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The Research and Practice of Talents Training Mode of Forest Engineering Major based on Industry-University-Research Cooperation

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Abstract: Along with the adjustment of industrial structure and the transformation and upgrading of development mode, the demand for complex innovative talents is increasingly strong. Taking Forest engineering major of Northeast Forestry University as an example, this paper introduces the reform mode of talent training program under collaborative education and its beneficial effects, and points out the existing problems in current industry-university-research.

Keywords: Talents training mode, Forest Engineering, Industry-University-Research Cooperation.

1. Introduction

Under the background of new engineering, school-local cooperation, integration of industry and education, and multi-party organization and education of industry, university and research have gradually become an institutional arrangement for higher education reform and human resources development. [1-2]Since 2014, the Department of Higher Education of the Ministry of Education has organized well-known enterprises at home and abroad to carry out industry-university cooperative education projects with colleges and universities, and encouraged enterprises to sponsor colleges and universities to carry out comprehensive professional reform and curriculum reform by independently initiating projects and providing special funds, so as to promote the reform of personnel training mode and promote industry-university cooperative education.[3-5] We will focus on cultivating application-oriented, versatile and innovative talents to meet the needs of industrial development.[6-7]

Forest engineering is a comprehensive application specialty for the purpose of the construction, protection, development and utilization of forest resources, and plays a very important role in the construction and economic development of Chinese forestry ecology engineering. In 2014, it was awarded the National Outstanding Agriculture and Forestry Personnel Training Program, and in 2021, it was awarded the national first-class major.

Under the background of "new engineering", adopt the way of university-enterprise cooperation and collaborative education interactive integration, practice in colleges and universities, enterprises and market coordination mechanism, the collaborative education of production, study and mechanism in teaching, practice, production and innovation in the process throughout, change the traditional forest engineering personnel training mode, to adapt to the new engineering of forest engineering personnel training requirements, It is of great significance to enhance the social competitiveness of forest engineering students to serve national modernized forestry, base on local economy and promote the development of ecological forestry.

2. Exploration on Education of Industry-University-Research Cooperation in Forest Engineering Specialty of Northeast Forestry University

According to the requirements of "new engineering", the surrounding forest engineering "should meet any requirements of talents training" and "in order to achieve the training goal should be to cultivate" two basic problems, to society and the demand as the guidance, the talent training quality as the core, to establish "the students for this, to adapt to the demand for" the direction of personnel training, Establish a professional personnel training system featuring school-enterprise integration, mutual teaching and research, and collaborative education. Reform should be carried out in the aspects of personnel training system, teaching method, teaching model, and talent evaluation system, and the professional training mode featuring in-depth cooperation between schools and enterprises should be implemented to cultivate professional personnel who meet the needs of modern forestry development.

2.1. Docking of Industry-University-Research Cooperation to Optimize Talent Training Objectives

According to the enterprise's demand for talents, it will be integrated into the training objectives, through the establishment of the bridge between social demand and forest engineering talents, the talent needs of employers will be tracked. According to the demand of the new engineering construction, composite innovative talents cultivation orientation, to establish "the students for this, to adapt to the demand for" the direction of personnel training, to reposition the talents training goal of forest engineering, further implement the "curriculum docking professional, professional industry docking" requirements, optimization of forest engineering talents training target.

2.2. Combining Industry-University-Research to Build a Composite Innovative Talent Training Model for Forest Engineering

Starting from the industry enterprises the ability demand for talent, build a multi-level and systematic curriculum system, realize the general courses, basic courses, professional course, personalized course in entrepreneurship and innovation "five one", do modular integration of teaching process, curriculum design, curriculum content more comprehensive, innovative activity curriculum, according to the relations of knowledge system, Spread the curriculum across the university learning process. Through course learning and practical ability cultivation, the talent cultivation goal of forest engineering can be realized step by step.

The analysis of the actual demand of enterprise, establish the platform contains the basic teaching, basic experiment teaching platform, professional innovation and engineering training platform, innovation and entrepreneurship training platform for practice teaching platform, the implementation of "basic experiment course assignments - comprehensive curriculum design - university-enterprise joint training - professional practice and graduation design" the practice of training process, Construct a hierarchical and progressive practical teaching system, and form a perfect training mode for composite innovative talents of forest engineering major.

2.3. Interaction Industry-University-Research to Reform of Forest Engineering Teaching Model

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2.4. Communication Industry-University-Research to Improve the Talent Evaluation Mechanism of Forest Engineering Professionals

Continuous improvement of teaching philosophy, through the process of training objectives, graduation requirements, curriculum system, teachers, support conditions and so on, the principle of "results-oriented, student-centered", comprehensively promote professional construction and teaching reform, improve the quality of talent training. Realize the production, exchange, in order to enterprise demand for graduates as the main evaluation index, set up and optimized to enhance the innovative ability as the goal of multidimensional evaluation mechanism, the introduction of multiple evaluation methods, the comprehensive examination of students' knowledge, ability and quality, optimize the training goal, improve the curriculum system, strengthen the teaching staff and other support conditions, Form a closed-loop operation mode of talent training, and realize the whole process of talent training, all-round scientific and reasonable evaluation.

3. Effect of Talent Training

Relying on the "double first-class" platform, the Forest engineering major actively explores the training mode of innovative and entrepreneurial talents serving modern forestry and local economy, adheres to the combination of teaching and practice, strengthens the cooperation between the university and enterprise, and has achieved certain results in the training of innovative and entrepreneurial talents.

(1) Students' comprehensive quality, professional skills and social service ability have been significantly improved. In the past three years, he has completed more than 30 innovation and entrepreneurship training projects for college students at all levels, published 31 papers and authorized 35 patents. The postgraduate entrance examination rate is about 33%, and the average employment rate of the first time is 92.13%. Employers are more satisfied with the performance of graduates in all aspects, and gave consistent praise.

(2) There are 17 teachers of Forest engineering major, all of whom have doctorate degrees, and 81% of whom have senior titles. All teachers under 45 years old have more than one year's study experience in top 200 universities in the world, and more than 50% of the teachers have work experience in enterprises or research institutes. In the past three years, one forest engineering teacher has been awarded the provincial advanced individual in teacher ethics, one of the top Ten teachers, two of the first prize in teaching quality, one of the second prize, and one of the advanced individual in teaching and educating.

(3) Since 2019, the Forest engineering major has participated in the competition, and the students have won more than 60 awards. The student-designed park lawn intelligent lawn mower and environment-friendly multifunctional material collector won the gold and silver awards of Heilongjiang Province "Challenge Cup" college Student Entrepreneurship Competition respectively. By participating in college students' innovation projects and design competitions, students' practical innovation ability has been improved, and the purpose of "promoting learning by competition, promoting application by competition, enhancing skills and improving innovation ability" has been achieved.

4. Conclusions

In this paper, from the perspective of collaborative education, the reform and exploration of the training program of forest engineering talents in Northeast Forestry University are carried out, aiming at optimizing the training mode of forest engineering talents and cultivating and exporting new engineering talents with engineering practice and innovation ability for the country. Through continuous exploration, the talent training mode of production-education integration and collaborative education has been increasingly effective, and students' ability to analyze and solve problems has been greatly improved.

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