Exploration and Practice of Talent Cultivation Mode of "Multi subject Collaboration" in Robot Engineering Major

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Abstract: In response to the problems of inaccurate talent positioning, uneven training quality, and a disconnect between theory and practice in the current talent cultivation of robotics engineering, this article explores a multi subject collaborative talent cultivation model. This model achieves efficient integration of teaching resources and improves the quality of talent cultivation through school enterprise cooperation, industry education integration, and interdisciplinary approaches. This article elaborates on the construction ideas, implementation paths, and practical effects of this model, providing new ideas and methods for talent cultivation in the field of robotics engineering.

Keyword: **robotics engineering; multi subject collaboration; talent cultivation mode; integration of industry and education; school enterprise cooperation**

1. Introduction

The rapid development of modern artificial intelligence and robotics technology has made robotics engineering one of the important disciplines in current higher education. However, the traditional talent cultivation model is no longer able to meet the demand for robotics engineering professionals in society[1]. How to build an efficient and scientific talent cultivation model is an urgent problem that needs to be solved in current robotics engineering education[2].

2. Current situation analysis

2.1 Inaccurate talent positioning

Currently, there is a deviation in the positioning of talent cultivation in the field of robotics engineering, often placing too much emphasis on imparting theoretical knowledge and neglecting the cultivation of practical abilities[3]. This leads to students having difficulty adapting to the actual needs of enterprises and lacking the ability to solve practical problems after graduation.

2.2 The quality of cultivation varies greatly

Due to differences in faculty and teaching resources among universities, the quality of talent cultivation in the field of robotics engineering varies greatly[4]. Some universities have deficiencies in curriculum design and teaching methods, making it difficult to cultivate high-quality professionals in robotics engineering.

2.3 The disconnect between theory and practice

Robotics engineering is a highly practical discipline, however, the current talent cultivation model often suffers from a disconnect between theory and practice[5]. The theoretical knowledge learned by students in school is difficult to apply in practice, resulting in a lack of improvement in their practical abilities.

3. Pattern construction

3.1 School enterprise cooperation

Our school actively explores the model of "school enterprise dual subject collaborative education" in the talent cultivation of robotics engineering major. The college has established cooperative relationships with multiple enterprises and jointly developed talent training programs and teaching plans. Students can not only learn theoretical knowledge in school, but also intern in enterprises to understand their actual work processes and technical needs. This type of school enterprise cooperation not only enhances students' practical abilities, but also strengthens their employment competitiveness.

3.2 Integration of Industry and Education

In the talent cultivation of vehicle robots and humanoid robots, our school actively explores the mode of industry

education integration. The college has established cooperative relationships with multiple industry groups to jointly build robot laboratories and training bases. Students learn the basic principles and programming techniques of robots in the laboratory, while also conducting practical operations and debugging in the training base. This integration of industry and education not only enhances students' practical abilities, but also promotes product technology innovation and industrial upgrading of industrial groups.

3.3 Interdisciplinary intersection

In the talent cultivation of robotics engineering major, our school focuses on interdisciplinary learning with other disciplines. We have integrated computer science and technology, mechanical engineering, and other disciplines to jointly offer multiple interdisciplinary courses. Students can learn knowledge and techniques in computer science and technology, mechanical engineering, and other fields while studying robotics engineering. This interdisciplinary approach not only enhances students' overall quality, but also promotes innovation and development in our university's robotics engineering technology.

4. Development Path

4.1 Develop a talent development plan

Understand the needs and expectations of enterprises for robot engineering professionals, and then develop corresponding course offerings and teaching methods based on the needs and expectations of enterprises. At the same time, attention should also be paid to cultivating students' practical and innovative abilities, using practical and scientific research projects to enhance students' comprehensive qualities and innovative abilities.

4.2 Establish practice bases and laboratories

Through cooperation with enterprises, we can jointly build practical bases and laboratories. In addition, we can also rely on the scientific research resources and technological advantages of universities to establish high-level scientific research laboratories. These practice bases and laboratories can provide students with better practical conditions and experimental environments, helping them improve their practical abilities.

4.3 Carry out scientific research projects and practical activities

Based on students' interests and strengths, choose suitable research projects and practical activities. At the same time, attention should be paid to cultivating students' teamwork spirit and communication skills. Through team projects and practical activities, students' teamwork and communication skills can be improved.

5. Practice effect

5.1 Improving the quality of talent cultivation

Our school has achieved significant results in talent cultivation in the field of robotics engineering through the implementation of the "school enterprise dual subject collaborative education" model. Students' practical and innovative abilities have been significantly improved, and their employment competitiveness has also been enhanced. At the same time, the college has also collaborated with enterprises to carry out multiple product innovation activities and developed multiple new products.

5.2 Significant achievements in interdisciplinary integration

Our school emphasizes cross disciplinary learning with other disciplines, integrating computer science and technology, mechanical engineering, and other subjects to jointly offer multiple interdisciplinary courses. Students can learn knowledge and technology in other fields while studying robotics engineering. This interdisciplinary approach not only enhances students' overall quality, but also promotes innovation and development in our university's robotics engineering technology.

5.3 Enhancing research and innovation capabilities

In the talent cultivation of vehicle robots and humanoid robots, our school has cooperated with enterprises to carry out multiple scientific research projects and technological innovation activities. Through joint research and innovation, we have achieved multiple scientific research results and patents. These scientific research achievements and patents not only enhance the technological level and competitiveness of enterprises, but also make important contributions to the innovation and development of our university's robot engineering technology.

6. Conclusion and Prospect

This article proposes a multi subject collaborative talent cultivation model, and elaborates on the construction ideas, implementation paths, and practical effects of this model in detail. Through school enterprise cooperation, integration of industry and education, and interdisciplinary approaches, efficient integration of teaching resources and improvement of talent cultivation quality have been achieved. This model is not only suitable for talent cultivation in the field of robotics engineering, but can also provide reference and guidance for talent cultivation in other engineering majors.

In the future, with the continuous development of artificial intelligence and robotics technology, the talent cultivation of robotics engineering will face more challenges and opportunities. Therefore, it is necessary to continuously explore and innovate talent training models to meet the needs of society and the development of disciplines. At the same time, it is necessary to strengthen exchanges and cooperation with advanced international countries and regions, learn from their experiences and practices, and continuously improve the quality and level of talent cultivation in China's robotics engineering profession.

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