Feasibility plan for ideological and political construction of engineering courses-Take the course "Motor and Electrical Control Technology" as an example

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Abstract. Our country's higher education is based on "literacy" and "cultivating people" as the core. How to silently integrate ideological and political elements into the teaching process of engineering professional courses is a problem that requires thinking and long-term construction. In order to cultivate high-skilled and high-quality talents with both talents and virtues, it is urgent to build an ideological and political program suitable for engineering courses. On the basis of analyzing the national boundary attributes of engineering majors, this paper integrates ideological and political elements into engineering majors, and constructs an ideological and political teaching system for engineering majors. On the basis of knowledge imparting, ability training, and spiritual shaping in the design of professional courses, six ideological and political goals of courses are cultivated, and the ideological and political curriculum construction framework of professional courses is constructed by combining three teaching modules, and three ideological and political strategies are integrated into three courses. Taking the course of "Motor and Electrical Control Technology" as an example, this paper discusses the feasibility of the ideological and political construction plan for engineering majors.

1 Introduction

In May 2020, the Ministry of Education's "Guidelines for the Ideological and Political Construction of Courses in Colleges and Universities" showed that the Marxist-Leninist standpoint, viewpoint, and scientific spirit should be organically combined with method education in the teaching process of engineering majors, in order to improve students' awareness, analysis and analysis. ,Ability to solve problems. To cultivate students' spirit of being a great country craftsman, pay attention to the education and training of students' engineering ethics, and then stimulate the patriotic feelings and mission of young students to serve the country through science and technology. As an engineering major, mechatronics technology major has strong practicality and professionalism, and puts forward higher requirements for students' logical thinking ability, innovation and creativity ability and ability to solve practical engineering problems. In the process of practice, on the

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basis of understanding our country's national conditions and people's conditions, we can cultivate students' spirit of not being afraid of difficulties, courage to explore, innovation and creativity, and teamwork spirit. The organic integration of professional curriculum education and ideological and political elements not only improves students' professional knowledge, but also improves students' moral and ideological literacy.

Engineering majors include many aspects of the national economy and people's livelihood. How to organically integrate professional courses into ideological and political elements to achieve the effect of subtle and silent education is a problem that needs to be considered and long-term construction[1]. As an engineering major based on basic disciplines such as mathematics, physics, and chemistry, it is a technical discipline developed by accumulating a large amount of practical experience in production[2], For the purpose of training employees who solve practical problems, most professional teachers and classmates believe that engineering majors are science and technology without borders that are separated from ideological attributes. But in real life, the emergence, development and application of every science and technology are inseparable from the advocacy and requirements of the state, so science and technology also have the attributes of ideology with national boundaries. There are three aspects of national border attributes.

1.1 The origin of science and technology

The research and development of science and technology is closely related to the needs of the country. The purpose of the development of science and technology in our country is to serve the interests of the broad masses of the people, so as to realize the sustainable development of the country. It is to serve the people, enhance our country's competitiveness, become an industry leader and standard setter, enhance our country's competitiveness and influence in the field of electromechanical science and technology, and then establish our country's international image.

1.2 The property of science and technology

From the shortage of chips in the past two years, it is proved that core technology cannot be bought or obtained. Only by mastering the core technology, can we achieve real autonomy and controllability, and realize the power of science and technology.

1.3 Serviceability of science and technology

Due to the different development stages and national conditions of different countries in the world, the development of science and technology is also very different. The development of science and technology in our country is to seek happiness for the people and development for the country.

Therefore, engineering professional courses contain a large number of ideological and political elements, and more ideological and political education content is needed in teaching. It is necessary to cultivate red and professional talents, and combine the knowledge teaching, practical ability and innovation ability of professional courses with thinking and thinking. The spiritual shaping of Zhengcheng and the organic combination of patriotic education have transitioned from "ideological and political courses" to a new model of "course ideological and political". According to the law of ideological change and psychological characteristics of young students, combined with the discipline law of engineering majors, we will carry out value guidance for students in a targeted manner, so that they can integrate family and national feelings into their study, life and work.
The "course ideology and politics" of engineering majors is an innovation of education and teaching concept, a rational return of educational value, not a simple teaching method or teaching method\(^3\). And the function of shaping value, they should take the responsibility of "cultivating morality and cultivating people". The original intention of professional curriculum design is to impart knowledge and let students understand the interpretation of knowledge. The basic task of teachers is to educate people. Therefore, as a teacher, not only should we impart professional knowledge to students, but also need to master more professional ability, so that students can shape their moral norms, political views and ideological concepts on the basis of subtly cultivating students' professional ability.

The major of mechatronics technology is an important subject in the high-tech field in today's world. The degree of development of mechatronics technology in a sense represents the level of scientific and technological development of a country, so its teaching and research occupy a very important role in our country. Location. As the core course of mechatronics technology major, "Electrical and Electrical Control Technology" plays an important role in teaching and cultivating high-quality professionals. It has very important reference significance and reference value for many engineering professional courses to integrate ideological and political elements of courses. Taking "Motor and Electrical Control Technology" as an example, on the basis of knowledge imparting, ability training, and spiritual shaping in the design of professional courses, six ideological and political goals of courses are cultivated, and three teaching modules are combined to construct the ideological and political course construction of core professional courses. Based on the framework, three curriculum ideological and policy strategies are given to provide methods and ideas for the curriculum ideological and political construction of engineering majors.

2 The ideological and political goals of the six courses

"Lide morality and cultivate people" is the foundation of curriculum ideology and politics, "idea practice" is the core of curriculum ideology and politics, and "full education" is the guarantee of curriculum ideology and politics. Ideological and political elements are integrated into engineering professional courses, which play a role in teaching and educating people. According to the characteristics of the "Motor and Electrical Control Technology" course, combined with General Secretary Xi's point in October 2019 that "six efforts" should be followed in cultivating young people in the new era \(^4\), the ideological and political courses of engineering courses in my country are in the content of In terms of design, efforts should be made in six aspects to train young students.

2.1 Work hard to cultivate students' firm ideals and beliefs

In the course of engineering curriculum design, combined with China's national conditions, using the characteristics of mechanical and electrical courses, through the comparison of the historical evolution, current status and future prospects of the development of mechatronics technology, through the "national standards" of electrical technology and "China's intelligent manufacturing" "Enhancing students' "four confidences" in socialism with Chinese characteristics. To cultivate students' ability to control my country's science and technology development strategies, and to establish firm beliefs and ideals to realize the great rejuvenation of the Chinese nation.
2.2 Efforts are made to cultivate students' patriotism

In the process of engineering curriculum design, it is necessary to rely on the major of mechatronics technology, compare with the international advanced technology vertically and horizontally, look for advantages, make up for deficiencies, and identify directions in the comparison, and guide young students to establish a correct view of the country. The national outlook and the historical outlook take family and country feelings as the driving force for self-improvement and unremitting struggle, organically combine one's own future and destiny with the development of the country, and achieve the purpose of enhancing students' "four consciousnesses".

2.3 Efforts are made to train students to strengthen moral cultivation

In the process of engineering curriculum design, on the basis of ensuring the improvement of students' professional technical skills and knowledge and cultural literacy, we should pay attention to the guidance of socialist core values and a correct outlook on life. The explanation and analysis of the hot and current affairs, let the students experience the great love, great virtue and great feelings of the role model, and cultivate the newcomers of the era with moral character, self-cultivation, responsibility and responsibility.

2.4 Make great efforts in cultivating students to increase their knowledge

In the process of engineering curriculum design, it is necessary to stimulate students' desire for knowledge and professional love, so as to increase students' knowledge, temper students' thinking, and lay a solid foundation for students' sustainable development and lifelong learning. With the popularization and prosperity of the Internet, it is more convenient and efficient for students to obtain information, which helps students accumulate knowledge, improve the system, broaden their horizons, and become talents in the new era with family and country feelings.

2.5 Work hard to guide students to cultivate the spirit of struggle

In the course of engineering course design, we will continue to excavate examples in the field of mechatronics that reflect the great struggle spirit of the Chinese nation, organically combine professional exploration, national prosperity, national rejuvenation with personal development and destiny, and integrate the struggle spirit into daily learning and practical activities. In order to achieve personal ideals and the great rejuvenation of the Chinese nation, students are trained to persevere and strive hard for the national spirit.

2.6 Make efforts to cultivate students' comprehensive quality

In the course design process, theory and practice are combined, focusing on project-based teaching to integrate theory into real projects. Cultivate students' ability and comprehensive quality to solve real engineering practice problems, so that students' innovative and creative thinking, comprehensive quality and civilization quality can be cultivated and improved, and become a new youth of the era with teamwork spirit and creative vitality.

The above six curriculum ideological and political goals point out the design direction for the curriculum ideological and political courses of professional courses. The above six elements are integrated into the teaching process of engineering majors to construct the ideological and political system of the course "Electrical and Electrical Control Technology".
3 Three teaching modules

As the core course of mechatronics technology major, the course "Motor and Electrical Control Technology" is highly professional and puts forward higher requirements for students' professional theoretical study and practical operation skills. It is particularly important to integrate political elements into professional courses. The "Motor and Electrical Control Technology" course is divided into three modules: basic theoretical reserve, single-phase skills training, and comprehensive skills application. Each module has distinct characteristics, and its integration into ideology and politics has different characteristics.

3.1 The basic theoretical reserve module

The basic theoretical reserve module is mainly based on the background of the curriculum and discipline, and the ideological and political elements of the curriculum are easier to integrate than the skills training link. The basic theoretical reserve mainly expounds the origin and development of the motor, the history and current situation of the development of the motor in China, and the study of the history and current situation of the motor. While students increase their knowledge and knowledge, they can stimulate students' patriotism and patriotism through the comparison between China and foreign countries, ancient and modern comparisons. Strong national self-esteem and pride.

Through the explanation of the invention process of the motor, the main purpose is to guide students to discover and solve problems. Combined with the explanation of hot current affairs and the country's development strategy (such as the application of electric motors on my country's high-speed rail), it plays a role in enhancing cultural self-confidence and cultivating patriotic feelings. According to the uniqueness of each professional knowledge, it sets off different philosophies of life. While accurately imparting professional knowledge, it allows students to experience the way of being a human being, so as to increase professional knowledge and knowledge, and at the same time enhance students' comprehensive quality and improve moral cultivation. In the course of explaining the theoretical reserve module, strengthen classroom interaction, fully arouse the enthusiasm of students, let students search for examples of scientists related to electrical machinery through the Internet in groups, and share the scientific research spirit of scientists in the classroom to improve students' knowledge Acquiring and screening ability helps young students discover the hidden social phenomenon behind professional knowledge, and strengthens students' ideological and political cultivation and morality. In the special report, students exercise their expressive ability and improve the comprehensive quality of young students.

3.2 The single-phase skill training module

The basic theoretical reserve module presents theoretical knowledge in the form of skill training, intuitively allows students to understand the application of basic theories, and deepens their knowledge and understanding of professional theoretical knowledge through hands-on operation. Exercise the practical ability of young students. In the process of skill training, each student is required to complete the corresponding practical operations, temper their strong will and character, and experience their psychological quality of not being afraid of failure; rank and assign scores to students' completion status, and cultivate the enterprising spirit of striving for the first; Let the students who completed first help those who have not completed, which has the effect of "giving roses and leaving fragrance in the hands", and cultivates the spirit of mutual help among students. To verify theoretical
knowledge in practical projects, let students learn to see the essence through phenomena, condense the philosophy contained in professional knowledge, improve students' perception ability, and improve their comprehensive quality.

3.3 The comprehensive skills application module

In the comprehensive skills application module, the theoretical knowledge is integrated into the comprehensive project, and the ideological and political elements are integrated into the comprehensive project, so that students can find and discover the sense of superiority and pride of socialism with Chinese characteristics, and strengthen the young students' respect for the country, cultural self-confidence and ideal self-confidence, cultivate patriotic feelings, and cultivate their spirit of fighting for the Chinese nation. In the process of project implementation, it is used for self-exploration, strengthening teamwork, actively discovering and solving problems, stimulating creativity and innovation, and improving the professional quality and comprehensive quality of young students. The ideological and political elements of the course are organically combined with the teaching of engineering majors. That is, the ideological and political curriculum of "Motor and Electrical Control Technology" is realized, which makes imparting knowledge, improving ability and shaping spirit organically compatible.

In the course design process of "Motor and Electrical Control Technology", knowledge imparting, ability training, and spiritual shaping are both mutually reinforcing and closely linked. In recent years, among the students who are teaching, through questionnaires, face-to-face communication, sampling statistics, etc., the feedback of the teaching effect is obtained, showing that the training mode of knowledge imparting, ability training, and spiritual shaping (Figure 1) can be achieved through limited offline training. The combined effect of study time and unlimited online study time is excellent. In the training time, let \( t_1 \) be the time for knowledge imparting, \( t_2 \) is the time for ability training, \( t_3 \) is the time for spiritual shaping, and the total time \( t_1 + t_2 + t_3 = 1 \), that is, the training time of the three is 1, but the training time is 1. Effects According to various forms of feedback to students, the results show that the comprehensive efficiency of educating people can reach 145%.

![Fig. 1. The cultivation of knowledge imparting ability and the cultivation mode of shaping spirit.](image)

4 Professional courses are integrated into the curriculum thinking strategy

Different teaching modules have different ideological and political goals, and different methods of integrating ideological and political courses. Combined with the course of
"Motor and Electrical Control Technology", the ideological and political construction plan of the course is as follows:

4.1 National conditions of science and technology strategy

Combining my country's national conditions with the development of electromechanical scientific and technological achievements, let students understand that scientists are based on nationality, and science and technology have national boundaries. For example, according to the characteristics of my country's vast area of energy distribution and unbalanced economic development, the problem of east-west development solved by west-to-east power transmission not only makes full use of the regional advantages of abundant water resources and large altitude difference in western my country, but the electricity cannot be digested locally. It also solves the problems of economic development in the eastern region, large demand for electric power and insufficient power supply, and realizes the optimization of resources and complements the surplus and deficiency. Combined with the characteristics of my country's national conditions, electrical scientific research workers must take the road of scientific research with Chinese characteristics, rather than blindly follow the direction of international research hotspots. Through the analysis of national conditions of science and technology, let students understand the great innovative spirit of the Chinese nation, and realize that in order to realize the people's yearning for a better life, my country's scientific research workers need to continue to innovate, forge ahead, and transform science and technology into productive forces for the benefit of the people.

4.2 Track current affairs strategy

Through professional hot news, combine cutting-edge technology with patriotism. The combination of social hot current affairs and professional knowledge can not only cultivate students' patriotism and social responsibility, but also help stimulate their enthusiasm for professional learning and interest in scientific research. For example, in February 2020, Leishenshan Hospital and Huoshenshan Hospital moved two 10KV lines with a total of 45 base poles, installed 24 box-type transformers, and four 10kV ring networks within five days. In early 2022, during the COVID-19 outbreak in Xi'an, Xi'an State Grid completed three 800KVA box-type transformers, 1 630-kVA box-type transformer, and 1 box-type transformer within 38 hours. The installation of the ring network cabinet, the laying of six high-voltage cables and the production of cable terminals are all work. The amazing speed bought time for epidemic prevention and control, made students feel the great spiritual power of the Chinese nation, once again reflected the power of "China Speed" and "Made in China", and reflected the Chinese people's sense of responsibility and mission, encouraging students As the future technicians and scientific researchers in our country, we must use the time in school and arm our minds with professional knowledge, and then we will be able to seek happiness for the people in the socialist construction of our country.

4.3 Scientific spiritual strategy

From the devotion of scientists and the far-reaching influence on social development, the determination of young students to devote themselves to scientific research is inspired. In the process of explaining, the famous scientists in the industry are introduced. The majors of these scientists are the same as those of the students, which makes the students more friendly and draws strength from these scientists. Such as: Zhong Zhaolin, a famous electrical scientist known as the father of Chinese electrical machinery, developed China's first AC motor and generator. In 1927, upholding his patriotism, he gave up the favorable
treatment of the Westinghouse Electric Company in the United States and resolutely returned to China. Adhering to the teaching concept of "good practice, bad empty talk" in the teaching process, it is suggested that education should be combined with productive labor, and the development of industry should be guided by the development of science and education. In 1954, the state moved Jiaotong University to Xi'an, and Professor Zhong "led to move westward to teach Xi'an Jiaotong University". In the early days of the establishment of Xi'an Jiaotong University, he was hands-on, faced with difficulties, overcame many difficulties, and established the first electrical machinery manufacturing laboratory in New China. Through Professor Zhong's deeds, he guides young students to closely combine personal development with national development, organically combine theory and practice, love their jobs and work hard, concentrate their efforts for the prosperity of the country and the prosperity of the motherland, and seek personal development.

5 Conclusion

Knowledge imparting, ability training, and spirit shaping are the basis of professional curriculum design, and curriculum ideology and politics are integrated into professional curriculum design. Focus on the teaching of professional knowledge in the course of teaching, let students feel the scientific and rigorous scientific attitude and the patriotic sentiment of rejuvenating the country through science and technology, and combine the theory of professional knowledge with the practice of ideological and political construction of the curriculum. Integrate the basic theories and values of ideology and politics into the learning of engineering professional courses, influence students' behavior and thinking in a silent way, and impart knowledge, cultivate ability, and shape spirit in professional curriculum design. Organic integration, three strategies of explaining national conditions, technology, tracking current affairs and scientific spirit are integrated into it, and ideological and political education is subtly integrated while teaching professional courses, so that close to the major gives students a sense of intimacy and makes students easy to accept. Taking Lide and cultivating people as the fundamental task of education, organically running ideological and political theories into the whole process of teaching professional courses, realizing the education pattern of all staff, whole process, all-round and whole courses, and forming a synergistic effect.

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References

