

Industry-Education Integration: Practices and Paths at Hubei University of Automotive Technology

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Abstract: Under the deepening integration of the new technological revolution and industrial transformation, there is an urgent need for high-quality applied and innovative talents. As a key base for talent development, applied universities must actively adapt to industrial upgrading and innovation-driven strategies. This paper takes Hubei University of Automotive Technology as a case study to examine its innovative practices in industry-education integration. By embedding deeply into the regional automotive industry chain, aligning programs with industrial demands, building a dual-qualified teaching team, and establishing multi-level educational platforms, the university has formed a distinctive model of collaborative talent development. However, challenges remain, including incomplete benefit-sharing mechanisms, insufficient depth in high-level collaboration, and institutional constraints. The study proposes strategic paths such as building strategic communities, enhancing collaborative innovation in cutting-edge fields, and improving institutional supply, offering valuable insights for similar institutions.

Keywords: Integration of Industry and Education; Applied Universities; School-Enterprise Cooperation; Hubei University of Automotive Technology; Talent Cultivation

1. Introduction

Against the backdrop of the deep integration of the current new round of technological revolution and industrial transformation, the demand for high-quality, applied, compound and innovative talents in the country's economic and social development has never been more urgent. As an important base for talent cultivation, applied universities must proactively adapt to the needs of industrial transformation and upgrading and the innovation-driven development strategy. Deepening the integration of industry and education and strengthening school-enterprise

cooperation have become the core proposition and inevitable choice for their high-quality and connotative development. Hubei University of Automotive Technology, as the only provincial ordinary undergraduate university in China named after automobiles, has taken advantage of its geographical location in the Hubei automotive industry cluster to carry out systematic and in-depth innovative practices in the integration of industry and education, forming a unique model of industry-education integration, providing valuable experience and reference for similar universities to explore industry-education collaborative education.

2. Innovative Practices and Typical Models of Industry-Education Integration

2.1 Deeply Embedded in the Regional Automotive Industry Chain, Achieving Genetic-Level Industry-Education Integration

Hubei Polytechnic Institute of Automotive Technology is located in Shiyan, Hubei Province, known as the Capital of Commercial Vehicles in China, and is deeply integrated into the automotive industry corridors of Xiangyang, Suizhou, Wuhan and other places. It has established long-term and stable deep cooperative relationships with leading enterprises such as Dongfeng Motor Corporation. This industry-education integration based on geographical advantages and historical connections enables the school to accurately grasp the pulse of the automotive industry's development and achieve seamless integration between education and industry. The school not only deeply integrates automotive industry elements into its educational philosophy, discipline and major layout, talent cultivation plans and curriculum system design, but also realizes the leap from surface-level cooperation to genetic-level integration through joint research and development platforms, shared talent resources, and joint technical research

projects. This integration is not only reflected at the material level, but also deeply at the cultural and value levels, forming an industry-education integration ecosystem.

2.2 Precise Alignment of Professional Clusters with Industrial Demands and Dynamic Optimization of Talent Cultivation Structure

In response to the new four modernizations (electrification, intelligence, connectivity, and sharing) transformation trend in the automotive industry, Hubei Polytechnic Institute of Automotive Technology closely follows the development dynamics and talent demand changes in the industry, continuously optimizing the professional structure and layout. On the one hand, the school upgrades traditional advantageous majors such as vehicle engineering and mechanical design, manufacturing, and automation with digital and intelligent technologies, and introduces new course modules like new energy vehicle technology and intelligent connected vehicle technology. On the other hand, it actively applies for and builds emerging majors such as new energy science and engineering, intelligent vehicle engineering, and data science and big data technology, forming a professional cluster system highly matched with the automotive industry chain. By establishing a dynamic adjustment mechanism for professional settings and a regular revision system for talent cultivation plans, it ensures that the direction of talent cultivation keeps in step with industrial development, and has provided a large number of high-quality applied talents that are usable, retainable, and developable for enterprises.

2.3 Establishing a Co-Attraction, Co-Cultivation, and Co-Sharing Mechanism to Build a High-Level Dual-Qualified Teacher Team

the teaching staff is a key element in the integration of industry and education. Hubei Polytechnic Institute of Automotive Technology has innovatively implemented a co-attraction, co-cultivation, and co-sharing mechanism for the construction of a dual-qualified teacher team, breaking down the barriers to talent flow between the school and enterprises. In terms of co-attraction, the school has jointly established industrial professor positions with enterprises such as Dongfeng Motor Corporation, introducing high-end talents such as senior

engineers and technical directors from enterprises to serve as professional leaders or main course instructors, bringing the latest technical standards and engineering cases into the classroom. Regarding co-cultivation, a sound system for teachers' enterprise practice has been established, with young teachers being regularly selected to undergo full-time practice and training in enterprises for half a year to one year, participating in enterprise technology research and development and production management, thereby enhancing their engineering practice capabilities and industrial vision. In terms of co-sharing, through the joint establishment of teacher development centers and technical and skilled master studios by the school and enterprises, the optimal allocation and efficient utilization of teaching resources have been achieved, forming a high-level dual-qualified teacher team that is proficient in both theoretical teaching and industrial practice.

2.4 Building a Multi-Level Collaborative Education Platform and Innovating Talent Cultivation Models

Hubei Polytechnic Institute of Automotive Technology has established a multi-level and three-dimensional industry-education collaborative education platform system, integrating industrial elements into talent cultivation in a comprehensive and full-process manner. In terms of physical platform construction, it has jointly built physical platforms such as the Dongfeng HUAT Racing Team, the Intelligent Automotive Industry College, and the New Energy Automotive Engineering Center with Dongfeng Motor Corporation, providing students with real engineering practice environments and project training opportunities. In terms of innovation platform construction, it has jointly established research institutions such as the Intelligent Connected Vehicle Technology Research Institute and the Collaborative Innovation Center for Intelligent Manufacturing of Automotive Parts, conducting joint research on key industrial technologies and converting research results into teaching resources. In terms of the practical teaching system, it has established a practical teaching system covering the entire academic period, including cognitive internship+production internship+graduation internship, implementing a four-stage progressive training model of experiment -

training - internship - practice, and promoting teaching methods such as project-driven, case-based teaching, and on-site teaching, enabling students to learn by doing and do by learning in real production environments, significantly enhancing their engineering practice ability, innovation and entrepreneurship ability, and professional quality.

3. Challenges and Dilemmas Faced by the Integration of Industry and Education

Although Hubei Polytechnic Institute of Automotive Technology has achieved remarkable results in integrating industry and education, its practical process also reflects some common challenges and deep-seated problems faced by application-oriented universities.

3.1 Incomplete Benefit-Sharing Mechanism and Insufficient Motivation for Enterprises to Participate

In school-enterprise cooperation, the phenomenon of schools being enthusiastic while enterprises being indifferent still exists. As market economy entities, the fundamental motivation for enterprises to participate in the integration of industry and education lies in obtaining tangible economic and talent benefits. However, the current benefit-sharing mechanism in school-enterprise cooperation is still incomplete, especially in terms of intellectual property rights, the distribution of technology transfer benefits, and the protection of talent sharing rights. This has affected the enthusiasm and sustainability of enterprises' participation. At the same time, the school's ability to provide technical services and talent support to enterprises also needs to be improved to meet the urgent needs of enterprises for transformation and innovation.

3.2 Insufficient Depth and Breadth of Integration, and the Need to Strengthen High-Level Collaborative Innovation

Currently, the integration of industry and education mainly focuses on basic aspects such as talent cultivation and internship training, while cooperation in high-level fields such as technology research and development, technology transfer, and standard setting is relatively insufficient. Especially in the frontier technology areas related to the new four modernizations transformation of the automotive industry, such as the three-electric systems of

new energy vehicles, intelligent perception and decision-making of connected vehicles, and the application of automotive big data, the depth and breadth of collaborative innovation between schools and enterprises need to be expanded. In addition, the internationalization level of the integration of industry and education also needs to be improved, and there is still much room for cooperation with globally renowned automotive enterprises and educational institutions.

3.3 Lagging Organizational Guarantee and Evaluation System, and Institutional Obstacles Still Exist

There is a contradiction between the traditional management system of universities and the flexible and rapid response mechanism required for the integration of industry and education. The internal management processes, performance evaluations, and resource allocation methods of schools still cannot fully meet the needs of the integration of industry and education. For example, the evaluation of teachers is biased towards academic papers and research projects, with insufficient incentives for industrial services and technology transfer; the procedures for adjusting professional settings and talent cultivation plans are complex, making it difficult to respond promptly to industrial changes; cross-disciplinary and cross-college projects of integrating industry and education lack effective organizational guarantees and resource integration mechanisms. In addition, the coordinating role of government departments in the integration of industry and education also needs to be strengthened, and relevant support policies and resource allocation need to be further optimized.

4. Paths and Strategies for Deepening the Integration of Industry and Education

In response to the above challenges, application-oriented universities need to make systematic plans and carry out reforms and innovations at the strategic level to promote the integration of industry and education to a deeper level and broader fields.

4.1 Build a Strategic Community and Innovate Cooperation Mechanisms and Models

Promote the transformation and upgrading of industry-education integration from project-based cooperation to strategic community. Both

schools and enterprises should jointly formulate strategic plans for industry-education integration, clarify cooperation goals, key areas and implementation paths. Explore the establishment of modern industry colleges with independent legal person status, implement the president responsibility system under the leadership of the council, and achieve in-depth binding of governance structure, resource input and performance evaluation. Innovate the benefit-sharing mechanism, and form a long-term mechanism of risk sharing and benefit sharing through the establishment of joint technology innovation funds, revenue sharing from technology transfer, and cost sharing for joint talent cultivation. At the same time, actively introduce multiple subjects such as industry associations and research institutes to build a multi-party collaborative ecosystem of industry-education integration featuring government, industry, academia, research and application.

4.2 Focus on the Cutting-Edge Fields of the Industry and Enhance the Level of Collaborative Innovation

Centering on the transformation trend of the automotive industry towards new four modernizations, focus on the frontier fields such as new energy and intelligent connected vehicles, intelligent manufacturing and digital twins, and new automotive materials and lightweighting. Jointly build high-level collaborative innovation platforms with enterprises. Collaborate with leading enterprises to create an innovation complex integrating technology research and development, technology transfer, pilot production and incubation, and talent cultivation. Jointly tackle key core technologies and formulate industry standards. Promote the joint establishment of key laboratories, engineering research centers, and technology innovation centers with enterprises, and jointly apply for and undertake major scientific research projects. Incorporate the latest technologies, processes, and standards of the industry into teaching content and the talent cultivation process. At the same time, strengthen international cooperation and exchanges, establish strategic partnerships with globally renowned automotive enterprises and universities, and jointly build international joint laboratories and talent cultivation bases to enhance the internationalization level of industry-education integration.

4.3 Improve Institutional Supply and Remove Institutional and Mechanism Obstacles

The education authorities should increase policy support and resource allocation, and issue special policies and guiding documents to encourage the integration of industry and education. They should support universities in carrying out reforms and innovations in personnel management, professional title evaluation, and achievement recognition, and establish an evaluation system centered on industrial contribution and students' sense of gain. Improve the teacher assessment and evaluation system, and incorporate teachers' participation in enterprise technical services, horizontal projects, achievement transformation, and industrial teaching into performance assessment and professional title evaluation conditions. Reform the talent cultivation model, implement flexible credit systems, project-based teaching, and enterprise mentorship systems, and other innovative measures to enhance the adaptability and flexibility of talent cultivation. At the same time, universities should establish a coordination mechanism for the integration of industry and education, set up a dedicated institution to be responsible for planning, management, and service of the integration of industry and education, break down departmental barriers, optimize resource allocation, and provide a strong organizational guarantee for the integration of industry and education.

5. Conclusion

The innovative practices of Hubei University of Automotive Technology have fully demonstrated that deeply integrating into the regional industrial ecosystem is the inevitable path for application-oriented universities to develop their own characteristics, improve quality, and achieve high-quality development. Through measures such as establishing a gene-level industry-education integration model, building a team of dual-qualified teachers, and setting up a collaborative education platform, the university has not only provided a large number of high-quality application-oriented talents for the automotive industry but also won a broad space for its own development. It has explored and formed provides a valuable reference for the reform of application-oriented higher education in China.

In the future, to deepen industry-education

integration, it is still necessary for the government, industry, enterprises, and schools to work together and jointly build a high-quality industry-education integration community of shared future featuring demand alignment, resource sharing, outcome sharing, and win-win development. the government should strengthen top-level design and policy guidance; the industry should play the role of a bridge and a standard leader; enterprises should deeply participate in talent cultivation and technological innovation; and schools should actively adapt to industrial demands and deepen educational and teaching reforms. Only when all parties form a synergy can industry-education integration be deepened and solidified, providing a solid talent support and intellectual support for building an education power and a manufacturing power.

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