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Original Paper

The Implementation Plan and Reform Path for Integrating Innovation and Entrepreneurship Education into Professional Education—Take the Engine Principles Course for Example

Xiaodan Lin[1] & Bin Zhang[1*]

[1] College of Mechanical and Electrical Engineering, Tarim University, Aral, China

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Abstract

In recent years, in the context of "Innovation and entrepreneurship", colleges and universities have been actively fostering versatile talents with a strong foundation in professional skills, innovative thinking, and entrepreneurial abilities. This has posed new Innovation and entrepreneurship challenges to the professional education of vehicle engineering. Taking the teaching of "Automobile Engine Principles" as an example, this paper integrates innovation and entrepreneurship education into professional education by reforming the teaching practice plan for the course on engine principles. It optimizes the course content, enhances the course evaluation system, cultivates students' potential for innovation and entrepreneurship, improves their abilities in these areas, and achieves the educational goal of comprehensive cultivation of knowledge, skills, and qualities.

Keywords

innovation education, professional education, teaching implementation

1. Introduction

Currently, the class hours of the "Automobile Engine Principle" course have been significantly reduced, and the teaching process lacks innovative design, thereby impeding the cultivation of students' innovative thinking and entrepreneurial abilities. The teaching method is relatively simplistic, with limited practical applications that fail to establish a strong connection between theory and practice. This not only hinders students' comprehension and application of knowledge but also fails to foster their practical skills. Moreover, the assessment methods are overly simplistic and lack an innovative evaluation mechanism, which fails to stimulate students' enthusiasm for learning or reflect the essence of applied learning. Consequently, this approach does not contribute effectively towards cultivating

students' comprehensive qualities.

2. Implementation Plan for Integrating Innovation and Entrepreneurship Education into Professional Education

In response to the pain points encountered during the teaching process of the engine principles course, the teaching team carried out a series of innovative educational reforms. We strengthened the training of students' innovative thinking, cultivated their potential for innovation and entrepreneurship, and enhanced their abilities in innovation and entrepreneurship. This approach aims to achieve the educational goal of comprehensive cultivation of "knowledge, ability, and quality". By using the "Automotive Engine Principles" course as a medium for imparting professional skills and innovative entrepreneurship skills, the course integrates professional content with innovative entrepreneurial thinking effectively. This integration realizes the bidirectional mutual promotion of professional skills and innovative entrepreneurial abilities,As shown in the Figure 1.

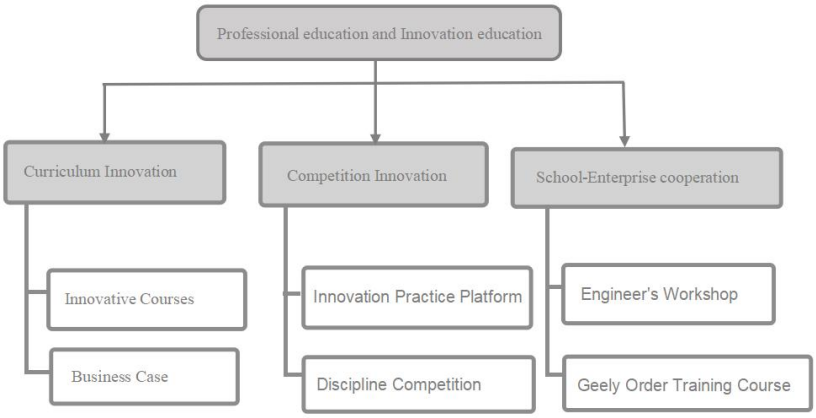

Figure 1. Fusion Scheme of Professional Education and Innovation Education

2.1 Integration of Professional Courses and Innovation

Based on the concept of innovation and entrepreneurship education, optimize the teaching content, attach importance to the teaching and learning of innovation and entrepreneurship knowledge in the course teaching process, strengthen the training of application ability, promote the effective integration of curriculum professional knowledge and innovation and entrepreneurship knowledge, and improve the awareness and spirit of innovation and entrepreneurship of teachers and students. In the course of teaching, various forms of innovation and entrepreneurship education are carried out, focusing on cultivating students' innovation and entrepreneurship ability, changing students' employment concept, developing students' entrepreneurial potential, and enabling students to have basic career judgment ability.

2.2 Integration of Discipline Competition and Innovation

Carry out the second class, stimulate students' innovative design ideas, provide students with

equipment and materials to practice innovative design, teachers are responsible for the whole process of guidance, and gradually establish students' science and innovation team, make up for students' lack of personal ability and difficulty in solving complex professional problems. Team inquiry learning helps students apply what they have learned and combines theory with practice. By participating in Internet +, College students' Innovation and Entrepreneurship Competition, Challenge Cup and other competitions, Improved students' practical ability and independent thinking and problem-solving ability, which greatly mobilize students' subjective initiative and improve their enthusiasm for learning.

2.3 Multi-Field Collaborative Education

implement collaborative education of industry, enterprise and profession, carry out activities such as famous teachers entering classes and master studios, invite famous teachers and enterprise experts to share learning and entrepreneurial experience, and explain the professional knowledge and skills required for talents in advanced technology of vehicle industry. At the same time, we should help students to discover entrepreneurial projects and implement entrepreneurial plans, and also have the ability to stimulate students' enthusiasm for participation and integrate resources to guide projects. BYD and Geely Auto company cooperates with universities to cultivate high-quality students

3. Engine Principle Course Teaching Reform and Path

3.1 Optimize Course Teaching Content and Increase Practical Teaching

In the design of the syllabus of "Engine Principle" course, it is necessary to clarify the teaching content of cultivating innovative consciousness and innovative ability, organically integrate innovative and entrepreneurial thinking and innovative and entrepreneurial ability training into the major teaching of automobile engine principle, so that students can master the professional knowledge of automobile engine principle and complete the construction of innovative and entrepreneurial knowledge.

Increase the class hours of experimental teaching of "Engine Principle" course, adopt the method of combining on-site experimental teaching and virtual simulation experimental platform experimental teaching, effectively strengthen students' hands-on ability, problem analysis and problem solving ability, and help students master entrepreneurial skills. It enables students to independently write innovation and entrepreneurship plans, participate in the application of school-level or provincial innovation and entrepreneurship training projects and participate in innovation and entrepreneurship competitions.

3.2 Promote the Application of Information Teaching Methods

Due to the strong practicality of the course "Engine Principle", the mixed teaching mode of online and offline is implemented in the course teaching activities. Teaching methods such as analysis, heuristic, discussion, flip and question answering are adopted offline. Online teacher-student interaction, inquiry, online learning, independent learning, group project and other methods, through the optimization and reform of teaching mode and teaching method, not only make up for the lack of curriculum theory, but also improve the enthusiasm of students to learn, students become the main body of teaching, the passive indoctrination teaching mode into active learning teaching mode. It enables students to

transform from knowledge receivers to active participants and learners, and constantly cultivates students' strong comprehensive professional ability and innovative and entrepreneurial level.

3.3 Diversified Examination and Evaluation Standards

On the basis of professional evaluation and assessment combined with the assessment of innovation and entrepreneurship ability, it is more in line with the characteristics of vehicle engineering teaching under the environment of innovation and entrepreneurship in the new era. The evaluation and assessment of the course "Engine Principles" should pay attention to both the assessment of basic professional knowledge and the application of professional ability, and increase the assessment and assessment of the process so that students can pay more attention to the whole process of learning. Therefore, the evaluation and assessment of the course should be combined with the comprehensive assessment of basic professional knowledge, application ability of professional skills and final assessment, so as to strengthen the training of students' innovative and entrepreneurial thinking. Therefore, the ability of innovation and entrepreneurship is regarded as an important part of curriculum evaluation. As shown in the Figure 2.

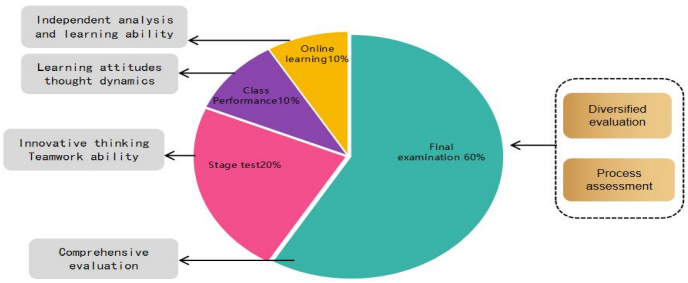

Figure 2. Diversified Assessment Mode

4. Conclusion

The integration of innovation and entrepreneurship education into professional education has caused changes in students' cognitive mode, learning mode, teachers' teaching mode, teaching strategy and role. After several rounds of teaching practice, the teaching quality has been greatly improved, students' learning effect has been well reflected, and students' learning enthusiasm for "Engine Principle" course has increased. Actively participated in the Internet +, college students innovation and entrepreneurship and Challenge Cup and other discipline competitions, and achieved ideal results, to achieve the goal of "knowledge, ability, quality" comprehensive training. It greatly improves students' innovative practice ability, stimulates students' subjective initiative, and forms a good learning atmosphere.

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