

The Innovative Path and Practice of Ideological and Political Construction of Mechatronics Technology in Higher Vocational College

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Abstract: With the rapid development of Chinas manufacturing industry, the ideological and political construction of mechatronics major in higher vocational colleges is becoming increasingly important. By deeply exploring ideological and political elements, innovating teaching methods, strengthening practical teaching and improving the construction of teachers, and taking the laser marking machine design project and comprehensive case study as examples, we can effectively improve the comprehensive quality and professional quality of students. In the future, we should continue to deepen the optimization of curriculum content, innovate teaching methods, strengthen the construction of teachers, promote interdisciplinary cooperation and strengthen cooperation with enterprises, so as to make greater contributions to the training of high-quality technical and skilled talents.

Keywords: Higher Vocational; Electromechanical Integration; Ideological and Political Construction; Innovation Path.

1. Introduction

1.1. Research Background

With the rapid development of China's manufacturing industry, mechatronics technology, as one of the core technologies of modern manufacturing industry, has an increasing demand for professionals. Mechatronics major in higher vocational colleges undertakes the important task of cultivating high-quality technical and technical talents for the country, and ideological and political education plays a vital role in talent cultivation [1].

At present, the ideological and political construction of mechatronics major in higher vocational colleges is facing some important problems. On the one hand, in the professional curriculum, the integration of ideological and political elements is not deep and systematic enough. Although some courses begin to try to integrate ideological and political content, they are often simple embellishments, lacking systematicness and coherence. For example, in professional courses such as mechanical design and control technology, the excavation of ideological and political elements such as craftsman spirit and innovative spirit is not deep enough. On the other hand, teaching methods lack innovation and effectiveness. Traditional teaching methods focus on knowledge imparting, which is difficult to stimulate students learning interest and enthusiasm, and is not conducive to the effective development of ideological and political education. In addition, the integration of practical teaching and professional education is not enough, the evaluation and feedback mechanism of ideological and political education is imperfect, and it is impossible to know students learning effects and needs in time, which affects the quality and effect of ideological and political education[2,3].

To sum up, it is of great practical significance to strengthen the ideological and political construction of mechatronics major in higher vocational colleges. By digging deeply into ideological and political elements, innovating teaching methods, strengthening practical teaching and improving the

evaluation mechanism, students ideological and political literacy and professional literacy can be effectively improved, and more high-quality technical and technical talents with both ability and political integrity can be cultivated for the development of Chinas manufacturing industry.

1.2. Purpose of the Study

This study aims to explore innovative ideological and political construction paths to improve the quality of higher vocational education. With the rapid development of the manufacturing industry, the demand for mechatronics professionals is not only reflected in their professional skills, but also puts forward higher requirements for their ideological and political literacy.

On the one hand, through the in-depth excavation of ideological and political elements, they are organically integrated into the teaching of professional courses, so that students can receive ideological and political education imperceptibly while learning professional knowledge. For example, when explaining the mechanical design course, we can introduce the cases of great craftsmen, so that students can understand their spirit of excellence and excellence, and cultivate students craftsman spirit. In the control technology course, the examples of scientific and technological innovation can be combined to stimulate the students innovative consciousness and patriotic feelings.

On the other hand, innovate teaching methods to improve the effectiveness of ideological and political education. Adopt case teaching, group discussion, project-driven and other teaching methods to let students actively participate in the teaching process and enhance their interest and initiative in learning. At the same time, the use of modern information technology, such as online courses, virtual simulation experiments, etc., to enrich teaching resources and expand teaching space.

In addition, strengthen the integration of practical teaching and ideological and political education. Through practical activities such as practice, innovation and entrepreneurship

projects, students can apply their professional knowledge and ideological and political literacy to practice, and cultivate their practical ability and social responsibility. For example, organize students to participate in the production practice of enterprises, so that they can personally experience the corporate culture and professional spirit, and improve their professional quality.

Through the above innovative ideological and political construction path, it is expected to comprehensively improve the quality of technical professionals in higher vocational colleges, and provide more high-quality technical talents with both integrity and ability for the development of China's manufacturing industry.

2. The Theoretical Basis of Ideological and Political Construction of Higher Vocational Electromechanical Integration Major

2.1. Connotation and Significance of Ideological and Political Courses

Curriculum ideological and political education is to put ideological and political education throughout the whole process of education and teaching, to realize the organic unity of knowledge transmission and value guidance. In the major of higher vocational electromechanics, ideological and political courses are of great significance.

2.1.1. Value of the Integration of Ideological and Political Education and Professional Education

The National Vocational Education Reform Implementation Plan clearly points out that talent cultivation in vocational colleges is a process of unifying educating people and cultivating talents. This fully reflects the necessity of integrating ideological and political education with professional education. In the mechatronics major of higher vocational colleges, the integration of ideological and political education and professional education is of great value. On the one hand, it helps to cultivate students professional ethics and professional quality. Students majoring in mechatronics will be engaged in manufacturing-related jobs in the future, and good professional ethics and professionalism are the keys to their success. Through ideological and political education, students can be guided to establish correct professional views and values, and their professionalism, teamwork and innovation spirit can be cultivated. On the other hand, it is conducive to enhancing students sense of social responsibility. Manufacturing is an important pillar of national economic development, and students majoring in mechatronics shoulder the important task of promoting the transformation and upgrading of manufacturing industry. Through ideological and political education, students can understand the development status and needs of the national manufacturing industry, enhance their sense of social responsibility and mission, and stimulate their enthusiasm for contributing to the development of the national manufacturing industry.

2.1.2. Improvement of Students Comprehensive Quality by Curriculum Ideological and Political Education

The ideological and political courses have a positive impact on the improvement of students comprehensive quality. First of all, it is helpful to improve the students professional quality. In ideological and political education, through the introduction of industry models, advanced deeds and other

cases, students can understand the professional norms and professional requirements, and cultivate their professional ethics and professional sense of responsibility. At the same time, ideological and political education can also cultivate students innovative consciousness and practical ability, and improve their professional competitiveness. Secondly, it is conducive to enhancing students sense of social responsibility. Through ideological and political education, students can understand the country's development strategy and social needs, guide them to closely link their personal development with the destiny of the country, and cultivate their sense of social responsibility and dedication. In addition, the ideological and political courses can also improve students humanistic quality. In the ideological and political education, the integration of humanistic knowledge and values can cultivate students humanistic spirit and aesthetic taste, and improve their comprehensive quality.

To sum up, ideological and political courses have important connotation and significance in higher vocational mechatronics major. Through the integration of ideological and political education and professional education, students comprehensive quality can be improved, and more high-quality skilled talents with both political integrity and ability can be trained for the country.

2.2. Relevant Educational Theory Support

Constructivist learning theory holds that the learning process of knowledge is the process of knowledge construction, which advocates students initiative and independent construction [4,5]. In ideological and political teaching, constructivism can provide us with the following methods and strategies.

2.2.1. Application of Constructivism in Ideological and Political Teaching

In the ideological and political teaching of mechatronics major in higher vocational colleges, we can use constructivism to guide students to independently construct ideological and political cognition. First, create real problem situations. For example, when explaining the application of mechatronics technology in intelligent manufacturing, some questions related to professional ethics and innovative spirit can be raised, such as "How to ensure product quality in the context of intelligent manufacturing?" "How to abide by professional ethics while technological innovation?" Let students actively think about ideological and political issues and construct their own ideological and political cognition in the process of solving practical problems. Secondly, carry out group cooperative learning. Divide students into small groups, let them discuss ideological and political issues together and share their views and experiences. Through group cooperation, students can gain different perspectives and ideas from their peers and enrich their ideological and political cognition. Finally, provide rich learning resources. Use multimedia, network and other channels to provide students with cases, videos, articles and other resources related to ideological and political education, so that students can constantly improve their ideological and political cognition in the process of independent learning.

2.2.2. Enlightenment of Other Educational Theories on Ideological and Political Construction

The theory of multiple intelligences holds that human intelligence is diversified, and everyone has development potential. In ideological and political education, we can learn from the theory of multiple intelligences and adopt diversified

teaching methods according to students different intelligence characteristics [6,7]. For example, for students with strong language intelligence, they can be organized to conduct ideological and political keynote speeches, debates and other activities; For students with strong visual spatial intelligence, they can make posters, videos and other works with ideological and political themes; For students with strong physical movement intelligence, they can be organized to participate in volunteer service, social practice and other activities. Through diversified teaching methods, students interest in learning can be stimulated and the effectiveness of ideological and political education can be improved. In addition, we can learn from other educational theories, such as behaviorism theory and cognitive development theory, to provide more enlightenment and methods for ideological and political construction. For example, behaviorism theory emphasizes shaping students behavior through reinforcement and punishment. We can set up some reward mechanisms in ideological and political education to encourage students to actively participate in ideological and political study and practical activities; Cognitive development theory emphasizes students cognitive development stage, and we can design ideological and political teaching contents and activities with different difficulties according to students cognitive development level.

3. Innovative Paths of Ideological and Political Construction of Mechatronics Major in Higher Vocational Colleges

3.1. Optimization of Course Content

Dig deep into ideological and political elements and integrate course content.

3.1.1. Methods of Mining Ideological and Political Elements

Take the mechanical design course as an example, in the mechanical design course, the ideological and political elements can be excavated from many aspects. For example, excavate innovative thinking from the design concept, and guide students to realize that innovation is the driving force to promote the continuous development of mechanical design. Introduce advanced mechanical design cases at home and abroad, such as Chinas major mechanical design achievements in high-speed rail, aerospace and other fields, to stimulate students national pride and enthusiasm for innovation. At the same time, the emphasis on the rigorous and meticulous working attitude in the design process, which is closely linked to the spirit of craftsmanship. It tells the story of some famous designers in order to pursue the perfect design, repeatedly modify the scheme and strive for perfection, so that students can deeply realize the importance of rigor and meticulous. In addition, ideological and political elements can also be excavated from the concept of environmental protection, guiding students to consider the rational utilization of resources and environmental protection in the mechanical design, so as to cultivate students sense of social responsibility.

3.1.2. Practice of Course Content Integration

In terms of the organic integration of ideological and political elements with professional knowledge, innovative thinking can be integrated into the explanation of design methods in the teaching of mechanical design courses. For

example, when introducing the innovative method of mechanical design, analyze the role of innovative thinking in solving the design problems in combination with practical cases. When explaining the design of mechanical structure, the case of craftsman spirit is introduced, emphasizing the careful design and polishing of every detail. For the concept of environmental protection, environmental protection requirements can be set in the design project, allowing students to consider how to reduce energy consumption and reduce environmental pollution in the design process. At the same time, in the course assessment, students should not only examine the degree of professional knowledge, but also evaluate the ideological and political literacy reflected by students in the design process, such as innovation consciousness, craftsman spirit and environmental awareness. In this way, the organic integration of ideological and political elements and professional knowledge can be realized to improve the comprehensive quality of students.

3.2. Innovation of Teaching Methods

3.2.1. Application of Case Analysis and Group Discussion

The innovation of teaching methods is illustrated with environmental pollution cases. Some practical cases of environmental pollution caused by mechatronics equipment in the production process can be introduced. For example, some old mechanical and electrical equipment consume a lot of energy and emit excessive emissions, causing serious pollution to air, soil and water resources. Show such cases to students and guide them to conduct in-depth analysis. In the process of case analysis, students are organized to discuss in small groups and explore how to reduce environmental pollution through innovation in mechatronics technology. Each group can propose its own solutions, such as improving the energy efficiency of equipment, adopting environmentally friendly materials, designing more intelligent control systems to achieve energy conservation and emission reduction, etc. In this way, students are not only deeply aware of the impact of mechatronics technology on the environment, but also cultivate their innovative thinking and social responsibility. At the same time, during the discussion, students can exchange views with each other and improve their communication skills and teamwork skills.

3.2.2. Ideological and Political Education in Practical Teaching

Cultivate students ability of team cooperation and problem-solving through group practical training. In the practical teaching link, some practical training projects with ideological and political education significance can be designed. For example, organize students to group the installation and debugging of mechanical and electrical equipment. Each group is composed of students of different personalities and abilities, who need to complete the task together. In the training process, students will encounter various problems, such as equipment failure, technical problems, etc. At this point, they need to teamwork and explore solutions. Teachers can in this process guide students to establish correct values, such as perseverance, courage to take responsibility, respect for others opinions. At the same time, through practical teaching, students can personally experience the combination of theoretical knowledge and practical operation, and cultivate their practical ability and problem-solving ability. For example, in the process of practical training, students may encounter the problem of weak installation of the equipment. At this time, they need to

use the knowledge of mechanical design and electrical control learned to jointly find the root cause of the problem and solve it. Through such practical teaching, it not only improves students professional skills, but also cultivates their teamwork spirit and problem-solving ability, laying a solid foundation for their future career development.

3.3. Construction of Teachers

Enhance teachers ideological and political awareness and teaching ability.

3.3.1. The Importance of Teacher Training and Discussion

Teachers are the organizers and implementers of teaching activities, and their ideological and political consciousness and teaching ability directly affect the effect of ideological and political education. Therefore, it is very important to strengthen teacher training and discussion.

On the one hand, teachers are regularly organized to participate in ideological and political education and training. Experts and scholars in the field of ideological and political education can be invited to the school to give lectures to deeply interpret the national policy requirements on ideological and political courses, so as to improve teachers understanding of the importance of ideological and political education. For example, by explaining the specific requirements for ideological and political education in the Implementation Plan of National Vocational Education Reform, teachers can clarify their responsibilities and missions in talent training. At the same time, the training content can also include the methods and skills of ideological and political education, such as how to explore the ideological and political elements in professional courses, and how to integrate ideological and political education into the teaching process. Through case analysis and practical operation, teachers can master effective ideological and political teaching methods.

On the other hand, to carry out teachers ideological and political teaching research activities. Organize teachers to share their experiences and practices in ideological and political teaching, and discuss the problems and solutions encountered in teaching together. For example, with the theme of "How to integrate the craftsman spirit into the mechatronics professional course", teaching seminars are conducted. Teachers can combine their own teaching practices to share specific cases and methods of integrating the craftsman spirit in mechanical design, electrical control and other courses. Through communication and discussion, teachers should broaden their teaching ideas and improve the level of ideological and political teaching.

3.3.2. Establishment of Incentive Mechanism

The establishment of incentive mechanism can effectively mobilize the enthusiasm of teachers to participate in ideological and political construction.

First of all, the establishment of ideological and political teaching achievements reward system. Teachers with outstanding performance in ideological and political teaching will be given material and spiritual rewards, such as issuing certificates of honor and giving performance rewards. For example, teachers who have made remarkable achievements in the integration of curriculum content and the innovation of teaching methods will be given certain bonus incentives. This can stimulate teachers enthusiasm for work and encourage

them to actively explore new methods and new ways of ideological and political teaching.

Secondly, ideological and political teaching should be incorporated into the teacher assessment and evaluation system. In the aspects of teachers professional title evaluation and post promotion, we should increase the assessment weight of ideological and political teaching. For example, in the professional title evaluation, teachers are required to provide the relevant results of ideological and political teaching, such as teaching cases, teaching and research papers, etc. In this way, teachers should pay more attention to ideological and political teaching and improve the quality and effect of ideological and political education.

In addition, it can also provide more development opportunities for teachers. For example, excellent teachers are selected to participate in ideological and political teaching exchange activities and academic seminars at home and abroad to broaden teachers horizons and improve their teaching ability and professional quality. At the same time, teachers are encouraged to participate in the research related to ideological and political education to provide theoretical support and practical experience for ideological and political teaching.

4. The Practical Case of Ideological and Political Construction of Higher Vocational Electromechanical Integration Major

4.1. Laser Marking Machine Design Project

4.1.1. Integration of Project Implementation Process with Ideological and Political Education

In the laser marking machine design project, ideological and political elements throughout. From the start-up stage of the project, the teachers guided the students to realize the significance of the project for the development of Chinas manufacturing industry, and stimulated the student's national pride and sense of responsibility. For example, to introduce students to Chinas major breakthroughs and leading position in the field of laser technology, and let students understand that the projects they are involved in are part of the national scientific and technological innovation.

In the project design stage, it emphasizes the rigorous and meticulous working attitude and the craftsman spirit of excellence. The teacher tells the story of some famous engineers in the design process repeatedly deliberated, constantly optimize the story, let the students deeply understand the details determine success or failure. At the same time, students are encouraged to be innovative, dare to try new design ideas and methods. For example, organize students to carry out brainstorming activities to stimulate their innovative thinking and cultivate their innovative consciousness.

In the project implementation stage, we should pay attention to the cultivation of team cooperation spirit. Divide the students into several groups, each with a clear division of labor and tasks. Teachers guide students to learn to communicate, coordinate and cooperate, and jointly solve the problems encountered in the project. For example, when there is a disagreement between groups, teachers encourage students to reach consensus through democratic discussion and consultation, cultivating their teamwork ability and respect for the opinions of others.

In the project acceptance stage, the integrity and the sense of responsibility are emphasized. Students are required to be responsible for their own design results to ensure the quality and safety of the project. For example, organize students to report and defend their projects, so that they can comprehensively elaborate and reflect on their own design process and results, so as to cultivate their sense of integrity and responsibility.

4.1.2. Improvement of Students Ability

By participating in the laser marking machine design project, the students have been significantly improved in many aspects.

In terms of professional skills, students have mastered the design principles and methods of laser marking machine, and improved their ability in mechanical design, electrical control, software programming and other aspects. They learned to use advanced design software and tools, such as CAD, CAM, PLC programming software, to improve the design efficiency and quality.

In terms of innovation ability, students boldly try new design ideas and methods in the project, and put forward many innovative design schemes. They learned to think about problems from different angles, find the best way to solve problems, and cultivate innovative thinking and innovative consciousness.

In terms of teamwork ability, students have learned to communicate, coordinate and cooperate through close cooperation with team members, and have improved their teamwork ability. They have learned to respect the opinions of others, give full play to their respective advantages, complete the project tasks together, and cultivate a good team spirit.

In terms of social responsibility, students realize their social responsibilities and mission by participating in the project. They understand the significance of their design results for the development of the countrys manufacturing industry, and stimulate their enthusiasm and motivation to contribute to the national scientific and technological innovation.

In short, the laser marking machine design project is a successful case of the ideological and political construction of higher vocational electromechanical integration major. Through the organic integration of ideological and political education with professional education, we not only improve students professional skills and comprehensive quality, but also cultivate their sense of innovation, team spirit and social responsibility, laying a solid foundation for their future career development.

4.2. Comprehensive Case Study

Internalize the "craftsman spirit" and cultivate the professional value orientation.

4.2.1. Task Guidance and Knowledge Transmission

In the comprehensive case study, the corresponding control circuit of the given automation equipment design is the task, and the ideological and political education is carried out. First of all, clarify the tasks and objectives, let students understand the importance of their work for the whole production process, and stimulate students sense of responsibility and mission. In the knowledge teaching link, the teacher explained the performance and use method of basic electronic components in detail, not only teaching professional knowledge, but also integrating the "craftsman spirit" into it. For example, when introducing the accuracy and reliability of electronic

components, we emphasize the importance of pursuing excellence in engineering practice, just as the craftsmen of a great country seek perfection in every detail. At the same time, through telling the development process and achievements in the field of automation equipment, stimulate students national pride and patriotism, cultivate their determination to contribute to the progress of national scientific and technological progress.

4.2.2. Changes in Students Behavior and Performance

After a comprehensive case study project, the students career value orientation has changed significantly. In terms of professional skills, students pay more attention to details, repeatedly consider each circuit design and the choice of components, and strive to be perfect. They are no longer satisfied with just completing tasks, but to pursue higher quality and performance. In terms of team cooperation, students have learned to respect and support each other, give full play to their respective advantages, and solve problems together. They understand the power of teamwork, and they understand how to take responsibility and share the results in the team. In terms of innovation consciousness, students dare to challenge the tradition and put forward new design ideas and methods. They are no longer limited to book knowledge, but actively explore cutting-edge technologies and try to apply them to practical projects. In terms of professional attitude, students have established correct professional values and realized the importance of professional ethics and norms. They consciously abide by laws and regulations in engineering practice, pay attention to safety and environmental protection, and show good professional quality. In short, through the comprehensive case study, students have not only improved their professional skills, but also made a positive change in their career value orientation, laying a solid foundation for their future career development.

5. Conclusion

This study deeply discusses the importance, current situation, innovation path and practice cases of higher vocational mechatronics, and obtains the following main conclusions.

In terms of innovation path, through the optimization of course content, dig ideological elements and integrate course content, mechanical design courses, for example, from the design concept, process and environmental protection concept mining ideological elements, innovative thinking, spirit, social responsibility and professional knowledge, in the course evaluation of students ideological literacy and professional ability. In terms of teaching method innovation, case analysis and group discussion are used to guide problems and propose solutions, develop innovative thinking and social responsibility, train their ability to work together and solve problems, and establish correct values. In terms of faculty construction, attach importance to teacher training and discussion, regularly organize ideological education training to improve the understanding of the importance and teaching ability of ideological education, establish incentive mechanism, establish the reward system for ideological teaching achievements, integrate ideological teaching into the teacher evaluation system, provide more development opportunities for teachers and improve teachers ideological consciousness and teaching level.

In terms of practical cases, laser marking machine design projects and comprehensive case studies have achieved

remarkable results. In the laser marking machine design project, ideological and political elements run through the whole process of project implementation, stimulating national pride and responsibility from the start-up stage. The design stage emphasizes rigor, meticulousness and excellence, the implementation stage focuses on the cultivation of teamwork spirit, and the acceptance stage emphasizes integrity and sense of responsibility. Students professional skills, innovation ability, teamwork ability and social responsibility have been significantly improved. In the comprehensive case study, task guidance is combined with knowledge transfer, and the "craftsman spirit" is integrated into the teaching of automation equipment control circuit design to stimulate students national pride and patriotism. Positive changes have taken place in students professional skills, teamwork, innovative consciousness and professional attitude, and their professional value orientation has been significantly improved.

In short, the ideological and political construction of mechatronics major in higher vocational colleges has effectively improved students comprehensive quality and professional quality through the exploration of innovative paths and the implementation of practical cases, and trained more high-quality technical and technical talents with both ability and political integrity for Chinas manufacturing industry.

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