

Innovation and Practice of Talent Cultivation Model Based on Co-education and Sharing between Schools and Enterprises

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Abstract

Vocational education is an important component of China's education system and a foundational project for cultivating high-quality technical talents. Under the background of the "new four modernizations" development in the automotive industry, it is necessary to address issues such as the insufficient integration of humanistic literacy and knowledge skills among automotive professionals in higher vocational education, the mismatch between the training specifications of automotive aftermarket talents and job demands, the disconnect between vocational skills and career development, and the mismatch between high-quality employment demands and innovation and entrepreneurship capabilities. The automotive program at our university, relying on the establishment of an enterprise college with benchmark enterprises, has planned and implemented research projects at the municipal, departmental, and higher levels, focusing on four core areas: automotive inspection and maintenance technology, automotive technical services and marketing, new energy vehicle technology, and intelligent vehicle technology. This exploration not only promotes school-enterprise cooperation but also collaborates with multiple institutions to build a four-dimensional "automotive quality" talent cultivation system. This system has shown remarkable effectiveness in educational practices and continues to supply the industry with high-quality talents.

Keywords

Vocational education; Cooperation between school and enterprises; Talent development system

1. Introduction

During his inspection tour of Guizhou on June 17, 2015, General Secretary Xi Jinping emphasized that vocational education constitutes a vital part of China's educational framework and serves as a foundational project for nurturing high-caliber skilled professionals, necessitating joint efforts at all levels for further enhancement. In

light of the "new four modernizations" driving the automotive industry's development, it is imperative to tackle challenges such as the inadequate integration and advancement of humanistic literacy alongside knowledge and skills among automotive professionals in higher vocational education. Additionally, there is a need to better align talent cultivation specifications with job requirements in the automotive aftermarket, strengthen the coupling between professional skills and career progression, and ensure a closer match between high-quality employment demands and innovative entrepreneurial capabilities.

Leveraging partnerships with industry-leading enterprises to establish enterprise colleges, our school's automotive majors have initiated and executed research projects at municipal and departmental levels and above, including "Research on the Construction and Reform of Higher Vocational Automotive Majors amidst the Trend of Intelligent Networking" and "Strategic Research on Talent Cultivation Reform for Higher Vocational Automotive Testing and Maintenance Majors within the Smart Manufacturing Context." Over the past six years, we have delved into and practiced within four key majors: Automotive Testing and Maintenance Technology, Automotive Technology Service and Marketing (formerly Automotive Marketing and Service), New Energy Vehicle Technology, and Automotive Intelligent Technology.

Our endeavors have also inspired some sister institutions, leading to the formation of a four-dimensional "automotive" quality talent cultivation model. This model, grounded in school-enterprise co-education and resource sharing, focuses on cultivating humanistic "automotive" qualities, craftsman "automotive" qualities, workplace "automotive" qualities, and entrepreneurial "automotive" qualities. This innovative approach has yielded positive educational and teaching outcomes.

2. Constructed four major humanistic soul-building projects guided by "value"

To tackle the challenge of inadequate integration and development of students' humanistic literacy alongside their knowledge and skills, we steadfastly uphold the principle of nurturing students with moral integrity as the cornerstone, with a strong emphasis on value orientation. We have instituted four key humanistic soul-nurturing projects:

1. **The Ideological Guidance Project:** This initiative is designed to instill correct values and a positive outlook on life, thereby significantly enhancing students' ideological comprehension.
2. **The Red Engine Project:** This project fosters the "Red Power" party-building brand, encouraging party building to guide league building, and effectively bolstering students' awareness of belief and mission.
3. **The Cultural Cultivation Project:** Through a series of thematic educational activities centered on "knowledge and courtesy," this project integrates traditional Chinese cultural education into both classrooms and workshops, effectively

cultivating students to excel in both moral and technical aspects.

4. **The Youth Sailing Project:** This endeavor designs and implements immersive youth activities tailored to students' growth characteristics, effectively broadening their horizons and enhancing their prospects for future development.

3. We have created a five-in-one craftsman cultivation model integrating "job, course, competition, certificate, and innovation"

To bridge the gap between talent cultivation specifications and job requirements in the automotive aftermarket, a "post-curriculum-competition-certificate-innovation" five-pronged craftsmanship cultivation model has been developed in collaboration with industry-leading enterprises.

1. **Job Task Analysis:** Schools and enterprises work together to dissect job tasks, concentrating on key roles like automotive maintenance, inspection, and troubleshooting. Through this collaboration, 210 typical work tasks have been identified.
2. **Curriculum Reconstruction:** By integrating curriculum with certification requirements and competitive events, professional core courses have been restructured. These courses align with the "Intelligent and Connected Vehicle Testing and Operation and Maintenance Vocational Skill Level Standards" (the "1+X" certificate) and the automotive technology competition of the National Vocational Colleges Skills Competition. Consequently, 22 professional core course standards have been established.
3. **Teaching Model Construction:** A "1-driven, 3-integrated, 11-loop" teaching model has been formulated. This model is task-driven and integrates the values of labor spirit, craftsmanship, and model worker ethos. The teaching process is meticulously designed to follow 11 workflow loops.
4. **Dual-Innovation Training Module:** A "1+N" dual-innovation training module has been devised. It comprises one course dedicated to fostering innovative consciousness and N credits of courses aimed at cultivating automotive craftsmanship innovation abilities.

4. Practiced the three paths of career development, namely "one system, two shifts, and three positions"

To tackle the challenge of inadequate coupling between students' professional skills and career development, we have leveraged the collaborative efforts of government, industry, enterprises, and schools, along with joint talent cultivation and sharing initiatives. We have implemented three career development pathways, namely the "one system, two classes, and three positions" approach:

1. **Modern Apprenticeship System:** This system facilitates alternating work and study, integrates innovation and entrepreneurship, enables credit conversion, allows identity exchange, and ensures mutual recognition of achievements.

Through enterprise practice, students sharpen their willpower, refine their character, and cultivate strong professional abilities.

2. **Named Classes and Order Classes:** These classes are grounded in the five core concepts of cognition, education, work, talent, and development. By integrating these concepts, they focus on academic career planning, professional career planning, and life development planning, thereby providing effective dream-building education for young students.
3. **Three-Position Progression:** This pathway involves recognizing, learning, and assuming positions, deeply integrating into positions and enterprises, and advancing through three distinct positions. It aims to cultivate professional abilities and realize a comprehensive career development plan that harmonizes education, training, and employment.

5. Established two platforms for maker cultivation, namely "innovation and entrepreneurship + dual competitions"

To tackle the mismatch between graduates' high-quality employment needs and their innovation and entrepreneurship capabilities, a "Double Innovation + Dual Competition" platform has been established to foster maker talent.

1. **Innovation and Entrepreneurship Platform:** This platform leverages the school's maker space and collaborates with enterprise colleges to jointly establish innovation and entrepreneurship funds and bases with both educational institutions and businesses. By promoting entrepreneurial models, it boosts students' confidence in innovation and entrepreneurship, deepens their understanding, and creates a supportive atmosphere. Entrepreneurs with extensive entrepreneurial experience and noble character are engaged as mentors to guide college students in their innovation and entrepreneurship training programs.
2. **Dual Competition Platform:** This platform utilizes competitions such as the "Internet Plus" College Students' Innovation and Entrepreneurship Competition and the "Challenge Cup" College Students' Entrepreneurial Plan Competition as vehicles to enhance college students' practical operational skills in innovation and entrepreneurship. These competitions provide students with the opportunity and impetus to excel in innovation and entrepreneurship.

6. Implementation Effect and Promotion and Application of Achievements

6.1. Four projects nurture the humanistic "automobile" spirit

Leveraging the "Four Projects"—namely, the Ideological Guidance Project, Red Engine Project, Cultural Cultivation Project, and Youth Sailing Project—we have set up a school-enterprise co-education platform. This platform aims to comprehensively enhance students' ideological awareness, sense of mission, moral and technical de-

velopment, and life outlook.

A joint party branch has been formed between the school and the enterprise. Our students have been collectively honored as the advanced collective in the 2017 provincial summer social practice activity for college and secondary vocational school student volunteers providing cultural, scientific, and health services in rural areas. They were also recognized as the advanced league organization in the 2018-2020 municipal "Three Dares and Three Bravos" campaign.

Additionally, our students have garnered numerous accolades, including the Excellent Activity Award at the 2017 municipal reading festival, the title of Exemplary Individual at the 2018-2019 municipal reading festival, the Excellent League Member of Suzhou in 2020, the "Excellent Social Practice Base" of Jiangsu Province in 2021, the Most Beautiful Vocational School Student of Jiangsu Province in 2021, and the "Good Youth of Suzhou" in 2021.

6.2. Five integrations to forge the "automobile" quality of craftsmen

The "post-curriculum-competition-certificate-creation" five-element integrated education model is tailored for the automotive aftermarket. It accurately identifies job tasks, aligns with professional competencies, and incorporates the "Intelligent Connected Vehicle Testing and Operation and Maintenance Vocational Skill Level Standards" (the "1+X" certificate), as well as the automotive technology competition category of the National Vocational Colleges Skills Competition.

Leveraging the resources of Tianfeng Automotive College, Jinlong Automotive College, and the production-oriented training base for vehicle body repair, this model adopts a three-stage progressive teaching approach: job cognition, work-study alternation, and shadow learning. This method nurtures students' craftsmanship spirit, underscoring the belief that "a craftsman's dedication surpasses his expertise, and his skills are renowned for precision." It cultivates the "automotive" qualities of new-era craftsmen who "grasp principles, excel in assembly and adjustment, are proficient in troubleshooting, and skilled in research."

Students under this model have achieved remarkable successes, including winning the first prize in the national higher vocational group of the "Baja Competition" in 2017, the second prize in the new energy vehicle technology and service category of the provincial higher vocational colleges skills competition in 2018, and the second prize in the automotive testing and maintenance category of the same competition in both 2019 and 2020. Additionally, they secured the third prize in the automotive marketing and service category of the provincial higher vocational colleges skills competition in 2016.

6.3. Three paths to cultivate the "automotive" quality in the workplace

Through the implementation of modern apprenticeship programs, students are effectively guided to undergo a transformation in their professional identities, bridg-

ing the gap between professional ethics and practical skills to achieve seamless integration. By incorporating named classes and order-based classes into the curriculum, corporate culture and workplace competencies are woven throughout the entire talent cultivation process, fostering a collaborative approach to talent development between educational institutions and enterprises.

Through a phased progression encompassing job recognition, practical training, and actual employment, students are immersed deeply into their respective roles and corporate environments. This direct exposure to workplace challenges enables them to cultivate essential professional abilities, enhance their professional recognition, and foster a strong sense of belonging, ultimately facilitating talent sharing between schools and enterprises.

Notably, our students secured the second prize in the 10th Provincial College Students' Career Planning Competition, a testament to their preparedness and professional acumen. Moreover, the Automobile Department has made significant strides by establishing 18 named classes and 6 order-based classes, launching two batches of apprenticeship pilot projects, and actively organizing and participating in over 100 corporate activities. These initiatives underscore our commitment to providing students with real-world experiences and preparing them for successful careers in their chosen fields.

6.4. Two platforms inspire makers' "automobile" quality

Leveraging the school's public innovation space and collaborating with enterprise colleges, the institution has jointly established innovation and entrepreneurship funds and bases with enterprises, providing students with the wings to soar in the realm of innovation and entrepreneurship. Through the promotion of entrepreneurial models, we bolster students' confidence in and understanding of innovation and entrepreneurship, cultivating a vibrant atmosphere.

We have engaged entrepreneurs with extensive entrepreneurial experience and noble character to serve as mentors for our student entrepreneurs. By capitalizing on provincial innovation and entrepreneurship training programs for college students, competitions such as the "Internet Plus" College Students' Innovation and Entrepreneurship Contest, and the Challenge Cup, we enhance students' practical operational skills in innovation and entrepreneurship. This inspires students to dare to explore, transcend conventions, and innovate with the "automobile" spirit of makers.

To date, we have set up 12 provincial-level innovation and entrepreneurship training programs for college students, secured 5 authorized patents, and witnessed our students clinch 1 second prize in the "Challenge Cup" Jiangsu Provincial College Students' Extracurricular Academic Science and Technology Works Competition, as well as 1 third prize in the Jiangsu Provincial "Internet Plus" College Students' Innovation and Entrepreneurship Competition. Furthermore, over 240 students have

successfully embarked on their entrepreneurial journeys.

Summary

The automotive program at our university, operating through a corporate academy partnership with industry leaders, has successfully implemented municipal and department-level research initiatives. Specializing in four core domains—automotive inspection and maintenance, automotive technical services and marketing, new energy vehicle technology, and intelligent vehicle technology—the program has not only strengthened industry-academia collaboration but also co-developed a four-dimensional "Automotive Quality" talent development framework with multiple institutions. This innovative system has demonstrated remarkable effectiveness in educational practices, consistently supplying the industry with high-caliber professionals.

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