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Research on the Coculture Model of Vehicle Engineering Graduate Students under the Concept of Innovative Coordination and Open Sharing

Jingyue Wang[1], Junnian Wang[2], Jianming Ding[3], Wenjun Luo[4]

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

[2]National Key Laboratory of Automotive Chassis Integration and Bionics, Jilin University, Changchun 130025, China

[3] State Key Laboratory of Rail Transit Vehicle System, Southwest Jiaotong University, Chengdu 610031, China

[4]State Key Laboratory of Mechanical Transmissions for Advanced Equipment, Chongqing University, Chongqing, 400044, China

Abstract

With the continuous development of technology and social progress, the demand in the field of vehicle engineering is constantly increasing, which puts forward higher requirements for talents. In response to the current problems of a single training mode for graduate students in vehicle engineering, scattered mentor resources, insufficient practical links, and a single evaluation system, this article proposes a training mode for graduate students in vehicle engineering based on the concepts of innovation coordination and open sharing. A new joint training model for graduate students in vehicle engineering has been established through reshaping the curriculum system, collaborative training with mentor teams, co construction of practical bases, and reconstruction of evaluation models. The aim is to build a more flexible, open, and mutually beneficial training system to assist in the cultivation of innovative and applied graduate students in vehicle engineering. To cultivate high-level and high-quality innovative applied graduate talents through reform to meet industry demands.

Keywords

Innovation coordination; Open sharing; Vehicle Engineering; Postgraduate; Coculture.

1. Introduction

With the rapid development of the automotive industry, the demand for high-level talents is increasing day by day. The cultivation of graduate students in vehicle engineering is the main way to achieve the supply of high-quality and comprehensive automotive talents. During the entire learning process, graduate students majoring in vehicle engineering not only need to master solid theoretical knowledge, but also possess practical and innovative abilities, applying knowledge to scientific research and development, applied research, etc. in this field[1]. Given that China's automotive industry is transitioning towards new energy vehicles, graduate students in the field of vehicles in China need to master knowledge in multiple disciplines such as mechanics, electronics, and materials[2]. Therefore, to achieve this goal, joint training of vehicle related graduate students is the most effective way to cultivate high-quality composite new energy vehicle technology talents to support the transformation and upgrading of China's automotive industry.Reform the training methods for graduate students based on the development concept of "innovation, coordination, openness and sharing".. By innovating the

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training mode and practical methods of graduate students, the education mode of graduate students can be better changed, and the comprehensive level of talent cultivation can be greatly improved[3].

In order to better cultivate graduate students in vehicle engineering with interdisciplinary comprehensive abilities, this study proposes a joint training model for graduate students in vehicle engineering based on the concept of innovation coordination and open sharing.

2. Innovative Coordination, Open Sharing Concept

The core concepts of this study are innovation coordination, open sharing concept, and innovation coordination. This concept takes innovation as the new driving force, coordination as the new approach, openness as the new opportunity, and sharing as the new goal, in order to solve the problems faced by current education development and improve the quality of education[4]. Innovation coordination aims to break down traditional disciplinary boundaries and promote the cross integration of knowledge and technology from various related fields. Open sharing emphasizes the sharing and cooperation of resources, making the cultivation system more flexible and open. These two factors together create a conducive environment for cultivating graduate students with innovative abilities and interdisciplinary literacy.

In the face of the rapid development and constantly emerging new problems in the field of vehicle engineering, the traditional graduate training model is becoming increasingly outdated and narrow. In order to better adapt to the needs of the times, this study introduces the concept of innovation coordination and open sharing, and based on this, rethought the way of cultivating graduate students in vehicle engineering.

Firstly, the introduction of the concept of innovative coordination aims to break down the barriers of traditional disciplinary fields and promote the cross disciplinary integration of knowledge and technology between different disciplines. The integration of knowledge from multiple disciplines in the field of vehicle engineering technology often leads to students being overly specialized and lacking comprehensive application abilities through traditional training models. Through innovative coordination, we can design a series of interdisciplinary core courses that enable students to comprehensively understand and grasp various aspects of vehicle engineering.

Secondly, the introduction of the concept of open sharing breaks through the closed academic environment in traditional training models, emphasizing the sharing and cooperation of resources. Under the guidance of open sharing, we can establish close cooperative relationships with other universities to achieve resource sharing. This includes introducing high-quality course resources from other universities, jointly forming mentor teams, and building practical bases. By collaborating with other universities, students can learn in a broader academic environment and be exposed to the research atmosphere and ideological concepts of different schools, providing strong support for their cultivation of cross-cultural and interdisciplinary comprehensive literacy.

Overall, based on the concept of innovation coordination and open sharing, a more flexible and open graduate training system can be constructed. This system can meet the demand for high-level and comprehensive technical talents in the field of vehicle engineering. Guided by this philosophy, we will better adapt to the demand for talent in modern society and promote education and research in the field of vehicle engineering towards a more cutting-edge and comprehensive direction.

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3. The Current Status of Graduate Education in Vehicle Engineering

At present, many universities generally train graduate students in the field of vehicles through professional courses and scientific research training, and graduate students are limited to learning knowledge related to the research topic throughout the entire research process. In the process of cultivating graduate students in the field of vehicles, universities will implement joint training methods such as school enterprise cooperation and academic exchanges between universities. The specific situation is as follows.

3.1. Culture method

Vehicle engineering graduate students are mainly divided into professional graduate students and academic graduate students. Professional graduate students aim to cultivate applied engineering and technical talents, with a focus on developing their practical abilities; Academic graduate students focus more on the study of vehicle engineering theory. Therefore, universities have different curriculum settings for professional and academic graduate students in the training process of vehicle related graduate students. At the same time, there are also differences in the training program, implementing a school enterprise dual mentor training system for professional graduate students [5]. This can train graduate students in the field of vehicles from two aspects: theoretical research-oriented talents and technical application-oriented talents, but there are also some problems in the actual training process.

3.2. Current issues

3.2.1. The graduate education model is single

The cultivation of graduate students in the field of vehicle engineering is mainly based on the results of their research papers. Therefore, during the graduate period, they focus on the process of completing their papers, and throughout the entire research process, they mainly read literature, simulate calculations, and conduct bench tests. There is relatively little cultivation of practical application research in enterprises, and the evaluation criteria for graduation defense are based on the completion of their papers. There is still a gap in the engineering application ability of the graduate students trained in this way, which cannot achieve the cultivation of high-level applied talents. This training model is too single and difficult to ensure the quality of graduate students[6].

3.2.2. Supervisor resources are scattered

The research and academic innovation ability of graduate supervisors affects the development of disciplines and scientific research. Only supervisors with high-level research and innovation abilities can cultivate students with higher academic levels[7]. Each university has a certain number of mentors in the field of vehicle engineering, but due to their scattered distribution, the mentor teams formed are relatively isolated and lack effective communication and collaboration models. Moreover, the composition of different mentor teams may vary in research directions, academic backgrounds, and other aspects, resulting in students only being exposed to knowledge in specific fields and having difficulty obtaining a more comprehensive disciplinary perspective. Students from different universities find it difficult to enjoy cross campus academic exchange opportunities. This limits graduate students' academic thinking and innovation, lacking inspiration from different academic schools. Meanwhile, opportunities for interdisciplinary research are limited. Graduate students in the field of vehicle engineering find it difficult to receive joint guidance from mentors from different disciplines when conducting comprehensive research, which affects the depth and breadth of the research. This will create a relatively closed academic atmosphere in each university. Students find it difficult to access novel research ideas and methods in such an atmosphere, which limits their potential for academic development.

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3.2.3. Insufficient practical experience

In the process of cultivating graduate students in the field of vehicle engineering, the degree of participation of enterprises plays a crucial role in cultivating the comprehensive abilities of graduate students, mainly manifested in their adaptability to working in enterprises [8]. Most universities only focus on imparting theoretical knowledge to graduate students in the field of vehicles, while relatively lacking in the cultivation of practical operation and experience. In the selection of thesis topics and research processes for graduate students in the field of vehicle engineering, there is a lack of reference to suggestions from enterprises, resulting in insufficient understanding and adaptation to the actual needs of the industry. This leads to graduates facing situations in the job market that do not match their actual work, which may result in insufficient application abilities for graduates in practical work. As a result, graduate students may not be able to meet the job requirements for skills after graduation. Moreover, in the process of cultivating graduate students in the field of vehicles, there is relatively little cooperation between different universities, and there is a lack of resource sharing and collaboration. This makes it difficult for some schools to fully utilize their respective strengths, which affects the overall improvement of their training level.

3.2.4. The evaluation system is single

At present, universities mainly use the publication of academic papers as the sole criterion for evaluating graduate students in the field of vehicle engineering. Throughout the entire training process, universities place more emphasis on the achievements of graduate students in scientific research projects, published papers, invention patents, and personal awards, but lack comprehensive evaluations of actual engineering project participation, team collaboration, and other aspects. For joint training of enterprises, a single evaluation system ignores the role of enterprise mentors in the training process of vehicle related graduate students, thereby reducing the enthusiasm of enterprise mentors to participate and affecting the training of vehicle related graduate students [9].

Based on the above issues, the current training mode for graduate students in the field of vehicle engineering urgently needs reform and innovation to better meet the development needs of the field and improve the overall quality and competitiveness of graduate students. The concept of innovative coordination and open sharing can provide new ideas and approaches for solving these problems.

4. Construction of Joint Training Model for Graduate Students in Vehicle Engineering

The construction of the joint training mode for graduate students in vehicle engineering aims to solve the problems existing in the current training mode for graduate students in vehicle engineering. This study explores the joint training mode for graduate students in vehicle engineering through innovative coordination and open sharing concepts. The construction of this model aims to break the constraints of traditional training models and enhance the comprehensive quality of graduate students. The following are the main construction points of this pattern.

4.1. Innovation of curriculum system

Schools should design interdisciplinary core courses for graduate students in the field of vehicle engineering, covering multiple disciplines such as mechanical engineering, electrical engineering, and materials science. At the same time, core electronic practical courses will be added, including basic experiments in circuit electronics and comprehensive application design of computer control technology. Resources will be integrated to combine theory with practical teaching, in order to cultivate graduate students in vehicle engineering as applied talents with

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comprehensive abilities. Through online courses and cooperation with other universities, we introduce high-quality course resources from each school to achieve the sharing and integration of courses between schools. Through this approach, graduate students can gain richer academic experiences in teaching environments across different schools.

4.2. Collaborative cultivation of supervisor team

Through inter school cooperation, mentor teams are jointly formed by mentors from different schools to cultivate graduate students. Through regular seminars, academic exchanges, and other means, promote collaboration among mentors, and enable students to benefit from different academic atmospheres. Establish a mentor collaboration model, encourage collaboration between mentors in research projects, research papers, and other areas, and improve the academic level of graduate students. By establishing a dual mentor training model through school enterprise cooperation, joint training is carried out for graduate students in vehicle engineering, focusing on both theoretical research and practical application, in order to shape comprehensive talents.

4.3. Co-construction of Practice Base

Joint practice bases will be established among universities, covering various fields of vehicle engineering such as automobile manufacturing, intelligent transportation, intelligent connected vehicles, new energy vehicles, etc. The construction of practice bases should focus on the progressiveness of facilities and the integration of enterprise resources. Through deep cooperation with enterprises, achieve the co construction and sharing of practical bases. This helps to provide graduate students with broader and more practical practical opportunities, cultivating their practical skills.

4.4. Establishment of evaluation mode

Design a comprehensive and scientific evaluation system that covers multiple aspects such as students' academic level, practical ability, and the collaborative training effect of the mentor team. Ensure the objectivity and scientificity of evaluation indicators.

Evaluate the academic ability improvement of vehicle engineering graduate students during the joint training process, including paper writing, academic exchange, scientific research innovation, and other aspects. Simultaneously assess the learning outcomes of interdisciplinary theoretical courses for graduate students majoring in vehicle engineering, including their practical application ability of knowledge, innovative thinking, etc. Investigate the frequency and effectiveness of collaboration among mentor teams in joint training, including team building, seminar organization, scientific research cooperation, etc. Evaluate the guidance and assistance provided by the mentor team to students based on their feedback and actual results. Evaluate the improvement of students' practical operational abilities in the practice base, as well as their enthusiasm for participating in engineering projects. Collect feedback from the industry to understand the performance and recognition level of jointly trained vehicle engineering graduate students in the workplace.

4.5. Key points for constructing a joint training model

In the process of joint training for graduate students in vehicle engineering, universities should establish inter school and school enterprise cooperation frameworks, clarify the content, goals, and division of responsibilities of cooperation. Develop a cooperation agreement to ensure that all parties can fully leverage their respective strengths in the training mode. Promote deep cooperation among universities through joint research projects, academic activities, and other forms. Ensure that cooperation not only stays on the surface, but also achieves substantial results in academic research and practical projects.

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Based on the above construction points, the joint training mode for graduate students in vehicle engineering will form a more flexible, open, and mutually beneficial training system. This is expected to provide stronger support for cultivating graduate students in the field of vehicle engineering with innovative abilities and interdisciplinary comprehensive literacy.

5. Conclusion

In summary, based on the concept of innovation coordination and open sharing, the joint training mode for graduate students in vehicle engineering provides new ideas and approaches for cultivating high-level and high-quality graduate students in vehicle engineering. Based on the concept of innovation coordination and open sharing, this study proposes that the cultivation of graduate students in vehicle engineering requires innovation in the curriculum system to promote the integration of theory and practice in the learning process; By cultivating the mentor team, promote academic exchange among graduate students and improve their academic level; By jointly building practical bases and integrating resources with enterprises, graduate students can better align with production practices; At the same time, by establishing an evaluation system, it promotes the cultivation of graduate students in vehicle engineering. Through the implementation of the joint training mode, it is expected to promote the transformation of talent training mode in the field of vehicle engineering and inject new vitality into the development of related fields. In the future, this model can be further optimized and expanded to better meet the needs of social development.

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