Exploration and Research on Ideological and Political Education in Electromagnetic Field and Wireless Technology Courses in Higher Vocational Colleges

Lei Qiu and Hongkai Cheng*

Ordnance NCO Academy, Army Engineering University of PLA, Wuhan 430075, China

*175823704@qq.com

Abstract. This paper focuses on ideological and political education in electromagnetic field and wireless technology courses in higher vocational colleges. It deeply analyzes the characteristics of this major, explores the value of implementing ideological and political education in courses, reveals the existing problems, and proposes targeted integration paths. The research finds that ideological and political education is of great significance for cultivating high-quality professionals in this field, but there are problems such as insufficient integration and insufficient teacher capabilities. Through clarifying ideological and political education goals, improving mechanisms, and enhancing teacher capabilities, the coordinated development of professional education and ideological and political education can be effectively promoted.

Keywords: Higher Vocational Colleges; Electromagnetic Field and Wireless Technology Major; Ideological and Political Education in Courses; Integration Path

1 Introduction

Under the background of the new era of education, higher vocational colleges shoulder the mission of cultivating high-quality technical and skilled talents for society. As an important major in the field of electronic information, the Electromagnetic Field and Wireless Technology major requires not only solid professional knowledge and skills but also correct values and a sense of social responsibility for its talent cultivation.[1] Conducting research on ideological and political education in this major's courses helps integrate ideological and political education into the entire professional teaching process, fostering morally and professionally competent professionals and meeting the demands of industry and social development.

Foreign countries have made many explorations in the integration of professional education and moral education, forming some valuable theories and practical experiences. Since its proposal, the research on ideological and political education in domestic courses has developed rapidly. Many scholars have conducted research on the ideological and political education construction of different disciplines and majors, but there

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are relatively few studies on the ideological and political education of the Electromagnetic Field and Wireless Technology major in higher vocational colleges, and there is still room for improvement in practical paths and evaluation systems.[2][3]

2 Characteristics of the Electromagnetic Field and Wireless Technology Major

The Electromagnetic Field and Wireless Technology major belongs to the category of electronic information under the discipline of engineering. It mainly studies electromagnetic field theory, wireless communication principles, and focuses on the generation, propagation, radiation of electromagnetic waves, and the processing and transmission of wireless signals. It is an important supporting discipline for the development of the electronic information industry.

The curriculum system of this major includes basic courses, professional courses, and practical courses. Basic courses such as advanced mathematics and college physics lay the foundation for professional learning; professional courses such as "Electromagnetic Field and Electromagnetic Waves" and "Microwave Technology and Antennas" deeply explain the core professional knowledge; practical courses enhance students' hands-on operation and engineering practice abilities through experiments, training, and internships.

The talent cultivation goal is to enable students to master the basic theories and professional skills of electromagnetic field and wireless technology, possess the ability to design, debug, and maintain communication systems, and cultivate high-quality technical and skilled talents with an innovative spirit, teamwork awareness, and good professional ethics. Graduates mainly work in communication operators, electronic equipment manufacturing enterprises, etc., engaged in the design of wireless communication systems, network optimization, equipment maintenance, and other jobs.[4]

3 The Value of Implementing Ideological and Political Education in the Electromagnetic Field and Wireless Technology Major

3.1 Implementing the Fundamental Task of Cultivating Virtue and Talent

Through ideological and political education in courses, socialist core values, patriotism, and other elements are integrated into professional teaching, guiding students to establish correct worldviews, outlooks on life, and values, cultivating students' love for the country and sense of social responsibility, ensuring that professional education always proceeds in the right direction and truly achieving the fundamental task of cultivating virtue and talent.[5]

3.2 Promoting the Coordinated Development of Professional Education and Ideological and Political Education

Ideological and political education in courses breaks the separation between professional education and ideological and political education, integrating and promoting each other in teaching goals, teaching contents, and teaching methods. Conducting ideological and political education while imparting professional knowledge not only enriches the connotation of professional teaching but also enhances the effectiveness of ideological and political education, achieving the maximization of educational effects.

3.3 Cultivating High-Quality Talents That Meet the Needs of the Times

With the rapid development of information technology, the industry's requirements for talents are not limited to professional skills but also emphasize comprehensive qualities. Through ideological and political education in courses, students' innovative consciousness, craftsmanship spirit, and professional ethics are cultivated, enabling them to adapt to the new demands of industry development and become high-quality talents with international vision, innovation ability, and social responsibility.[6]

4 Problems in the Implementation of Ideological and Political Education in the Electromagnetic Field and Wireless Technology Major

4.1 Insufficient Integration of Ideology and Politics with Courses

Currently, there is a phenomenon of artificial separation between the Electromagnetic Field and Wireless Technology major's courses and ideological and political education. Some teachers only briefly read some ideological and political content at the end of the course without deeply exploring the ideological and political elements in professional courses, resulting in the failure to truly integrate ideological and political education with professional knowledge teaching and failing to achieve the expected educational effects.

4.2 Insufficient Capacity of Teachers in Implementing Ideological and Political Education in Courses

Many teachers lack systematic training in ideological and political theories, and have an insufficient understanding of the goals, contents and methods of ideological and political education. In teaching practice, their teaching methods are monotonous, making it difficult to naturally integrate ideological and political elements into professional course teaching. Meanwhile, some teachers have a weak sense of subjectivity in ideological and political education in courses and have not fully recognized their important role in the construction of ideological and political education in courses.

4.3 Incomplete Course Teaching Design

The objectives of professional courses often focus only on the cultivation of knowledge and skills, neglecting the goal of value shaping. The teaching content does not fully explore ideological and political elements, lacking both specificity and systematicness. The teaching methods are mainly traditional lectures, lacking interactivity and innovation. The evaluation methods mainly rely on examination scores, which cannot comprehensively assess students' overall quality and the effectiveness of ideological and political learning.

5 Pathways for Integrating Ideological and Political Education into Electromagnetic Field and Wireless Technology Courses

5.1 Clarify Ideological and Political Teaching Objectives

In line with the talent cultivation requirements of the Electromagnetic Field and Wireless Technology major and the demands of ideological and political education, formulate clear ideological and political teaching objectives. In terms of knowledge impartation, enable students to master professional knowledge while understanding the development history of the industry and the achievements China has made in this field; in terms of ability cultivation, focus on fostering students' teamwork skills, innovation capabilities, and the ability to solve practical problems; in terms of value shaping, guide students to establish correct professional values and a sense of social responsibility.

For instance, in the course of "Electromagnetic Fields and Waves", when explaining the principles of electromagnetic wave propagation, the development process of China's communication technology from backwardness to leading the world can be introduced, such as the breakthrough in 5G technology, to enable students to understand the role of knowledge in promoting the scientific and technological progress of the country and to inspire their national pride and learning motivation.

5.2 Improve the Ideological and Political Education Mechanism in Courses

Establish a collaborative education mechanism, enhance cooperation and communication among professional teachers, ideological and political teachers, and enterprise mentors, and jointly promote the construction of ideological and political education in courses. Improve the guarantee mechanism, with the school providing support in terms of policies, funds, and resources to create favorable conditions for the construction of ideological and political education in courses. Improve the evaluation mechanism, incorporate ideological and political education in courses into the teaching assessment of teachers and the academic evaluation system of students, and regularly assess and provide feedback on the effectiveness of ideological and political education in courses to continuously improve it.

Some vocational colleges have established partnerships with communication enterprises. Enterprise mentors participate in the construction of ideological and political education in courses, sharing professional ethics and innovation cases in the industry. The schools have set up special funds for ideological and political education in courses, encouraging teachers to carry out teaching reform projects in this area. At the same time, students' ideological and political performance is included in the internship assessment to comprehensively evaluate students.

5.3 Enhance Teachers' Ideological and Political Competence

The school regularly organizes teachers to participate in ideological and political theory training and ideological and political teaching ability training for courses. It invites experts and scholars to give lectures and provide guidance to improve teachers' ideological and political theoretical level and teaching ability. It encourages teachers to carry out ideological and political teaching research and exchange activities for courses, share experiences and cases, and jointly enhance the quality of ideological and political teaching for courses.

For instance, a certain vocational college invites experts in ideological and political education to give special lectures to professional teachers every semester, and organizes teachers to participate in ideological and political teaching competitions of courses, promoting teaching through competitions and enhancing teachers' ability to integrate ideological and political education into their courses.

5.4 Deep Integration of Professional Courses with Ideological and Political Education

We should thoroughly explore the ideological and political elements in the professional courses of Electromagnetic Field and Wireless Technology. For instance, when teaching antenna design, we can incorporate China's innovative achievements in the 5G communication field and the spirit of craftsmanship. In practical teaching, we can use real cases to guide students to establish a sense of quality and safety. Teachers should also pay attention to setting an example through their words and deeds in the teaching process, using their own moral qualities and professional dedication to serve as role models for students.

At Nanjing University of Posts and Telecommunications, in the course of Electromagnetic Field and Wireless Technology, the importance of the Beidou system in disaster relief after the Wenchuan earthquake is used as a case study to guide students to actively explore the application of electromagnetic waves and inspire their national pride. When teaching electromagnetic radiation at Jinling Institute of Technology, the FAST (Five-hundred-meter Aperture Spherical Telescope) is introduced, which not only helps students understand the relevant professional knowledge but also cultivates their spirit of exploration in scientific research and craftsmanship.

5.5 Enriching the Teaching Methods of Ideological and Political Education in Courses

Adopt case-based teaching methods, select typical cases within the industry, such as the research and development process of China's Beidou Satellite Navigation System, to stimulate students' interest in learning and patriotic enthusiasm; apply project-based teaching methods, allowing students to cultivate teamwork skills and innovative spirit through completing projects in teams; utilize information-based teaching approaches, making use of online courses, virtual simulations and other resources to expand the teaching space and enrich the teaching content.

Teachers use virtual simulation software to have students simulate the construction of wireless communication systems, allowing them to experience the importance of teamwork in practice; they share cutting-edge industry technologies and ideological and political cases through online platforms to guide students to conduct independent learning and discussions after class.

5.6 Optimize the Evaluation and Assessment Methods of Courses

Establish a diversified evaluation system to comprehensively assess students' mastery of professional knowledge, practical ability, innovation ability, and ideological and political quality. Improve the process evaluation, paying attention to students' performance during the course learning process, including classroom participation, group cooperation, and assignment completion. Strengthen the application of evaluation results, providing feedback to teachers and students to offer a basis for teaching improvement and student development.

The school has designed a comprehensive evaluation system that includes professional knowledge tests, practical operation assessments, group project evaluations, and ideological and political performance evaluations to conduct a comprehensive assessment of students. At the same time, based on the evaluation results, teachers adjust their teaching strategies and students clarify their directions for improvement.

6 Conclusion

This research has conducted a comprehensive exploration and study on the ideological and political education in the Electromagnetic Field and Wireless Technology major in higher vocational colleges. It has analyzed the characteristics of the major and the value of ideological and political education in the curriculum, pointed out the existing problems, and proposed specific integration paths. By clarifying the ideological and political education goals, improving the mechanism, and enhancing the teachers' capabilities, it can effectively promote the construction of ideological and political education in this major and achieve the organic integration of professional education and ideological and political education.

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