

Exploration and Practice of Talent Training Model for Vehicle Majors from the Perspective of Intercollegiate Cooperation

Jingyue Wang¹, Limin Zheng², Yongcheng Ling³, Xuejiao Na⁴ and Liang Zhang¹

¹School of Automobile and Transportation, Shenyang Ligong University, Shenyang, 110159, China

²School of Automobile and Traffic Engineering, Liaoning University of Technology, Jinzhou 121001, China

³School of Automobile and Transportation, Shenyang University, Shenyang, 110044, China

⁴School of Mechanical Engineering and Automation, Shenyang Institute of Technology, Fushun 113122, China

Abstract

In order to adapt to the new technology, new industry and its new model of the new industrialization era, to better cultivate the current social needs of vehicle professionals, this paper briefly discusses the training objectives of vehicle professionals, takes the current situation of education reform in Liaoning Province as an example to analyze the problems of the current vehicle talent training model, considers the impact of intercollegiate cooperation on talent training, and explores the training model applicable to vehicle professionals. Through the effect of the strategy implemented in the cultivation of vehicle talents by the intercollegiate cooperation project of general undergraduate higher education schools in Liaoning province, the feasibility of the cultivation mode is proved, which helps the cultivation of vehicle professional talents and lays a good foundation for the development of China's vehicle industry and provides reference for intercollegiate cooperation education.

Keywords

Intercollegiate cooperation; Vehicle major; Talent training; Comprehensive quality.

1. Introduction

Talent cultivation is a constant topic in the education sector, and this is especially true for universities. As China enters a new era of industrialisation with new technologies, new industries and new models, the transformation and upgrading of industrial structures and the conversion of old and new functions cannot be delayed[1]. This is the case for universities. At the same time, information technology, new material technology and new energy technology are constantly breaking through and cross-fertilising, and the industrial revolution is ready to take off. The good development of these industries requires more engineering talents with the ability of engineering practice, innovation and high quality to keep up with the times. Along with the change in the form of social development, higher education has also undergone a corresponding major development or popularisation. Universities cooperate in teaching, scientific research and social services to achieve certain goals or actions through joint investment and efforts, thus realising intercollegiate cooperation. To meet the needs of social development, intercollegiate cooperation has increasingly become one of the basic ways to make full use of resources and create conditions, and its strategic significance for the coexistence and co-prosperity of universities is realistic, and for the cultivation of comprehensive applied talents is in line with the needs of the times.

China's automotive industry is also undergoing continuous transformation and upgrading, with cars constantly developing in the direction of electrification and intelligence. The Chinese automotive industry is also in dire need of innovative, practical engineering training and highly qualified and complex vehicle professionals to improve the core competitiveness of domestic vehicles. In order to better achieve this goal, institutions of higher learning that specialise in vehicles need to focus on acquiring more resources to strengthen their professional development, enhance students' comprehensive capabilities, deepen the reform of school-enterprise cooperation, and keep pace with the times to explore new talent training models.

2. Overview of Intercollegiate Cooperation

With the development of society, school ideology tends to be diversified, school forms tend to be diversified, school directions tend to be characterised, and intercollegiate cooperation is increasingly valued by all schools.

Intercollegiate cooperation is a manifestation of the relationship between universities, which can promote effective communication and cooperation between universities, share the concept of schooling and promote the development of universities to achieve "1+1>2"[2]. The cooperation between universities is a reflection of the relationship between universities. In order to improve the quality and efficiency of school running, the two sides can have access to more and newer resources through information sharing, exchange of practices and resource sharing, providing opportunities for both sides to learn from each other and make full use of each school's own advantages, so as to improve the quality of teaching.

At present, intercollegiate cooperation is not a mature project and there are still many problems. Due to the limitation of geographical area, the object and content of cooperation have certain limitations. Intercollegiate cooperation is mostly based on cooperation in the same city or province, and it is common for comprehensive universities and engineering universities to become the closest partners[3]. There is little willingness to collaborate between schools and teachers, with teachers themselves immersed in the classroom and students unable to give appropriate feedback.

As Internet teaching can break geographical space restrictions, educators can teach face-to-face through channels such as online videos and online classes, or record teaching videos for students to watch and learn[4]. This will enable cross-territory cooperation, and intercollegiate cooperation will eventually be the future trend of talent training mode.

3. Training Objectives and Problems of Vehicle Professionals

With the development of network and information technology, the automobile is no longer limited to the traditional machinery, but integrates the automobile with electronics and intelligence, and the automobile industry has entered into a brand new field. New energy, electrification, intelligence, networking and sharing are the new trends in the development of automobiles, and driverless has also become a research goal of the automotive industry. Driverless integrates artificial intelligence, automatic control, architecture, visual perception and computing, and is a product of the times in the development of pattern recognition, intelligent control technology, computer science and vehicle engineering, and is also a measure of a country's industrial level and stage of technological development an important symbol of a country's industrial level and technological development stage[5]. It is also an important indicator of a country's industrial level and technological development stage. This undoubtedly places a higher demand on the level of vehicle professionals.

3.1. Objectives of Training for Vehicle Professionals

The vehicle course aims to cultivate senior applied talents and management personnel with solid basic theoretical knowledge and professional knowledge, strong practical and hands-on ability, as well as good engineering quality, professional ethics and humanities and science quality[6]. The major of vehicle engineering is aimed at cultivating senior applied talents and management personnel with good engineering quality, professional ethics and humanities. With the development of the Internet and computers, as well as the application of electronic devices and technologies such as Netlink in automobiles, electronic information, automatic control and intelligence are more and more widely used in automobiles[7]. The vehicle industry is becoming more and more widespread. Today's vehicle majors are all complex majors involving multi-disciplinary crossover. Based on the demand for vehicle talents in the new industrialisation era of new technologies and industries, China's vehicle talents should have at least the following abilities and qualities.

1. A good grounding in the subject matter and a proficient grasp of vehicle expertise and other basic professional disciplines are the basis for future practical problem solving and improved innovative and practical skills.
2. With a deep cultural cultivation, vehicle talents as part of the new engineering talent should have a certain cultural cultivation and cultural awareness, with cultural cultivation and cultural awareness of the people more conducive to the long-term development of the future.
3. have strong practical ability, improve students' practical education, provide excellent practical environment and practical capacity, practical ability is the key ability of vehicle class talents.
4. Have good innovation ability, innovation is the way to development, the key ability to adapt to the new industrial development is innovation, vehicle professionals must have the ability to innovate.
5. have good moral cultivation, vehicle professionals are part of the talent, the basis of talent is to have excellent moral quality, moral cultivation is the root of success.

3.2. An Analysis of the Problems of Training Talents in the Vehicle Class

In order to respond positively to the reform policy in education, in September 2014, the Liaoning Provincial Department of Education launched the first pilot work of intercollegiate credit study in general universities to carry out the mutual recognition of intercollegiate credit study in the province. in January 2016, the Liaoning Provincial Working Committee of Higher Education of the CPC Liaoning Provincial Committee and the Liaoning Provincial Department of Education jointly issued the "Work Points of the Provincial Department of Education (Provincial Working Committee of Higher Education of the CPC Liaoning Provincial Committee) in 2016", which clearly emphasized "Promoting intercollegiate study courses and mutual recognition of credits based on high-quality open courses and online learning platforms". Currently, several universities in Liaoning Province have joined the camp of intercollegiate cooperation. In terms of platform construction, the province to build a number of online education platforms, and the organization of a number of professional educators to clarify course content[8]. However, there are still some problems in the process of cooperation in our province:

1. There is no professional regulatory body and a lack of uniform standards.
2. The content of the platform built is not complete and the platform is not sufficiently regulated.
3. Students are not sufficiently motivated and only view the videos as a task, rarely offering their own opinions.
4. The practice is too formal and not integrated with the theoretical basis.

5. Since 1999, although the number of full-time teachers in higher education in Liaoning Province has grown rapidly, the student-teacher ratio has grown even more rapidly, and there is a clear shortage of teachers, with the growth rate of teachers not meeting the needs of the growing student population^[9]. The growth rate of teachers has not been able to meet the needs of student growth.

4. The Exploration and Practice of Vehicle Class Talent Training Mode

4.1. The Impact of Intercollegiate Cooperation on Talent Development

Intercollegiate cooperation can achieve resource sharing and complementary advantages between universities, enabling schools to enhance their competitiveness and get better development.

1. Realising the sharing and collision of teaching ideas. Intercollegiate cooperation can promote sharing in terms of teaching resources between partner schools, and also promote the exchange of teaching ideas among teachers from different universities, strengthening the communication and contact between universities, seeking common ground while reserving differences, arriving at more advanced educational ideas and promoting innovation in thinking.

2. Propose an innovative talent training model. What universities need to cultivate nowadays is no longer the traditional single-specialist talents, but to cultivate complex and high-quality talents. The partner universities break the boundaries of schools and provide students with different teaching platforms and educational environments. The setting up of mutual credit recognition and intercollegiate course selection provides students with different teaching methods, which is conducive to developing students' thinking and stimulating their interest in learning, and helps students experience the environment of different schools and receive diversified education. At the same time, mutual exchanges between universities can also realise the complementary advantages between universities and promote the development of each other's universities.

3. Promoting intercollegiate cooperation for a win-win situation The improvement of intercollegiate cooperation makes universities no longer engage in shallow and inefficient exchanges, not only limited to campus visits and research exchanges, but deeper academic discussions, giving students from both sides enough space to exchange and learn. For example, joint construction of exchange platforms, or joint completion of research projects.

4.2. Exploration of Cultivation Models

In view of the impact of intercollegiate cooperation on talent training, each university should combine the current type of vehicle class talent demand, according to their own situation, determine the training objectives for students, around the engineering practice ability and innovation ability, humanities and comprehensive ability to develop training plans, focus on training students' practical ability and multidisciplinary comprehensive professional ability, highlighting professional characteristics. Intercollegiate cooperation is more beneficial to the cultivation of vehicle professionals, through the cooperation with other schools to cultivate, can better improve the school teaching level. For example, joint training, mutual recruitment of teachers and construction of teaching materials are carried out according to the faculty of different institutions. Highlights are described below.

1. Improving the quality of the curriculum and the competence of teachers The excellent quality of lectures in universities provides the basic guarantee for intercollegiate cooperation. While ensuring the stable development of our high-quality subjects, we must also make every effort to improve our disadvantaged subjects, which requires higher professional competence and lecture levels of teachers.

In order to improve teachers' abilities and strengthen the teaching force, schools may choose to implement a teacher sharing and cooperation model, which means that teachers from two schools are recruited from each other. Different schools and teachers have different teaching philosophies and educational methods, providing a platform for teachers to exchange ideas, promoting innovation in teaching philosophy and learning from each other among different teachers, greatly enhancing their research. At the same time, students can be subjected to a variety of teaching styles and choose the right teacher according to their own personalities, which helps to enhance students' enjoyment and motivation towards learning.

2. Reasonable selection of cooperation targets and contents. All universities are different from each other in terms of disciplines, levels, resources, goals and needs of cooperation, which may affect the implementation and effectiveness of intercollegiate cooperation[10]. These factors may affect the implementation and effectiveness of intercollegiate cooperation. Therefore, this choice is inevitable. When choosing universities, we should not only consider geographical factors, but also the strengths of the cooperating universities in terms of subjects and professional levels, so as to rationalize the complementary advantages and resource sharing between universities.

3. Improve the practice platform. Make full use of the advantages of the practice platform to expand safe places that can meet the daily practice and internship of students, so as to realize the combination of theory and practice. At the same time, universities can also choose to cooperate with enterprises, which will not only improve students' scientific research, provide them with standardised and safe internship opportunities and make full use of their holidays, but also deliver standardised and targeted professionals to enterprises, thus increasing the employment rate.

4. Abandon traditional thinking and adapt to the times. Both leaders, teachers and students should gradually accept the trend of cooperation and encourage teachers and students to communicate with partner schools. Intercollegiate cooperation is no longer about universities fighting alone, but about integrating the teaching resources of superior and inferior schools, so that superior schools can give greater play to their strengths and inferior schools can not only get more opportunities to improve their students' abilities, but also learn about their weaknesses so that they can improve and become a better individual, cultivating complex talents to meet the needs of society.

5. Put aside geographical constraints and choose online lectures at the right time. Online lectures should be chosen for courses that are highly theoretical and whose content will not change significantly in a short period of time. Students' awareness of online learning should be raised, training for teachers in online teaching should be strengthened, and a system should be established to manage the lecture platform.

6. Establish a professional management body. This body needs to be fully responsible for the coordination of the content of intercollegiate cooperation, while appropriate policies need to be put in place to ensure the smooth running of the cooperation. A suitable management system should be developed according to the different modes of cooperation and according to local conditions. In the case of credit-sharing cooperation, the institution's staff should establish a uniform mechanism to ensure fair credit transfer; in the case of teacher-sharing cooperation, the institution should assess the competence of teachers to ensure the quality of teaching; in the case of online teaching, the institution should update the online resource library and manage the online environment in a timely manner, etc.

4.3. Practice of the training model

In order to improve the overall ability of students, Liaoning Province has implemented an intercollegiate cooperation project for the joint training of undergraduates, regarding the training of talents, based on the characteristics and faculty of the partner institutions offering

vehicle courses, and then combining the teaching expertise of teachers and specialised courses. Considering the different courses and corresponding institutions, majors and credit hours, a number of Shenyang University of Technology teachers are employed by other institutions with vehicle majors to conduct online or offline teaching, which can greatly improve teaching efficiency and make up for the teaching deficiencies of the school.

Implemented a teacher mutual recruitment strategy to improve students' academic ability. Thirteen teachers from Liaoning University of Petroleum and Chemical Technology, Shenyang Agricultural University, Shenyang University of Aeronautics and Astronautics, Shenyang Engineering College and Shenyang Institute of Technology were appointed as co-directors for the graduation design of Shenyang University of Technology in Vehicle Engineering, Transportation, Energy and Power Engineering and Armored Vehicle Engineering, including five professors, four associate professors and four lecturers. Two teachers from Shenyang Polytechnic University were appointed to supervise 4 students in Vehicle Engineering of Liaoning University of Technology. Through the mutual appointment of teachers to supervise students' graduation design, we can solve the situation that our teachers are not competent enough in individual fields of vehicle engineering, provide good learning opportunities for students and improve their scientific research ability.

In order to improve the richness of teaching content, the universities have integrated their resources, and many universities have combined their knowledge to jointly build teaching materials for vehicles, led by Shenyang University of Science and Technology, jointly with Liaoning University of Technology and Shenyang University to write the Experimental Course on Vehicle Performance and Testing; led by Shenyang University, jointly with Shenyang University of Science and Technology, Shenyang Engineering College and Shenyang Institute of Science and Technology to write the Vehicle Network Technology" and "Vehicle Operation Materials"; "Vehicle Finite Element and Optimization Design" led by Shenyang University of Technology and jointly prepared by Liaoning University of Technology, Liaoning University of Engineering and Technology and Shenyang University of Technology was awarded the provincial excellent teaching materials in 2020. Through the joint construction of teaching materials, it can enrich the teaching content of vehicle class, get rid of the teaching of a single mechanical class knowledge, consider the application of multidisciplinary knowledge in vehicle class, promote the cultivation of compound vehicle class talents, and realize the sharing of teaching resources in universities.

For the cultivation of students' practical ability, we can provide students with a high-quality practical platform through school-enterprise cooperation and other means. Shenyang University of Technology is a university jointly built by the National Bureau of Defense Science and Technology Industry, China Arms Industry Group and China Arms Equipment Group and the Liaoning Provincial People's Government, mainly serving the military industry and the local economic construction of Liaoning Province, and the university is positioned to build a first-class high-level application-oriented university in the province. The School of Automotive and Transportation has majors in Vehicle Engineering, Transportation, Energy and Power Engineering and Armored Vehicle Engineering[11]. The School of Automotive and Transportation has majors in Vehicle Engineering, Transportation, Energy and Power Engineering and Armored Vehicle Engineering. Through years of construction, the college has cooperated with many factories, automobile industry companies, automobile research institutes and other enterprises to jointly establish off-campus practical education bases, which can provide students with good practice opportunities, so that students can combine theory with practice, have a deeper understanding of the profession, and give full play to the advantages of the new education mode of practical education.

The implementation of these programmes has enabled the integration of university resources, while promoting cooperation between universities and helping to improve the overall abilities of students, which is beneficial to the training of well-rounded vehicle professionals.

5. Conclusion

The talent cultivation mode under the perspective of intercollegiate cooperation is of great significance to the transformation and development of colleges and universities, especially for the development of application-oriented college education. In this paper, we take intercollegiate cooperation as the starting point to explore the cultivation mode of current vehicle talents, in order to adapt to the new system of the current development of the automobile industry to the needs of vehicle professionals, we propose that the cultivation mode of vehicle professionals should be combined with the characteristics of their own profession, pay attention to the comprehensive and practical nature of the knowledge learned by vehicle professionals, and improve the quality of teaching, enrich the subject content and enhance the strength of teachers through joint training and other means. Cultivate high quality composite automotive talents with excellent professional quality, high innovation and practical ability, and strong interdisciplinary integration ability, so as to make contributions to China's automotive industry.

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