative ideas or the ability to identify opportunities.

Decision-making ability has a significant impact on market analysis capability. Whether entrepreneurs can analyze problems methodically and formulate coping strategies in the face of complex Market analysis conditions determines whether they can truly transform their early-stage creative ideas and opportunity identification into actionable business pathways. Market analysis, networking, and collaboration capabilities serve as transmission channels and significantly influence strategic planning capabilities, indicating that entrepreneurial success necessitates internal qualities, a keen insight into the Market analysis environment, and the ability to integrate external resources.

From the perspective of the overall pathway structure, this model validates that entrepreneurial capabilities constitute a cognitive and action-oriented "input-transformation-output" entity: inventiveness, opportunity identification, and decision-making serve as input sources, undergoing transformation through market analysis and connectivity, and ultimately outputting to strategizing capabilities. This structure not only aligns with the fundamental logic of the entrepreneurial process, which progresses from internal to external and from thought to action, but also underscores that imparting creativity and stimulating entrepreneurial intent in entrepreneurship education are insufficient.

Therefore, from an educational practice standpoint, entrepreneurship education should not focus solely on idea inspiration or opportunity identification, but should delve deeper into developing students' market analysis and collaboration capabilities. Students should be guided in simulated scenarios to solve complex problems, analyze market dynamics, and drive plan implementation through teamwork. Only through the

systematic cultivation of these mediating capabilities can the transformation of entrepreneurial qualities into practical capabilities be achieved, thereby enhancing students' competitiveness and success rates in real-world entrepreneurial environments.

3. What are the potential areas for improvement in the current entrepreneurial skill enhancement model at these universities?

Despite the significant progress made by China's application-oriented universities in cultivating entrepreneurial skills, they still face practical challenges, which are manifested in three key aspects: curriculum systems, faculty strength, and practical platforms. The curriculum system for entrepreneurial education still needs improvement. Although innovation and entrepreneurship courses have been incorporated into the compulsory system, their content and structure remain inadequate. There is insufficient deep integration with various professional disciplines. Many courses are still primarily theory-based, with limited practical training time, resulting in students lacking hands-on experience. Due to the lack of high-quality training platforms, many courses struggle to provide effective practice, which in turn affects the development of students' entrepreneurial abilities.

The professionalism of the faculty and teaching methods still need enhancement. Many universities lack dedicated teachers for innovation and entrepreneurship education, leading to relatively monotonous teaching content that fails to meet students' needs in entrepreneurial knowledge, skills, and practical guidance. Some teachers lack business management or entrepreneurial experience, making the course content abstract, lacking relevance, and impractical. The teaching methods are relatively traditional, low in interactivity and practicality, making it difficult to stimulate students' innovative thinking and entrepreneurial passion.

Therefore, improving teachers' professional competence, increasing the participation of enterprise mentors and industry experts, and constructing a dual-teacher teaching model of "university teachers + enterprise mentors" are important directions for future improvement. The inadequacy of practical training platforms constrains the development of students' entrepreneurial abilities. Many universities have limited investment in entrepreneurial practice, lack specialized innovation and entrepreneurship training bases within the campus, and limited cooperation resources with external enterprises, making it difficult for students to obtain real entrepreneurial practice opportunities. Additionally, due to the lack of in-depth research on social demands by some universities, the directions of entrepreneurial projects are disconnected from Market analysis demands, leading to low student participation and unsatisfactory practical effects.

Despite the current entrepreneurial education model's results, further improvements in curriculum system optimization, faculty construction, and practical platform establishment are still necessary to cultivate innovative entrepreneurial talents with Market analysis competitiveness.

5.2 Conclusion

The initial intention of designing the model, as revealed through interviews with entrepreneurs, university teachers, and HR professionals, shows that students with firm market analysis plans and planning typically exhibit superior entrepreneurial skills in

work practice and overall personal competence. The research consider which skills can be enhanced to improve students' entrepreneurial abilities. Empirical analysis found that inventiveness, opportunity identification, decision-making, market analysis, and connectivity influence business and strategic planning. Direct impact effect tests suggest that decision-making has a significant influence on strategic planning. Opportunity identification has the second most substantial impact, while inventiveness has the weakest. The indirect impact test results indicate that market analysis has the most decisive influence on strategy planning, while connectivity ranks second. In summary, although all skills are important, the study suggests that to enhance entrepreneurial skills among students in central China, greater emphasis should be placed on problem-solving, decision-making, and market analysis. The empirical results indicate that all hypotheses are supported.

The research findings and the Entrepreneurial Skills Enhancement Model presented in this study have significant implications for designing, implementing, and evaluating entrepreneurship education in application-oriented universities, particularly in Central China. By examining the gaps in entrepreneurial skills enhancement among students and developing a comprehensive operational framework, this research offers valuable insights into how universities can better align their curricula with the demands of the labor market, foster innovation, and support entrepreneurial success The research findings and the entrepreneurial skills model presented in this study have significant implications for the design, implementation, and evaluation of entrepreneurship education in application-oriented universities, particularly in Central China. By examining the gaps in entrepreneurial skills enhancement among students and developing a comprehensive operational framework, this research offers valuable insights into how universities can better align their curricula with the demands of the labor market, foster innovation, and support entrepreneurial success. This study aimed to provide answers to 3 main research questions:

1. How is the entrepreneurial skill enhancement model development currently implemented in application-oriented universities in Central China?

In recent years, China's innovation education for college students has made significant progress in policy support and implementation. For example, the "National Medium- and Long-Term Education Reform and Development Plan Outline (2010-2020)" proposed "prioritizing development, focusing on education, reform and innovation, promoting fairness, and improving quality," positioning reform and innovation as a powerful driving force for educational development. Furthermore, the 18th National Congress of the Communist Party of China put forward the "implementation of an innovation-driven development strategy," demanding a comprehensive implementation of quality-oriented education across the educational sector, deepening comprehensive reforms, and fostering students' sense of social responsibility, innovative spirit, and practical abilities.

To deepen comprehensive reforms in higher education and stimulate the creativity of college students, to cultivate the main force of "mass entrepreneurship and innovation," to promote the transformation of research results, and to facilitate the formation of new business models of the "Internet Plus" economy, serving the upgrading of economic quality and efficiency. The Ministry of Education, in collaboration with local governments and universities, has jointly hosted the China

International "Internet Plus" College Students' Innovation and Entrepreneurship Competition, an event with international influence. Since its establishment in 2015, the China International "Internet Plus" College Students' Innovation and Entrepreneurship Competition has been held annually from April to October. The competition aims to promote comprehensive reforms in higher education through contests, to inspire students' innovative spirit, entrepreneurial abilities, and social responsibility. Competition is a platform for display and an important means to promote the organic connection between the educational, talent, industrial, and innovation chains. The competition aims to promote higher-quality entrepreneurship and employment opportunities for college graduates through innovation, leadership in entrepreneurship, and driving employment growth.

2. What are the relationships among all skills within the entrepreneurial skill model?

The results indicate that the effects of inventiveness, opportunity identification, and decision-making on strategizing are primarily mediated through the variables of market analysis and connectivity. The indirect effect of decision-making through market analysis suggests that problem-solving ability is crucial for enhancing entrepreneurial skills. In addition, market analysis and connectivity play a key role in promoting strategic thinking, further emphasizing the importance of market analysis research skills and collaborative networks in entrepreneurial practice. The study verifies that entrepreneurial skill enhancement is a hierarchical process. It emphasizes that entrepreneurship education should focus on developing students' Market analysis, research, collaborative networking, and problem-solving skills to improve their entrepreneurial success.

3. What are the potential areas for improvement in the current entrepreneurial skill enhancement model at these universities?

Despite significant progress, Chinese university students' innovation education still faces challenges. Firstly, the curriculum for innovation and entrepreneurship needs improvement. Although these courses are mandatory, there are still deficiencies in educational content and course structure. They are not fully integrated with the disciplines, faculties, and professional backgrounds, and there is a lack of practical training hours, as well as a shortage of training platforms. Secondly, the teaching staff for innovation and entrepreneurship education is limited. Many schools lack full-time teachers in this field, and the professionalism and teaching methods of the teachers need improvement. Lastly, there is a lack of practical platforms for innovation and entrepreneurship. Some universities fail to research social needs, resulting in a lack of practical training based on campus and low participation rates in entrepreneurial projects. Students lack practical training platforms.

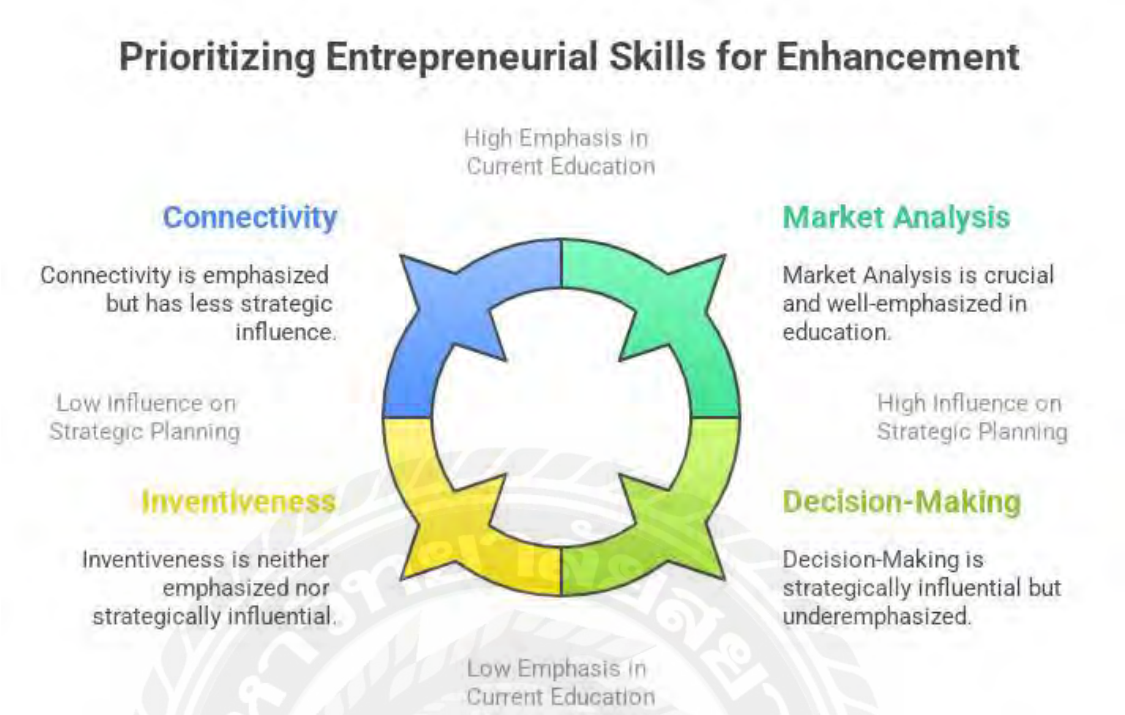


Figure 5.2 Mind Map of Prioritizing Entrepreneurial Skills for Enhancement

5.3 Recommendation

5.3.1 Optimizing Curriculum Systems to Enhance the Pertinence and Practicality of Entrepreneurship Education

Universities should strengthen the deep integration of entrepreneurship courses with professional disciplines. Universities can develop personalized innovation and entrepreneurship curriculum modules based on the characteristics of various disciplines. Engineering majors can focus on technological innovation and the commercialization of research outcomes. In contrast, business majors can emphasize Market analysis and business model design, aligning courses more closely with the needs of students from different backgrounds. Universities should increase the proportion of practical courses to bolster students' hands-on capabilities. Drawing from international best practices, universities can adopt models such as "Project-Based Learning (PBL)" or "Problem-Oriented Learning (POL)" to engage students in analyzing, planning, and executing real-world entrepreneurial cases, thereby enhancing their entrepreneurial competencies. Universities should incorporate entrepreneurial training courses, including business plan writing, financial management, risk assessment, and marketing, to ensure students possess comprehensive entrepreneurial knowledge. A dynamic adjustment mechanism should be established to update course content in response to Market analysis, periodic demands, industry trends, and social innovation hotspots. For instance, courses on entrepreneurship in emerging fields such as artificial intelligence, big data, and the digital economy can be introduced to synchronize students' Entrepreneurial Skills Enhancement with Market analysis developments.

5.3.2 Strengthening Faculty Development to Enhance Teachers' Professional Competence and Practical Guidance Capabilities

Universities should intensify efforts to cultivate "dual-qualified" entrepreneurship education teachers, who possess solid theoretical knowledge and practical experience in entrepreneurial or corporate management. Teachers can gain deeper insights into practices through corporate attachments, entrepreneurship training, and industry exchanges, enhancing their sensitivity to Market analysis dynamics and practical teaching abilities. Entrepreneurs and investors should be invited as guest professors or part-time mentors to enrich the practical aspects of teaching. For example, an "Entrepreneur Mentor Program" can be established to regularly invite entrepreneurs to campus to lecture or mentor student entrepreneurial projects, providing industry insights and entrepreneurial experience. Furthermore, the "Silicon Valley mentorship Model" can be adopted to establish a long-term team of external mentors who provide students with continuous entrepreneurial guidance and resource support. Universities should strengthen teachers' instructional capability training and encourage innovative teaching methods. For instance, flipped classrooms, case studies, and simulated entrepreneurial competitions can be introduced to make classrooms more interactive and practical. Additionally, online educational resources such as MOOCs, micro-lectures, and entrepreneurial live streams can enhance teaching flexibility and reach.

5.3.3 Establishing Diversified Entrepreneurial Practice Platforms to Enhance Students' Entrepreneurial Competency Capabilities

Universities should establish specialized entrepreneurial incubators and maker spaces in a low-cost, low-risk environment that fosters entrepreneurial experimentation. "Entrepreneurial Laboratories" should be established and equipped with office space, legal consultation, marketing support, and financial assistance to help students transform entrepreneurial ideas into actual projects. Universities should strengthen cooperation with corporations, governments, and industry associations to build "university-enterprise cooperation" entrepreneurial practice platforms. In collaboration with renowned enterprises, "Entrepreneurial Practice Bases" should be established to enable students to participate in corporate innovation projects and product development, thereby enhancing their practical experience. Additionally, cooperation with local governments can encourage students to participate in entrepreneurial practice projects such as local industrial upgrading and rural revitalization, thereby imparting social value to entrepreneurial activities. Universities should promote the integration of entrepreneurial competitions with practical projects. By participating in national competitions such as the "Internet+" College Student Innovation and Entrepreneurship Contest and the "Challenge Cup," students can refine their business acumen and entrepreneurial skills through competition. Simultaneously, universities can establish "campus entrepreneurial funds" to provide seed funding support for outstanding entrepreneurial projects, encouraging students to bring their ideas to life.

5.3.4 Policy Support and Incentive Mechanisms to Promote the Sustainable Development of Entrepreneurship Education

Universities should implement incentive policies to encourage students to engage in entrepreneurial activities. Entrepreneurship credits should be incorporated into graduation assessment systems, or students may be permitted to substitute

entrepreneurial practice for some internship credits. An "Outstanding Entrepreneurial Project Reward Mechanism" should be established to provide financial and resource support to outstanding entrepreneurial teams, thereby enhancing students' entrepreneurial enthusiasm and motivation. Universities should establish a comprehensive entrepreneurial incubation mechanism to provide ongoing policy and resource support for entrepreneurial students. A dedicated entrepreneurial guidance center should be established to provide students with services such as entrepreneurial policy consultation, legal support, and financial planning, helping them navigate various challenges throughout the entrepreneurial process. Governments and universities can collaborate to launch entrepreneurial support programs, such as providing startup loans, tax incentives, and entrepreneurial subsidies, to lower the barriers and risks associated with student entrepreneurship. Governments should encourage local governments to establish college student entrepreneurial parks, providing graduates with a more stable entrepreneurial environment and development opportunities.

In summary, improvements are needed in curriculum systems, faculty development, practical platforms, and policy support to enhance the effectiveness of entrepreneurship skills training in applied universities. Universities should optimize entrepreneurship courses to enhance their practicality and pertinence. They should strengthen the construction of "dual-qualified" faculty to improve teaching quality. Diversified entrepreneurial practice platforms should be established to bolster students' combat capabilities. Furthermore, policy incentives and entrepreneurial incubation mechanisms should be leveraged to promote the sustainable development of entrepreneurship education.

5.3.5 Expert Suggestions

Experts have provided feedback that the research model has garnered significant recognition at multiple levels. They have also put forward several directions and suggestions for improvement that warrant serious consideration. The model's practical significance and regional relevance have been highly commended. Education administration experts have noted that the study "offers a timely and pertinent examination of entrepreneurship education in Central China" and that "the proposed model is a robust response to regional challenges," indicating that its theoretical design aligns with the actual educational landscape of the region and applies to the reform endeavors of applied universities. Economists have also emphasized that the study "makes a substantial contribution to understanding the nexus between education and regional economic development," demonstrating that the model possesses not only educational significance but also economic value.

The model's structure has been deemed scientific and systematic. Entrepreneurship education experts have stated that the model "aligns well with current best practices" and that "the emphasis on creativity, innovation, and business planning is pivotal," suggesting that its content encompasses the core elements of contemporary entrepreneurship education. Human resources experts have also opined that the model "correctly identifies the gap between the skills students possess and the skills employers demand," reflecting its solid foundation in practical application.

Several experts have noted that the model faces various constraints in its practical implementation, including cultural, economic, and resource-related factors. Cultural anthropologists have noted that "the resistance to entrepreneurship and the preference for stable, traditional careers are significant barriers" and have stressed that "the success of the proposed model will largely depend on its ability to influence cultural norms," suggesting that for the model to be truly viable, it must deeply consider the ingrained career perceptions within the region. Education experts and entrepreneurship educators have highlighted that "its practical implementation might encounter challenges given the conservative regional mindset and limited resources," and that "more interactive and immersive learning opportunities" have not been fully integrated.

At the application level, some experts have called for the model to emphasize the overall synergy of the entrepreneurship ecosystem. Business consultants have criticized it as "one-dimensional," arguing that "the model's emphasis on regional education is one-dimensional" and fails to fully integrate external support elements such as access to funding, market environment, and policy frameworks. Policymakers have also suggested that the model could "be further enhanced by incorporating policy recommendations to improve cross-sector collaboration," emphasizing that the sustainable promotion of the model also hinges on the linkage mechanism between government, industry, and universities.

In summary, the research model has laid a solid foundation in theoretical design and regional adaptability, earning positive evaluations from experts in education, economics, human resources, and other fields. Its strengths lie in addressing local practical issues, integrating diverse perspectives, and proposing a systematic framework for skill development. However, for the model to achieve broader practical application, it still needs to consider cultural psychology, resource allocation, policy support, and the overall synergy mechanism of the entrepreneurship ecosystem. If continuously optimized in light of expert suggestions, it will possess even greater practical value and promotion potential in driving the integration of entrepreneurship education in universities in Central China with regional economic development.

5.4 Future Research

Future research endeavors can delve into the differentiated models of entrepreneurship education across various disciplinary backgrounds. Students from diverse majors may encounter challenges and opportunities during their entrepreneurial journeys. Consequently, future studies could analyze how to tailor entrepreneurial curricula and training paradigms to the unique characteristics of each discipline, thereby enhancing the relevance and effectiveness of education. Furthermore, future research can delve deeply into the long-term impact of entrepreneurship education on students' career development. Current research primarily focuses on the short-term influence of entrepreneurship education on entrepreneurial intentions. However, future studies could adopt longitudinal research methods to track students who have undergone entrepreneurship education, analyzing the long-term changes in their career progression, innovative capabilities, and employment quality.

Future research can examine the influence of digital technologies on entrepreneurship education. With the advent of artificial intelligence, big data, and blockchain technologies, new models such as online entrepreneurship education, virtual incubators, and intelligent entrepreneurial mentoring are gradually emerging. Future

studies can investigate how these technologies enhance the effectiveness of entrepreneurship education and explore the integration of digital tools into university entrepreneurship courses. Lastly, future research can also focus on the impact of the policy environment on entrepreneurship education in universities. The varying degrees of policy support, industrial structures, and governmental entrepreneurial assistance measures across different regions may affect the implementation outcomes of entrepreneurs the marketing and computer science departments Investigating how to optimize the policy environment and facilitate the integration of entrepreneurship education with regional economic development will be a crucial direction to pursue.

The findings of this study open several avenues for future research. Firstly, further studies are needed to empirically validate the Entrepreneurial Skills Enhancement Model by testing its implementation in real-world settings. Longitudinal research could provide valuable insights into the model's long-term impact on student outcomes, such as startup creation, innovation, and employability. Additionally, comparative studies across different regions and countries could explore how cultural, economic, and institutional factors influence the effectiveness of entrepreneurship education models.

Another area for future research is the role of technology in enhancing entrepreneurship education. Emerging technologies, such as artificial intelligence, virtual reality, and online learning platforms, offer significant potential for creating more engaging and personalized learning experiences. Investigating how these technologies can be integrated into the model could enhance its effectiveness and scalability.

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APPENDIX

APPENDIX A

Questionnaire Assessing Entrepreneurial Skills Enhancement Development in University Students

Section 1: Demographics	
Questions	**Options**
What is your age? 你的年龄是？	[ ] 18-20 [ ] 21-23 [ ] 24-26
What is your gender? 你的性别是？	[ ] Male 男性 [ ] Female 女性
Which province is your institution located in, in the central part of China? 你所在的院校在中国中部的那个省份？	[ ]HENAN 河南 [ ]JIANGXI 江西 [ ]HUNAN 湖南 [ ]HUBEI 湖北 [ ]ANHUI 安徽 [ ]SHANXI 山西
What is your major? 你所学的专业是什么	[ ]Management Science 管理学 [ ]Economics 经济学 [ ]Marketing 市场营销学

Section 2: Entrepreneurial Skills Enhancement		
Entrepreneurial Skill	**Questions**	**Options**
Inventiveness 创意与创新	I typically propose various solutions or creative ideas when faced with an entrepreneurial project. 在面对一个创业项目时，我通常能尝试提出不同的解决方案或创意	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意
	My university encourages inventiveness in its programs and activities. 我的大学鼓励在课程和活动中展现创意与创新。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	I often participate in various creative competitions and innovation and entrepreneurship activities.我经常参加各类创意竞赛、创新创业活动	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	I can think creatively to solve problems in academic or personal projects. 我能够创造性地思考以解决学术或个人项目中的问题。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
Opportunity Identification 机会识别	I can easily identify and evaluate potential entrepreneurial opportunities. 我能够轻松识别并评估潜在的创业机会	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)

Section 2: Entrepreneurial Skills Enhancement		
Entrepreneurial Skill	**Questions**	**Options**
Opportunity Identification 机会识别	My university provides adequate resources to help me identify entrepreneurial opportunities. 我的大学提供了足够的资源来帮助我识别创业机会。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	I actively identify opportunities in my environment (e.g., Market analysis gaps, business ideas). 我积极寻求在环境中识别机会(例如，市场空白、商业想法)。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意
Market analysis 市场调研与分析	I feel confident conducting Market analysis research to analyze customer needs and Market analysis trends. 我对进行市场调研以分析客户需求和市场趋势感到自信。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	My university has equipped me with the skills necessary for market analysis. 我的大学为我提供了市场调研与分析技能。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	I frequently apply market analysis skills to my projects. 我经常在项目中应用市场调研与分析技能。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)

Section 2: Entrepreneurial Skills Enhancement		
Entrepreneurial Skill	**Questions**	**Options**
Decision-making 解决问题与决策制定	I am confident in my ability to solve complex problems and make decisions. 我对自己的解决复杂问题和制定决策的能力感到自信。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	My university provides practical training to develop my problem-solving skills. 我的大学提供了有效的培训来培养我的解决问题能力。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	I can compare multiple options and make the optimal choice .我能够对多个方案进行比较并做出最优选择	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	I can effectively analyze information to make decisions under uncertainty. 我能够有效地分析信息以在不确定性下做出决策。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
Connectivity 网络建设与协作	My family can provide me with the network of resources needed to start a business. 我的家庭能为我提供创业所需的资源网络。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	My university facilitates networking opportunities with professionals and entrepreneurs. 我的大学为我提供了与专业人士和创业者建立网络的机会。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)

Section 2: Entrepreneurial Skills Enhancement		
Entrepreneurial Skill	**Questions**	**Options**
Connectivity 网络建设与协作	I believe collaboration is essential for entrepreneurial success. 我相信合作对于创业成功至关重要。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
Strategizing and Strategy 商业计划与策略	I am familiar with creating business plans and Strategies. 我熟悉制定商业计划的过程。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	My university teaches practical strategies for Business Planning, Strategy, and execution. 我的大学教授了有效的商业规划与执行策略。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	Learning to strategize is very helpful for future career development. 我认为学习商业规划和战略未来职业发展的帮助非常大	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)
	I feel confident in defining goals and strategies for Strategizing. 我对为企业计划制定目标和策略充满信心。	1 (Strongly Disagree) - 5 (Strongly Agree) 1 (非常不同意) - 5 (非常同意)

English to Chinese Translator: Zhen Lehong
Chinese to English Translator: Zhang Ying

Part 1: Demographic information

Remark: Please choose by using ✓ in □ or fill in the information in the blank

Item	Question	Expert's score					
		1	2	3	4	5	total
1	**Age** 年龄 18-20 21-23 24-26	1	1	1	1	1	1
2	**Gender** Male 男性 Female 女性 Prefer not to say 不愿透露	1	1	1	1	1	1
3	**Province** 省份 HENAN 河南 JIANGXI 江西 HUNAN 湖南 HUBEI 湖北 ANHUI 安徽 SHANXI 山西	1	1	1	1	1	1
4	**Major** 专业 Management Science 管理学 Economics 经济学 Marketing 市场营销学	1	1	1	1	1	1

Part 2 Assessment on Entrepreneurial Skills Enhancement

Remark: Please choose by using ✓ in □ or fill in the information in the blank

Item	Your Entrepreneurial Skill 你的创业技能	Expert's score					
		1	2	3	4	5	total
Inventiveness **创意与创新**							
1	I usually propose different solutions or creative ideas when facing an entrepreneurial project. 在面对一个创业项目时，我通常能尝试提出不同的解决方案或创意。	1	1	1	-1	1	06
2	My university encourages inventiveness in its programs and activities. 我的大学鼓励在课程和活动中展现创意与创新。	1	-1	1	1	1	0.6
3	I often participate in various creative competitions and innovation and entrepreneurship activities. 我经常参加各类创意竞赛、创新创业活动。	1	1	1	1	1	1
4	I can think creatively to solve problems in academic or personal projects. 我能够创造性地思考以解决学术或个人项目中的问题。	1	1	1	1	1	1
Opportunity Identification **机会识别**							
5	I can easily identify and evaluate potential entrepreneurial opportunities. 我能够轻松识别并评估潜在的创业机会。	1	1	1	1	1	1
6	My university provides adequate resources to help me identify entrepreneurial opportunities. 我的大学提供了足够的资源来帮助我识别创业机会。	1	1	1	1	1	1
7	I actively identify opportunities in my environment (e.g., Market analysis gaps, business ideas). 我积极寻求在环境中识别机会(例如，市场空白、商业想法)。	0	1	1	1	1	0.8

Item	Your Entrepreneurial Skill 你的创业技能	Expert's score					
		1	2	3	4	5	total
Market analysis 市场调研与分析							
8	I feel confident conducting Market analysis research to analyze customer needs and Market analysis trends. 我对进行市场调研以分析客户需求和市场趋势感到自信。	1	1	-1	1	1	0.6
9	My university has equipped me with market analysis skills. 我的大学为我提供了市场调研与分析技能。	-1	1	1	1	1	0.8
10	I frequently apply market analysis skills to my projects. 我经常在项目中应用市场调研与分析技能。	1	1	1	1	1	1
Decision-making 解决问题与决策制定							
11	I am confident in my ability to solve complex problems and make decisions. 我对自己的解决复杂问题和制定决策的能力感到自信。	1	1	1	1	1	1
12	My university provides practical training to develop my problem-solving skills. 我的大学提供了有效的培训来培养我的解决问题能力。	0	0	0	1	1	0.4
13	I can compare multiple options and make the optimal choice. 我能够对多个方案进行比较并做出最优选择。	1	1	1	1	1	1
14	I can effectively analyze information to make decisions under uncertainty. 我能够有效地分析信息以在不确定性下做出决策。	1	1	1	1	1	1
Connectivity 网络建设与协作							
15	My family can provide me with the network of resources needed to start a business. 我的家庭能为我提供创业所需的资源网络。	1	1	1	0	1	0.8

Item	Your Entrepreneurial Skill 你的创业技能	Expert's score					
		1	2	3	4	5	total
Connectivity **网络建设与协作**							
16	My university facilitates networking opportunities with professionals and entrepreneurs. 我的大学为我提供了与专业人士和创业者建立网络的机会。	1	1	1	1	1	1
17	I believe collaboration is essential for entrepreneurial success. 我相信合作对于创业成功至关重要。	1	1	1	1	1	1
Strategizing **商业计划与策略**							
18	I am familiar with the process of creating a business plan. 我熟悉制定商业计划的过程。	0	1	1	0	1	0.6
19	My university teaches practical strategies for business planning and execution. 我的大学教授了有效的商业规划与执行策略。	1	1	0	1	0	0.6
20	I believe that learning to strategize is very helpful for future career development. 我认为学习商业规划和战略未来职业发展的帮助非常大。	1	0	1	1	1	0.8
21	I feel confident in defining goals and strategies for a business plan. 我对为企业计划制定目标和策略充满信心。	1	1	1	1	1	1

Appendix B: Interview Protocol

Introduction
Briefly introduce the purpose of the interview and its significance. 简要介绍面试的目的和意义。
Ensure participants are comfortable and aware of the interview's confidentiality. 确保参与者感到舒适并了解面试的保密性。
Participant Background
Gather basic information about the participant (name, position, experience). 收集参与者的基本信息（姓名、职位、经验）。
For students: Major, academic year, and any previous entrepreneurial experiences. 对于学生：专业、学年以及任何以往的创业经验。
For professors: Field of expertise, years of teaching experience, and involvement in entrepreneurship education. 对于教授：专业领域、教学经验以及参与创业教育的情况。
I For University Teachers
Section 1: Inventiveness
How do you stimulate students' creativity and innovative thinking in your teaching process? 在您的教学过程中，您如何激发学生的创造力和创新思维？
What impacts do you think the curriculum settings and teaching methods of the school have on cultivating students' innovative abilities? 您认为学校的课程设置和教学方法对培养学生的创新能力有何影响？
What innovative activities or projects do you encourage students to participate in, and how practical are these activities in enhancing students' innovative abilities? 您鼓励学生参与哪些创新活动或项目？这些活动对提升学生创新能力的效果？
Do you think the current support from universities for teachers in innovative teaching is sufficient? 您认为当前高校对教师创新教学的支持是否充足？
Section 2: Opportunity Identification
How do you guide students in identifying opportunities in academic research and future career development? 您如何引导学生识别学术研究和未来职业发展的机会？
What aspects of opportunities do you think students are most likely to overlook in your field? 在您的领域，您认为学生最容易忽视机会的哪些方面？
Through what cases or practices will you help students improve their opportunity identification abilities? 您会通过哪些案例或实践帮助学生提高机会识别能力？
How do you think universities should create an environment conducive to students' identification of opportunities? 您认为高校应如何营造有利于学生发现机会的环境？

Section 3:Market analysis
How do you teach students to conduct effective Market analysis research when guiding students on relevant topics? 在指导学生进行相关主题时，您如何教学生进行有效的市场调查？
What difficulties do you think students often encounter in the market? 您认为学生在市场调查和分析中最常遇到的困难是什么？
What tools or methods would you recommend students use for marketing? 您会建议学生使用什么工具或方法进行市场分析？
What benefits do you think the cooperation between universities and enterprises in Market analysis research has for students? 您认为大学和企业在市场调研方面的合作对学生有什么好处？
Section 4: Solving and Decision Making
In classroom teaching, how do you cultivate students' decision-making abilities? 在课堂教学中，如何培养学生解决问题和决策的能力？
What practical cases will you provide students to exercise their abilities in these aspects? 您会给学生提供哪些实践案例来锻炼他们在这些方面的能力？
What are the main factors affecting students' practical problem-solving and decision-making? 您认为影响学生有效解决问题和决策的主要因素是什么？
In what aspects do you think universities can improve in cultivating students' two abilities? 您认为大学在培养学生这两种能力方面可以改进哪些方面？
Section 5：Connectivity
How do you encourage students to build effective interpersonal networks and collaborate with others? 您如何鼓励学生建立有效的人际网络和开展团队合作？
What common problems do you think university students have in interpersonal communication and team cooperation? 您认为大学生在人际交往和团队合作方面普遍存在哪些问题？
What activities will you organize to promote cooperation and communication among students? 您会组织什么活动来促进学生之间的合作和交流？
Do you think the cooperation between universities, enterprises, and research institutions helps students expand their interpersonal networks? 您认为大学与企业、科研机构的合作有助于学生扩大人际网络吗？
Section 6：Planning and Strategy
In your courses, how do you impart knowledge of strategizing formulation to students? 在您的课程中，您如何向学生传授商业规划和战略制定的知识？
What are the biggest challenges students face when learning to strategize? 您认为学生在学习商业计划和战略时面临的最大挑战是什么？

Section 6：Planning and Strategy
What books or cases would you recommend students read to learn this knowledge? 您会推荐学生阅读哪些书籍或案例来学习这些知识？
How should universities and enterprises strengthen their cooperation in teaching strategies? 您认为高校和企业应如何加强在商业规划与战略教学方面的合作？
II. For University Students
Section 1: Inventiveness
What factors stimulate your creativity and innovative thinking in your study and life? 在您的学习和生活中，什么因素最能激发您的创造力和创新思维？
What innovative activities or projects have you participated in, and how have these experiences enhanced your abilities? 您参加过哪些创新活动或项目，这些经历如何增强了您的创新能力？
Do you think the innovative resources provided by the school (such as laboratories, innovative courses, etc.) meet your needs? 您认为学校提供的创新资源（如实验室、创新课程等）是否满足您的需求？
What improvements do you hope the school will make in cultivating students' innovative abilities? 您希望学校在培养学生的创新能力方面做出哪些改进？
Section 2: Opportunity Identification
How do you discover potential learning and development opportunities in your professional field? 在您的专业领域，您如何发现潜在的学习和发展机会？
What channels or methods do you think are most helpful for you in identifying opportunities? 您认为哪些渠道或方法对您发现机会最有帮助？
What difficulties have you encountered in identifying opportunities, and how did you overcome them? 您在寻找机会的过程中遇到了哪些困难？您是如何克服它们的？
What else can the school do to help students identify opportunities? 您认为学校还能做些什么来帮助学生发现机会？
Section 3:Market analysis
Have you participated in Market analysis research projects? What have you learned in this process? 您参加过市场调研项目吗？在这个过程中您学到了什么？
What aspects do you think Market analysis research is important for college students? 您认为市场调查在哪些方面对大学生很重要？
What is the biggest problem you encountered in the market? 您在市场调查和分析中遇到的最大问题是什么？
What guidance on Market analysis do you hope the school or teachers will provide? 您希望学校或老师在市场调研和分析方面提供什么样的指导？

Section 4: Solving and Decision Making
When facing problems in study and life, what steps do you usually take to solve them? 当您在学习和生活中遇到问题时，您通常采取什么步骤来解决它们？
What are your most significant advantages and disadvantages in the decision-making process? 在做决定的过程中，您认为您最大的优点和缺点是什么？
Have you participated in training or activities to improve decision-making abilities? How effective are they? 您参加过提高解决问题和决策能力的培训或活动吗？它们的效果如何？
How do you think the school should strengthen the cultivation of these two abilities in students? 您认为学校应该如何加强对学生这两种能力的培养？
Section 5：Connectivity
How do you expand your interpersonal network? What help do these interpersonal networks bring to you? 您如何扩大您的人际网络？这些人际网络给您带来了什么帮助？
In team cooperation, what do you think is the most important factor? 在团队合作中，您认为最重要的因素是什么？
What difficulties have you encountered in team cooperation, and how did you solve them? 您在团队合作中遇到过哪些困难？您是如何解决的？
What resources or platforms do you hope the school will provide to promote cooperation and communication among students? 您希望学校提供哪些资源或平台来促进学生之间的合作与交流？
Section 6：Planning and Strategy
What do you know about strategizing formulation? Through what channels did you obtain this knowledge? 您对商业计划和战略制定了解多少？您是通过什么渠道获得这些知识的？
Do you think learning Strategizing is helpful for your future career development? Why? 您认为学习商业计划和战略对您未来的职业发展有帮助吗？为什么？
If you have a business startup plan, what preparations have you made regarding strategizing and strategy? 如果您有一个创业计划，您在商业计划和战略方面做了哪些准备？
What improvements do you hope the school will make in teaching strategizing and strategy? 您希望学校在商业计划与战略的教学上有哪些改进？
III. For Entrepreneurs
Section 1: Inventiveness
In the development process of your enterprise, what role has inventiveness played? 在您的企业发展过程中，创造力和创新发挥了什么作用？
What measures have you taken to encourage the innovative behavior of enterprise employees? 您采取了哪些措施来鼓励企业员工的创新行为？

Section 1: Inventiveness
What is the biggest challenge enterprises face in the innovation process? 您认为企业在创新过程中面临的最大挑战是什么？
How do you balance the relationship between innovation investment and short-term enterprise returns? 您如何平衡创新投资与企业短期回报之间的关系？
Section 2: Opportunity Identification
In your industry, how do you discover and seize business opportunities? 在您的行业中，您如何发现并抓住商机？
What is the most important ability for entrepreneurs to identify opportunities? 您认为企业家最重要的机会识别能力是什么？
What information channels and methods do you mainly rely on in the opportunity identification process? 在机会识别的过程中，您主要依靠哪些信息渠道和方法？
In the current Market analysis environment, in what fields do you think new business opportunities are mainly concentrated? 在目前的市场环境下，您认为新的商业机会主要集中在哪些领域？
Section 3:Market analysis
How does your enterprise conduct Market analysis to support enterprise decision-making? 您的企业如何进行市场调查和分析以支持企业决策？
What aspects of Market analysis are important for enterprise development? 您认为市场调研和分析在哪些方面对企业发展很重要？
What difficulties and challenges have you encountered in the market? 在市场调研和分析的过程中遇到了哪些困难和挑战？
What suggestions do you have for market analysis tools and methods? 您对市场调查和分析的工具和方法有什么建议？
Section 4: Solving and Decision Making
In the operation of the enterprise, how do you lead the team in solving complex problems and making important decisions? 在企业运营中，您如何带领团队解决复杂问题，做出重要决策？
What key factors affect the enterprise's practical problem-solving and correct decision-making? 您认为影响企业有效解决问题和正确决策的关键因素是什么？
In the decision-making process, how do you weigh various factors and risks? 在决策过程中，您如何权衡各种因素和风险？
How do you think enterprises should cultivate employees' decision-making abilities? 您认为企业应该如何培养员工的解决问题和决策能力？
Section 5：Connectivity
In developing your enterprise, what roles have interpersonal networks and cooperation played? 在您的企业发展过程中，人际网络和合作发挥了什么作用？

Section 5：Connectivity
How do you establish and maintain the cooperative partnership of the enterprise? 如何建立和维护企业的合作伙伴关系？
What do you think is the most important issue to pay attention to in the cooperation process of enterprises? 您认为企业合作过程中最需要注意的问题是什么？
What expectations and suggestions do you have for the cooperation between universities and enterprises? 您对校企合作有什么期待和建议？
Section 6：Planning and Strategy
When your enterprise formulates a strategy, what factors are mainly considered? 您的企业在制定经营计划和战略时，主要考虑哪些因素？
What are the key elements of enterprise business planning and strategy? 您认为企业商业计划和战略的关键要素是什么？
How do you adjust the enterprise's strategy in response to changes in market analysis? 您如何根据市场变化调整企业的经营计划和战略？
What are your suggestions for start-up enterprises in formulating their strategy? 您对创业企业在业务规划和战略制定方面有什么建议？
IV. For HR
Section 1: Inventiveness
How do you evaluate candidates' creativity and innovative abilities in recruitment? 在招聘过程中，您如何评价候选人的创造力和创新能力？
What environment and incentive measures should enterprises provide to stimulate employees' innovative thinking? 您认为企业应该提供什么样的环境和激励措施来激发员工的创新思维？
In employee training, how do you cultivate employees' innovative abilities? 在员工培训中，您如何培养员工的创新能力？
How important do you think innovative ability is for employees' career development in the enterprise? 您认为创新能力对员工在企业的职业发展有多重要？
Section 2: Opportunity Identification
When recruiting talent for the enterprise, what opportunity identification abilities do you expect candidates to have? 在为企业招聘人才时，您希望候选人具备什么样的机会识别能力？
How do you think enterprise employees can improve their opportunity identification abilities? 您认为企业员工如何提高自己的机会识别能力？
In your work, how do you help employees discover career development opportunities? 在您的工作中，您如何帮助员工发现职业发展机会？
Do you think enterprises pay enough attention to cultivating opportunity-identification abilities in talent cultivation? 您认为企业在人才培养中是否足够重视机会识别能力的培养？

Section 3:Market analysis
When recruiting talents for relevant positions, what are your requirements for candidates' Market analysis abilities? 在招聘相关岗位的人才时，贵公司对候选人的市场调研和分析能力有什么要求？
Which departments within the enterprise do you think most need to possess Market analysis abilities? 您认为企业的哪些部门最需要具备市场调查和分析能力？
What methods will you adopt in employee training to improve employees' Market analysis abilities? 在员工培训中，您会采用哪些方法来提高员工的市场调研和分析能力？
What impact do you think Market analysis abilities have on the enterprise's competitiveness? 您认为市场调查和分析能力对企业的竞争力有什么影响？
Section 4: Solving and Decision Making
In the recruitment process, how do you examine candidates' decision-making abilities? 在招聘过程中，您如何考察候选人的解决问题和决策能力？
How should enterprises cultivate employees' decision-making abilities at work? 您认为企业应该如何培养员工在工作中解决问题和决策的能力？
In employee performance appraisal, how do you evaluate employees' abilities in these two aspects? 在员工绩效考核中，您是如何评价员工在这两方面的能力的？
How much do you think employees' decision-making abilities affect enterprise operations? 您认为员工解决问题和决策的能力对企业运作有多大的影响？
Section 5：Connectivity
How do you evaluate candidates' abilities in expanding interpersonal networks and team collaboration when recruiting? 在招聘时，您如何评估应聘者拓展人际网络和团队协作的能力？
How do you think enterprises should create a good team-cooperation atmosphere? 您认为企业应该如何营造良好的团队合作氛围？
What activities will you do in employee training to improve cooperation? 在员工培训中，您会开展哪些活动来提高员工的合作能力？
What role do employees' interpersonal networks and cooperation abilities play in promoting enterprise projects? 您认为员工的人际网络和合作能力对企业项目的推进有什么作用？
Section 6：Planning and Strategy
When recruiting candidates for strategic planning-related positions, what abilities and qualities do you require of them? 在招聘战略规划相关职位的候选人时，您们对他们的能力和素质有什么要求？
To what extent do enterprise employees need to understand Strategizing? 您认为企业员工在多大程度上需要了解企业规划和战略？

Section 6：Planning and Strategy
How do you convey the enterprise's strategy to employees in employee training? 在员工培训中，您如何向员工传达企业的经营计划和战略？
What impact do you think employees' understanding of the enterprise's Strategizing has on enterprise development? 您认为员工对企业经营计划和战略的理解对企业发展有什么影响？
How do you convey the enterprise's strategy to employees in employee training? 在员工培训中，您如何向员工传达企业的经营计划和战略？
Closing
Express gratitude for their time and valuable insights. 对他们的时间和宝贵见解表示感谢。
Reiterate the importance of their contribution to improving entrepreneurship education. 重申他们对改善创业教育所作贡献的重要性。

English to Chinese Translator: Zhen Lehong
Chinese to English Translator: Zhang Ying

APPENDIX C: List of Experts

List of Experts for IOC

No.	Full Name	Organization	Position	Graduation Institution	Education Level	Years of Experience
1	Timothy Scott	Assumption University	**Instructor**	Assumption University	Ph.D. in Education	21
2	Dong ShouSheng	School of Teacher Education of Weifang University	Professor/Executive Vice Dean of Shandong Vocational Education Research Institute Professor	East China Normal University	Ph.D. in Education	12
3	Bai Beier	Shandong Women's University	Professor	Shaanxi Normal University	Ph.D. in Education	11
4	Wenyu Guan	Assumption University	Associate Professor	**Shandong Normal University**	Ph.D. in Philosophy	12
5	Yin Yun Wei	Assumption University	Instructor		Ph.D. in Education	3

SU. 0210.04/ 28

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

Feb 2025

Dear Professor Timothy Scott, Professor at Graduate School of Human Sciences,
Assumption University of Thailand Educational Administration and Leadership
Program (PhD)

Subject: Invitation to be an expert to examine research tools

Since Ms. Kang YaQi student ID. 6319000022, a doctoral student in English program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor), the Graduate School of Education would like to invite you to be an expert to examine the research tools.

Questionnaire regarding current circumstances is a significant tool of the research which is needed to be considered and examined including suggestion for research tools. Ms Kang YaQi will contact and coordinate all details by herself.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

SU. 0210.04/ 031

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

Feb 2025

Dear Professor Wenyu Guan, Professor at Guangdong Medical University Department of Foreign Languages

Subject: Invitation to be an expert to examine research tools

Since Ms. Kang YaQi student ID. 6319000022, a doctoral student in English program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor), the Graduate School of Education would like to invite you to be an expert to examine the research tools.

Questionnaire regarding current circumstances is a significant tool of the research which is needed to be considered and examined including suggestion for research tools. Ms Kang YaQi will contact and coordinate all details by herself.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

SU. 0210.04/ 032

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

Feb 2025

Dear Assoc. Prof. Yin Yun Wei, Graduated from Assumption University, Educational Administration Leadership PhD.

Subject: Invitation to be an expert to examine research tools

Since Ms. Kang YaQi student ID. 6319000022, a doctoral student in English program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor), the Graduate School of Education would like to invite you to be an expert to examine the research tools.

Questionnaire regarding current circumstances is a significant tool of the research which is needed to be considered and examined including suggestion for research tools. Ms Kang YaQi will contact and coordinate all details by herself.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

SU. 0210.04/ 029

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

Feb 2025

Dear Assoc. Prof. Dong ShouSheng, Professor at Associate Dean of the School of Teacher Education, Weifang University, Professor, Doctor, also serves as a graduate mentor at the School of Educational Sciences, Qufu Normal University.

Subject: Invitation to be an expert to examine research tools

Since Ms. Kang YaQi student ID. 6319000022, a doctoral student in English program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor), the Graduate School of Education would like to invite you to be an expert to examine the research tools.

Questionnaire regarding current circumstances is a significant tool of the research which is needed to be considered and examined including suggestion for research tools. Ms Kang YaQi will contact and coordinate all details by herself.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

List of College Students and Business Managers to Evaluate the Applicability of the Entrepreneurial Skills Enhancement Model

1. Zhangwei Hunan ZTE Software Co., Ltd. Manager

2. Wangpeng Wuhan FiberHome Networks Co., Ltd. Manager

3. LiPanPan Zhengzhou Yutong Bus Co., Ltd. Manager

4. Wangqongbo Henan Liyuan Information Technology Co., Ltd. Manager

5. MaChangjun Xi'an New Building Materials Co., Ltd. Manager

6. Zhangdingshan Graduates of the School of Economics and Management, Wuhan University

7. Lining Ph.D. in Education, graduated from Henan University.

, Henan University

8. Dr. Hongfu Gao, Ph.D. in Educational Leadership, graduated from Xiamen University.

9. Dr He Jie, Vice Dean of the Economics and Management, Pingdingshan University

10. Liulongfei Graduates of the School of Public Administration, Zhengzhou University

11. Yangxikang graduates of the School of Economics and Management. Hubei University

12. Dr Beier Bai, Ph.D. in Education, graduated from Shaanxi Normal University.

13. Lilele, Graduate of the School of Industrial Engineering, Henan University

14. Baiqunahua Graduates of the School of Public Administration, Wuhan Technology University

15. Wangxiao, Graduates of the School of Economics and Management, Xi'an University

16. Lijiaxin, Graduate of the School of Economics and Management, Changsha University

List of the Experts Who Assess the Suitability and Feasibility of the Management Strategies

No.	Full Name	Organization	Position	Graduation Institution	Education Level	Years of Experience
1	Gao Hongfu	Weifang University of Science and Technology	Professor	Xiamen University	Ph.D. in Educational Leadership	30
2	He jie	Pingdingshan University	Professor/Vice Dean of Teacher Education College	Zhengzhou University	Vice Dean of the Economics and Management	20
3	Bai Beier	Weifang University	Professor of Teacher Education School	Shaanxi Normal University	Ph.D. in Education	22
4	Li Ning	, Pingdingshan University	Professor of Education	He Nan University	Ph.D. in Education	17
5	LiPanPan	Zhengzhou Yutong Bus Co., Ltd.	HR	Hunan University		18

1. Dr. Hongfu Gao: ghfjyhy@163.com
   Ph.D. in Educational Leadership, graduated from Xiamen University.
2. Dr He Jie: 15434272@qq.com
   Vice Dean of the Economics and Management, Pingdingshan University
3. Dr Beier Bai: 37699767@qq.com
   Ph.D. in Education, graduated from Shaanxi Normal University.
4. Dr. Lining: 461162848@qq.com
   Ph.D. in Education, graduated from Henan University.
5. HR LiPanPan: 875331794@qq.com
   I graduated from Hunan University and currently serve as the director and deputy general manager of Zhengzhou Yutong Bus Co., Ltd., where I am responsible for managing the company's personnel.

SU. 0210.04/ 42

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

March 2025

Dear Professor Gao Hongfu, Professor at Weifang University of Science and Technology, Ph.D. in Educational Leadership, graduated from Xiamen University.

Subject: Invitation to be an expert in focus group discussion

Since Ms. Kang Yaqi, student ID 6319000022, a doctoral student in Educational Leadership program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor) ,the Graduate School of Education would like to invite you to be an expert to provide your opinion in a focus group discussion oncollege student entrepreneurial skills at 2:00 PM on Apt 10, 2025 at Conference room of School of Education, Weifang University.

Focus group discussion is a significant aspect ofthe research conclusion that needs an approval. Ms. Kang Yaqi will contact you and coordinate all details himself later.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

SU. 0210.04/ 44

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

March 2025

Dear Professor Bai Beier, Professor at Associate Dean of the School of Teacher Education, Weifang University, Professor, Doctor, also serves as a graduate mentor at the School of Educational Sciences, Qufu Normal University.

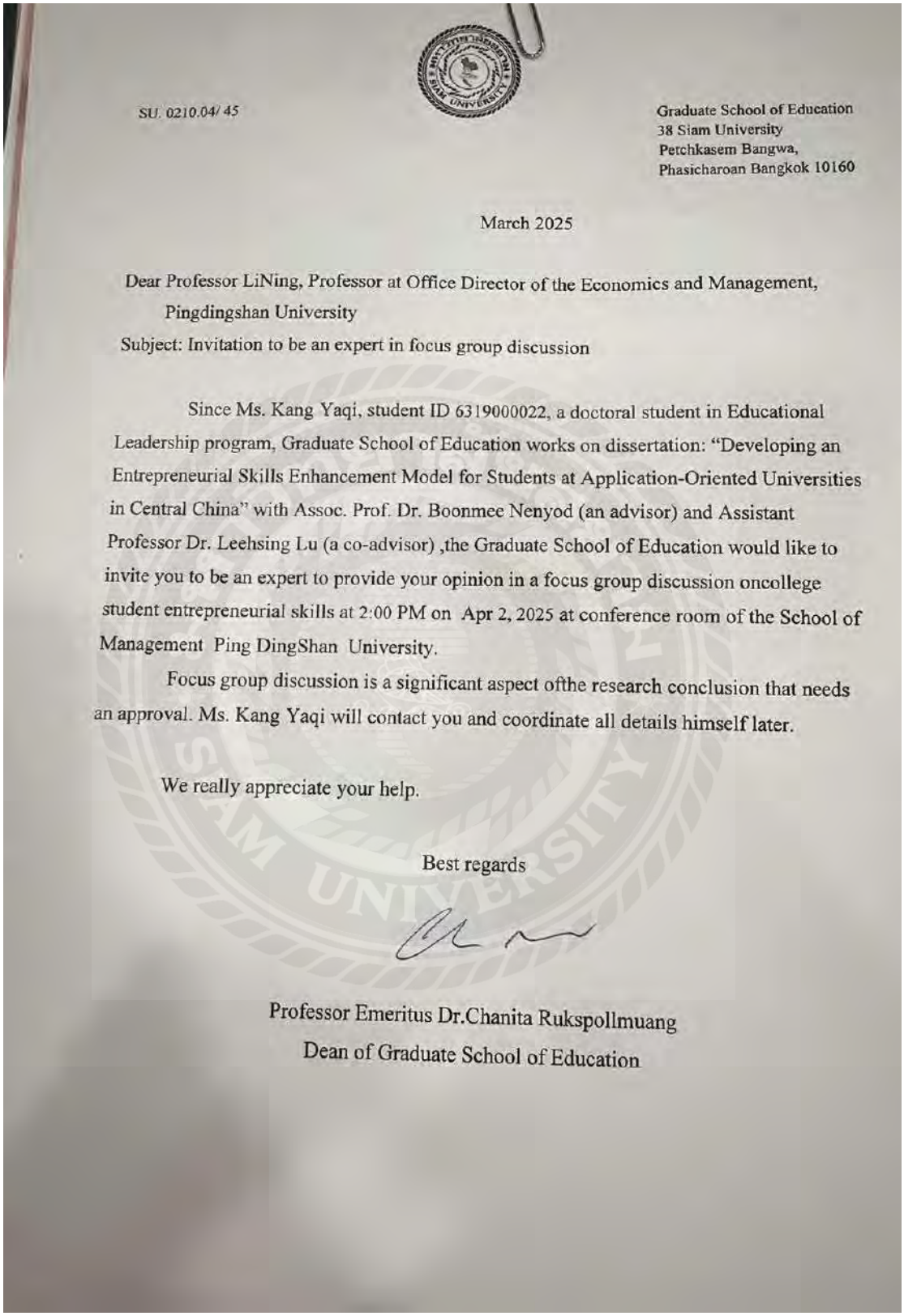
Subject: Invitation to be an expert in focus group discussion

Since Ms. Kang Yaqi, student ID 6319000022, a doctoral student in Educational Leadership program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor) ,the Graduate School of Education would like to invite you to be an expert to provide your opinion in a focus group discussion oncollege student entrepreneurial skills at 2:00 PM on Apr 10, 2025 at Conference room of School of Education, Weifang University.

Focus group discussion is a significant aspect ofthe research conclusion that needs an approval. Ms. Kang Yaqi will contact you and coordinate all details himself later. We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education



SU. 0210.04/ 45

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

March 2025

Dear Professor LiNing, Professor at Office Director of the Economics and Management, Pingdingshan University

Subject: Invitation to be an expert in focus group discussion

Since Ms. Kang Yaqi, student ID 6319000022, a doctoral student in Educational Leadership program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor) ,the Graduate School of Education would like to invite you to be an expert to provide your opinion in a focus group discussion oncollege student entrepreneurial skills at 2:00 PM on Apr 2, 2025 at conference room of the School of Management Ping DingShan University.

Focus group discussion is a significant aspect ofthe research conclusion that needs an approval. Ms. Kang Yaqi will contact you and coordinate all details himself later.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

SU. 0210.04/ 46

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

March 2025

Dear Li Pan Pan Graduated from Hunan University is currently the director and deputy general manager of Zhengzhou Yutong Bus Co., Ltd., responsible for the personnel management of the company.

Subject: Invitation to be an expert in focus group discussion

Since Ms. Kang Yaqi, student ID 6319000022, a doctoral student in Educational Leadership program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor) ,the Graduate School of Education would like to invite you to be an expert to provide your opinion in a focus group discussion oncollege student entrepreneurial skills at 2:00 PM on Apr 5, 2025 at conference room of the Zhengzhou Yutong Bus Co

Focus group discussion is a significant aspect of the research conclusion that needs an approval. Ms. Kang Yaqi will contact you and coordinate all details himself later.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

SU. 0210.04/ 43

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

March 2025

Dear Professor He Jie, Professor at Vice Dean of the Economics and Management,
Pingdingshan University

Subject: Invitation to be an expert in focus group discussion

Since Ms. Kang Yaqi, student ID 6319000022, a doctoral student in Educational Leadership program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor) ,the Graduate School of Education would like to invite you to be an expert to provide your opinion in a focus group discussion oncollege student entrepreneurial skills at 2:00 PM on Apr 2, 2025 at conference room of the School of Management Ping DingShan University.

Focus group discussion is a significant aspect ofthe research conclusion that needs an approval. Ms. Kang Yaqi will contact you and coordinate all details himself later.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

SU. 0210.04/ 48

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 1016

March 2025

Dear Associate Professor Zhang Ying,
School of Foreign Languages, Shandong Yingcai University
Subject: Invitation to be an expert to verify the translation of the research questionnaires

Ms, Kang Yaqi, student ID 6319000022, a doctoral student in the English program at the Graduate School of Education, Siam University Thailand, is working on a dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China ". Research questionnaires are an essential tool for researchers to find answers.

Since Ms, Kang Yaqi conducted this research in English, the instrument was designed in English. However, it must be applied to Chinese respondents. Your role as an expert in verifying the translation of the research questionnaire from English into Chinese is of utmost importance for the success of this research, Ms, Kang Yaqi will contact and coordinate all details himself.

We really appreciate your help.

Best wishes

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

SU. 0210.04/ 43

Graduate School of Education
38 Siam University
Petchkasem Bangwa,
Phasicharoan Bangkok 10160

March 2025

Dear Professor He Jie, Professor at Vice Dean of the Economics and Management,
Pingdingshan University

Subject: Invitation to be an expert in focus group discussion

Since Ms. Kang Yaqi, student ID 6319000022, a doctoral student in Educational Leadership program, Graduate School of Education works on dissertation: "Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" with Assoc. Prof. Dr. Boonmee Nenyod (an advisor) and Assistant Professor Dr. Leehsing Lu (a co-advisor) ,the Graduate School of Education would like to invite you to be an expert to provide your opinion in a focus group discussion oncollege student entrepreneurial skills at 2:00 PM on Apr 2, 2025 at conference room of the School of Management Ping DingShan University.

Focus group discussion is a significant aspect ofthe research conclusion that needs an approval. Ms. Kang Yaqi will contact you and coordinate all details himself later.

We really appreciate your help.

Best regards

Professor Emeritus Dr.Chanita Rukspollmuang
Dean of Graduate School of Education

APPENDIX D: Validation of Research Outcomes

Expert1: Expert Evaluation of the Conceptual Framework

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities		√			
	P2*	Logical consistency between theoretical frameworks and empirical analysis		√			
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy		√			
	P4	Operational feasibility of policy recommendations		√			
	P5	Consider cultural differences in the design of leadership style improvement strategies		√			
Feasibility 0.4	F1*	Cost control capability of develop programs		√			
	F2	Accessibility of continuing learning cooperation resources		√			
	F3	Implementation challenges of promote situational leadership			√		
	F4	The possibility of a policy culture of mutual support among colleagues		√			
	F5	Sustainability of dynamic evaluation mechanisms		√			
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy		√			
	U2	The promotion of leadership style optimization		√			
	U3	The overall harmony of the school has been improved		√			
	U4	The efficiency of transforming teachers' ability into actual benefits		√			
	U5	Effectiveness of long-term career development support systems		√			

Expert2: Expert Evaluation of the Conceptual Framework

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities	✓				
	P2*	Logical consistency between theoretical frameworks and empirical analysis	✓				
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy	✓				
	P4	Operational feasibility of policy recommendations	✓				
	P5	Consider cultural differences in the design of leadership style improvement strategies		✓			
Feasibility 0.4	F1*	Cost control capability of develop programs	✓				
	F2	Accessibility of continuing learning cooperation resources		✓			
	F3	Implementation challenges of promote situational leadership		✓			
	F4	The possibility of a policy culture of mutual support among colleagues		✓			
	F5	Sustainability of dynamic evaluation mechanisms		✓			
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy	✓				
	U2	The promotion of leadership style optimization	✓				
	U3	The overall harmony of the school has been improved	✓				
	U4	The efficiency of transforming teachers' ability into actual benefits	✓				
	U5	Effectiveness of long-term career development support systems	✓				

Expert3: Expert Evaluation of the Conceptual Framework

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities		✓			
	P2*	Logical consistency between theoretical frameworks and empirical analysis		✓			
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy		✓			
	P4	Operational feasibility of policy recommendations		✓			
	P5	Consider cultural differences in the design of leadership style improvement strategies		✓			
Feasibility 0.4	F1*	Cost control capability of develop programs		✓			
	F2	Accessibility of continuing learning cooperation resources		✓			
	F3	Implementation challenges of promote situational leadership		✓			
	F4	The possibility of a policy culture of mutual support among colleagues		✓			
	F5	Sustainability of dynamic evaluation mechanisms	✓				
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy		✓			
	U2	The promotion of leadership style optimization		✓			
	U3	The overall harmony of the school has been improved		✓			
	U4	The efficiency of transforming teachers' ability into actual benefits		✓			
	U5	Effectiveness of long-term career development support systems	✓				

Expert4: Expert Evaluation of the Conceptual Framework

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities	✓				
	P2*	Logical consistency between theoretical frameworks and empirical analysis		✓			
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy	✓				
	P4	Operational feasibility of policy recommendations		✓			
	P5	Consider cultural differences in the design of leadership style improvement strategies	✓				
Feasibility 0.4	F1*	Cost control capability of develop programs		✓			
	F2	Accessibility of continuing learning cooperation resources	✓				
	F3	Implementation challenges of promote situational leadership		✓			
	F4	The possibility of a policy culture of mutual support among colleagues	✓				
	F5	Sustainability of dynamic evaluation mechanisms		✓			
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy	✓				
	U2	The promotion of leadership style optimization	✓				
	U3	The overall harmony of the school has been improved		✓			
	U4	The efficiency of transforming teachers' ability into actual benefits		✓			
	U5	Effectiveness of long-term career development support systems	✓				

Expert5: Expert Evaluation of the Conceptual Framework

Dimension	No.	Evaluation Indicator	1=Strongly Disagree, 5=Strongly Agree				
			5	4	3	2	1
Propriety 0.3	P1*	Alignment with the development needs of private universities		✓			
	P2*	Logical consistency between theoretical frameworks and empirical analysis		✓			
	P3*	Applicability of research methods to the cultivation of teachers' self-efficacy		✓			
	P4	Operational feasibility of policy recommendations		✓			
	P5	Consider cultural differences in the design of leadership style improvement strategies		✓			
Feasibility 0.4	F1*	Cost control capability of develop programs		✓			
	F2	Accessibility of continuing learning cooperation resources		✓			
	F3	Implementation challenges of promote situational leadership		✓			
	F4	The possibility of a policy culture of mutual support among colleagues		✓			
	F5	Sustainability of dynamic evaluation mechanisms		✓			
Utility 0.3	U1*	Enhancement effects on teachers' self-efficacy		✓			
	U2	The promotion of leadership style optimization		✓			
	U3	The overall harmony of the school has been improved		✓			
	U4	The efficiency of transforming teachers' ability into actual benefits		✓			
	U5	Effectiveness of long-term career development support systems		✓			

Expert Review Committee Overall Evaluation Form:

Expert Evaluation of the Conceptual Framework

No	Evaluation Indicator	E1	E2	E3	E4	E5	Mean
P1*	Alignment with the development needs of private universities	4	5	4	5	4	4.3
P2*	Logical consistency between theoretical frameworks and empirical analysis	5	5	4	4	4	4.3
P3*	Applicability of research methods to the cultivation of teachers' self-efficacy	5	5	4	5	4	4.4
P4	Operational feasibility of policy recommendations	5	5	4	4	4	4.4
P5	Consider cultural differences in the design of leadership style improvement strategies	5	4	4	5	4	4.4
F1*	Cost control capability of develop programs	4	5	4	4	4	4.1
F2	Accessibility of continuing learning cooperation resources	4	4	4	5	4	4.1
F3	Implementation challenges of promote situational leadership	4	4	4	4	4	4.0
F4	The possibility of a policy culture of mutual support among colleagues	4	4	4	5	4	4.1
F5	Sustainability of dynamic evaluation mechanisms	4	4	5	4	4	4.1
U1*	Enhancement effects on teachers' self-efficacy	4	5	4	5	4	4.3
U2	The promotion of leadership style optimization	4	5	4	4	4	4.4
U3	The overall harmony of the school has been improved	4	5	4	5	4	4.3
U4	The efficiency of transforming teachers' ability into actual benefits	4	5	4	5	4	4.3
U5	Effectiveness of long-term career development support systems	5	4	5	4	4	4.4

Expert Opinion

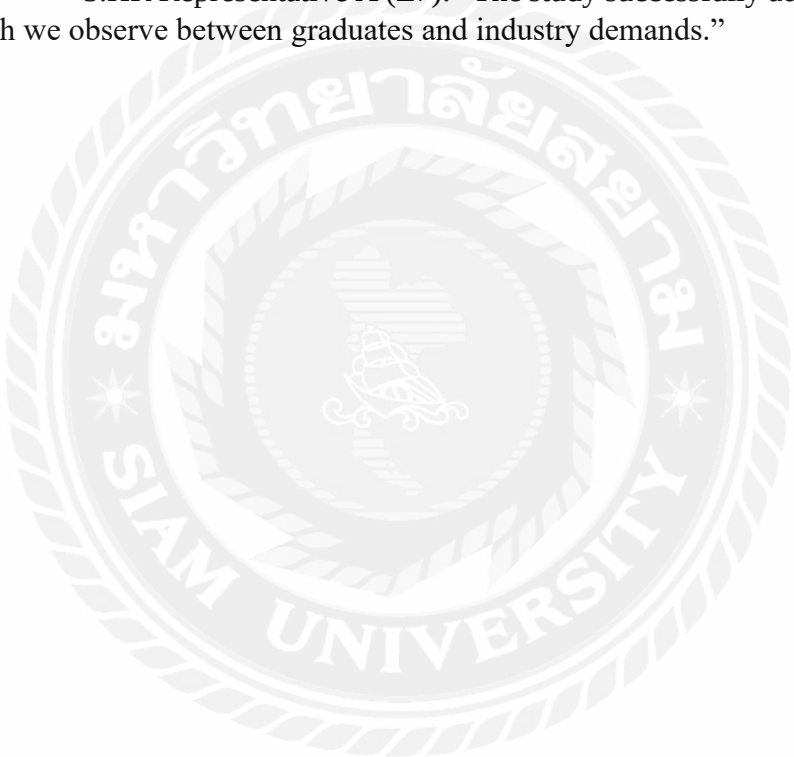
1. Professor A (E3): “The study’s model is pedagogically sound and provides an actionable framework for nurturing entrepreneurship in higher education.”

2. Professor B (E4): “This research bridges the gap between entrepreneurship theory and practice, particularly for application-oriented universities.”

3. Entrepreneur A (E5): “The model captures the core competencies needed by young entrepreneurs and reflects real-world entrepreneurial pathways.”

4. Entrepreneur B (E6): “I see strong alignment between the model and current trends in youth-led innovation across cultural and international contexts.”

5.HR Representative A (E7): “The study successfully addresses the skill mismatch we observe between graduates and industry demands.”



这项研究及时而贴切地审视了当前大学生毕业所面临的现实问题，所提出的模型有力回应了区域性挑战，特别是在应用型大学中。定性数据与定量数据的结合使结论更具说服力。对未来我们大学生创业技能的提升有很大帮助。

李乐乐

Lilele Graduates of the School of Economics and Management Changzhou University 474129240@qq.com

This study provides a timely and pertinent examination of the practical issues currently faced by university graduates upon graduation. The proposed model offers a robust response to regional challenges, particularly in applied universities. The integration of qualitative and quantitative data renders the conclusions more compelling. It will greatly contribute to enhancing the entrepreneurial skills of our university students in the future.

Lilele

这项研究对制定公共政策具有极高价值，尤其考虑到其与华中地区国家发展目标的契合度。所提供的见解可以指导资源向培育创业生态系统的教育项目倾斜。但需进一步思考政策如何为创业教育提供必要的基础设施和支持体系，例如导师计划、孵化器设施以及风险投资渠道。该模型可通过纳入促进学术界、产业界和政府跨部门协作的政策建议来进一步完善。

赵明

Zhaoming： Graduated from English College of Shandong Normal University, master student.

, warking age 20 years.Email：13733785@qq.com:

" This study is highly valuable for shaping public policy, especially considering the alignment with the national development goals for Central China. The insights offered could guide the allocation of resources toward education initiatives that foster entrepreneurial ecosystems. However, there is a need to consider how policy can facilitate the necessary infrastructure and support systems for entrepreneurial education, such as mentorship programs, incubators, and access to venture capital. The model could be further enhanced by incorporating policy recommendations to improve cross-sector collaboration between academia, industry, and government."

Zhaoming

这项研究探讨了华中地区教育体系中一个重要的文化转变。研究准确指出了对创业精神的抵触以及对稳定、传统职业的偏好这些显著障碍。所提出模型的成功与否，很大程度上取决于其影响文化规范、将思维模式转向创新和冒险的能力。更多民族志研究或能提供更深入的见解，帮助我们理解在此情境下影响学生创业意愿和行为的社会文化因素。

Dr Beier Bai 37699767@qq.com Ph.D. in Education, graduated from Shaanxi Normal University.:

"This research tackles an important cultural shift in Central China's education system. The resistance to entrepreneurship and the preference for stable, traditional careers are significant barriers that the study aptly identifies. The proposed model's success will largely depend on its ability to influence cultural norms and shift mindsets toward innovation and risk-taking. More ethnographic research could provide deeper insights into the sociocultural factors affecting students' entrepreneurial intentions and behaviors in this context."

这项研究提出了一个将教育成果与商业需求对接的出色框架。然而，该模型对区域教育的侧重是单维度的——主要聚焦于高校本身，却未考量更广泛的创业生态系统，包括融资渠道、监管壁垒和市场条件等因素。若能整合地方商业发展举措和政府支持体系，采用更全面的方法，或将显著提升该模型的整体效能。

李宁

.Dr Lining 461162848@qq.com Ph.D. in Education, graduated from Henan University.

The research presents an excellent framework for aligning educational outcomes with business needs. However, the model's emphasis on regional education is one-dimensional — focusing predominantly on the universities themselves without considering the broader entrepreneurial ecosystem, including access to funding, regulatory barriers, and market conditions. A more comprehensive approach that integrates local business development initiatives and governmental support structures would likely increase the model's overall effectiveness.

Ling

这项研究及时而贴切地审视了华中地区的创业教育。所提出的模型有力回应了区域性挑战，特别是在应用型大学中。定性数据与定量数据的结合使结论更具说服力。不过，若能更深入分析这些技能如何转化为现实环境中的创业成功，研究将更具价值。虽然该模型较为全面，但考虑到部分地区保守的思维模式和一些院校有限的资源，其实际落地可能面临挑战。

高宏富

Dr.Hongfu Gao : ghfjyhy@163.com Ph.D. in Educational Leadership, graduated from Xiamen University.

" This research offers a timely and relevant examination of entrepreneurship education in Central China. The proposed model is a strong response to regional challenges, particularly in application-oriented universities. The inclusion of both qualitative and quantitative data makes the conclusions more robust. However, the study would benefit from a deeper analysis of how these skills are transferred into entrepreneurial success in real-world contexts. While the model is comprehensive, its practical implementation might face challenges given the conservative regional mindset and limited resources at some institutions."

Hongfu Gao

从教育者的角度来看，这个提升创业技能的模型设计全面，与当前最佳实践高度契合。其对创造力、创新意识和商业规划的重视至关重要。不过在中国中部地区的文化和经济环境下，实际落地可能面临更大挑战。我建议整合更多互动式和沉浸式学习机会，比如实习实训与创业模拟，以更好地弥合理论知识与实际应用之间的鸿沟。

Dr He jie 15434272@qq.com Vice Dean of the Economics and Management, Pingdingshan University

From an educator's perspective, the proposed model for enhancing entrepreneurial skills is comprehensive and aligns well with current best practices. The emphasis on creativity, innovation, and business planning is crucial. However, practical implementation could be more challenging in the context of Central China's cultural and economic conditions. I would suggest integrating more interactive and immersive learning opportunities, such as internships and entrepreneurial simulations, to better bridge the gap between theoretical knowledge and real-world application.

Hejie

作为人力资源从业者，我认为劳动力市场预期的研究至关重要。该研究准确指出了学生现有技能与雇主需求技能之间的差距。若能在研究模型中纳入更详细的行业反馈——关于这些技能如何影响招聘决策和工作表现，将使研究更加完善。此外，评估这些技能是否与动态行业中的职业持久性和适应能力相关，也将是个值得探讨的方向。

.HR LiPanPan 875331794@qq.com

Graduated from Hunan University is currently the director and deputy general manager of Zhengzhou Yutong Bus Co., Ltd., responsible for the personnel management of the company:

As an HR professional, I find the investigation of labor market expectations crucial. The research correctly identifies the gap between the skills students possess and the skills employers demand. The study ' s model could be further enriched by incorporating more detailed industry feedback on how these skills impact hiring decisions and job performance. It would also be interesting to assess whether these skills correlate with career longevity and adaptability in dynamic industries.

LiPanPan

AUTHOR'S BIOGRAPHY

Name and Surname	:	Kangyaqi
Date of Birth	:	10.21.1981
Nationality	:	Chinese
Birth of Place	:	Pingdingshan city HeNan China
Address	:	Room 1702, Building 10, Tangong, Xinhua District, Pingdingshan, Henan, China.467002
E-Mail	:	893503428@qq.com
Work Position	:	Student
Workplace	:	Siam University
Education	:	38 Petkasem Road,Bangwa Phasicharoen,Bangkok,10160.

Bachelor's Degree

Degree	Bachelor
Major	Manage
Institution	Tianjin Public Security Management College
Country	China
Year	2004

Master's Degree

Degree	Master
Major	Chinese
Institution	He Nan University
Country	China
Year	2015

Publishing Research:

Title " Developing an Entrepreneurial Skills Enhancement Model for Students at Application-Oriented Universities in Central China" will be published in Journal of Educational Innovation and Research, Volume 10, Issue 3, 2026 (July-September 2026)