

Research and Practice on Pathways of Innovative and Entrepreneurial Talent Cultivation Model in the Context of Industry-Education Integration: A Case Study of the "Internet + " Innovation and Entrepreneurship Competition

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Abstract For students in higher vocational colleges, the "Internet + " Innovation and Entrepreneurship Competition not only provides them with a rare platform for communication and learning but also significantly promotes their comprehensive development and substantially enhances their innovative and entrepreneurial capabilities. This paper explores the collaboration models between higher vocational colleges and industries in advancing the "Internet + " Innovation and Entrepreneurship Competition, analyzes the impact of the competition on the educational systems and curriculum design of higher vocational colleges, and proposes pathways for research and practice on innovative and entrepreneurial talent cultivation models, aiming to cultivate high-quality and high-skilled talents who can adapt to industrial transformation and upgrading and achieve high-quality development.

Key words "Internet + " Innovation and Entrepreneurship Competition, Higher vocational colleges, Industry-education integration, Innovation and entrepreneurship, Talent cultivation

0 Introduction

With the continuous advancement of internet technology, innovative and entrepreneurial activities have become a key factor driving economic development and social progress. The "Internet + " Innovation and Entrepreneurship Competition, as a nationally influential event, has been successfully held for ten consecutive years up to 2024 since the Ministry of Education launched the first China International "Internet + " College Students Innovation and Entrepreneurship Competition (hereinafter referred to as the "Internet + " Competition) in 2015, and has been renamed the China International College Students Innovation Competition. This competition has attracted active participation from 5 406 universities in 153 countries and regions worldwide, with a total of 5.14 million projects and over 20.836 million student participants^[1], establishing its status as the largest and most influential international platform for innovation and entrepreneurship education exchange. For students in higher vocational colleges, this competition not only provides a valuable opportunity for cross-institutional communication and learning, enabling them to access and draw lessons from the innovative and entrepreneurial cultures and practical experience of different universities, thereby broadening their

horizons and enhancing their cross-disciplinary collaboration capabilities to adapt to the diversified demands of future workplace environments.

The core value of the "Internet + " Innovation and Entrepreneurship Competition lies in emphasizing the practical implementation and market application of projects, and providing students with a platform to accumulate hands-on experience and enhance practical operational skills. During the competition process, students are required to complete a series of practical activities ranging from the conception of innovative projects to market research, business model design, and project promotion. These experiences will have profound impacts on their future career development, particularly in self-entrepreneurship. Additionally, the competition significantly promotes industry-education integration. Through the form of student-enterprise collaborative projects, it will deepen students' understanding of enterprise demands while enabling enterprises to engage in talent cultivation processes at an early stage, thereby establishing closer connections between higher education institutions and enterprises. This collaboration model not only strengthens the market adaptability of education by equipping students with more practical knowledge and skills but also opens new avenues for educational reform under the background of industry-education integration and provides feasible practical pathways.

Therefore, the functions of the "Internet + " Innovation and Entrepreneurship Competition in the educational practices of higher vocational colleges cannot be underestimated. It not only promotes the comprehensive development of students and enhances their innovative and entrepreneurial capabilities but also drives in-depth collaboration between colleges and enterprises, offering ro-

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bust support for cultivating high-quality talents adapted to market demands. This holds profound significance for educational reform in the context of industry-education integration.

1 Higher vocational colleges cooperating with industrial circles to promote "Internet + " Innovation and Entrepreneurship Competition

1.1 Cooperation model between universities and industrial circles

1.1.1 University-enterprise cooperation: higher education institutions (colleges and universities) and enterprises establish cooperative relationships to jointly promote the development of the "Internet + " Innovation and Entrepreneurship Competition. Universities provide talent and technical support, while enterprises offer market demand insights and financial support, jointly participating in the organization and evaluation of the competition. This cooperation model can enhance communication and cooperation between universities and enterprises, thereby improving the quality and practicality of the competition.

1.1.2 University-association cooperation model: higher education institutions and industry associations establish cooperative relationships to jointly advance the development of the "Internet + " Innovation and Entrepreneurship Competition. Industry associations possess abundant industry resources and networks, which can provide students with professional guidance and advice, as well as offer funding and resource support for participating projects. This cooperation model enables students to gain deeper insights into industry dynamics and trends, thereby enhancing the quality and practical application value of the competition.

1.1.3 University-local government cooperation model: universities and local government establish collaborative relationships to jointly promote the development of the "Internet + " Innovation and Entrepreneurship Competition. Local governments can provide policy supports and funding investment to help universities and enterprises better carry out innovation and entrepreneurship activities. Meanwhile, universities and enterprises can also contribute to local economic development, realizing mutual benefits and win-win outcomes for both parties. This cooperation model helps drive the development of local economy and the construction of innovation and entrepreneurship culture.

1.2 Industrial circle participating in student development and project incubation

1.2.1 Participating in the formulation of talent training programs: the industrial circle participates in the formulation of talent training programs in colleges and universities, and incorporates industry standards and market demand into the process of talent training. Through cooperation with enterprises, colleges and universities can more clearly understand the development trend of the industry and market demand, optimize the curriculum and teaching content, and cultivate talents more in line with market demand.

1.2.2 Providing practice opportunities and internship positions: The industry provides practice opportunities and internship positions for college students, so that they can master professional skills and practical experience in practical work. Through cooperation with enterprises, students can get in touch with real projects and cases, improve their practical ability and comprehensive quality, and enhance their employment competitiveness.

1.2.3 Participating in project incubation: the industry participates in the project incubation of college students, providing financial, technical and market support to help them transform their ideas into practical products or services. This cooperation model can help students realize their entrepreneurial dreams, and also provide new innovations and business models for enterprises.

1.2.4 Jointly carrying out scientific research projects: the industry and universities jointly carry out scientific research projects, explore new technologies and business models, and promote industrial upgrading and innovative development. Through cooperation, universities can obtain more scientific research resources and financial support to improve their scientific research level and innovation ability; enterprises can obtain new technologies and business models to improve their competitiveness and innovation ability.

1.2.5 Participating in the construction of teaching staff: the industry participates in the construction of teaching staff in colleges and universities, provides teachers with practical experience and professional skills training, and helps them better guide students and practice teaching. Through cooperation, university teachers can improve their practical ability and teaching level, and better serve personnel training and social services.

2 Impacts of "Internet + " Innovation and Entrepreneurship Competition on education system and course setting

2.1 Impacts on relevant course setting and improvement

2.1.1 The competition promotes higher vocational colleges to offer Internet + innovation and entrepreneurship courses, such as innovative thinking and entrepreneurship foundation, to meet the needs of the competition^[2]. These courses aim to cultivate students' innovative consciousness and entrepreneurial ability, and improve their competitiveness in the competition. In addition, teachers will constantly improve the course content and teaching methods to improve the quality of teaching according to the requirements of the competition and the needs of students.

2.1.2 Facilitating project practice and achievement transformation. In the competition, students are required to apply theoretical knowledge to real-world projects. This process helps translate theoretical understanding into practical experience, enhancing their hands-on capabilities and problem-solving skills. Simultaneously, the competition promotes the incubation of outstanding projects and the commercialization of results, providing students with increased support and resources for entrepreneurial endeavors.

2.1.3 Fostering interdisciplinary collaboration and exchange. The competition demands that students integrate multidisciplinary knowledge, such as computer science, marketing, and product design, to address challenges. This approach encourages cross-disciplinary communication and collaboration, cultivating students' comprehensive competencies and teamwork abilities^[3]. Additionally, interdisciplinary cooperation drives curriculum integration and optimization, thereby improving the quality of education.

2.1.4 Enhancing teachers' professional expertise. During the competition, instructors must guide students in resolving challenges and refining their skills. This requires teachers to possess advanced professional competence and innovative capabilities, enabling them to continuously update their knowledge and skills to meet both competition requirements and student development needs. Through mentoring roles in the competition, educators also elevate their pedagogical proficiency and professional growth.

2.2 Impacts on the educational philosophy and teaching methods of colleges and universities

2.2.1 Impacts on educational philosophy. (i) Emphasizing innovation and entrepreneurship education; driven by the "Internet + " Innovation and Entrepreneurship Competition, higher vocational colleges have increasingly prioritized innovation and entrepreneurship education, integrating it as a core component of their educational systems. This reflects their commitment to fostering students' innovative spirit, entrepreneurial awareness, and venture-building capabilities to meet societal demands for innovative talents^[4].

(ii) Emphasizing practice and application; the competition emphasizes students' practical abilities and applied skills, prompting higher vocational colleges to adopt educational philosophies centered on practice and application. By strengthening hands-on teaching and project implementation, students' operational competencies are enhanced. This approach helps students better adapt to industry requirements and improves their employability.

(iii) Emphasizing openness and cooperation; the competition encourages cross-disciplinary and cross-domain cooperation and exchange, leading higher vocational colleges to prioritize openness and collaboration in their educational frameworks. Institutions enhance partnerships with industries and enterprises to promote resource sharing and complementary strengths, thereby elevating students' comprehensive competencies and innovation capabilities.

2.2.2 Impacts on teaching methods. (i) Blended teaching model; the implementation of the competition has facilitated the promotion and application of blended teaching models in higher vocational colleges. Teachers adopt a combination of online and offline teaching methods, integrating traditional classrooms with digital platforms. This approach provides more flexible and diverse learning methods as well as abundant learning resources, better meeting students' educational needs.

(ii) Project-based teaching approach; the competition often revolves around real-world projects, driving the development of

project-based teaching methodologies in higher vocational colleges. Teachers align instructional content with practical projects, guiding students to acquire knowledge and skills through project completion. This pedagogical method enhances students' practical abilities and teamwork skills.

(iii) Innovative practical methods; by encouraging students to engage in innovative practices, the competition has led higher vocational colleges to prioritize the application of innovative practical methods. Teachers foster students' innovative awareness and hands-on capabilities through inquiry-based learning and thought-provoking guidance, ultimately improving their comprehensive competencies.

3 Research and practice on the cultivation model of innovative and entrepreneurial talents

3.1 Optimizing the teaching staff and building an educational mechanism involving multiple subjects

It is necessary to establish an innovation and entrepreneurship education training mechanism that integrates theory and practice, promotes multi-party cooperation among educational institutions, industries, enterprises, and governments, and consolidates resources in curricular instruction and practical training to jointly develop talent cultivation programs. A dual-mentor educational system should be implemented by forming instructor teams with both teaching and practical expertise. Deep integration with enterprises will be strengthened through initiatives such as inviting enterprises into campuses or establishing enterprise partnerships on-site. This approach aims to attract high-level industry mentors to participate in practical courses, with a focus on addressing real-world corporate challenges as their core mission^[5].

3.2 Building a practical platform and establishing an interactive platform for innovation and entrepreneurship

It is recommended to establish practical platforms or bases, such as innovation hubs, to cultivate students' innovation and entrepreneurship skills through extracurricular programs. By mobilizing social resources and research capital to engage in university students' innovation and entrepreneurship initiatives, platform interactions can be enhanced, thereby increasing entrepreneurial success rates. Leveraging these platforms, participation in competitions such as the "Internet + " Innovation and Entrepreneurship Competition for College Students, the "Chuang Qingchun" Entrepreneurship Competition, and the "Challenge Cup" Competition can ignite students' entrepreneurial passion and enthusiasm, fostering their entrepreneurial mindset.

3.3 Promoting innovation and entrepreneurship education for college students and deeply participating in the process of education

It is recommended to promote innovation and entrepreneurship education and practice in the fields of big data, big health, and food/agricultural products, set entrepreneurship training courses for students with entrepreneurial interests and aspirations, and provide elite development programs for teams par-

ticipating in outstanding projects within crowd-creation spaces. In addition, it is necessary to gradually establish a progressive modular curriculum system that covers all students, integrates disciplines, spans the entire educational journey, advances step-by-step, and employs categorized instruction. By embedding innovation and entrepreneurship education throughout the talent cultivation process, this framework supports major strategies such as rural revitalization in Guizhou and drives the high-quality development of the institution^[6].

3.4 Exploring the proper education model according to local conditions

It is essential to explore new models of deep integration in government-industry-university-research-application collaboration by leveraging regional characteristics and industrial demands, and coordinating efforts among universities, research institutions, government agencies, and industry enterprises. For instance, the Guizhou Collaborative Innovation Center for Mountain – Specific Fruits and Alcoholic Products and the Guizhou Engineering Research Center for Big Data – Driven Ecological Food and Agricultural Products have been established in alignment with Guizhou's local industrial development needs. By collaborating with top-tier provincial institutions such as Guizhou University, the Guizhou Academy of Sciences Innovation and Entrepreneurship Park, and other leading universities, research entities, government bodies, and industry partners, these centers have pioneered an organic synergy model integrating government, universities, research institutions, enterprises, and innovation parks, achieving deep convergence of policy, industry, academia, research, and application.

With the goals of enhancing the supply capacity of Guizhou's mountain-specific fruits and other food/agricultural products and cultivating high-level interdisciplinary innovation talents, this model drives coordinated innovation across the entire industry chain of Guizhou's specialty food and agricultural products. It focuses on cutting-edge core technologies and industrial bottlenecks in areas such as health management, quality safety control and testing, processing, and comprehensive resource utilization. The initiative builds six major platforms for: technology R&D, technical training, student internships, employment and entrepreneurship, external cooperation, achievement commercialization. Through these efforts, influential applied innovation teams, demonstration centers, and industrial bases are formed. This framework nurtures high-quality innovative talents, serves national and regional strategic priorities, and drives high-quality industrial development in Guizhou^[6].

3.5 Professional education docking innovation and entrepreneurship to enhance practical innovation ability

On the basis of relevant professional education, we should make good use of the platform of skills competition and scientific research activities, actively explore the integrated teaching mode of "class competition and training", and explore the cultivation path of innovative talents relying on "Internet + ". While mastering professional knowl-

edge, students spontaneously set up interest groups and teams to actively participate in the "Internet + " innovation and entrepreneurship competition. Through this competition-driven approach, we encourage student teams to develop new products to broaden their horizons and improve their theoretical literacy.

4 Conclusions

4.1 Promoting organic combination of industry-education integration and competition to improve the quality of personnel training

The organic combination of industry-education integration and "Internet + " Innovation and Entrepreneurship Competition has successfully trained a large number of high-quality talents with innovative consciousness and entrepreneurial ability through the practice of intelligent employment and entrepreneurship platform and competition. The competition has constructed a practical stage, deepened the combination of theory and practice, strengthened inter-school and school-enterprise exchanges, and effectively improved the accuracy and effectiveness of personnel training.

4.2 The educational model of innovation and entrepreneurship competitions is a valuable experiment in talent cultivation reform

The educational model based on the "Internet + " Innovation and Entrepreneurship Competition has provided a beneficial exploration for talent cultivation reform in higher vocational colleges. This model significantly enhances students' innovative awareness and entrepreneurial capabilities, deepens the integration of theory and practice, strengthens inter-school and school-enterprise collaboration, and elevates the quality of talent development.

4.3 Emphasizing students' diverse and individualized needs

The design and implementation of the competition must address students' differentiated and individualized needs. Through questionnaires and interviews, precise insights are gathered to offer diverse project activities, supported by professional mentor teams, and to implement personalized guidance.

4.4 Closely aligning with industrial development and market demands

The educational model of innovation and entrepreneurship competitions must remain closely attuned to industrial trends, market demands, and enterprise dynamics. It requires flexible adjustments to talent cultivation plans and curriculum design, strengthened collaboration with enterprises and industries, and ensures the relevance and effectiveness of talent development.

4.5 Cultivating innovative thinking and entrepreneurial spirit

The core objective of the competition-based educational model should be to cultivate innovative thinking and entrepreneurial spirit. Through diverse projects and activities, students' imagination and creativity are stimulated. Professional mentor teams and training courses are provided, practice-oriented projects are designed, and students are guided to focus on industry developments and market demands, while receiving entrepreneurial guid-

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ance and support.

4.6 Exploring the implementation path of comprehensive "discipline-competition-innovation" integration In agricultural and related disciplines at higher vocational colleges, the implementation path of comprehensive integration of "discipline-competition-innovation" is being explored. Leveraging the competition platform, this approach deeply integrates professional education with innovation practices, aiming to holistically enhance students' comprehensive competencies and employability, thereby precisely aligning with industrial development needs. Concurrently, policy support and institutional reforms from governments and higher vocational colleges provide robust guarantees for the sustained development of the competition.

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