

## **The Training Program of Vehicle Engineering Professionals under the Background of New Engineering**

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**Abstract:** With the rise of new automotive technologies in the three major themes of safety, energy saving, and environmental protection, especially the rapid development of smart connected automotive technology, new requirements have been placed on the professional capabilities of vehicle engineering students. This paper combines the current status of new technology development in today's society with the problems faced by the vehicle engineering major, and proposes a professional talent training program that is ability-oriented, which is ability oriented, establishing characteristic professional curriculum system, ensuring practice effect and setting up new talent training target. Vehicle engineering characteristic compound talents with excellent comprehensive quality, strong professional quality, outstanding practical ability and strong interdisciplinary learning ability are cultivated, so as to improve the market competitiveness of vehicle engineering professionals in the new situation.

### **1. Introduction**

With the continuous emergence of new technologies, new energy sources, and new industries, the new round of industrial technology revolution has been pushed to the highest point. The rise of new science and technology and the birth of new majors have a great impact and challenge on the traditional engineering education [1]. Since February 2017, the Ministry of Education has actively promoted the construction of new engineering subjects, and has formed the "Fudan Consensus", "Tianda Action" and "Beijing Guide". It also released the "Notice on the Development of New Engineering Research and Practice" and "Notice on the Promotion of New Engineering Research and Practice Projects" and other relevant policies to fully explore the Chinese model and Chinese experience leading the global new engineering education[2].

Vehicle engineering is a traditional engineering major with a high degree of interdisciplinary, which integrates many professional features such as electronic technology, engineering mechanics, computer technology and artificial intelligence, design and physical and chemical materials [3, 4]. The vehicle engineering teaching curriculum training program is similar to the traditional mechanical majors, but due to its high interdisciplinary, it also determines that it must follow the footsteps of new engineering science and technology development[5]. The construction of "new engineering" is a new model of engineering education development, which requires the vehicle engineering major to pay more attention to high quality, high skills and innovation in personnel training.

### **2. The problems faced by the vehicle engineering major in the Application-oriented Universities under the background of new engineering**

#### **2.1. Weak professional quality**

The major of vehicle engineering in most colleges and universities in China is mainly to train application-oriented talents, while research-oriented talents are few. The theoretical knowledge education received by the students majoring in vehicle engineering is often difficult to keep pace with the times. More importantly, they simply understand the basic knowledge related to vehicles. There are very few graduates who can be put into the front line of the national automobile industry immediately after graduation [6]. The professional quality of the graduates majoring in vehicle engineering is difficult to adapt to the rapid development of the current automobile industry As well as the higher requirements of the automobile industry for specialized talents. The contents of the talent training program in Colleges and universities are the same, and the curriculum system they have learned is not the same, which leads to the fact that there is not much difference between the graduates of vehicle engineering major and the graduates of traditional mechanical major after graduation, and they lack the characteristics of vehicle engineering major [7].

## **2.2. Poor practical ability**

In the four-year study, the major of vehicle engineering is mainly based on theoretical knowledge, and the practical ability of undergraduates is often inversely proportional to their theoretical mastery ability. Practice is the only standard to test the truth, but there are very few colleges and universities that can provide effective practical courses for students majoring in vehicle engineering [8, 9]. Most colleges and universities can provide few practical opportunities, but few undergraduates can make full use of these few practical opportunities. Therefore, students can clearly distinguish the parts of the engine parts drawing in the textbook, but they do not know the real engine parts.

## **2.3. Weak comprehensive ability**

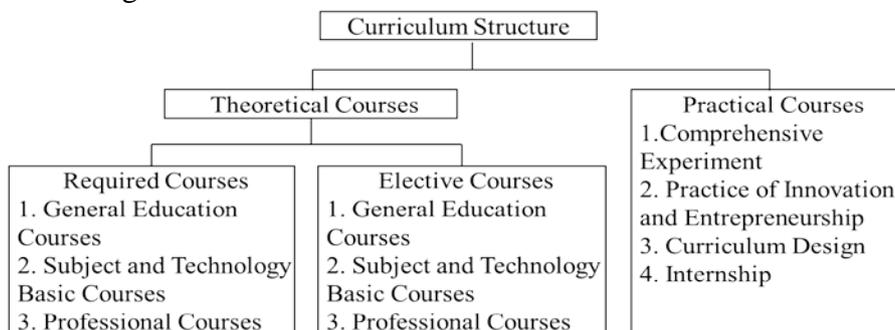
The undergraduate major of vehicle engineering aims to train application-oriented compound senior professionals with solid foundation of mechanical manufacturing technology and electronic information processing technology, basic theory, knowledge and practical skills in modern vehicle design and manufacturing and production management. Under the background of new engineering, the development of new economy is inseparable from the rise of new industries, and the rise of new industries is inseparable from the support of new specialties [10]. The new scientific and technological talents cultivated by new majors have not only excellent professional quality, but also new scientific and technological thinking and comprehensive learning ability. As an undergraduate student of vehicle engineering, the comprehensive abilities such as interdisciplinary integration ability, self-study ability and innovative practice ability are essential. The training programs of vehicle engineering professionals in Colleges and universities often limit the development of students' comprehensive abilities to a certain extent, and it is difficult for students of vehicle engineering to adapt to the work of automobile industry in the context of new engineering after graduation Research on rhythm and interdisciplinary professional knowledge in graduate stage [11]. In view of the above three aspects, this paper intends to explore the new talent training program of vehicle engineering under the background of new engineering in today's society, aiming to provide some ideas for improving the training mode of vehicle engineering in Colleges and universities across the country.

## **3. Study on personnel training program of vehicle engineering under the background of new engineering**

### **3.1. Establishing characteristic curriculum system**

Vehicle engineering is an interdisciplinary and complex major, but now the weak professional knowledge of undergraduate students has been unable to meet the development of new technology. Therefore, under the background of new engineering, the major of vehicle engineering should conform to the trend of the times, actively absorb the world's advanced automobile theory and emerging technology, keep pace with the times, build a complete set of new characteristic curriculum

system based on the basic knowledge of traditional machinery for students, and further subdivide the characteristic direction in the original training scheme of vehicle engineering major, such as airport specialty Vehicle direction, new energy vehicle direction, etc. On the one hand, it can cultivate students' comprehensive professional quality, on the other hand, it can improve students' self-study ability, and it can really be a compound talent that can be developed in many aspects. Characteristic curriculum system as Figure 1.



**Figure 1.** Characteristic curriculum system

### 3.2. Strengthen the cultivation of practical ability

Increase the proportion of practical class hours, divide the students into different groups and carry out practical exercises in multiple batches. A teacher leads a small number of students in a group to carry out teaching practice, maximizing the distribution effect of limited teacher resources on students, reducing the burden of teachers, and reducing the risk coefficient. In addition, the theory course is the basis of students' learning. Therefore, we should combine the theory course with the practice course and the innovation ability development to enter the students' classroom. It is the key to improve students' innovation ability and practice ability to infiltrate the competition experience of various disciplines of automobile in the new curriculum system, cultivate students' literacy, consciousness and ability to write invention or utility model patents, and strengthen the effective expansion of professional knowledge and comprehensive ability of the curriculum. The training system of tutor system has been implemented for students majoring in vehicle engineering, and students will carry out practical activities and innovative research relying on tutor projects or practical topics. At the same time, under the guidance of the tutor, students can also form a relevant task team, actively apply for the innovation and entrepreneurship training plan of college students with the task team as the unit, and select the project topics according to their personal interests and professional knowledge. Each student participating in the project not only further consolidates the basic theory and professional knowledge they have learned, but also solves the practical technical problems through team cooperation, so that the innovation consciousness, development ability and team cooperation ability of the project members can be comprehensive

### 3.3. Establishing the training mechanism of University Enterprise talents

With the rapid development of new energy automobile industry, the college has established close cooperation with a number of automobile enterprises. With the help of the cooperation between the college and enterprises, it continues to expand the off campus practice and practice base of vehicle engineering major. By regularly organizing students to practice in the enterprise, it further improves the professional quality and practical ability of students, and cancels the social production practice and practice in advance Cutting edge equipment manufacturing technology helps to improve students' innovation awareness and level. In order to cultivate excellent applied talents, we need an excellent teaching team. For the vehicle engineering specialty, we need a "double teacher" teaching team. Teachers should not only have a solid professional theoretical basis and teaching experience of college teachers, but also have rich professional practice experience of senior engineering technicians. This puts forward higher requirements for teachers and the establishment of a good teaching team plays a very important role in training application-oriented vehicle engineering students. On the one

hand, we should actively introduce excellent talents; on the other hand, we should strengthen the training of internal teachers. Every summer, we should send teachers to the enterprise for engineering training to understand the advanced new technology, knowledge, technology and methods of the enterprise, and at the same time, we should make full use of the opportunity of production and learning cooperation to directly obtain advanced technology and management experience from the production line, so as to lay a good foundation for the realization of teaching objectives Foundation.

## Summary

Under the background of new engineering, the training of vehicle engineering students needs to be carried out from the aspects of integration concept, in-depth integration system, student assessment method, characteristic curriculum system, construction of teaching staff, construction of practice platform, school enterprise cooperation, etc. Based on the preliminary study of the training plan of vehicle engineering talents, this paper puts forward that the training of talents should be guided by ability, set up a special professional system, further develop the practical ability of students, strengthen the cooperation between schools and enterprises, and combine with the new demands of the automobile industry, keep pace with the times, so as to cultivate compound professional talents with excellent professional quality, strong practical ability and high comprehensive quality.

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