

# *Research on the Paradigm of Innovation and Entrepreneurship Education in Applied Universities from the Perspective of Specialization and Innovation Integration*

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**Abstract:** The integration and development of professional education and innovation and entrepreneurship education is the only way for application-oriented universities to implement comprehensive talent cultivation. Universities need to establish a robust curriculum system under the framework of "specialized integration," with an emphasis on an outstanding "innovation-oriented" training mechanism as the core. Supported by a high-level "college + base + industrial park" entrepreneurial platform, and ensuring an effective "four-dimensional integrated" evaluation system, the construction of an application-oriented university innovation and entrepreneurship education model from the perspective of specialized integration is essential. This model serves as a reference for all universities engaging in innovation and entrepreneurship education, providing theoretical support for the cultivation of innovative talents.

Currently, a new round of global technological revolution is accelerating, with innovation and development becoming the primary driving force for this revolution. The key to innovation lies in talent, and the cultivation of talent depends on education. Education plays a significant role in advancing the implementation of a nation's innovation-driven strategy. Strengthening innovation and entrepreneurship education in higher education is of great importance for promoting students' comprehensive development, enhancing the quality of higher education, and achieving the educational development goals in our country.

The cultivation of innovative and entrepreneurial high-quality talents is an urgent requirement for contemporary development and an inevitable need for socialist modernization. Integrating innovation and entrepreneurship education into the talent cultivation model of universities is a necessary requirement of the times and a crucial focal point for deepening educational and teaching reforms in higher education institutions.

Adhering to innovation as the primary driving force, implementing the strategy of innovation-driven development, and emphasizing the development of science and technology and innovation are the strategic support for improving social productivity and overall national strength, and they must be placed at the core of the national development agenda. The reform of the innovation and entrepreneurship talent cultivation model has become an urgent need in higher education at present.

In the process of talent cultivation in higher education, focusing on the characteristics of talent supply related to students' knowledge structure, career orientation, and development direction, deeply integrating innovation and entrepreneurship education with professional education is an important issue in the current reform of innovation and entrepreneurship in Chinese higher education. Therefore, conducting research on the application-based university innovation and entrepreneurship education paradigm based on the integration of specialization and innovation not only helps better cultivate students' innovative thinking, innovative abilities, and entrepreneurial capabilities but also provides a reference and demonstration for similar universities to carry out innovation and entrepreneurship education. It offers theoretical support for the cultivation of innovative talents.

## **1. The Current State of Integration of Vocational Education and Innovation and Entrepreneurship Education in Application-Oriented Universities**

Since the beginning of this century, the training of innovative talents in higher education has received increasing attention and has achieved significant progress. However, the cultivation of innovation and entrepreneurship capabilities remains a weak link in higher education. Currently, the curriculum system in most universities, including general education, primarily focuses on the study and practice of professional theoretical knowledge. Although a few universities have introduced some innovation and entrepreneurship courses, they often exist in isolation without forming a systematic curriculum structure for innovation and entrepreneurship education. Furthermore, there is a disconnect between professional education and innovation and entrepreneurship education, leading to an insufficient synergy in student competency development. Several factors constrain the cultivation of innovative and entrepreneurial talents in higher education. From the perspective of faculty, the emphasis during education is on knowledge transfer, neglecting the cultivation of innovative thinking and the enhancement of entrepreneurial skills in the process of professional education. Regarding the training process, professional education and innovation and entrepreneurship education are often separate, without a well-established model of integration. This separation prevents the creation of a collaborative effort in cultivating innovative and entrepreneurial talents. When it comes to performance evaluation, the current focus is primarily on quantifiable indicators such as students' patents, publications, and awards during their time in school. Unfortunately, this approach overlooks the development of students' innovative spirit and values, leading to an emphasis on accumulating achievements rather than fostering competence. Given these constraining factors, it is imperative to explore and establish an application-oriented university model for innovation and entrepreneurship education based on the "integration of specialization and innovation," which will enable a significant leap in the development of innovative talents. This model will have exemplary significance for local applied universities.

## **2. Constructing an Innovation and Entrepreneurship Education Model for Application-Oriented Universities from the Perspective of Specialization and Innovation Integration**

With the educational concept of "integration of specialization and innovation" as the starting point for talent development and reform, the focus will be on optimizing the curriculum system, innovating the talent development mechanism, and constructing a dual-innovation platform.[1] The implementation of an "innovation and entrepreneurship education effectiveness evaluation system" ensures the practicality of the entire process of dual-innovation education, combining the organic fusion of value shaping, competency development, and knowledge dissemination throughout the talent cultivation process. It emphasizes the integration of values, abilities, knowledge dissemination, and practical education, as well as the connection between different discipline levels. This approach involves infusing innovative value concepts into the entire process of innovation and entrepreneurship

competency development.[2] The goal is to nurture a value system characterized by innovative spirit, entrepreneurial awareness, craftsmanship, responsibility, professional leadership, and an entrepreneurial spirit. This includes the development of comprehensive scientific thinking, a solid professional foundation, novel creative abilities, mature innovation training, well-rounded comprehensive qualities, and in-depth entrepreneurial practical skills. Achieving the fusion of the knowledge dissemination system with the practical education system leads to the creation of a scientifically sound, feasible, and operationally viable new model for the cultivation of innovative and entrepreneurial talents (as shown in Figure 1).

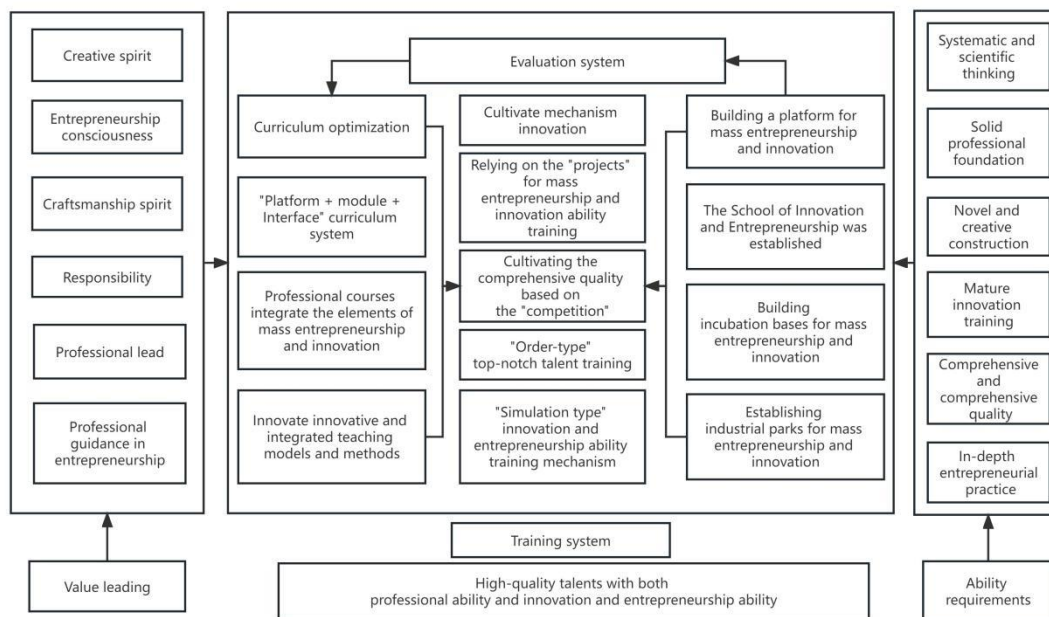


Figure 1 Innovation and entrepreneurship education mode in application-oriented universities from the perspective of special innovation and integration

## 2.1. Curriculum Optimization

### 2.1.1. The "Platform + Modules + Interface" Curriculum System

Classroom instruction is a crucial component in the talent development process, and in the context of nurturing innovation and entrepreneurship capabilities, there is a need to optimize the curriculum system and reform teaching content. Fostering students' innovation awareness and innovation and entrepreneurship skills should be a central theme throughout the entire teaching process.[3]

In the process of educational practice, a curriculum system for applied talent development is optimized and enhanced, encompassing "general education + professional education + concentrated practical education + innovation and entrepreneurship expansion education" across four platforms, "mandatory general education courses + elective general education courses + fundamental professional courses + required professional courses + elective professional courses + concentrated practice + innovation and entrepreneurship education + character development" spanning eight modules, and one interface for various specialized directions [4]. By taking full advantage of the unique characteristics of disciplines such as engineering, agriculture, management, arts, humanities, education, science, and economics, we incorporate diverse innovation and entrepreneurship and character development platform courses into different programs for cultivating innovative and entrepreneurial talents. This integration is achieved through collaboration with local government,

industry, enterprises, and other universities, as well as by introducing high-quality resources from society. The goal is to enhance students' innovation and practical capabilities comprehensively and incorporate innovation and entrepreneurship education throughout the entire process of specialized talent development [5].

In the "4 platforms, 8 modules, 1 interface" curriculum system configuration, additional courses focusing on nurturing students' innovative thinking, innovation skills, and entrepreneurial awareness, such as courses in "Introduction to College Students' Innovation Thinking and Innovation Qualities" and "Introduction to College Students' Entrepreneurship," should be added to the existing curriculum system. These courses will help students understand industry trends and policies, equip them with fundamental innovation methods, and build their innovation and entrepreneurship awareness. The introduction of an innovation and entrepreneurship education module fosters a harmonious fusion of professional education and innovation and entrepreneurship education, as well as theoretical instruction and practical experience. This organic integration brings disciplines and innovation and entrepreneurship education even closer, making it possible to enhance students' innovation and entrepreneurial capabilities in a more targeted manner and improve their ability to link theory to practice.

### **2.1.2. Incorporating Entrepreneurship Elements into Professional Courses**

"Double innovation" education plays a positive role in improving the quality of talent development and promoting entrepreneurship and employment [6]. In 2015, the State Council issued the "Implementation Opinions on Deepening Innovation and Entrepreneurship Education Reform in Higher Education," which provided clear requirements for strengthening innovation and entrepreneurship education [7]. In 2019, the Ministry of Education proposed the development of high-quality online open courses for innovation and entrepreneurship education and the creation of exemplary courses with the feature of "specialization and innovation integration". The 14th Five-Year Plan emphasizes the need to adhere to innovation-driven development and deepen educational evaluation reform in the new era. The introduction of innovation and entrepreneurship elements into professional course theory and practical teaching helps students grasp professional technical knowledge more effectively and equips them with the ability to solve practical problems [8]. The "specialization and innovation integration" course development calls for being guided by Socialism with Chinese Characteristics for a New Era, deepening the reform of innovation and entrepreneurship education curriculum, further refining the curriculum system for innovation and entrepreneurship, closely aligning with the development characteristics of different specialties, and exploring various dimensions from theory to practice. By integrating entrepreneurship elements into professional courses and reforming the "specialization and innovation integration" practical teaching model, this approach effectively incorporates innovation and entrepreneurship education into professional education, achieving a deep integration of professional education and innovation and entrepreneurship education [9].

### **2.1.3. Innovative "Specialization and Innovation Integration" Teaching Methods**

By fully utilizing modern educational technology, integrating high-quality teaching resources, offering in-house online courses, uploading excellent learning materials and course question banks, we provide students with high-quality course resources for learning. We use online platforms for teaching and teaching management. Smart classrooms are used for multimedia teaching. We focus on the fundamental points of the curriculum and integrate ideological and political elements. We meticulously design courseware, apply multimedia technology, and complement these with images, videos, and animations. This combination of text and visuals, along with auditory and visual impact,

makes full use of modern educational technology to broaden learning paths, stimulate student interest, and enhance learning effectiveness.

The "specialization and innovation integration" course design requires the flexible use of diverse classroom formats for teaching, including heuristic, task-based, group discussion, case analysis, field visits, survey reporting, combined online and offline, scenario simulation, and project-driven approaches. Industry professionals with extensive entrepreneurial management experience are invited to participate in classroom teaching activities. We strengthen the "student-centered" practical teaching component, cultivating students' innovative spirit and entrepreneurial awareness in their respective fields [10].

## **2.2. Innovation in Talent Development Mechanisms**

### **2.2.1. Establishing the "Customized" Elite Talent Training Mechanism**

The talent development model is the core component of talent development system reform. Building upon the existing outstanding talent development plans and the collaborative education plans integrating science and education, we aim to establish distinct "customized" training mechanisms for all students and outstanding students with professional potential. The objective is to comprehensively enhance students' overall quality while respecting individual differences and fostering potential development. The "customized" elite talent training mechanism is a system where enterprises place orders with the school based on their specific talent needs and specifications. Upon accepting these orders, the school collaborates with the enterprises to reform and innovate in training outstanding talents according to the order, relying on the "project" for cultivating innovation capabilities and "competition" for comprehensive quality development. By leveraging initiatives such as college students' innovation training programs, college students' entrepreneurship training programs, college students' entrepreneurship projects, "Internet+" innovation and entrepreneurship competitions, the "Challenge Cup" academic and scientific competition, and the "Challenge Cup" entrepreneurship plan competition, we aim to break the constraints of faculties and majors. We guide students to actively innovate and engage in practical activities, addressing the issue of overemphasizing theory and neglecting practice in the talent development process, ultimately focusing on cultivating elite talent and enhancing students' innovation and entrepreneurship capabilities.

### **2.2.2. Establishing the "Simulated" Innovation and Entrepreneurship Capability Training Mechanism**

In terms of fostering innovation and entrepreneurship capabilities for all students, a new mechanism for talent development combines student innovation and entrepreneurship practices with simulated enterprise operations. The core idea of this mechanism is to guide students to form virtual enterprises in a team format within their professional education process. Each student takes on different roles within the enterprise, including responsibilities in product design, production, marketing, and intellectual property protection. This mechanism allows students to experience the entire process of running an enterprise and accumulate experience in product design, innovative application, and entrepreneurial practice.

Within the talent development mechanism mimicking enterprise operations, the entire teaching process is closely integrated with students' professional learning. It seamlessly incorporates innovation and entrepreneurship capability development throughout the educational process. A "three-stage" talent development plan is constructed based on the progress of professional learning, including the general education stage (first year), the post course education stage (second year), and

the practical training stage of simulating enterprise behavior (third year). Through the introduction of various innovation and entrepreneurship courses and practical content at different stages, this approach blends general education with innovation and entrepreneurship education. It helps students progressively learn relevant knowledge, experience the complete enterprise operation process on campus, and lay the foundation for future innovation and entrepreneurship activities.

### **2.2.3. Building Innovation and Entrepreneurship Platforms**

Given the current situation where different departments are operating independently in student innovation and entrepreneurship education, there is an urgent need to establish interdisciplinary innovation and entrepreneurship platforms to break down the constraints of academic disciplines and promote comprehensive growth of fourth-year students [11]. We actively integrate resources from both on-campus and off-campus student innovation and entrepreneurship practice bases, constructing a system of innovation spaces with "one garden and multiple zones" as the core. This system serves as an on-campus innovation and entrepreneurship nursery, and it uses a university science and technology park company as an entrepreneurship accelerator. It connects with external entrepreneurial incubation bases in society, thus creating a linked innovation and entrepreneurship education and practice system. Additionally, we establish innovation and entrepreneurship colleges and develop double innovation industrial parks, among other innovation and entrepreneurship practice studios, to serve students in the areas of creative innovation and entrepreneurship education.

### **2.2.4. Construction of an Evaluation System**

On the foundation of innovation in the talent development mechanism and improvement of the curriculum system, the establishment of an evaluation system for innovation and entrepreneurship talent development outcomes is crucial. The guidance to schools and teachers is to undergo three significant shifts in mindset. Firstly, the evaluation of talent development effectiveness should shift from focusing on student performance to emphasizing students' innovation awareness and innovative spirit. Secondly, the focus should shift from concentrating on easily quantifiable innovation outcomes such as papers and patents during students' academic years to post-graduation innovation and entrepreneurship practices. Thirdly, the perspective should shift from heavy emphasis on accumulating results to prioritizing capability development. To evaluate the effectiveness of optimized curriculum systems, innovative talent development mechanisms, and the establishment of innovation and entrepreneurship platforms, we have designed an assessment system for innovation and entrepreneurship capability development. This system is structured across four dimensions: teaching processes, capability development, assessment formats, and teaching effectiveness, allowing the evaluation of students' innovation and entrepreneurship capability development outcomes. In this dimension, we consider not only students' performance during their academic years but also the tracking of their future development. As students' academic years are not the primary stage for producing innovation and entrepreneurship results, but rather for building the foundation of capabilities required for future innovation and entrepreneurship practices, a results-oriented system alone cannot comprehensively reflect the effectiveness of students' innovation and entrepreneurship capability development. Therefore, we will introduce forms such as employer satisfaction surveys and graduate sampling surveys within this dimension, and engage social third-party organizations to track students' entire career paths in innovation and entrepreneurship activities and their outcomes. This approach will assess students' short-term and long-term capabilities in conducting innovation and entrepreneurship activities.

### 3. Conclusion

The integration of professional education and innovation and entrepreneurship education is a crucial foundation for comprehensive talent development in applied universities. It also meets the requirements for talent specifications in a society driven by innovation [12]. Therefore, implementing integrated professional and creative education is an indispensable path for the reform of professional education and teaching in universities. To address the current state of integration between professional and creative education, continuous improvement and optimization are undertaken in areas such as curriculum design, training mechanisms, innovation and entrepreneurship platforms, and evaluation systems. A robust "professional-creative" curriculum system serves as a vehicle. A core elite "innovative" training mechanism is established, and high-level "academy + base + industrial park" innovation and entrepreneurship platforms provide support. An effective "four-dimensional and integrated" evaluation system safeguards the integration of innovation and entrepreneurship education throughout the entire process of professional talent development.

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