

Exploration on the Construction of Production and Education Integration Platform of Automobile Intelligent Manufacturing and Technical Service Innovation Demonstration Base: Take Sichuan Technology & Business College for Example

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Abstract: *Made in China 2025 puts forward new requirements for talents, and "new technology" and "new industry" will also give birth to "new specialty", "new specification" and "new mode" of education development. According to the market survey and industry background analysis report of the new energy vehicle technology specialty, the development of the automotive specialty of Sichuan Polytechnic for Industry and commerce is positioned to serve the automotive intelligent manufacturing and technical service industry. The college's new energy vehicle technology specialty is to build a characteristic specialty with a curriculum structure system characterized by "credit system, menu style, modularization and openness", build an automobile intelligent manufacturing and technical service innovation demonstration base, build an industry education integration platform, and explore a new mode of professional talent training.*

Keywords: *Innovative Intelligent Teaching, Curriculum System, Industry-Education Platform Integration*

1. Introduction

1.1 Build a solid green technology service platform

The college establishes an automobile industry Education Alliance or an industry education integration community to jointly promote the development of Automobile Specialty in higher vocational colleges. According to the goal of specialty construction, the college has built a demonstration base for teaching automotive intelligent manufacturing and technical service innovation. The combination of teaching and industry through the base is conducive to improving the teaching, scientific research and social service ability of the automobile professional teachers; It is conducive to improving the professional comprehensive ability of students majoring in automobile. The college aims to promote the development of automotive specialty in higher vocational colleges, build the teaching paradigm of automotive specialty in business school, build a service platform for the specialty, and help realize the goal of modern apprenticeship construction of enrolment and employment of automotive specialty.

1.2 Cross disciplinary collaboration to boost the development of green light industry

The incubation park provides an innovation and entrepreneurship platform for students, graduates of the school, and high-quality enterprises outside the school. Students start businesses with themselves as the main body, guided by professional teachers as mentors. Each project is equipped with multiple mentors as needed for guidance. The incubation project team consists of professional teachers and students. Through incubation parks, students can also start their own businesses outside of school. The incubation park aims to cultivate entrepreneurial abilities and talents. All projects in the incubation park can be combined with automotive professional teaching, and new technologies and projects can be introduced into the incubation park according to industry development.

1.3 Construction of "green mass entrepreneurship and innovation" base and team innovation practice platform

Relying on the base platform, the teacher team actively implements the integration of science and education, transforms scientific research projects into teaching projects with practical significance, and provides students with more practical teaching content. By incubating new technologies and projects, the teacher team not only improved their scientific research ability, but also provided students with valuable opportunities for "green mass entrepreneurship and innovation" innovation practice.^[2] This not only helps to cultivate students' innovative consciousness and practical ability, but also paves a solid path for their future career development. In order to better support teachers' teaching and research work, the college has also built a research and teaching service team composed of professional teachers and students.^[1] This team actively participates in Teachers' teaching, scientific research and social service work, and has become an important assistant for teachers and a powerful partner for students' practice. Their existence has injected new vitality into the teaching and scientific research work of the college and promoted the continuous improvement of the overall level of the college.

2. Construction Content

2.1 Multi input to jointly build a "base platform"

Based on platform construction, with professional development as the core, cross disciplinary integration as the focus, and driven by new energy vehicle technology and intelligent vehicle technology, the college has invested in multiple aspects to jointly create a "base platform" and improve the quality of talent cultivation and social service capabilities. Schools and enterprises jointly participate in the establishment of an automotive professional entrepreneurship incubation park, a new energy vehicle technology research and development and talent training center, an automotive green environmental protection technology application research and talent training center, an automotive electronic product testing center, and an automotive parts intelligent manufacturing technology center, forming a "one park, four centers" platform. The college will establish a cooperation framework, introduce funds, technology, and talents, and build a base platform. This platform breaks through the boundaries of schools, deepens the integration of industry and education, and achieves projects with sources, research and development teams, production bases, and transformation channels.

2.2 Realize the Department and department interdisciplinary integration system

The college is committed to achieving cross disciplinary integration, using horizontal integration as a means, and focusing on building a professional group with "new energy vehicle technology" as the core. The professional group includes majors such as "Intelligent Network Automotive Technology", "Automotive Services and Marketing", "Electronic Information Technology", "Mechatronics Integration", and "Artificial Intelligence Technology". The college closely integrates the construction of automotive majors with industrial development, achieving complementary integration with other majors, and jointly serving the transformation and upgrading of the automotive industry. This cross disciplinary integration system helps to improve the overall teaching level and talent cultivation quality of the college.

2.3 Multi wheel drive throughout the whole process of specialty construction

The college pays attention to technological application innovation and combines innovation and entrepreneurship, environmental protection and energy conservation with new energy to form a multi wheel drive development trend. This strategy runs through the course construction, project development, product development and other links, aiming to cultivate automotive professionals with comprehensive application ability. Through close cooperation with the industry, the college continues to introduce the latest technological achievements into teaching, so that students can be exposed to the cutting-edge knowledge and skills of the industry. At the same time, the college also actively carries out practical teaching, encourages students to participate in practical projects, and improves their practical ability and problem-solving ability. This training mode based on technology application innovation will help to cultivate more excellent talents who meet the needs of the automotive industry and inject new vitality into the sustainable development of the automotive industry.

3. Construction tasks

3.1 Promote the integration of production and education

3.1.1 Construction of automobile professional entrepreneurship Incubation Park

The incubation park provides an innovation and entrepreneurship platform for students, graduates of the school, and high-quality enterprises outside the school. Students start businesses with themselves as the main body, guided by professional teachers as mentors. Each project is equipped with multiple mentors as needed for guidance. The incubation project team consists of professional teachers and students. Through incubation parks, students can also start their own businesses outside of school. The incubation park aims to cultivate entrepreneurial abilities and talents. All projects in the incubation park can be combined with automotive professional teaching, and new technologies and projects can be introduced into the incubation park according to industry development.

3.1.2 Construction of automobile green environmental protection technology application research and talent training center

School enterprise cooperation to jointly build an Automotive Environmental Protection Technology Center, an Automotive Battery (Solid Waste) Recycling Technology Center, and an Exhaust Gas Treatment Technology Research and Development and Motor Vehicle OBD Diagnosis Center. Schools and enterprises jointly cultivate talents in areas such as automotive maintenance and production environmental protection technology, new energy vehicle solid waste recycling, and traditional automotive exhaust treatment technology, solving the problems of motor vehicle exhaust pollution control and prevention, solving environmental pollution problems in enterprises, and addressing the shortage of green environmental protection technology talents for automobiles.

3.1.3 Construction of new energy vehicle technology research and development and talent training center

The college integrates advantageous cooperative resources and establishes a mutually beneficial automotive new energy vehicle technology research and development and talent training center among manufacturers, universities, and research institutions. The center will provide practical opportunities for faculty and students of the college, as well as technical support and talent development services for enterprises and research institutions. Through industry university research cooperation, the college will better connect with enterprises, understand industry trends and market demands, and improve the quality of talent cultivation. At the same time, it will also promote the transformation and application of scientific research achievements, and promote the innovation and development of new energy vehicle technology. The construction of this center will further promote deep cooperation between the college and enterprises, achieve resource sharing and complementary advantages, and jointly promote the development of the new energy vehicle industry.

3.1.4 Construction of automotive electronics testing center

The college is building an automotive electronic product testing center to provide comprehensive solutions for the testing and measurement of automotive electronic products. The center has environmental testing capabilities, including low-temperature testing and high-temperature testing, to ensure the performance stability of products in different environments. ^[3] In addition, the center also focuses on the testing of intelligent cabins, providing support for the development of intelligent vehicles. At the same time, the center has the ability to conduct vehicle electromagnetic compatibility testing and automotive electronic product testing to meet the testing needs of the automotive industry.

3.1.5 Building an Intelligent Manufacturing Technology Center for Automotive Parts

The college is building an intelligent manufacturing technology center for automotive parts, providing intelligent manufacturing design solutions for automotive parts and vehicle manufacturing enterprises. The center is committed to promoting the informatization of manufacturing processes, providing comprehensive solutions for manufacturing informatization, and improving production efficiency and product quality. ^[4] In addition, the center also focuses on the field of automotive modification technology, providing modification technology and product design solutions.

3.2 Cultivate high-quality talents to meet social needs

The construction of a new pattern of seamless connection between talents and industries in the base

provides talent support for the construction of the automotive industry in the Chengdu Chongqing Economic Circle. By relying on high-quality enterprises in school enterprise cooperation and the "one park, four centers" resource platform on campus, we can achieve seamless connection between industries and talents. The college focuses on cultivating innovative, compound and applied talents to meet the needs of the society, and establishes a modern apprenticeship training teaching mode.^[5] Students can complete the course study, complete credits and issue certificates by choosing the courses provided by the teaching demonstration base. The college builds a curriculum structure system characterized by "credit system, menu style, modularity and openness", with the purpose of improving students' employment competitiveness, enterprise recognition and employment quality. The teaching demonstration base takes the automobile professional entrepreneurship Incubation Park, the new energy automobile technology research and development and talent training center, the automobile green environmental protection technology application research and talent training center, the automobile electronic product testing center, the automobile product (parts) intelligent manufacturing technology center, and the automobile off campus training base platform as the carrier, driven by the entity projects provided by the base platform, and adopts the modern apprenticeship and project-based teaching mode. Taking the production task as the guidance, the curriculum standards of automobile specialty are generated to realize the enrollment of automobile specialty, that is, employment and entrepreneurship.

3.3 Construction of teaching and scientific research innovation team

In order to meet the needs of talent cultivation in the field of new energy vehicles, the college actively promotes a combination of full-time and part-time work, and is committed to building a high-level teaching, research, and innovation team. The college has hired external experts with social recognition and industry influence as professional leaders, and at the same time, the school has also matched teachers with deputy high professional titles or above as professional leaders. This dual professional leader system can fully leverage the advantages of experts both inside and outside the school, and better lead the development of the profession. In addition, the college has also formed a teaching and research innovation team composed of backbone teachers, enterprise experts, and outstanding students. This team will conduct in-depth research and exploration around the core courses and research projects of the new energy vehicle professional group, through continuous innovation and practice. Through a combination of full-time and part-time teaching, the college will further optimize its faculty structure, improve teaching quality and research level.

3.4 Promote project oriented entrepreneurship and innovation education

The college is building an entrepreneurship incubation base based on the linkage of professional laboratories, training rooms, and campus entrepreneurship parks, providing students with a hard environment support for entrepreneurship and entrepreneurship. Through an open and shared public platform, the college establishes channels for students to communicate and interact with the outside world. Enterprises can obtain information on student works and innovative achievements, and students can seek potential investors and technology partners. Teachers participate in guiding student entrepreneurship projects, and the department integrates internal and external resources to promote the transformation of innovative achievements. This measure aims to cultivate students' innovative spirit and entrepreneurial ability, improve the quality and effectiveness of entrepreneurship education, promote cooperation and exchange between colleges and enterprises, and promote the transformation

3.5 Improve the quality of social services

The college integrates off campus expert resources, gives play to the leading role of the teaching and scientific research innovation team, and actively carries out social service projects. Combined with the high-quality resources of enterprises, the college has formed comprehensive advantages in qualification, reputation, brand and other aspects, carried out applied scientific research, and undertook vertical and horizontal projects and major projects of jingxinkou. At the same time, the college also cooperates with enterprise production, carries out social training, and improves the skill level of enterprise employees. In addition, the college also strengthens cooperation with the government, industry associations and enterprises to jointly promote local economic and social development. Through these measures, the college has continuously improved the quality and effect of social services and made positive contributions to local economic and social development.

3.6 Assist the development of Sichuan Chongqing Automobile Industry

With the major of new energy vehicle technology as the core, the college, together with other relevant majors, has built a professional group of new energy vehicle technology with application and R&D capabilities around the key links of the automotive intelligent manufacturing and automotive aftermarket industry chain. The professional group will serve the automotive intelligent manufacturing and automotive aftermarket industries in Sichuan and Chongqing. Through the establishment of an interdisciplinary technical innovation team, it will actively carry out collaborative work in the fields of interdisciplinary education and teaching mode, curriculum construction and enterprise technical services around the application of after-sales service technology and manufacturing technology. In this way, the college aims to cultivate talents with the application and R&D ability of advanced technologies such as new energy vehicle technology, automotive intelligent technology and automotive green environmental protection technology, and provide strong talent protection and technical support for the automotive industry in Sichuan and Chongqing^[6]. At the same time, the college will also continue to deepen the integration of production and education, strengthen cooperation and exchange with enterprises, promote the transformation and application of scientific and technological achievements, and make greater contributions to local economic and social development.^[7]

4. Conclusions

The college will establish a provincial-level first-class automobile intelligent manufacturing and technology service innovation demonstration base, equipped with a student lifecycle management system, tracking student data throughout the process, generating quality reports, and helping enterprises select talents. The base will implement a model of school leadership, enterprise participation, and institutional resource integration, and carry out technology research and development, training, and technical consulting in the fields of new energy vehicles, intelligent vehicles, intelligent manufacturing of automobiles, after-sales services, green environmental protection of automobiles, and sales of automobiles (parts). In order to improve the quality of talent cultivation, the college has established a "credit system, menu based, modular, and open" curriculum system, enhancing the comprehensive quality and employment competitiveness of students. This measure will provide students with more opportunities and choices, laying a solid foundation for their future development.

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