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The Promotion Effect of the Construction of New Energy Vehicle Engineering Technology Major on the High-quality Development of Regional Automotive Industry Clusters

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Abstract: With the rapid development of new energy automobile industry, the demand for transformation and upgrading of automobile industry cluster in Hunan Province is becoming stronger and stronger. As an important channel for training related technical talents, the new energy automobile engineering technology program plays a crucial role in promoting the high-quality development of the regional automobile industry cluster, through the promotion of the regional automobile industry cluster in terms of technological innovation, talent cultivation and scientific research synergy, etc. The new energy automobile engineering technology program has been widely used in the automobile industry in Hunan Province.

Keywords: New Energy Vehicle Engineering Technology, Automotive industry cluster, High quality development

1. Introduction

In the context of the global automotive industry's transformation to green and intelligent, new energy vehicles have become an important direction of industrial development [1]. As an important automobile industry base in China, Hunan Province, driven by both policy support and market demand, the new energy automobile industry is developing rapidly, and the demand for high-end skilled personnel is becoming more and more prominent [2]. The construction of new energy automobile engineering technology specialty is of great significance to meet the regional industrial talent demand, promote technological innovation, and promote industrial upgrading. By optimizing the talent training mode and strengthening the integration of industry and education, the specialty focuses on cultivating professionals with innovative ability and practical skills, providing strong support for the high-quality development of the automotive industry in Hunan Province.

2. Construction status of new energy automobile engineering technology major

With the rapid development of new energy automobile industry, related majors have been widely set up and gradually improved in colleges and universities. Especially in vocational undergraduate colleges and universities, the construction of new energy automobile engineering technology has become an important support to promote the development of local industry. At present, the current situation of the construction of this specialty is characterized by the following aspects.

2.1 Gradual Improvement of Curriculum System

The curriculum system of new energy automobile engineering technology majors mainly covers the fields of electric vehicle foundation, power battery technology, vehicle engineering, intelligent control, charging facilities and battery management. With the continuous updating of technology, some colleges and universities have gradually introduced

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advanced technologies such as artificial intelligence, automatic driving and vehicle networking, forming a curriculum with new energy power system and intelligent technology as the core [3].

2.2 Reinforcement of practical teaching link

In order to improve students' practical ability and engineering application ability, many institutions have strengthened cooperation with enterprises in the construction of their specialties, established off-campus practice bases, and provided real projects and practical training opportunities. This mode of school-enterprise cooperation not only enhances students' hands-on ability, but also helps them better adapt to the technical application and innovation needs in their future work.

2.3 Innovation of Talent Cultivation Mode

With the rapid development of the new energy automobile industry, the demand for talents tends to be high-end and composite, and the cultivation mode of professional construction is also constantly innovated. Many colleges and universities have begun to try to cultivate high-skilled talents according to the specific needs of enterprises. At the same time, some institutions are also actively exploring interdisciplinary curriculum design to cultivate composite talents with engineering and management capabilities [4].

Overall, the new energy automobile engineering technology specialty has made significant progress in theory and practice teaching, curriculum system construction, etc. In the future, with the further development of the industry, the specialty construction will continue to advance in the direction of more closely matching the market demand and more timely technical updates.

3. Current Situation and Development Needs of the Regional Automotive Industry Cluster

3.1 Current Situation of the Automotive Industry Cluster in Hunan Province

As an important automotive industry base in central China, the automotive industry in Hunan Province occupies an important position in the provincial economy. In recent years, relying on its strong manufacturing base, Hunan Province has promoted the integration and development of new energy vehicles, intelligent internet-connected vehicles and traditional fuel vehicles. Especially in cities such as Changsha and Zhuzhou, a number of leading automobile manufacturing enterprises have emerged, such as CSR Times Electric, BYD and other well-known new energy vehicle enterprises. The clustering effect of the automobile industry in Hunan Province is increasingly visible, and the supporting facilities upstream and downstream of the industry chain are gradually improved, which has a basic pattern of the whole industry chain from vehicle manufacturing to core components, charging piles, power batteries, etc. However, the automobile industry in Hunan Province is still facing the challenge of the integration of traditional fuel vehicles.

However, Hunan automobile industry still faces certain challenges. In particular, there are still gaps in the core research and development of new energy vehicle technology, the application of intelligent network technology and the deep integration of the industry chain. The innovation ability of technology, R&D investment, and the attraction of high-end talents still need to be strengthened.

3.2 Demand for the Development of Automobile Industry in Hunan Province

With the rapid development of new energy vehicles, the automobile industry in Hunan Province is facing a critical stage of transformation and upgrading. First of all, the core technology research and development and industrialization level of new energy vehicles need to be upgraded urgently. Although Hunan Province has some technical accumulation in the fields of battery and motor, there is still much room for improvement in the integrated innovation of power system, popularization of charging facilities, and application of intelligent driving technology. The lack of internationally competitive technologies and products requires the strengthening of collaborative innovation in the upstream and downstream of the industrial chain.

Secondly, the automobile industry in Hunan Province needs to cultivate more high-end technical talents with composite skills. With the development of the industry in the direction of high-tech and green, the automotive industry has an increasing demand for interdisciplinary talents in engineering technology, artificial intelligence, information technology, etc. [5] Existing institutions of higher education and vocational education system urgently need to dock with the actual needs of enterprises, and cultivate innovative talents adapted to future development.

3.3 Demand for professional construction in the new energy automobile industry

The transformation of the automobile industry in Hunan Province not only requires the improvement of professional technology, but also requires a high degree of compatibility between the professional education system and the industry's needs. The new energy automobile engineering technology profession needs to continuously optimize the curriculum, especially to strengthen the training of intelligent, green manufacturing, automatic driving and other cutting-edge technologies. At the same time, school-enterprise cooperation and scientific research combination will become the key to professional development, and only by closely combining with the needs of the regional automobile industry can we cultivate high-quality technical talents in line with the market demand, and promote the high-quality development of the automobile industry cluster in Hunan Province [6].

4. Promoting role of new energy automobile engineering technology specialty on regional automobile industry cluster

4.1 Docking between talent cultivation and industrial demand

The promoting role of the construction of new energy automobile engineering technology specialty on regional automobile industry cluster is firstly embodied in talent cultivation. With the rapid development of the automobile industry in Hunan Province, especially the rise of new energy vehicles and intelligent networked vehicles, the traditional automobile engineering technology personnel training mode can no longer meet the needs of the emerging industry. The construction of this specialty can accurately dock the market demand and cultivate a group of composite technical talents with the background of electrification, intelligentization and network connection.

4.2 Integration of technological innovation and industrial development

The new energy automobile engineering technology major is not only committed to the cultivation of talents, but also plays an active role in promoting the integration of technological innovation and industrial development. The construction of the program focuses on the close integration of teaching content and industrial demand, and promotes the integration of production, learning and research through cooperation with local enterprises. Students not only learn the latest new energy technology in the classroom, but also have direct contact with actual engineering and technology problems through participation in enterprise projects to enhance their ability to solve practical problems.

4.3 Promoting Industry Chain Integration and Synergistic Development

The construction of the new energy automobile engineering technology program can also promote the integration and synergistic development of the regional automobile industry chain. By integrating quality resources inside and outside the university and establishing enterprise training bases and innovation laboratories, the specialty provides technical support and service platform for the local automobile industry. At the same time, the discipline construction of the specialty also drives the synergistic development of upstream and downstream industries. With the gradual improvement of the industrial chain and the deepening of collaborative innovation, the new energy automobile industry cluster in Hunan Province can more efficiently utilize local resources and enhance the competitiveness of the overall industry.

4.4 Promoting Industrial Green Transformation and Intelligent Upgrading

The construction of the new energy automobile engineering technology specialty has helped the automobile industry cluster in Hunan Province move towards green transformation and intelligent upgrading. The updating of the content of the professional curriculum enables students to master the core technologies of new energy vehicles, such as electric drive systems, power batteries, charging facilities, etc., helping the industry to make technological breakthroughs in environmental protection, energy saving and low carbon. Meanwhile, with the introduction of intelligent technology, the program has trained students with the ability to develop intelligent internet-connected vehicles, promoting the application and popularization of intelligent vehicle technology in the local industry. In the process of transformation of the automobile industry cluster in Hunan Province in the direction of green and intelligent, the new energy automobile engineering technology specialty has become an important driving force for industrial innovation.

5. Countermeasures and Suggestions

5.1 Optimize Curriculum System and Enhance the Cultivation of Green and Intelligent Technologies

In order to better serve the strategic layout of the regional automobile industry cluster, the new energy automobile engineering technology major should further optimize the curriculum system and integrate green and intelligent technologies into the teaching. The course content should pay more attention to the core technology of new energy vehicles, such as battery management, electric drive system, intelligent network technology and other cutting-edge areas of in-depth explanation. At the same time, interdisciplinary knowledge such as artificial intelligence, big data and Internet of Things should be added to cultivate students with comprehensive technical ability and innovative thinking, and help promote the green transformation and intelligent development of the industry.

5.2 Deepen scientific research cooperation and promote technological innovation and application

The development of the regional automobile industry cluster can not be separated from the continuous innovation and application of technology, and the new energy automobile profession should strengthen the collaborative innovation with local automobile enterprises and scientific research institutions by deepening the scientific research cooperation with enterprises. Through the joint establishment of technical research centers, laboratories and other platforms, the exchange and cooperation between students and enterprise technicians can be promoted to enhance the core competitiveness of the new energy automobile industry. In addition, the school can train technical talents according to the needs of enterprises in a targeted manner, promoting the two-way integration of the school and enterprises, and further promoting the technological innovation and industrial upgrading of the regional automobile industry cluster.

5.3 Strengthen the integration of green development concept and intelligent technology

In the process of green transformation of the regional automobile industry, the new energy automobile specialty should play a key role. By promoting the R&D and application of technologies such as green manufacturing, intelligent driving systems and charging facilities, it will promote the low-carbon, environmental protection and intelligent upgrading of the new energy automobile industry. Combined with regional policy guidance and market demand, it strengthens the research of new energy automobile related technologies, actively promotes the application of intelligent and green technologies in the industry, and provides solid technical support for the green transformation and intelligent development of the automobile industry cluster in Hunan Province.

Conclusions

The new energy automobile engineering technology specialty plays an important role in promoting the high-quality development of the regional automobile industry cluster. By optimizing the curriculum system, deepening the cooperation between industry, academia and research, and strengthening the integration of green and intelligent technologies, it can effectively promote the green transformation and intelligent development of the automobile industry in Hunan Province. In the future, the construction of the specialty needs to be closely integrated with the regional industrial demand, provide high-quality talent support for the industry, promote technological innovation, and help the local automotive industry cluster to occupy a favorable position in the global competition and achieve sustainable development.

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Hunan 14th Five-Year Education Planning Project (Research on the Construction Path of Vocational Education Undergraduate Majors Actively Docking with Re-gional Industry Development. XJK23BZJ010).

References

[1] TIAN Ze, LIU Zixian, REN Yangjun. Research on the mechanism of digital economy empowering the high-quality development of new energy automobile industry[J]. Industrial Technology and Economics,2025,44(02):67-77.

[2] Shi Hailin, Yao Ting, Huang Xiaolin, etc Research on the Development Path of New Energy Vehicle Industry in Hunan Province [J]. Science and Technology Square, 2023, (04):38-44.

[3] Yang Hengdong, Li Pengwei, Huang Xiage, etc Research on the "Industry University Research" Innovative Talent

Training System for Vocational Undergraduate New Energy Vehicle Engineering Technology Major [J]. Modern Vocational Education, 2024, (24):45-48.

[4] Peng Jinquan, Wang Jingxia The realistic dilemma and transcendence of cultivating composite talents in vocational undergraduate education: a qualitative study based on the perspective of school enterprise symbiosis [J]. Vocational and Technical Education, 2025, 46 (02): 12-17

[5] Wang Jing Challenges and Response Strategies for High Quality Development of China's Electric Vehicle Industry under Technological Change [J]. Enterprise Economics, 2024, 43 (09): 15-24

[6] Jiang Jiyou, Fan Chunfeng The research and innovation project driven teaching mode of battery education in universities [J]. Battery, 2025, 55 (02): 402-405