Research on the Training Mode of "Vehicle + Transportation" Talents under the Background of Intelligent Internet Connected Automobile Industry

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Abstract: According to the needs of the society for the transportation professionals in the Application-oriented Undergraduate Colleges under the background of the intelligent network association, and the professional characteristics of the transportation discipline in the direction of intelligent transportation in the vocational and Technical Normal University, the teaching reform and exploration of the transportation specialty are carried out from the aspects of curriculum system design, teaching resource development, faculty construction, laboratory construction, school enterprise cooperation, etc., in order to form It has become a high-level application-oriented talent training model guided by social needs.

1. Introduction

The intelligent production represented by "German industry 4.0" has triggered a new revolution in the industry. In response, the Chinese government put forward the "China 2025" and "Internet plus development strategy", which accelerated China's new round of technological innovation. Environmental awareness, planning and decision-making, control and information interaction are integrated high-tech complex, and the emergence of intelligent vehicles is the right time [1]. With the continuous optimization and adjustment of the automobile industrial structure, the demand for technical capabilities of transportation experts has also changed. As an important platform for cultivating talents with high application as the goal, undergraduates must follow the social needs and take improving the quality of reform and exploration talents as the goal.

2. Talent Demand Analysis

In order to solve urban congestion, promote investment and economic development, many cities in China are actively developing urban rail transport. By the end of 2015, there were 116 urban rail lines in 26 cities in China. At present, with the approval of the national development and Reform Commission, 42 cities (including completed cities) have railway construction plans. According to the construction plan and development trend, about 10000 km of railway will be built by 2020 [2]. In terms of actual demand, the urban population is more than 3 million and the urban GDP is more than 10 billion yuan. If these cities with potential demand build 50 km of railway transportation, it will reach about 12000 km according to the planned mileage of China's railway transportation in 2020. The average number of employees per 1 km is 50~80. According to this calculation, the demand for relevant personnel is 400000 to 600000. Therefore, in the field of railway transportation, the strong demand for talents will be maintained for a long time. However, under the current domestic education system, it is difficult to meet the demand in quantity and quality. It is urgent to explore and establish a new training mechanism.

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Table 1 Global hot technology patents in China and total patents of local hot technology in China

Hot technology IPC classification number	Global patent volume in China	Domestic patent volume in China
G08G	144	388
B60W	79	61
G01C	52	49
B60R	33	183
G05D	35	144

3. Training Status at Home and Abroad

3.1. Training of Foreign Talents

Railway transportation in developed countries has begun. For example, London Underground in England was implemented in 1863, and its talent training system and model have been gradually improved after more than 100 years. As a manufacturing country, Germany is the forefront of school enterprise cooperation, and many technology application universities will continue to provide qualified personnel for enterprises. General training engineering experts in foreign countries[3]. For example, the aetec 2000 engineering education system has been established in the United States. Applied technology is a general extended training term for German universities to cultivate strong practical ability and professional personnel to solve the problems of professional application theory and production practice. In Japan, two basic courses, engineering design and engineering design, are offered to independently solve students' skills and abilities. The curriculum reform in Singapore is mainly employment oriented. The development of China's railway transportation is relatively backward, and the enterprise management system and university training system are totally different from those of foreign countries. Foreign experience can be used for reference, but more needs can be combined with the existing national conditions to explore the talent training system of railway with Chinese characteristics.

3.2. Personnel Training of Domestic Traditional Railway Colleges and Universities. Domestic Ownership Track

The establishment of universities in the transport province and most of them in the old railway province. The goal of their professional setting and personnel training is the goal of large-scale railway system and railway machinery manufacturing enterprises in the past. Take Jiaotong University in the southwest of the first domestic Railway University as an example, its professional department is very good[4]. The training of railway transportation related talents is scattered in different universities and specialties. Strong staff, graduates with solid theoretical basis and high level of professional knowledge. However, the disadvantages are obvious. Too detailed professional departments will bring insufficient range to students' level knowledge. For example, the students who study transportation do not know transportation at all, otherwise, the students who study transportation knowledge are very lack of vehicle knowledge. At the same time, focusing on theory and ignoring the tradition of practice makes graduates popular in research institutions and manufacturing units. However, it is difficult to give full play to the advantages of operating units in the subway. However, some graduates lack of theoretical knowledge. Take Tianjin Railway Vocational and Technical College as an example[5]. Its urban rail system includes urban railway engineering, urban railway undertaking, urban railway vehicles, urban railway control and urban railway power supply. At present, there are 42 classes and more than 1000 students in urban railway, including 1000 classes. It has a lot of experimental training equipment, focusing on the actual training. Later, during the three-year academic system and practical training, it is difficult or difficult for students to learn theoretical knowledge in a short period of time so that they can get better development in practical work.

3.3. The Construction of the New Curriculum System of Rail Transit in China.

China's railway transportation industry has developed well, and many non-traditional railway universities have been employed to provide employers with urgently needed majors in transportation. However, from the perspective of students' research and employment, the results are not satisfactory. The position of the circle specialty is not clear. Professional orientation is the first element of professional construction, which belongs to the high-level design of professional construction[6]. For example, the purpose of training for a certain urban railway transportation specialty is to have the relevant basic knowledge, basic theory and basic method of urban railway transportation industry, to be able to engage in the "comprehensive" professional teaching staff of this specialty, or to be a senior job who can engage in urban railway transportation applicable to experts. Training objectives are too broad and need to be clearer. The breeding system is not perfect. Some newly established professional experience and lack of accumulation. After the panic setting, the focus is not obvious because the composition of the guiding team and the training system are not completed[7]. As a result, students do not have systematic knowledge and experience. Employer needs.

Table 2 Global and Chinese distribution of hot technology patents of ICV

IPC	Global patents		Global patent in China		Domestic patent in China	
	Ranking	Patent amount	Ranking	Patent amount	Ranking	Patent amount
G08G	1	2104	1	144	1	331
B06W	2	924	2	79	12	61
G01C	3	777	14	52	14	39
B60R	4	551	19	33	3	118

4. Social Demand of Transportation Professionals under the Background of Intelligent Internet Connection

Artificial intelligence promotes driverless driving. Since 2016, China has started to develop smart cars. On July 20, 2017, the national conference published the "new generation of artificial intelligence development plan" and emphasized the ideal application areas of the combination of artificial intelligence technology, autonomous driving, intelligent transportation and artificial intelligence technology in the plan. The emerging industrial intelligent delivery vehicle is also one of the main topics of the plan. To meet the needs of talents in today's society and the characteristics of applied undergraduate education talents, master the basic theoretical knowledge, technical basis and innovative practical technology in the field of transportation graduates, knowledge transportation technology and knowledge vehicle application, as well as the installation and test of intelligent vehicle equipment, as well as the application and maintenance of intelligent transportation tools, we can put "human senior technical talents and management of road vehicle environment" System integration, traffic information collection and processing.

5. On the Mode of Personnel Training

5.1. Insist on Differential and Step-By-Step Training

The demand for talents in railway transportation is different at different levels. Before, employers and universities didn't quite understand that[8]. This is that some high-end talents are utilized, and low-end talents are "powerless", which indirectly leads to an increase in the burden of enterprise staff training. The author believes that personnel training must follow a clear level. For example, traditional railway universities such as Southwest Jiaotong University must insist on training high-end talents, most of whom are sent to scientific research institutions and production enterprises for research and development and technical work. Vocational colleges will, according to their own positions, train talented students in trams with lower theoretical requirements and higher operating conditions. For example, bogias enbura is the basic work of manufacturing enterprises

such as brake brake and brake pad exchange. Graduates and universities should adhere to the status of undergraduates as graduate students and application engineers, and engage in the theoretical and practical requirements of maintenance engineers and dispatchers.

6. Insist on Compound Cultivation

Track is a complex system, including control, signal, transportation, vehicle, electrical and many other mainstream. Setting up too detailed experts makes it difficult for students to access the bypass, which is more difficult to meet the needs of employers [9]. The cultivation of students should be diversified and complicated. Students studying transportation must understand the basic structure and knowledge. In this way, students not only have good jobs, but also have a broader development space from the field of railway transportation.

6.1. Adhere to Application Oriented Training

School training cannot be divorced from actual needs. Regular discussions with employers, market demand or research in collaboration with schools and enterprises in implementation must be used to develop training objectives. For example, the training of high-speed rail drivers, due to the line jump, the current demand gap of high-speed rail drivers is very large, and the driver seems simple, in fact, it is a very serious post. Not only that, we also need to understand the structure and principle driven technology of some vehicles. In addition, understand signals and dispatch[10]. Enterprises usually spend a lot of time and energy to train a qualified driver. In view of the above characteristics, it is necessary to deal with them during the period of further study in schools. For example, the construction of vehicles and traffic, etc., need to have a corresponding route. In addition, in order to deal with this situation, the knowledge of railway vehicle safety and maintenance must be set. The same device needs to be set up by the taxi for your driving skills training simulation.

Table 3 Main Chinese and global owners of domestic ICV patents

Patent owner	Patent amount	Patent owner	Patent amount
Currency	288	Ford	41
Bosch	184	Chery	39
Porsche	104	BMW	27
Modern	84	Shanghai Jiaotong University	23
Auspicious	66	Samsung	23

6.2. Optimization Design of Curriculum System

Cooperate with enterprises to design application-oriented graduate transportation technology route system to meet market demand. We will give full play to the role of schools and enterprises in building curriculum teams, and create a number of characteristic courses according to the needs of industrial development.

7. Conclusion

There is a long way to go for the reform of the transportation personnel training system. This is a practical summary of continuous experience, and the basic goal of comprehensive practical personnel training required to track the development of the industry is to meet the needs of the industry, strengthen the continuing education staff, and strengthen the construction link for better construction.

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