

Exploration of the Mechanism and Path for the In-depth Integration of Innovation and Entrepreneurship Education with Professional Education in Colleges and Universities

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Abstract: Against the backdrop of the national strategy of innovation-driven development, colleges and universities, as the core base for talent cultivation, need to break down the barriers between innovation and entrepreneurship education and professional education, achieving their deep integration. Based on the current realities of teaching reform in higher education, this paper analyzes the current state and existing problems in the integration of innovation and entrepreneurship education with professional education. It explores the internal mechanisms for deep integration from three dimensions: the collaborative education mechanism, the curriculum system construction mechanism, and the faculty team building mechanism. Furthermore, it proposes integration paths based on professional characteristics, relying on practical platforms, and leveraging industry-academia cooperation. The aim is to provide theoretical reference and practical guidance for cultivating high-quality talents with innovative spirit and practical abilities in colleges and universities.

Keywords: Innovation and Entrepreneurship Education; Professional Education; Deep Integration

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1 Introduction

With the transformation and upgrading of the economic structure and the acceleration of the technological revolution, societal demand for talent is shifting from traditional knowledge-based and skill-based types to innovative and interdisciplinary types. As the main channel for talent cultivation, colleges and universities bear the important mission of supplying innovative talents for the nation. Innovation and entrepreneurship education, being a key link in cultivating students' innovative thinking, entrepreneurial awareness, and practical abilities, is inextricably linked to professional education. Professional education serves as the foundation for innovation and entrepreneurship education, providing students with professional knowledge and skills support; innovation and entrepreneurship education, in turn, is an extension and expansion of professional education, stimulating students' application ability and innovative potential regarding their professional knowledge. However, in the current teaching process of some colleges and universities, a disconnect still exists between innovation and entrepreneurship education and professional education, manifested in issues such as a lack of relevance in curriculum design, insufficient collaboration among faculty, and poor integration of practical platforms, which severely affects the quality of talent cultivation. Therefore, exploring the mechanisms and paths for the deep integration of innovation and entrepreneurship education with professional education in colleges and universities holds significant theoretical and practical value.

2 Current Situation and Problems in the Integration of Innovation and Entrepreneurship

Education and Professional Education in Colleges and Universities

2.1 Current State of Integration

In recent years, the state has successively issued policy documents such as the "Implementation Opinions of the General Office of the State Council on Deepening the Reform of Innovation and Entrepreneurship Education in Higher Education Institutions" and "Opinions on Promoting the High-Quality Development of Modern Vocational Education," explicitly requiring colleges and universities to integrate innovation and entrepreneurship education into the entire process of talent cultivation and promote the organic combination of innovation and entrepreneurship education with professional education. In this context, various colleges and universities have actively responded and carried out reforms and practices in innovation and entrepreneurship education. Some universities have added innovation and entrepreneurship course modules to their professional talent training plans, such as offering "Software Development Innovation and Entrepreneurship Practice" courses in computer science majors and "Intelligent Equipment Entrepreneurial Design" courses in mechanical engineering majors. Some universities have established cross-disciplinary innovation and entrepreneurship practice platforms, such as setting up Student Innovation and Entrepreneurship Incubation Centers, attracting students from different majors to form teams for project development. Others have introduced real enterprise projects into the classroom through industry-academia cooperation, promoting the combination of professional education and innovation and entrepreneurship practice.

2.2 Existing Problems

Although colleges and universities have made some progress in integrating innovation and entrepreneurship education with professional education, many problems remain, mainly reflected in the following three aspects:

2.2.1 Lack of Systematic Integration in the Curriculum System

Innovation and entrepreneurship courses in some colleges and universities are independent of professional courses, lacking organic connection. On one hand, innovation and entrepreneurship courses are often offered as general education courses, with content leaning towards theoretical explanation, such as "Fundamentals of Innovation and Entrepreneurship" and "Entrepreneurship Management," and are not closely integrated with students' professional knowledge, making it difficult for students to combine innovative and entrepreneurial thinking with professional practice. On the other hand, professional courses still focus on traditional knowledge transmission, with teaching content updates lagging behind industry development needs, lacking cultivation of students' innovative thinking and practical abilities, and thus unable to provide effective professional support for innovation and entrepreneurship education. For example, in the marketing major of a certain university, professional courses mainly revolve around marketing theory, consumer behavior, etc., while innovation and entrepreneurship courses are offered separately, without integrating innovative cases in the marketing field or entrepreneurial project design into the teaching of professional courses. This makes it difficult for students to form a composite knowledge structure of "professional + innovation" during their studies.

2.2.2 Lack of Collaboration in the Faculty Team

The faculty team is a key force in promoting the integration of innovation and entrepreneurship education and professional education. However, the current faculty in colleges and universities often work in isolation, lacking collaborative cooperation. On one hand, professional teachers, who are long engaged in the teaching of professional courses, possess solid professional knowledge but often lack practical experience in innovation and entrepreneurship, making it difficult for them to effectively guide students in innovation and entrepreneurship activities during teaching. On the other hand, innovation and entrepreneurship education teachers mostly come from fields such as economics, management, and law, possessing certain entrepreneurial theoretical knowledge and guidance experience, but they often lack sufficient understanding of the technical characteristics and industry demands of specific professional fields, thus unable to provide professionally targeted innovation and entrepreneurship guidance for students. For example, when guiding students in the "Intelligent Agricultural Irrigation System R&D" entrepreneurial project, professional teachers can provide technical support but are deficient in areas like business plan writing and market analysis; innovation and entrepreneurship education teachers can guide business operations but cannot provide effective help for problems encountered during the technical R&D process,

leading to suboptimal project guidance outcomes.

2.2.3 Lack of Integration in Practical Platforms

Practical platforms are important carriers for realizing the integration of innovation and entrepreneurship education and professional education. However, practical platforms in some colleges and universities are decentralized and fragmented, lacking effective integration. On one hand, professional practice platforms such as laboratories and training bases primarily serve the practical teaching of professional courses, have a single function, and lack the capacity to incubate and support innovation and entrepreneurship projects. On the other hand, innovation and entrepreneurship practice platforms such as maker spaces and incubation centers, while possessing functions like project incubation and funding support, lack linkage with professional practice platforms and cannot fully utilize the equipment resources, technical resources, and industry resources of professional fields. For example, the mechanical engineering major of a certain university has an advanced mechanical processing laboratory, but this laboratory is only used for students' practical training in professional courses and is not open to innovation and entrepreneurship teams. Meanwhile, the university's innovation and entrepreneurship incubation center has entrepreneurial projects stationed, but due to the lack of professional mechanical processing equipment, some entrepreneurial projects involving mechanical design cannot carry out R&D work smoothly.

3 Mechanism Construction for the Deep Integration of Innovation and Entrepreneurship Education and Professional Education in Colleges and Universities (Abbreviated Version)

3.1 Collaborative Education Mechanism

As the core guarantee for integration, a "University-Faculty/Department-Professional Program-Enterprise" four-level system needs to be constructed. At the university level, establish a leading group to formulate integration measures, set up special funds, and incorporate integration effectiveness into assessments. Faculties/Departments develop plans based on professional characteristics, form interdisciplinary teaching teams, and deepen industry-academia cooperation. Professional programs determine integration priorities according to industry needs, such as focusing on technological innovation in science and engineering, and business model innovation in humanities and social sciences, holding regular talent cultivation seminars. Enterprises provide project cases and internship platforms, such as Huawei establishing "Innovation Experimental Classes" to promote the integration of technology and curriculum.

3.2 Curriculum System Construction Mechanism

Construct a "General Education + Professional Education + Practical Education" trinity system. General education courses include "Fundamentals of Innovation and Entrepreneurship," etc., integrating professional cases to cultivate "professional + innovation" thinking. Professional courses incorporate industry frontier content into theoretical teaching, such as discussing 5G entrepreneurship cases in electronic information majors; practical teaching includes innovation components, such as requiring teams in mechanical engineering majors to design innovative products. Practical courses include professional internships, project incubation, etc., establishing "on-campus + off-campus" platforms. For example, civil engineering students first design prefabricated buildings on campus and then practice operations in enterprises.

3.3 Faculty Team Building Mechanism

Construct a system of "Professional Teachers + Innovation and Entrepreneurship Education Teachers + Industry Experts." Universities enhance the capabilities of professional teachers through training and enterprise secondments, for instance, sending 50 teachers for secondments annually. Introduce entrepreneurs, etc., as full-time or part-time innovation and entrepreneurship teachers, and encourage internal teachers to transition. Form interdisciplinary teams, such as an "Intelligent Medical Teaching Team" with members from medicine, computer science, and other fields, to jointly develop courses and guide projects.

4 Exploration of Paths for the Deep Integration of Innovation and Entrepreneurship Education and Professional Education in Colleges and Universities (Abbreviated Version)

4.1 Integration Path Based on Professional Characteristics

Explore differentiated paths according to professional differences: Science and engineering majors focus on technological innovation, integrating innovation and entrepreneurship education with technological R&D and research projects. For example, computer science students transform AI image recognition research results into an "Intelligent Security Surveillance System" project. Humanities and social sciences focus on business model innovation, combining professional services with social practice. For example, marketing students build an "Agricultural Products E-commerce Platform" to solve sales difficulties. Arts majors emphasize creative design, integrating with cultural industries. For example, visual communication design students integrate traditional paper-cutting art into packaging design and establish a design company.

4.2 Integration Path Relying on Practical Platforms

Construct multi-level platforms of "On-campus - Off-campus - Collaborative": On-campus, establish laboratories, maker spaces, etc. For example, a university's "Innovation and Entrepreneurship Maker Space" has functional zones and is equipped with mentors for student project R&D. Off-campus, expand resources from industry-academia bases and industry associations. For example, co-building an e-commerce training base with Alibaba where students participate in store operations, and jointly organizing innovation and entrepreneurship competitions with associations. Promote on-campus and off-campus collaboration, establishing resource sharing and teaching collaboration mechanisms. For example, the materials major cooperates with enterprises, where on-campus laboratories support enterprise R&D, and enterprises provide student practice projects, achieving a win-win-win situation for all three parties.

4.3 Integration Path Leveraging Industry-Academia Cooperation

Use industry-academia cooperation as a link to deepen integration: Co-develop talent training plans. For example, the Internet of Things major cooperates with Haier to integrate enterprise technical standards into the curriculum. Co-organize innovation and entrepreneurship projects. For example, cooperating with Tencent on the "Cloud Incubation Plan," where enterprises provide project demands and resources, universities assign teachers for guidance, and outstanding projects succeed in operation. Share faculty and technology. Enterprises send key personnel as part-time teachers; university teachers serve as consultants in enterprises. For example, the artificial intelligence major shares technology platforms with Baidu for collaborative talent cultivation.

5 Safeguard Measures for the Deep Integration of Innovation and Entrepreneurship Education and Professional Education in Colleges and Universities (Abbreviated Version)

5.1 Improve Policy and Institutional Safeguards

Governments and universities need to collaboratively build a policy and institutional system: The government should increase investment, establish special innovation and entrepreneurship funds to support university reforms, platform construction, and faculty training. Simultaneously, introduce policies such as tax reductions and talent introduction subsidies to encourage enterprise participation in industry-academia cooperation. Universities should establish and improve internal systems, incorporate integration effectiveness into assessments, recognize outstanding collectives and individuals, regularly evaluate the quality of course teaching and project guidance, and promptly solve problems.

5.2 Strengthen Funding Investment Safeguards

Use multi-channel fundraising to solidify the material foundation: Universities should optimize internal funding structures, allocate funds from education operating expenses towards curriculum construction, platform setup, faculty training, and project incubation. Actively seek external support by applying for government special funds, corporate sponsorships, and social donations. Obtain revenue through industry-academia cooperation and technology transfer. For example, a university raised tens of millions of funds to promote the in-depth development of integrated education.

5.3 Establish Sound Evaluation and Supervision Safeguards

Construct a scientific evaluation and supervision system: Establish evaluation indicators including curriculum integration degree, faculty collaboration, platform integration, and student ability improvement, using a combination of quantitative and qualitative methods for regular assessment. Involve enterprise representatives, industry experts, and third-party institutions in the evaluation to ensure objective results. Establish a feedback and application mechanism, using evaluation results to adjust policies, optimize curricula, and improve teaching. For example, a university establishes an expert evaluation committee that assesses and guides reforms annually to enhance integration quality.

6 Conclusion

In the context of the in-depth implementation of the innovation-driven development strategy, achieving the deep integration of innovation and entrepreneurship education and professional education in colleges and universities is an inevitable requirement for cultivating innovative and interdisciplinary talents, and also an important direction for promoting the reform of higher education teaching. By analyzing the current situation and existing problems in the integration of innovation and entrepreneurship education and professional education in colleges and universities, this paper constructs the internal mechanisms for their deep integration from three dimensions: the collaborative education mechanism, the curriculum system construction mechanism, and the faculty team building mechanism. It also proposes integration paths based on professional characteristics, relying on practical platforms, and leveraging industry-academia cooperation, while clarifying safeguard measures such as improving policies and institutions, strengthening funding investment, and establishing sound evaluation and supervision.

However, the deep integration of innovation and entrepreneurship education and professional education in colleges and universities is a systematic project that requires the joint efforts of the government, universities, enterprises, and all sectors of society. In the future, colleges and universities should further deepen teaching reforms, continuously explore integration models that conform to their own school-running characteristics and professional features, strengthen deep cooperation with enterprises, integrate various educational resources, and provide students with higher-quality innovation and entrepreneurship education and professional education services. Meanwhile, the government should increase policy support and guidance, create a favorable ecological environment for innovation and entrepreneurship education, and promote the integration of innovation and entrepreneurship education and professional education in colleges and universities towards deeper levels and higher standards. This will cultivate more high-quality talents with an innovative spirit, entrepreneurial awareness, and practical abilities for the country, providing strong talent support for realizing the Chinese Dream of the great rejuvenation of the Chinese nation.

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