

Exploration of Talent Cultivation Mode of Automobile Specialties in the Context of Higher Vocational Articulation



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Abstract: With the rapid development of automobile industry technology and the continuous change in market demand, the traditional education mode has made it difficult to meet the demand for highly skilled automobile professionals. In this context, optimizing middle and higher vocational education articulation mode has become the key to improving the effect of talent cultivation and meeting the development needs of the industry. This paper analyzes the challenges of middle and high vocational education articulation in the automotive professional talent training mode, and discusses the strategies to improve the quality of education through innovative talent training modes such as clarifying the segmented training objectives, reconstructing the segmented curriculum system, promoting the dual-teacher system and sharing of teachers, and constructing practical training bases through cooperation between schools and enterprises. It will respond to the technological update and market changes in the automobile industry, meet the demand for highly skilled personnel in the automobile industry, and promote the sustainable development of automobile professional education.

Keywords: middle and high school articulation; automobile specialty; talent training mode; dual-teacher system; 1+X certificate system

Introduction

With the rapid development of science and technology, the automotive industry market has a growing demand for professional and technical talents. Especially in new energy and intelligent networked vehicles, the shortage of high-skilled talents is obvious. To adapt to this market demand, the effective articulation between secondary vocational education and higher vocational education is particularly important. As an important part of high school education, secondary vocational education mainly cultivates skilled talents with practical skills, laying the foundation for students' careers; while higher vocational education is committed to cultivating higher-end skilled talents, promoting technological innovation and industry development. Effective middle and high vocational articulation can not only build a perfect modern vocational education system but also significantly

enhance the ability of vocational education to support the development of industry and realize the scientific development of vocational education. Therefore, it is of great theoretical and practical significance to explore the talent cultivation mode for automobile majors in the context of middle-higher vocational education articulation to meet the needs of the industry and promote education reform.

1. The Goal and Significance of Middle and High Vocational Articulation

Secondary vocational education trains students to master the necessary professional skills, laying a solid foundation for their further study and career development. Higher vocational education, on the other hand, pays more attention to the cultivation of high-end skills and innovation ability on this basis and leads the technological progress and innovation of the industry. Middle and higher vocational articulation refers to promoting the coordinated

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development of secondary and higher vocational education by the requirements of building a modern vocational education system, and systematically cultivating skillful, especially high-end skillful talents adapted to the needs of economic and social development. The effective implementation of middle and higher vocational articulation has greatly enhanced the ability of vocational education to support industrial development through the integration of resources and optimization of curriculum. Measures such as adjusting talent training objectives closely to regional industrial needs, optimizing the professional structure, and promoting teaching reform are all aimed at better adapting to the needs of industrial transformation and upgrading. This education model not only improves the quality of education but also enhances the vocational adaptability and innovation ability of students. In the current context of rapid economic and social development, it is particularly important to promote the through mode of middle and high vocational articulation. This kind of articulation can not only provide more educational opportunities and promote social equity but also strengthen practical teaching and improve the match between education and industry needs through various forms such as school-enterprise cooperation. Therefore, strengthening the middle and higher vocational articulation is not only a need to improve the quality of education but also an important strategy to promote social and economic development.

2. Problems to be Solved in the Articulation of Middle and Higher Vocational Education in the Automobile Specialty

2.1 Disconnect between training objectives and curriculum system

In the articulation of secondary and higher vocational education for automobile majors, the disconnection between the training objectives and the curriculum system is a prominent problem. In terms of training objectives, the secondary education stage focuses mainly on cultivating students' basic skills, and the course content mostly revolves around basic theories and simple practical exercises, with the aim of enabling students to quickly master a skill to adapt to the work demands of junior positions. Upon entering the higher vocational level, however, the educational objective shifted to cultivating high-end

skills and the ability to solve complex problems, with the expectation that students would be able to understand complex technical principles and perform advanced operations and management. This abrupt change has not been effectively transitioned and articulated in the cultivation objectives, resulting in students' difficulty in adapting to the learning requirements of the higher vocational stage. In terms of the curriculum system, the curriculum arrangement at the intermediate level often pays too much attention to the teaching of basic cultural knowledge and neglects the in-depth cultivation of professional skills, which makes the students seem to be unable to cope with the requirements of more complicated professional skills when they are promoted to the higher vocational level. As many secondary vocational colleges and universities in order to improve the rate of advancement, over-emphasis on theoretical teaching and neglect of practical training, resulting in students failing to meet the entrance requirements for higher vocational education in terms of both theoretical knowledge and practical skills (Cong, 2023). Higher vocational colleges and universities also often fail to give full consideration to the actual foundation of intermediate vocational students when formulating curricula, resulting in repetitive and disjointed curricula, and students encountering major challenges in adapting to new learning environments. The root of these problems lies in the lack of a systematic communication and feedback mechanism between secondary and tertiary institutions, which makes it difficult to identify and solve the duplications or disconnections in curriculum content in a timely manner. The lack of effective articulation and communication not only reduces the quality of education, but also hinders the rational allocation and utilization of educational resources. Ultimately, this inconsistency in curriculum system and cultivation objectives leads to low efficiency of middle and high vocational articulation and fails to meet the industry's demand for high-quality skilled personnel.

2.2 Disconnection between talent assessment mode and market demand

One of the major problems in the articulation of middle and higher vocational education for automobile majors is the disconnection between the talent assessment mode and the market demand. With the rapid development of the automobile industry,

especially the rise of new energy vehicles and intelligent network car technology, the industry's demand for technical personnel is undergoing profound changes. The current vocational education assessment model is often still stuck in the traditional stage of internal combustion engine technology, and the demand for new technologies and skills is still in the groping stage (Li, 2023). The main reason for this disconnect is that the update of the education system lags behind the speed of industry development. Educational institutions tend to be conservative in the design of curricula and assessment content, lacking flexibility and foresight to cover emerging technology areas. Lack of adequate communication and collaboration between education and industry leads to a gap between educational content and actual job requirements. Educational institutions fail to make full use of industry feedback to adjust teaching and assessment content promptly, making students appear to have insufficient skills to meet employers' expectations when faced with a new type of work environment after completing their studies. This disconnect between the assessment model and market demand not only affects students' competitiveness in employment but also limits the development potential of the industry. The mismatch between vocational education and market demand is further exacerbated by the fact that education assessment standards fail to reflect the latest industry standards and technical requirements, and students' training results are often not directly translated into the actual competencies required by the industry.

3. Talent Cultivation Mode of Automobile Specialty in Middle and High Vocational Articulation

In the middle-higher vocational education articulation of automotive specialties, an innovative talent cultivation model is the key to ensuring that the quality of education is highly compatible with the industry demand. This model focuses on the integration of industry and education, the combination of engineering and learning, and the formation of an integrated talent training system through project-driven teaching (Ma et al., 2020). Secondary and higher vocational education should adopt the "2+3 system" joint mode, which can effectively connect the educational resources of secondary and higher vocational education and form

a continuous learning path. Under this model, secondary education provides students with basic skills training, while higher vocational education enhances students' high-end technical skills and ability to solve complex problems on this basis, and designs the curriculum in full accordance with the vocational qualification standards and industry needs. Strengthening school-enterprise cooperation is the core of this model. Through close cooperation with industrial enterprises, educational institutions can directly involve the management and technical personnel of enterprises in curriculum design and system construction to ensure the practicality and foresight of teaching content. This not only accelerates the response speed of vocational education to social demand but also enables the curriculum system to be dynamically adjusted promptly. Combining the middle- and high-vocational through-training mode with the 1+X certificate system provides students with multi-skill level certificates, which breaks the limitations of traditional vocational qualification certificates and emphasizes the comprehensive application of practical skills and theoretical knowledge. The perfect "dual-teacher" teacher training system requires teachers not only to master theoretical knowledge but also to have practical skills, which ensures the quality of integrated teaching. Strengthening digitization and information construction is also part of this model. By improving teachers' information technology application ability and using computer virtual simulation technology, software, and digital technology, students' practical skills and digitization and information literacy can be comprehensively improved to meet the development trend of new energy automobiles and intelligent networked automobiles. Carrying out online-offline hybrid teaching can effectively combine the interactive advantages of traditional face-to-face teaching and the flexibility of online teaching to provide students with a more diverse and personalized learning experience. Through this mode, students can seamlessly connect between practical operation and theoretical learning, and enhance their learning effect and practical ability. In short, the automobile professional talent cultivation mode of middle and high-vocational articulation comprehensively improves the vocational ability of automobile students through the strategies of

school-enterprise cooperation, work-learning integration, and project-driven, ensures a high degree of compatibility between the quality of education and the needs of the industry, and at the same time provides solid support for the students' vocational development and the technological progress of the industry.

4. Talent Cultivation Strategy for Automobile Majors under the Mode of Middle and High Vocational Articulation

4.1 Clarify the goal of segmented training

Under the middle and high vocational articulation mode, clear segment cultivation objectives are the basis for realizing the efficient cultivation of automobile professionals. The intermediate stage should focus on cultivating students' basic skills and primary vocational skills, to lay a solid foundation for the in-depth study in the higher vocational stage. The higher vocational stage should focus on improving students' high-end skills and comprehensive problem-solving ability so that students can adapt to more complex work requirements. To effectively realize these training objectives, the introduction of the 1+X certificate system has become key. This system not only breaks through the limitations of traditional vocational qualification certificates but also emphasizes the educational concept of "multi-skilled" by providing different vocational skill level certificates (Guo & Liu, 2022). In automobile majors, for example, the "Vocational Skill Level Certificate of Automobile Utilization and Maintenance" covers the comprehensive skills of traditional and modern automobile technology, especially with the addition of the module of "Automobile Gateway Control and Entertainment System Technology", which is directly connected to the latest market demand. The program is directly connected to the latest market demand. Meanwhile, the "Intelligent New Energy Vehicle Vocational Skill Level Certificate" focuses on new energy vehicle technologies, such as battery technology and electronic and electrical systems, which is more in line with the current market trends (Zhang, 2024). In this way, students can choose to obtain one or more primary vocational skills level certificates according to their interests and abilities at the intermediate level, while they can continue to deepen their skills in related fields or even study for

higher level certificates at the senior level. This flexible, step-by-step in-depth certificate system not only provides students with a clear career development path, but also ensures a high degree of matching between the educational content and the industry demand, greatly enriches the assessment and evaluation of the talents in the middle- and high-vocational articulation, and cultivates more professional and adaptable high-skilled talents for the automobile industry.

4.2 Reconstruction of segmented curriculum system

Under the mode of middle-higher vocational articulation, the reconstruction of the segmented curriculum system aims to ensure the continuity and systematical of the course content and meet the actual needs of the industry. This requires a thorough industry needs analysis to ensure that the curriculum design is aligned with the latest technology and skills needs of the automotive industry. This includes working with industry experts to regularly update the curriculum content, especially for emerging technologies such as smart connected cars and new energy technologies. In concrete terms, the secondary education stage should focus on basic skills and fundamental theoretical knowledge to provide students with a solid technical foundation. Courses at this stage should include basic mechanical knowledge, electronic technology, and elementary automotive maintenance technology while emphasizing practical training. The senior stage is further expanded on this basis to include more complex diagnostic techniques, advanced maintenance techniques, automotive design principles, etc. while enhancing students' innovation and ability to solve complex problems (Gao, 2024). To ensure seamless curriculum articulation, middle and high vocational colleges and universities need to establish a close collaborative relationship and work together to develop curriculum standards and syllabify. Transition courses and bridging programs can be set up to ensure seamless articulation, reduce duplication of learning, and improve learning efficiency when students progress to higher vocational levels. Curriculum design can be modularization and distributed so that students can choose different learning modules according to their interests and career plans, and at the same time facilitate the updating and adjustment of the

curriculum to cope with technological advancement and market changes. Through such a strategy, a dynamically updated curriculum system can be constructed that conforms to the laws of education and meets the market demand, effectively supporting the seamless connection of middle and higher vocational education and the cultivation of high-quality talents.

4.3 Co-construction of dual-teacher teams and sharing of teachers in middle and high vocational education

Under the mode of middle and high vocational articulation, the core of this strategy lies in integrating the educational resources of middle and high vocational education and creating a team of teachers who have both rich industrial experience and advanced teaching methods. Establishing a platform for teacher exchange and training is the basis for building a "dual-teacher" team. Through regular teacher exchange programs, middle and higher vocational colleges and universities can rotate teachers between different stages of education, so that they can have a deeper understanding of the teaching needs and student characteristics at each stage. They can join hands with industrial enterprises to provide teachers with opportunities for fieldwork and training so that they can have direct contact with the latest industrial technology and workflow and enhance their practical teaching ability. Further, a "dual-teacher" teacher certification process should be promoted to ensure that all teachers meet the "dual-teacher" standard, i.e. possessing professional technical skills and education and teaching abilities. This includes regular training of teachers in professional skills and pedagogy to strengthen their dual role in vocational education (Zhang & Chen, 2024). At the same time, secondary and tertiary institutions should jointly develop and share teaching resources, such as jointly offering online courses and seminars and using digital tools such as virtual simulation laboratories to enhance the quality of teaching interactions and practical exercises. Through these measures, it is possible to ensure that the teaching team maintains consistency in teaching concepts, methods, and contents, and effectively supports the systematic cultivation of automotive professionals. Through the implementation of such strategies, the teaching quality and professionalism of teachers can be effectively improved, and students

can be provided with richer and more efficient learning experiences, to realize more efficient and quality talent cultivation in the middle-higher vocational articulation.

4.4 Strengthening practical teaching and creating practical training bases

Under the mode of middle-higher vocational articulation, strengthening practical teaching and building practical training bases are key measures to improve students' practical ability and vocational adaptability. To realize this goal, middle and high vocational colleges and universities need to take the following specific steps. First, establish close cooperative relationships with industry-leading enterprises to jointly develop and maintain practical training bases. These bases should not only be equipped with the latest technology and equipment but also simulate real working environments, including automotive maintenance workstations, new energy vehicle technology laboratories, and intelligent vehicle testing grounds, to ensure that students can learn and apply their skills in a real-world environment. Second, develop a practical training curriculum that is updated in tandem with industry standards and technological development. By bringing in industry experts to participate in curriculum design and teaching, it is ensured that the content of the practical training not only reflects the latest technology of the current industry but also anticipates future technological trends. In addition, the practical training courses should include a full range of skills training from basic operation to advanced technology application to meet the learning needs of different levels. Again, project-driven teaching methods are implemented to encourage students to participate in real engineering projects, such as automobile design, modification, maintenance, and troubleshooting (Niu et al., 2023). This teaching mode can enhance students' problem-solving ability and innovative thinking, as well as teamwork and project management skills. Finally, the operation and teaching effects of the training base are regularly evaluated and optimized. By collecting feedback from students, teachers, and business partners, teaching methods and practical training facilities are constantly adjusted to ensure that the quality of education is kept in sync with the industry's demand. Through these measures, middle and high vocational colleges and universities can

provide a practical and efficient learning platform for automotive students, greatly enhancing their vocational skills and employment competitiveness.

Conclusion

In conclusion, the study reveals the key problems in the current education system and its solution strategies by exploring the application of the middle-higher vocational articulation model in the cultivation of automotive professionals. The main findings emphasize the importance and urgency of middle- and high-vocational articulation in realizing educational continuity, meeting the needs of the industry, and cultivating highly skilled personnel. In particular, the growing demand for professionals in the automotive industry in the face of rapid technological development requires that the education model must be innovated to adapt to these changes. Looking ahead, the development of automobile education should pay more attention to school-enterprise cooperation, and strengthen students' practical skills and innovation ability through the construction of practical training bases and "dual-teacher" teacher teams. At the same time, the application of flexible evaluation methods such as the 1+X certificate system can more accurately assess and certify students' multi-skills. In conclusion, to cultivate high-quality technical and skilled talents who can adapt to the future development of the automotive industry, middle and high vocational education needs to continuously carry out structural adjustment and curriculum innovation. This is not only a demand in the field of education, but also a need for national industrial upgrading and economic development.

Conflict of Interest

The author declares that she has no conflicts of interest to this work.

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