

# Multi-factor Synergy and Optimization Strategies for the Business Model of Private Higher Education Institutions' Innovation and Entrepreneurship Incubators

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**Abstract:** Globalization and advancements in science and technology foster innovation and entrepreneurship. Although national strategies provide substantial support, innovation, and entrepreneurship incubators in private colleges and universities face challenges such as insufficient funding and a lack of talent. This study enhances the theoretical framework of innovation and entrepreneurship education and broadens the application of business model theory. It examines the current state of innovation and entrepreneurship incubators in private universities, using the Maker Dream Workshop at Guangzhou University of Science and Technology as a case study. Key aspects such as value proposition, resource allocation, and profit models are analyzed. Additionally, challenges in multi-factor collaboration, including internal synergy barriers and external coordination difficulties, are identified. Optimization strategies are proposed, such as establishing an information-sharing platform, optimizing resource allocation mechanisms, improving benefit distribution systems, developing a long-term mechanism for industry-university-research cooperation, strengthening communication with the government, and encouraging participation from investment institutions. Furthermore, the study outlines the strategic measures required to ensure the sustainable development of innovation and entrepreneurship incubators in private colleges and universities.

**Keywords:** Private colleges and universities; Innovation and entrepreneurship incubator; Business model; Multi-factor coordination optimization strategy

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## 1. Research background and significance

In the current era of globalization and rapid technological advancements, innovation and entrepreneurship serve as critical drivers of economic and social progress. The national innovation and entrepreneurship strategy

provides policy support and technological resources for innovation and entrepreneurship incubators in private colleges and universities. However, these institutions face inherent challenges such as limited access to resources, financial constraints, talent shortages, and ineffective incubation outcomes. Furthermore, the lack of guidance in constructing and operating business models exacerbates these difficulties.

From a theoretical perspective, this study focuses on private colleges and universities to refine the theoretical framework of entrepreneurship and innovation education and extend the application of business model theory. From a practical perspective, it aims to provide actionable guidance for constructing incubators, optimizing resource coordination, and enhancing operational efficiency and competitiveness to achieve sustainable development. Societally, this study aims to accelerate the transformation of scientific and technological achievements, contribute to local economic, industrial, and employment growth, and serve as a reference for improving entrepreneurship and innovation education in private colleges and universities. Ultimately, it seeks to build a comprehensive ecosystem for innovation and entrepreneurship education.

## **2. Theoretical basis**

### **2.1. Theories related to innovation and entrepreneurship incubators**

As a critical platform for supporting innovation and entrepreneurial activities, innovation and entrepreneurship incubators provide physical space, resource sharing, and professional services <sup>[1]</sup>. The functions of incubators are primarily demonstrated in facilitating the transformation of scientific and technological achievements, fostering the growth of emerging enterprises, and cultivating innovative talent. The concept of incubators dates back to the 1950s when initial models supported startups by offering low-cost office spaces and basic infrastructure. With the evolution of the innovation ecosystem, modern incubators have shifted their focus toward building open innovation networks and utilizing digital tools and platforms to advance entrepreneurial projects <sup>[2]</sup>.

Within the innovation and entrepreneurship ecosystem, incubators play a pivotal role in connecting innovation resources and accelerating enterprise development. Their support for entrepreneurial teams extends beyond resource provision and network building to include personnel training and policy guidance, thereby forming a closed-loop innovation support system <sup>[3]</sup>.

### **2.2. Business model theory**

Business model theory serves as a vital framework for understanding and analyzing how incubators create, deliver, and capture value. This theory explores the integration of elements such as value proposition, customer base, channel strategy, partnerships, cost structure, and revenue sources to provide value-added services to startups <sup>[4]</sup>. Incubators should emphasize the role of market mechanisms within their service systems, adjusting their business models to align with market demands and improve operational efficiency in response to environmental changes <sup>[5]</sup>.

Through effective business model design, incubators can enhance their own business value while also delivering benefits to the entrepreneurial teams they support and the broader innovation ecosystem <sup>[6]</sup>. This dual impact underscores the importance of adopting adaptive and market-responsive strategies in incubator operations.

### **2.3. Synergy theory of multiple elements**

Synergy theory highlights the importance of interaction and coordination among multiple elements to achieve optimal system performance. Within the business models of innovation and entrepreneurship incubators, the

synergy of these elements is particularly critical <sup>[7]</sup>. By aligning resources, capabilities, and market demands, incubators can allocate their limited resources more efficiently, thereby enhancing the operational efficiency of the entire innovation and entrepreneurship ecosystem <sup>[8]</sup>.

The synergy mechanism encompasses effective communication within internal organizational structures, the integration of external network resources, and adaptive responses to dynamic market conditions. Enhancing the ability to integrate resources and innovate services improves the market competitiveness and sustainable development capacity of entrepreneurial teams <sup>[9]</sup>. The optimization of business models for innovation and entrepreneurship incubators must be grounded in a comprehensive understanding of their functions, development trajectories, market orientation, and the synergistic interaction of multiple elements.

### **3. Current situation of business models of innovation and entrepreneurship incubators in private colleges and universities**

#### **3.1. Overview of development status**

In recent years, the number of innovation and entrepreneurship incubators in private colleges and universities has exhibited a steady growth trend, with business models evolving toward diversification, coordination, efficiency, and pragmatism. Within the context of industry-education integration, private colleges and universities have emphasized the construction of efficient innovation and entrepreneurship incubation bases. These bases not only offer students entrepreneurial knowledge and skill development but also serve as crucial links in fostering school-enterprise cooperation. By introducing enterprise resources and industry experts, these institutions collaboratively undertake innovation and entrepreneurship projects, thereby achieving resource-sharing and complementary advantages <sup>[10]</sup>.

Through collaboration with various stakeholders—including students, faculty, enterprises, and government agencies—private colleges and universities enhance the overall quality of education, improve the success rate of entrepreneurship, and promote the optimal allocation of resources and the effective dissemination of knowledge <sup>[11]</sup>. Despite progress in the development of innovation and entrepreneurship incubators, challenges persist, such as resource limitations and the absence of standardized operational norms. Addressing these issues requires strengthening the systematic management of incubation platforms, establishing standardized processes, and implementing robust evaluation mechanisms to enhance the operational effectiveness of incubators <sup>[12]</sup>. Additionally, the interactive mechanisms for the transformation of scientific and technological achievements within incubators at private universities require further improvement <sup>[13]</sup>.

#### **3.2. Analysis of the business model of Maker Dream Workshop at Guangzhou University of Science and Technology**

The Maker Dream Workshop (National Maker Space) represents a comprehensive innovation and entrepreneurship ecosystem that supports faculty, students, and alumni in completing the entire process from ideation to prototype development, product creation, and commercialization. Recognized as a National Maker Space and an A-level Maker Space in Guangdong Province, it has also been designated as an entrepreneurship (incubation) demonstration base in Guangzhou. In 2022, the Maker Dream Workshop was awarded the title of “National Model University of Innovation and Entrepreneurship,” highlighting its significant role in fostering innovation and entrepreneurship within the academic community.

### **3.2.1. Value proposition**

The Maker Dream Workshop aims to provide college students with a comprehensive innovation and entrepreneurship ecosystem, supporting the transformation of ideas into tangible products. Guided by the principles of “professional alignment, resource aggregation, school-enterprise collaboration, community assistance, inspiration gathering, and collective dream building,” the platform helps students achieve their innovation and entrepreneurship aspirations. It fosters the cultivation of an innovative spirit and practical skills while promoting the integration of academic disciplines, professional development, and innovation and entrepreneurship education.

### **3.2.2. Resource allocation**

The Maker Dream Workshop is equipped with professional personnel to offer a full range of services to resident projects, including assistance with project applications, financial management, and legal consultations. A robust team of entrepreneurship mentors, consisting of university experts, professors, business executives, and external industry specialists, provides professional guidance and strategic advice.

The workshop offers rent-free office spaces equipped with essential facilities and equipment, such as office furniture, computers, and networking devices, to reduce startup costs for students. Additionally, shared spaces, including conference rooms and negotiation rooms, are available to meet the daily operational and communication needs of entrepreneurial teams.

Leveraging its expertise, the workshop integrates resources from eight engineering centers, such as intelligent manufacturing and automobile maintenance, to provide technical support and research and development platforms for innovation and entrepreneurship projects. This integration facilitates the alignment of innovation and entrepreneurship activities with academic and professional disciplines.

### **3.2.3. Profit model**

- (1) Profit sharing from successful incubation: When a resident project achieves substantial development and generates economic benefits, the workshop receives a pre-agreed share of the profits, such as equity dividends or commission-based revenues, fostering mutual benefits and win-win outcomes.
- (2) Government support and project funding: The workshop actively seeks funding and policy support from government departments for innovation and entrepreneurship initiatives. A portion of these funds is allocated for operational and developmental purposes, while the remainder is distributed as project funding or support grants to outstanding students, thereby promoting project growth and sustainability.
- (3) Training and consulting service fees: The workshop offers innovation and entrepreneurship training courses and consulting services to students and entrepreneurial teams in need. These services include entrepreneurial skills training and business model design training, with fees collected to diversify income streams and enhance the skills and capabilities of entrepreneurial teams.

## **4. Analysis of multiple elements of the business model of innovation and entrepreneurship incubators in private colleges and universities**

### **4.1. Identification of core elements**

In the business model of innovation and entrepreneurship incubators in private universities, several core elements play a pivotal role:

- (1) Site facilities: These provide the fundamental infrastructure for operations, with their scale and functional layout influencing the comfort and flexibility available for project implementation.
- (2) Capital: Serving as the primary driving force, capital is essential for the procurement of equipment, maintenance of facilities, and provision of project funding. Adequate capital flow ensures the incubator's smooth operation and enhances its ability to attract high-quality projects.
- (3) Technology: Acting as the core competitive factor, advanced technologies and scientific research achievements from universities provide the foundation for project incubation. Cutting-edge technology accelerates the success of high-potential entrepreneurial ventures and improves the overall incubation success rate.
- (4) Talent: Talented individuals, including university faculty, students, and external experts, are central to innovation. They contribute ideas, knowledge, and experience, facilitating the transition of projects from conception to implementation.
- (5) Service: Serving as the connecting element, services such as entrepreneurial guidance, training, and resource integration address the gaps in entrepreneurial teams' capabilities and drive their growth and development.

## **4.2. Analysis of the synergistic relationship among elements**

The core elements of the business model exhibit significant interdependence, creating a synergistic effect that enhances the efficiency and effectiveness of the incubator's operations:

- (1) Capital and technology: These elements have a mutually reinforcing relationship. Capital investments facilitate technological research, development, and transformation, while advanced technologies attract further capital inflows. For example, scientific research funding accelerates technological innovation, and promising technological projects are more likely to secure investments.
- (2) Talent and services: These factors work in tandem. Skilled professionals provide high-quality services, and an environment of exceptional service attracts and retains talent. For instance, expert mentors enhance their value and reputation by delivering entrepreneurial guidance, while a supportive service ecosystem draws additional talent to the incubator.
- (3) Site facilities and other factors: The relationship between site facilities and other elements is characterized by mutual constraint. Efficient site planning can optimize fund utilization, facilitate talent interaction, and support technological research and development. Conversely, poorly planned facilities may hinder technological advancement, result in resource waste, and obstruct talent collaboration. Insufficient capital can impair the construction and upkeep of facilities, while a lack of talent may lead to underutilized resources.

## **5. Problems and challenges in the collaboration of multiple elements**

### **5.1. Internal synergy barriers**

Innovation and entrepreneurship incubators in private universities face significant challenges in achieving effective internal coordination among various elements. A prominent issue is information asymmetry, which stems from the absence of an efficient platform for information sharing among key stakeholders such as technology research and development teams, entrepreneurship service departments, and venue management entities. These groups often operate within distinct departments or management systems, making the unified

allocation of resources—such as facilities, funding, and talent—particularly difficult <sup>[14]</sup>.

Furthermore, the operations of business incubators involve the interests of multiple parties, including universities, students, and investors. Conflicting objectives and interests among these stakeholders hinder the establishment of a shared vision and reduce the willingness to collaborate effectively. This lack of coordination not only restricts the development of entrepreneurial projects but also negatively impacts the overall innovation outcomes of the incubator <sup>[15]</sup>.

## **5.2. External collaboration dilemmas**

External collaboration also encounters numerous challenges, particularly related to rigid cooperation mechanisms and conflicting objectives:

- (1) **Rigidity of cooperation mechanisms:** Administrative procedures within colleges and universities are often overly complex, conflicting with the rapid decision-making processes typical of enterprises. This discrepancy slows down the progress of collaborative projects. For instance, even after an enterprise confirms its investment intention, the internal project approval and contract signing processes within universities may take an extended period, delaying project implementation.
- (2) **Inadequate government support:** While some regional policies encourage innovation and entrepreneurship, incubators in private universities often struggle to fully benefit due to their unique status. For example, these incubators may face restrictions in accessing tax incentives or special subsidies specifically intended for innovation-focused initiatives.
- (3) **Misaligned objectives between investment institutions and universities:** Investment institutions generally prioritize short-term high returns, whereas universities emphasize long-term project development and talent cultivation. These differing objectives complicate collaboration in project selection and incubation timelines. As a result, entrepreneurial projects face challenges in securing sustained financial support and accessing market resources, hindering their overall growth and success.

## **6. Optimization strategy**

### **6.1. Optimize the integration strategy of internal elements**

#### **6.1.1. Build an information-sharing platform**

Modern information technology should be leveraged to establish a comprehensive information-sharing platform. This platform should integrate data on-site facilities, funding, technological achievements, and talent, ensuring that all stakeholders can access the information they require within their designated permissions. This approach will facilitate efficient and accurate information exchange, reducing resource waste and coordination challenges caused by poor communication.

#### **6.1.2. Optimize the resource allocation mechanism**

Specialized agencies should be created to oversee resource allocation and scheduling. Resource distribution plans should be developed based on objective indicators such as the development stage of entrepreneurial projects. For instance, during the initial phase, priority should be given to ensuring access to facilities and capital, alongside assigning entrepreneurial mentors. During the research and development phase, technological investment should be increased. In the promotion phase, emphasis should shift to market resource allocation. This dynamic optimization approach will improve resource utilization efficiency and enhance the synergistic effects among elements.

### **6.1.3. Improve the benefit distribution system**

A fair, transparent, and incentivizing benefit distribution system should be established. This system should clearly define the methods and proportions for distributing benefits among stakeholders following the successful incubation of a project. Returns should be provided to technical teams, service personnel, and management based on the quantified value of their contributions. Such a system will stimulate active participation, ensuring the stability and sustainability of internal coordination efforts.

## **6.2. External collaborative network expansion policies**

### **6.2.1. Establish a long-term mechanism for industry-university-research cooperation**

Long-term partnerships should be formed with enterprises and scientific research institutions by signing agreements for collaborative research projects. These partnerships can include the joint development of internship and training bases and the organization of exchange activities to facilitate the transformation of research outcomes and address industry needs. This win-win collaboration can advance industrialization efforts and mutual growth.

### **6.2.2. Strengthen communication and cooperation with the government**

A government relations coordination group should be established to monitor policy developments and ensure timely communication. Active participation in relevant government initiatives will help secure policy support and undertake government projects, enhancing institutional influence. Additionally, expanding government partnerships will create a more favorable environment and open new channels for collaboration.

### **6.2.3. Attract the participation of investment institutions**

An investment docking platform should be developed to organize project roadshows and implement an investment evaluation system. Personalized services such as the establishment of dedicated funds and optimization of investment environments and service mechanisms should be offered. These measures will encourage the participation of investment institutions, providing much-needed funding for entrepreneurial projects while promoting growth through the capital operation expertise of investors.

## **7. Safeguard measures for the implementation of strategies**

### **7.1. Adjustment of organizational structure**

A specialized entity, such as a collaborative management office or development center, should be established to facilitate coordination efforts. This entity would manage communication and collaboration among internal coordination elements, develop and implement strategic coordination plans, and oversee their effectiveness through monitoring and evaluation. Additionally, it should foster and maintain partnerships with enterprises, government agencies, and investment institutions, organize exchange activities, promote the execution of industry-university-research projects, and address collaborative concerns. The entity's responsibilities must include resource allocation and ensuring efficient organizational coordination.

### **7.2. Talent team building**

The emphasis should be placed on cultivating and attracting multidisciplinary talents. Internal training programs should be implemented in collaboration with enterprises to enhance the collaborative management and innovation

capabilities of existing staff, fostering “dual-role” talents skilled in both academic and practical domains. Professionals with experience in enterprise management, investment, or business incubation should also be recruited to diversify the management and service team. These individuals would bring advanced methodologies and perspectives, thereby improving the overall quality of the team and enhancing the level of collaborative innovation services.

### **7.3. System and culture construction**

Clear rules and regulations should be established to define the code of conduct, roles, responsibilities, and rights of all participants involved in collaborative innovation. These systems should cover aspects such as information sharing, resource allocation, and the management of cooperative projects. Concurrently, efforts should be made to foster a cultural environment conducive to collaborative innovation. Initiatives such as innovation and entrepreneurship culture festivals, exhibitions, and awareness campaigns should be organized to promote the principles and values of innovation and teamwork. These activities aim to inspire enthusiasm for innovation and foster a collaborative spirit among all stakeholders, ultimately creating a positive cultural environment that encourages participation at all levels.

## **8. Conclusion**

This study provides significant insights into the business model of innovation and entrepreneurship incubators in private universities. Theoretically, it contributes to the enrichment of the framework of entrepreneurship and innovation education as well as business model theory. Practically, it offers guidance to enhance the sustainable development of incubators, fostering local economic growth, industrial advancement, and employment opportunities.

Nonetheless, the research has certain limitations, including a restricted sample size and insufficient quantitative analysis. Future studies should address these limitations by broadening the sample scope, strengthening quantitative methodologies, and maintaining a focus on policy and market dynamics to refine strategies further.

By establishing an efficient business model, effectively coordinating multiple elements, addressing internal and external challenges, and reinforcing safeguard measures, innovation and entrepreneurship incubators in private colleges and universities can significantly enhance their incubation efficiency and competitiveness. This will enable them to play a greater role in fostering innovation and entrepreneurship education, developing more innovative talent for society, facilitating the transformation of scientific and technological achievements, and contributing to economic growth.

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