

# Exploring Teaching Methods that Integrate Dual Innovation Education with Specialty-Creation Synergy within Engineering Practice Courses

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## Abstract

Innovation and entrepreneurship education has become a hot topic in the field of education today. How to organically connect innovation and entrepreneurship education with engineering practice courses, and explore more effective teaching methods through the integration of innovation and entrepreneurship teaching methods is the focus of research. Taking electronic information majors as an example, this paper elaborates in detail on the role of innovation and entrepreneurship integration teaching methods in the connection between innovation and entrepreneurship education and engineering practice courses. This article aims to explore the teaching method of integrating innovation and entrepreneurship in the engineering practice course of entrepreneurship and entrepreneurship education, and provide theoretical support and practical guidance for educational practice.

## Keywords

Entrepreneurship and entrepreneurship education, engineering practice courses, integrated teaching methods of specialization and innovation, linkage, educational practice.

## 1. Introduction

As an important way to cultivate innovation and entrepreneurship abilities, entrepreneurship and entrepreneurship education has received widespread attention. However, in practical teaching, how to organically combine entrepreneurship and entrepreneurship education with engineering practice courses to achieve better educational results is one of the challenges facing the current education field. As an emerging teaching method, the integration of specialized and creative teaching provides a possible solution. This article aims to explore the application effect of the integration of specialized and creative teaching methods in the integration of entrepreneurship and innovation education and engineering practice courses, and provide reference for future teaching reforms.

## 2. Analysis of the Relationship between Innovation and Entrepreneurship Education and Engineering Practice Courses

There is a close relationship between entrepreneurship education and engineering practice courses, which complement each other and jointly promote the cultivation of students' comprehensive qualities and the improvement of their innovation and entrepreneurship abilities.

Firstly, entrepreneurship and entrepreneurship education emphasizes the cultivation of students' innovative and entrepreneurial awareness and abilities, enabling them to have the ability to think independently and solve problems. As an important form of practical teaching,

engineering practice courses provide students with a platform for cultivating hands-on and practical skills. Through engineering practice courses, students can combine theoretical knowledge with practical applications, improve their ability to solve practical problems, and cultivate innovative thinking.

Secondly, entrepreneurship education focuses on cultivating students' teamwork and practical abilities, encouraging them to engage in innovative practices within the team. Engineering practice courses are often based on group collaboration or projects, requiring students to work together to complete design, implementation, and evaluation. In this process, students need to cooperate and divide tasks, cultivate teamwork spirit, and improve practical and problem-solving abilities.

In addition, entrepreneurship and innovation education advocates the cultivation of students' interdisciplinary comprehensive abilities and innovative thinking, and encourages students to learn and cooperate across disciplines and fields. Engineering practice courses often involve interdisciplinary knowledge and fields, requiring students to comprehensively apply knowledge from various disciplines and collaborate across boundaries to solve problems. Through engineering practice courses, students can broaden their disciplinary perspectives, cultivate interdisciplinary comprehensive abilities, and promote cross-border innovation.

Finally, entrepreneurship and entrepreneurship education emphasizes the application of knowledge and emphasizes the cultivation of practical application and practical abilities. The engineering practice course provides a practical scenario for students to apply the knowledge they have learned in a real environment, verify theories through practical operations, and cultivate their practical and application abilities. Through practical activities in engineering practice courses, students can better transform theoretical knowledge into practical abilities, promote the implementation and achievement transformation of innovation and entrepreneurship practices.

In summary, entrepreneurship education and engineering practice courses mutually promote and support each other, jointly serving the cultivation of students' comprehensive qualities and the improvement of their innovation and entrepreneurship abilities. The organic combination of entrepreneurship education and engineering practice courses can better cultivate students' innovation awareness, practical ability, and teamwork spirit, laying a solid foundation for their future career development and innovation and entrepreneurship path. The deepening development of this relationship will help promote continuous innovation and progress in education and teaching, and make positive contributions to cultivating more outstanding talents with innovative spirit and practical ability.

### **3. Analysis of the Current Situation of the Engineering Practice Course for the Integration of Entrepreneurship and Entrepreneurship Education**

The connection between entrepreneurship education and engineering practice courses is of great significance in the current field of education, but there are also some challenges and problems in practical implementation.

Firstly, there is a problem of insufficient teaching resources in the connection between entrepreneurship education and engineering practice courses. Entrepreneurship and entrepreneurship education requires the provision of educational resources and guidance for innovation and entrepreneurship, while engineering practice courses require strong practical resource support. However, there is currently an imbalance in resource allocation in some schools, resulting in insufficient support for entrepreneurship education and engineering practice courses, which affects teaching effectiveness.

Secondly, the construction of the teacher team is another challenge faced by the practical courses of the Double Innovation Education Connection Project. Innovation and

entrepreneurship education and engineering practice courses have put forward higher requirements for the abilities and qualities of teachers, requiring them to possess interdisciplinary knowledge and practical experience, and be able to guide students in innovative practice. However, currently some teachers still have shortcomings in interdisciplinary teaching and practical guidance, and it is necessary to strengthen the construction of the teaching staff and improve the comprehensive quality of teachers.

In addition, curriculum design and integration are one of the areas that urgently need improvement in the practical courses of the integration of entrepreneurship and entrepreneurship education. The content and form of entrepreneurship education and engineering practice courses vary. How to organically integrate the two and design courses that meet student needs and teaching objectives is the current challenge. We need to strengthen the overall planning and interdisciplinary integration of curriculum design to ensure smooth connection between entrepreneurship education and engineering practice courses.

In addition, the establishment of evaluation mechanisms and feedback systems is also an area that needs to be improved in the practical course of connecting entrepreneurship and entrepreneurship education. Evaluation is an important guarantee of teaching quality, and it is crucial for the connection between entrepreneurship education and engineering practice courses. At present, some schools lack a comprehensive evaluation mechanism to effectively evaluate the effectiveness of connections and student learning outcomes, and lack timely feedback and improvement mechanisms, which affects the improvement of teaching effectiveness.

In summary, the practical course of the entrepreneurship and innovation education linkage project is currently facing challenges and problems in terms of insufficient resources, teacher team construction, curriculum design and integration, and evaluation and feedback mechanisms. To solve these problems, schools and educational institutions need to strengthen resource investment, enhance teacher training, optimize curriculum design, establish a sound evaluation and feedback system, promote the organic connection between entrepreneurship and engineering practice courses, and provide better support and guarantee for the growth of students and the improvement of their innovation and entrepreneurship abilities.

#### **4. Exploration of the Role of The Integration of Specialized and Creative Teaching Methods in The Connection Between Entrepreneurship and Engineering Practice Courses**

The integration of specialized and creative teaching methods plays an important role in the connection between entrepreneurship and engineering practice courses. This method combines professional knowledge with the cultivation of innovation and entrepreneurship abilities, and promotes comprehensive development of students through interdisciplinary teaching design and practical activities. The following will explore both theoretical and practical aspects, and compare them with practical cases.

Firstly, from a theoretical perspective, the integrated teaching method of specialization and innovation combines traditional disciplinary knowledge with innovative and entrepreneurial concepts, emphasizing the application of knowledge and the practice of innovation. Through the organic integration of professional courses and innovation and entrepreneurship courses, students can cultivate innovation and entrepreneurship awareness and practical abilities while learning professional knowledge, achieving a dual harvest of knowledge and abilities. For example, in engineering practice courses, students can not only learn engineering technology knowledge, but also apply the knowledge they have learned to practical innovation projects through entrepreneurial oriented project design and implementation, thereby enhancing practical abilities and innovative thinking.

Secondly, from the perspective of practical case analysis, adopting the integration of specialized and creative teaching methods can effectively promote the connection between entrepreneurship and innovation education and engineering practice courses. Taking the engineering practice course of a certain university as an example, this course introduces professional course knowledge and innovative and entrepreneurial concepts. Through team project cooperation, experimental design, and other methods, it cultivates students' teamwork ability and innovative and entrepreneurial spirit. Students not only learn professional skills in the course, but also develop problem-solving skills and innovative thinking through practical entrepreneurship projects. Compared with traditional engineering practice courses, courses that adopt the integration of specialized and creative teaching methods can better stimulate students' interest in learning and improve teaching effectiveness.

In addition, compared with single subject teaching, the integrated teaching method of specialization and creativity can better meet the current demand for versatile talents in society. In the connection between entrepreneurship and engineering practice courses, students not only need to master professional knowledge, but also need to have the ability to innovate and start businesses. The use of specialized and innovative integrated teaching methods can cultivate students' interdisciplinary thinking and practical abilities, improve their comprehensive quality and competitiveness, and better adapt to the development needs of future society.

In summary, the integration of specialized and creative teaching methods plays an important role in the connection between entrepreneurship and engineering practice courses. By organically integrating professional knowledge with innovation and entrepreneurship concepts, we promote the comprehensive development of students. The practical case analysis also confirms the effectiveness of this method. Compared with traditional teaching methods, the integration of specialized and creative teaching can better cultivate students' innovation and entrepreneurship abilities, improve their comprehensive quality, and lay a good foundation for their future development.

## **5. Exploration of the Role of The Integration of Specialized and Creative Teaching Methods in The Connection Between Entrepreneurship and Engineering Practice Courses**

The electronic information major, as a field involving technological innovation and entrepreneurship, is very suitable for adopting a teaching method that integrates expertise and innovation. Below, I will take the electronic information major as an example to describe the implementation strategy and path exploration of the integration of specialized and creative teaching methods, including specific implementation steps and processes.

Firstly, the first key step in implementing the integration of specialized and creative teaching methods in the field of electronic information is to determine teaching objectives. Teachers need to clearly cultivate students' professional knowledge and skills, while emphasizing the cultivation of innovation and entrepreneurship abilities, and based on this, carry out subsequent teaching design and implementation. By setting clear goals, teaching direction can be effectively guided to ensure that teaching activities achieve the expected results.

Secondly, the design of teaching content is crucial. In the field of electronic information, teachers can combine traditional professional course content with innovative and entrepreneurial concepts to design teaching content that includes both professional knowledge and practical application. By introducing innovative and entrepreneurial cases and project practices, we can stimulate students' innovation awareness and entrepreneurial potential, thereby stimulating their learning interest and motivation.

Finally, the key to implementing the integrated teaching method of specialization and creativity lies in practical implementation. By setting up teaching activities guided by innovation and entrepreneurship projects, students can practice and apply the knowledge and skills they have learned in practical problems, cultivate their problem-solving ability and innovative thinking. This practical teaching method can better stimulate students' learning enthusiasm, improve their innovation and entrepreneurship abilities, and lay a solid foundation for their future career development.

## 6. Summary

This article explores and analyzes the teaching method of integrating innovation with engineering practice courses in the integration of entrepreneurship and entrepreneurship education. It is found that this teaching method plays a positive role in promoting students' innovative thinking, practical ability cultivation, and the organic combination of engineering practice courses and entrepreneurship education. However, it should also be recognized that there are still some challenges and shortcomings in the practical application of this method. Therefore, further in-depth research is needed in the future to improve the integration of specialized and creative teaching methods, in order to better adapt to the needs of different learning environments and student groups, and provide more possibilities and choices for education and teaching.

## References

- [1] Chen Kejian and Fang Liang, Analysis of the Talent Training Model for Mechanical Engineering Majors in Independent Colleges under the New Situation of "Double Innovation" Education - Taking Jiageng College of Xiamen University as an Example Research and Practice on Innovation and Entrepreneurship Theory, 2020 3 (01): Pages 97-99
- [2] Sheng Zhenwen, "Five educations simultaneously" to build an innovation and entrepreneurship education system China Higher Education, 2022 (06): Pages 59-61
- [3] Ge Suxia et al., Research on the Cultivation Model of College Students' Innovation and Entrepreneurship Abilities Based on the Theory of Gender Equality Modern Commerce and Industry, 2023 44 (18): Pages 136-137
- [4] Shen Zhenghua, Jin Jinsuo, and Zheng Zexiang, Reform of Specialized and Creative Integration Teaching Model Based on CDIO-EF - Taking the Course of Automatic Detection Technology as an Example Journal of Wenzhou Vocational and Technical College, 2022 22 (03): Pages 49-53
- [5] Li Yongliang, Du Yanbin, and Xia Hongjun, Exploring the Implementation Path of Innovative Engineering Training in the Context of New Engineering Technology and Innovation, 2022 (10): Pages 99-102
- [6] Chen Gui et al., The Reform Path of Innovation and Entrepreneurship Education in Universities under the Background of New Engineering China Education Technology Equipment, 2023
- [7] Wang Ruijin et al., Practice of Innovation and Entrepreneurship Education in Universities under the Background of New Engineering Computer Education, 2023 (04): Pages 146-151