

Research on the "2+1" Talent Training Model in Higher Vocational Railway Colleges under the "Four Platforms and One Meeting" Linkage Mechanism

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Abstract: This study aims to explore the construction and implementation of the "2+1" talent training model in higher vocational railway colleges under the "Four Platforms and One Meeting" linkage mechanism. Through theories of school-enterprise cooperation, Internet+ education, and talent training models, the study analyzes the construction methods of school-enterprise teaching platforms, online resource platforms, enterprise practice platforms, and school-enterprise joint "2+1" teaching feedback platforms. The research finds that the "Four Platforms and One Meeting" linkage mechanism can effectively integrate school and enterprise resources, leverage the advantages of Internet+, improve the quality of talent training, and provide innovative pathways for the reform of higher vocational education.

Keywords: Four Platforms and One Meeting; School-Enterprise Cooperation; 2+1 Talent Training Model; Higher Vocational Railway Colleges; Educational Reform; Internet+

Introduction

Currently, higher vocational education faces the demands and challenges of rapid development, making the cultivation of high-quality technical and skilled talents a crucial task for vocational colleges. School-enterprise cooperation, as an effective educational model, can facilitate the seamless connection between educational resources and industrial needs, thereby improving the quality of talent training. With the rapid advancement of Internet technology, the application of the Internet+ education model in higher vocational education is gradually becoming widespread, bringing new opportunities and challenges to traditional teaching models.

1 Theoretical Basis

1.1 School-Enterprise Cooperation Theory

School-enterprise cooperation is an educational model that combines higher education with industrial practice through close collaboration between schools and enterprises, jointly cultivating high-quality talents that meet market demands. The core of school-enterprise cooperation theory is to achieve an organic combination of education and productive labor to develop students' practical abilities and professional qualities. Its main components include:

1.1.1 Collaborative Education

Schools and enterprises jointly participate in the educational process, leveraging their respective advantages and resources to optimize the allocation of educational resources. Schools provide systematic theoretical education and foundational knowledge, while enterprises offer practical platforms and real work environments to help students apply theoretical knowledge in practice.

1.1.2 Resource Sharing

In the school-enterprise cooperation model, schools and enterprises share educational and practical resources, promoting collaboration in teaching facilities, faculty, research projects, and more. Through resource sharing, the quality of teaching and students' practical abilities are enhanced, facilitating the transformation and application of scientific achievements.

1.1.3 Mutual Benefit

School-enterprise cooperation achieves mutual benefits for both schools and enterprises. Schools gain more practical resources and employment opportunities through cooperation with enterprises, thereby improving educational quality and employment rates. Enterprises, on the other hand, benefit from participating in talent training by acquiring high-quality talents that meet their needs, enhancing their competitiveness.

1.1.4 Continuous Innovation

School-enterprise cooperation requires continuous innovation in cooperation models and mechanisms to adapt to market and technological changes. For example, establishing joint school-enterprise laboratories, cooperative research projects, and shared practice bases can promote the deep integration of education and industry, fostering innovative talents.

1.2 Internet+ Education

Internet+ education refers to the deep integration of Internet technology with education, driving innovation and transformation in educational models. Its main components include:

1.2.1 Online Education Platforms

Online education platforms provide rich digital teaching resources and learning tools, breaking the limitations of time and space, and realizing the sharing and popularization of educational resources. For example, MOOC (Massive Open Online Courses) platforms offer high-quality course resources to students worldwide, enhancing the accessibility and fairness of education.

1.2.2 Blended Learning

In the Internet+ education model, blended learning has become an important teaching format. Blended learning combines online learning with face-to-face instruction, using online courses, virtual experiments, and e-textbooks to enhance teaching effectiveness and student learning experiences.

1.2.3 Big Data and Artificial Intelligence

Big data and artificial intelligence technologies enable personalized learning and intelligent teaching management. Big data analysis helps teachers understand students' learning conditions and behavior patterns to develop personalized teaching plans. Artificial intelligence technologies provide intelligent tutoring, automated grading, and academic prediction services, improving teaching efficiency and quality.

1.2.4 Integration of Educational Resources

Internet+ education promotes the integration and sharing of educational resources, realizing the widespread dissemination and application of high-quality educational resources. By building open educational resource platforms, it fosters cooperation and exchange among schools and between schools and enterprises, driving innovation and development in education and teaching.

1.3 Talent Training Model

A talent training model is a systematic and scientific talent cultivation plan and implementation path formulated under certain educational concepts and goals. Its main components include:

1.3.1 Goal-Oriented

The talent training model is market and society-oriented, clearly defining talent training goals. For example, the goal of higher vocational education is to cultivate application-oriented talents with solid theoretical knowledge and proficient practical skills to meet the actual needs of industries and enterprises.

1.3.2 Curriculum System

A scientifically reasonable curriculum system is the core of the talent training model. The design of the curriculum system needs to comprehensively consider the proportion of theoretical and practical courses, emphasize interdisciplinary integration, and develop students' comprehensive qualities and innovative abilities.^[1]

1.3.3 Teaching Methods

Diverse teaching methods are crucial for achieving talent training goals. For example, using case-based teaching, project-based teaching, and situational teaching methods can enhance students' interest and initiative in learning, improving teaching effectiveness. Through simulated experiments, practical courses, and enterprise internships, students' practical skills and professional qualities are enhanced.

2 Construction of the "Four Platforms and One Meeting" Linkage Mechanism

2.1 School-Enterprise Teaching Platform

The school-enterprise teaching platform is the core of the "Four Platforms and One Meeting" linkage mechanism. By integrating the teaching resources of schools and enterprises, it establishes a platform for joint participation in talent cultivation, enhancing teaching quality and student practical abilities. The main contents include:

2.1.1 Joint Curriculum Development

Schools and enterprises jointly develop and design curricula to ensure that the teaching content closely aligns with actual production needs. For example, industry experts can participate in formulating course outlines, providing the latest industry trends and technological advancements, making the curriculum more relevant to practical applications.

2.1.2 Shared Faculty

College instructors and enterprise engineers jointly undertake teaching tasks, leveraging their respective professional strengths. Enterprise engineers can regularly give specialized lectures and practical guidance at colleges, while college instructors can conduct practical research in enterprises, enhancing their practical skills and teaching levels.

2.1.3 Shared Teaching Facilities

Schools and enterprises jointly build and share laboratories, training bases, and other teaching facilities, providing students with more practical opportunities. For instance, colleges can utilize enterprise production equipment and technical resources for training, while enterprises can use college research equipment and technical expertise for collaborative R&D.

2.1.4 Joint Teaching Management

Schools and enterprises establish a joint teaching management mechanism, collaboratively formulating teaching plans and assessment standards to ensure the normativity and scientific nature of the teaching process. For example, regular teaching seminars and coordination meetings can be held to discuss and resolve issues and challenges encountered in teaching.

2.2 Online Resource Platform

The online resource platform integrates digital teaching resources and online learning tools, providing a convenient and efficient learning environment, promoting the application and development of the "Internet+" education model. The main contents include:

2.2.1 Digital Teaching Resources

Construct a comprehensive digital teaching resource library, including e-textbooks, instructional videos, and online courses, providing students with rich learning materials. For example, by introducing high-quality online courses and teaching resources from home and abroad, the diversity and quality of teaching content can be enhanced.

2.2.2 Online Learning Platform

Build a fully functional online learning platform that supports various learning activities such as course learning, online discussions, and assignment submissions. For instance, using MOOC platforms and self-built online learning systems, convenient online learning channels can be provided, facilitating student self-study and interactive exchanges.^[2]

2.2.3 Virtual Experiments and Simulation Training

Develop and apply virtual experiment and simulation training systems, offering students more practical opportunities. For example, through virtual laboratories and simulation training systems, students can conduct experimental operations and skill training in a virtual environment, enhancing their practical abilities and operational skills.

2.2.4 Learning Data Analysis

Utilize big data and artificial intelligence technologies to analyze and mine student learning data, providing support for teaching improvement and personalized learning. For example, by analyzing student learning behavior and performance data, teaching problems can be timely identified and addressed, optimizing teaching plans and strategies.

2.3 Enterprise Practice Platform

The enterprise practice platform is a critical link for students to apply theoretical knowledge to actual work through school-enterprise cooperation, providing a real enterprise practice environment, enhancing their professional qualities and employment competitiveness. The main contents include:

2.3.1 Internship Base Construction

Schools and enterprises jointly establish stable internship bases, ensuring students can regularly engage in enterprise practice. For instance, selecting a batch of capable and willing enterprises to sign long-term cooperation agreements and establish school-enterprise cooperative internship bases to provide stable practice venues for students.

2.3.2 Practice Project Design

Design diverse practice projects based on enterprise needs and student training goals to ensure students learn useful skills through practice. For example, enterprises can arrange specific work tasks and projects for students based on actual production and project requirements, improving their practical skills and teamwork abilities.

2.3.3 Implementation of Mentorship

Implement a mentorship system in enterprise practice, where enterprise engineers and college instructors jointly guide student practice activities. For example, enterprise mentors provide daily work guidance and skills training, while college mentors oversee the application of theoretical knowledge and academic support, ensuring comprehensive guidance and assistance for students in practice.^[3]

2.3.4 Evaluation of Practice Outcomes

Establish a scientific evaluation system for practice outcomes, comprehensively assessing students' practical abilities and performance. For instance, enterprise mentors and college mentors jointly formulate assessment standards and evaluate students through practice reports, skill tests, and work performance, ensuring comprehensive and fair evaluations.

2.4 School-Enterprise Joint "2+1" Teaching Effect Feedback Platform

The school-enterprise joint "2+1" teaching effect feedback platform constructs a comprehensive feedback mechanism to timely understand and improve teaching effectiveness, ensuring continuous improvement in talent cultivation quality. The main contents include:

2.4.1 Collection of Feedback Data

Utilize information technology to collect feedback data from students, teachers, and enterprises, forming a comprehensive evaluation system of teaching effectiveness. For example, through questionnaires, online evaluation systems, and interviews, feedback on teaching content, methods, and practical effects can be collected.

2.4.2 Analysis of Feedback Data

Systematically analyze the collected feedback data to identify problems and deficiencies in teaching, providing a basis for improvement. For example, using big data analysis techniques, large amounts of feedback data can be organized and analyzed to identify common issues and key factors, proposing targeted improvement suggestions.

2.4.3 Application of Feedback Results

Apply feedback results to teaching improvement and curriculum optimization to ensure continuous improvement in teaching quality. For instance, based on feedback results, adjust course content and teaching methods, optimize training projects and practice arrangements, and enhance teaching effectiveness and student satisfaction.

2.4.4 Continuous Improvement Mechanism

Establish a continuous improvement mechanism, regularly conducting teaching effect feedback and improvement to ensure steady improvement in teaching quality. For example, regularly hold teaching effect feedback meetings and teaching improvement seminars to discuss and summarize feedback results, formulate and implement improvement measures, promoting continuous enhancement in teaching quality.

3 "2+1" Talent Training Model under the "Four Platforms and One Meeting" Linkage Mechanism

3.1 Model Design

The "2+1" talent training model under the "Four Platforms and One Meeting" linkage mechanism aims to cultivate high-skilled talents that meet modern industrial needs through school-enterprise cooperation, integration of network resources, and practical teaching. The main aspects of the model design include:

3.1.1 Two Years of Theoretical Study

In the first two years, students complete foundational theoretical courses and professional knowledge learning on campus, solidifying their theoretical foundation. This phase emphasizes systematic theoretical education, covering basic subjects, core professional courses, and relevant electives to ensure students master the necessary theoretical knowledge and technical principles. ^[4]

3.1.2 One Year of Enterprise Practice

In the third year, students undergo practical training in enterprises, enhancing their practical skills and professional qualities through real work environments and projects. This phase focuses on applying theoretical knowledge to practice, with students participating in enterprise production and projects under the guidance of both enterprise and college mentors, gaining practical experience and improving their employability.

3.1.3 Collaborative Training by Schools and Enterprises

Throughout the training process, schools and enterprises collaboratively participate in designing courses and practical projects to ensure that talent cultivation goals are closely aligned with enterprise needs. By jointly formulating training plans and constructing practical teaching systems, students receive comprehensive guidance and support during their learning and practice phases.

3.2 Teaching Content and Methods

In the "2+1" talent training model under the "Four Platforms and One Meeting" linkage mechanism, the teaching content and methods emphasize the combination of theory and practice, innovative teaching methods, and improved teaching effectiveness.

3.2.1 Theoretical Teaching Content

Foundational Theoretical Courses: Include basic subjects such as mathematics, physics, and chemistry to lay a solid foundation for professional learning.

Core Professional Courses: Cover subjects like railway technology, engineering management, and signal control to ensure students master professional knowledge and skills.

Elective Courses: Offer a variety of electives such as information technology and management to broaden students' knowledge and skillsets.

3.2.2 Practical Teaching Content

Training Courses: Conducted in on-campus training bases, focusing on simulated operations and experimental training to enhance students' hands-on abilities and operational skills.

Enterprise Practice Projects: Students participate in enterprise production and projects, gaining practical experience and enhancing their professional qualities through real-world operations and project management.

3.2.3 Teaching Methods

Case-Based Teaching: Using real-world case analyses to enhance students' understanding and application of theoretical knowledge. For example, analyzing actual railway engineering projects in engineering management courses to discuss problem-solving strategies.^[5]

Project-Based Teaching: Integrating course content with actual projects, where students complete projects under teacher guidance to improve practical abilities and teamwork. For instance, in signal control courses, students design and implement signal control systems.

Blended Learning: Combining online and face-to-face instruction, utilizing online resource platforms to provide rich learning resources and interactive tools to enhance learning outcomes. For example, students watch instructional videos on online learning platforms, complete online quizzes, and engage in discussions.

3.3 Implementation Steps

The implementation steps of the "2+1" talent training model under the "Four Platforms and One Meeting" linkage mechanism include several stages:

3.3.1 Preparation Stage

Market Research and Enterprise Needs Analysis: Conduct comprehensive market research to understand current industry requirements for technical and skilled talents, determine talent training goals, and set up curriculum. Research includes skill requirements of graduates, changes in the job market, and new technology developments.

Signing Detailed Cooperation Agreements with Enterprises: Clearly define responsibilities and obligations in the talent training process to ensure long-term stable cooperation. Agreements cover specific cooperation methods, contributions and responsibilities of each party, arrangements for student practice, and guarantee measures.

Integrating Teaching Resources: Assess existing resources, determine what needs to be added or optimized, and ensure effective allocation and utilization of resources. This includes building school-enterprise teaching platforms, online resource platforms, enterprise practice platforms, and school-enterprise joint "2+1" teaching feedback platforms. [6]

3.3.2 Implementation Stage

Theoretical Teaching Implementation: Conduct foundational theoretical and core professional courses according to the teaching plan, using diverse teaching methods to enhance teaching effectiveness. Emphasis is on systematic and scientific teaching, incorporating case-based, project-based, and situational teaching methods to apply theoretical knowledge to real problems.

Practical Teaching Implementation: Conduct simulated operations and experimental training in on-campus training bases to enhance students' hands-on abilities and operational skills. Arrange for students to participate in enterprise practice projects, ensuring the systematization and scientific nature of practical teaching. Practical teaching focuses on operations and management in real environments, such as working on enterprise production lines to understand production processes and management methods.

Teaching Effect Feedback Stage: Use the school-enterprise joint "2+1" teaching feedback platform to collect and analyze feedback data, promptly adjusting and optimizing teaching plans. Feedback includes student learning status, practice performance, and evaluations from enterprises and teachers.

3.3.3 Evaluation Stage

Evaluating Teaching Effectiveness: Use a diversified evaluation system to comprehensively assess students' learning outcomes and practical abilities. Evaluation standards include knowledge mastery, operational skills, problem-solving ability, and teamwork capability to ensure comprehensive and

objective evaluations.

Evaluating Enterprise Satisfaction: Through surveys and interviews, understand enterprise evaluations of student practice performance and professional qualities to ensure that talent training quality meets enterprise needs.

Summarizing and Reflecting on Evaluation Results: Based on evaluation results, summarize and reflect to formulate improvement measures, continuously optimizing the talent training model and teaching methods to enhance training quality. Regularly hold teaching improvement seminars to discuss evaluation results and improvement measures, ensuring continuous optimization and enhancement of the talent training model.

Conclusion

This study explores the "2+1" talent training model under the "Four Platforms and One Meeting" linkage mechanism in higher vocational railway colleges. The findings indicate that implementing this mechanism significantly improves students' professional skills and employability, as well as enterprise satisfaction. Future research should further explore the application of this mechanism in different specialties and colleges to disseminate successful experiences; study the application of more Internet+ technologies in vocational education to enhance teaching effectiveness and student experience; and explore long-term school-enterprise cooperation mechanisms to ensure sustained interaction and mutual development between schools and enterprises.

Fund project

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