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Analysis of the Integration Strategies of Ideological and Political Education into College Physics Teaching

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Abstract: In the context of quality-oriented education, the concept of ideological and political education in courses aims to deeply integrate professional courses with ideological and political education, achieving the common development of knowledge teaching and literacy cultivation. As a basic subject for science and engineering majors, College Physics, with its rich scientific knowledge, humanistic elements, and natural operation laws, provides abundant materials and educational carriers for the integration of ideological and political education. Integrating ideological and political education into College Physics teaching is of great significance for improving teaching quality and cultivating well-rounded talents.

Keywords: College Physics; Ideological and political education in courses; All-around development; Values

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1. Introduction

Higher education shoulders the heavy responsibility of imparting professional knowledge and skills and cultivating high-quality and high-level talents for society. To achieve this core goal, universities should actively promote teaching reform, organically integrate professional courses with ideological and political elements, and cultivate students' all-around development. As a core course for science and engineering majors, College Physics not only undertakes the responsibility of teaching physical knowledge and enhancing students' core physical literacy but also shoulders the mission of cultivating students' logical thinking ability, scientific observation ability, and spirit of exploration. Integrating ideological and political education into College Physics teaching can enable teachers to guide students to form correct values while explaining physical knowledge, cultivate their sense of social responsibility, enable them to better serve society with their professional knowledge in their careers, and promote the continuous progress of science and technology.

2. The necessity of integrating ideological and political education into College Physics teaching

2.1. Conducive to cultivating students' comprehensive literacy

As a basic course for college science and engineering majors, College Physics requires students to master profound physical knowledge and have excellent ideological qualities and moral cultivation to promote their all-around development [1]. Based on this, teachers need to rely on the concept of ideological and political education in courses to promote the establishment of socialist core values among students. Therefore, teachers should integrate ideological and political elements into College Physics teaching, strengthen the cultivation of students' ideological awareness and values, and enable students to grow into outstanding talents in the new era with both moral integrity and professional competence [2]. The cultivation of talents in universities is not only about imparting knowledge and skills but, more importantly, about cultivating students' comprehensive qualities. The integration of ideological and political education elements can enhance the educational nature and attractiveness of College Physics teaching, stimulate students' learning interest, guide students to explore the humanistic values and social significance contained in physical knowledge more actively, and cultivate their values and humanistic qualities, thus achieving all-around development.

2.2. Conducive to cultivating students' scientific spirit

As an important and crucial basic course in universities, College Physics mainly studies knowledge in natural science, engineering technology, etc. Its importance lies not only in the study of the most basic and universal forms of material motion and their laws but also in the fact that, as the foundation of natural science and engineering technology, it lays a solid foundation for students' future academic research and career development [3]. The learning of physical knowledge is a process of observation, experiment, reasoning, and verification, with certain logic and scientificity. Integrating ideological and political education elements into College Physics courses is not only helpful for students to deepen their understanding of the physical discipline but also can cultivate their rigorous exploration ability, rigorous and realistic spirit, and scientific attitude, which play an important role in students' personal growth and career development [4].

3. Problems in integrating ideological and political education into College Physics teaching

3.1. Imperfect curriculum system

The application of ideological and political education in College Physics teaching requires a sound curriculum system as support [5]. The professional curriculum system is the carrier for the implementation of ideological and political teaching, including elements such as teaching content, teaching mode, and teaching objectives. If the integration of ideological and political education and professional course teaching is not deep enough, it will be difficult to give full play to the educational function and value of physics teaching [6]. Therefore, a perfect curriculum system is the key to deeply integrating the concept of ideological and political education in courses and giving full play to the educational value of ideological and political education. However, at present, some universities have not integrated ideological and political education into the curriculum system of College Physics courses, nor have they developed a perfect teaching objective and education plan from the ideological and political aspect. This makes teachers lack a scientific and specific plan for curriculum education, resulting in a shallow integration of ideological and political education in College Physics teaching. At the same time, due

to the lack of physical teaching resources in some schools, ideological and political education in courses lacks professional theoretical support, making it difficult to stimulate students' enthusiasm and affecting the overall educational effect.

3.2. Insufficient ideological and political awareness of teachers

In the process of cultivating students' all-around development, teachers' ideological and political education ability plays an important role. The excellent ideological and political education ability of teachers can not only cultivate students' sense of social responsibility and shape their character but also help them establish correct values, outlook on life, and worldview, enabling them to develop more healthily and comprehensively [7]. However, due to the insufficient ideological and political awareness of professional teachers, the goal setting of College Physics courses tends to focus more on the transmission of traditional theoretical knowledge, lacking the integration of necessary moral education materials and insufficiently cultivating students' ideological awareness, moral qualities, and values. Therefore, there is a problem of insufficient ideological and political awareness of teachers in College Physics teaching. At the same time, due to the fact that some teachers do not have a deep understanding of the concept of ideological and political education in courses, they cannot effectively integrate and connect professional courses with ideological and political education, resulting in a "superficial" phenomenon of ideological and political education [8].

4. Specific strategies for integrating ideological and political education into College Physics teaching

4.1. Based on physics textbooks and explore ideological and political elements

The exploration and application of ideological and political elements can not only enrich the curriculum content but also enhance the applicability and attractiveness of College Physics teaching [9]. College Physics textbooks contain rich physical knowledge and ideological and political elements, and these high-quality teaching contents provide an important basis for students' professional ability improvement and comprehensive development. Teachers should make full use of teaching resources to cultivate students' scientific spirit, craftsman spirit, and sense of social responsibility by explaining the stories behind scientists and introducing practical examples of physical applications, improving students' physical subject literacy, and laying a solid foundation for their all-around development. First, College Physics has certain experimental and logical characteristics. In the teaching process of College Physics, teachers can, based on the professional knowledge of the course, explore some related celebrity stories. By telling their research processes and achievements, teachers can stimulate students' professional identity and rigorous scientific spirit.

Secondly, teachers can also combine current social hot topics, important discoveries, and physical application cases to explain physical knowledge, guide students to explore the deep-seated connotations behind them, analyze the relationships between physical knowledge and fields such as society, science, and engineering, and cultivate their socialist core values, scientific spirit, craftsman spirit, and sense of social responsibility [10]. For example, teachers can introduce major breakthroughs in China's engineering and technology fields into the classroom, enriching the teaching content, deepening students' understanding of physical concepts, guiding students to pay attention to the development of science and technology and social progress, and deepening students' understanding of physical concepts to cultivate students' comprehensive qualities.

Finally, teachers can explain the stories behind the generation of some physical concepts [11]. When

explaining physical principles and formulas, teachers can tell the birth and exploration process of physical knowledge, guiding students to feel the difficulty of scientific knowledge research and stimulating their curiosity and thirst for knowledge. For example, when introducing the "electromagnetic induction phenomenon", teachers can tell the methods and difficulties in Faraday's exploration of the law of electromagnetic induction, helping students understand the essence of the electromagnetic induction phenomenon.

4.2. Cultivate teachers' ideological and political literacy and improve educational quality

Teachers' professional abilities and ideological and political literacy are closely related to the educational effect of College Physics courses. Therefore, it is of great educational significance to enhance teachers' ideological and political literacy and professional ethics.

Universities should establish a scientific and comprehensive training system to ensure that teachers can comprehensively and scientifically improve their ideological and political literacy and professional abilities [12]. First, universities should regularly organize training meetings on ideological and political education in courses, invite professors and experts in ideological and political education to serve as instructors. The content should cover basic theories of ideological and political education, teaching methods, and strategies for integrating ideological and political education with physics courses. This helps physics teachers deeply understand and master the basic concepts and educational methods of ideological and political education in courses. In addition, universities can establish an exchange platform for ideological and political education in courses, including various forms such as online forums, offline symposiums, and seminars, providing opportunities for teachers to learn and exchange teaching achievements. At the same time, on this platform, teachers can share their teaching experiences and insights, forming a positive interaction and achieving comprehensive improvement.

Secondly, universities can regard ideological and political education in courses as one of the important indicators of performance assessment and reward and encourage teachers who perform well [13]. The school can set up special awards and incorporate elements such as teachers' professional abilities, educational effects of ideological and political education in courses, and teaching quality into specific standards. Teachers who perform outstandingly and have innovative ideas in the practice of ideological and political education in courses can be fully rewarded.

Finally, universities can set up awards for educational achievements in courses and reward teachers who perform outstandingly in the integration of ideological and political education and education with bonuses and awards. This can stimulate teachers' innovative consciousness, encourage them to carry out educational activities more actively and proactively, promote the in-depth implementation of ideological and political education in College Physics teaching, and lay a solid foundation for students' all-around development.

4.3. Pay attention to physics experiments and enhance the pertinence of education

As an important part of College Physics, experiments are not only the practice and verification of theoretical knowledge but also a key link in cultivating students' comprehensive qualities and integrating ideological and political education [14]. In the process of integrating College Physics with ideological and political education, teachers need to make full use of this important link. This can not only help students intuitively understand physical laws, deeply master physical knowledge, but also improve their practical operational ability. In College Physics teaching, the experimental link is an inalienable part, a key link for students to strengthen theoretical knowledge and improve the application ability of physical knowledge, and an important carrier for exploring ideological and educational elements and cultivating students' comprehensive qualities. Therefore, teachers

should actively integrate the concept of ideological and political education in courses into physics experiment teaching to better improve students' comprehensive qualities and help them achieve all-around development.

In group experiments, teachers should actively advocate the importance of teamwork to enable students to complete experimental tasks efficiently and cultivate their sense of collectivity and responsibility. By clarifying the responsibilities and roles of group members, each student can be ensured to participate more actively and proactively, exploring physical knowledge and laws. Teachers can design some experimental projects that require teamwork, such as the construction and debugging of complex circuits and the precise measurement of optical experiments, so that students can feel the importance of teamwork in the experiments. During the group cooperation process, teachers should guide students to communicate, collaborate, and share actively. This can not only improve the experimental efficiency but also enhance the friendship and trust among classmates, and improve their teamwork ability, scientific attitude, and craftsman spirit.

In addition, teachers can also guide students to think about the social value of experimental results in combination with the experimental content, cultivating their sense of social responsibility and mission. For example, teachers can guide students to think about the specific ways to use the knowledge they have learned to solve practical problems and contribute to society. In electromagnetic experiments, teachers can guide students to pay attention to the development of new energy technologies and inspire them to contribute their wisdom to the country's energy security. Finally, after the experiment, teachers can lead students to analyze and summarize, let them share their experimental feelings, reflect on the gains and shortcomings in the experiment, and guide them to think about the physical principles and scientific spirit behind the experiment.

4.4. Innovate teaching methods and achieve educational effectiveness

On the one hand, the interactive teaching method refers to the analysis, discussion, and research of problems or tasks by teachers and students based on equal communication through a specific task. In daily teaching, the interactive teaching method is frequently used. It can maximize the enthusiasm and initiative of students. Through forms such as practical operations, problem discussions, and group cooperation, students can deeply understand and apply the knowledge they have learned, thus enhancing their professional abilities [15]. At the same time, the interactive teaching method provides students with opportunities to display and express their views. In this process, students' communication skills, teamwork ability, and professional attitude will be fully exerted.

On the other hand, teachers can adopt the case-based teaching method to enable students to deeply understand real cases and projects in the industry and improve the effectiveness of ideological and political education. The case-based teaching method is a teaching method based on cases or projects. Teachers and students jointly focus on discussion and analysis through specific situations. In the analysis process, students can not only exercise their abilities to discover, analyze, and solve problems but also discover the ideological and political elements contained therein. By implementing the case-based teaching method, teachers can introduce real cases into classroom teaching, which can maximize the connection between physical knowledge and real life. At the same time, by exploring the ideological and political elements in them, teachers can strengthen the effectiveness of ideological and political education. This not only enhances the professionalism and practicality of the course but also promotes the improvement of students' comprehensive qualities, especially the cultivation of professional ethics and a sense of social responsibility.

5. Conclusion

In conclusion, the concept of ideological and political education in courses is an important carrier for university education reform and talent cultivation, and an important way for universities to achieve the fundamental task of cultivating people with moral integrity. Teachers of College Physics courses in universities should be aware of the importance of ideological and political education in courses for teaching innovation and curriculum construction. At the same time, teachers need to actively update their educational concepts and deeply integrate ideological and political education into College Physics teaching through various methods such as exploring ideological and political elements, improving their own ideological and political literacy, paying attention to physics experiments, and innovating teaching methods. While teaching students physical knowledge, teachers should enhance their comprehensive qualities and enable them to contribute better to society.

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References

[1] Wang Y, 2025, Teaching Practice of Ideological and Political Education in College Physics Courses: Taking the Teaching of the Momentum Theorem as an Example. Western China Quality Education, 11(1): 87–91.

[2] Wang S, Li X, 2024, Research on the Exploration and Teaching Design of Ideological and Political Elements in College Physics Courses. Contemporary Teaching-Research Forum, 10(10): 45–49.

[3] Liu Y, 2024, Research and Exploration on Guiding the Ideological and Political Education in College Physics and Experiment Courses with the Scientific Outlook. Physics Bulletin, 2024(10): 58–60.

[4] Luo H, 2024, Exploration and Reflection on Integrating "Ideological and Political Education in Courses" into the Teaching of College Physics Public Courses. Tiannan, 2024(4): 162–164.

[5] Zhang Y, 2024, The Role of Ideological and Political Education in Courses in Improving the Teaching Quality of College Physics. Teaching of New Curriculum (Electronic Edition), 2024(12): 189–191.

[6] Jie Q, Li H, 2024, Exploration of College Physics Teaching and Ideological and Political Education in Courses Based on the Forward Design Concept in Engineering Practice. Teaching of New Curriculum (Electronic Edition), 2024(11): 187–190.

[7] Yang W, 2024, Exploration of Integrating Ideological and Political Education into College Physics Teaching: Taking the Mechanical Vibration Course as an Example. Guangxi Physics, 45(1): 150–152.

[8] Yin L, Tan M, Liu J, 2023, Approaches to Integrating Ideological and Political Education into College Physics Teaching in Application-Oriented Undergraduate Colleges. Teaching of New Curriculum (Electronic Edition), 2023(24): 189–190.

[9] Yan J, 2022, Exploration on Integrating Ideological and Political Education into College Physics Experiment Teaching: Taking the Michelson Interference Experiment as an Example. Guangxi Physics, 43(4): 241–243.

[10] Meng D, Zhang K, Wang S, et al., 2022, Case Analysis of Ideological and Political Education in the Teaching Process of College Physics: Taking Particle Dynamics as an Example. Data, 2022(9): 80–82.

[11] Wang R, Yang N, Gao Y, et al., 2022, Design of Integrating Ideological and Political Education into College Physics Teaching: Taking "The Effect of a Magnetic Field on a Moving Charge" as an Example. Physics Bulletin, 2022(5): 80–83 + 87.

[12] Li D, 2022, Discussion on the Implementation Path of Ideological and Political Education in Application-Oriented Universities. Modern Business Trade Industry, 43(8): 177–179.

[13] Yang L, Cheng J, Yue X, et al., 2022, Design and Implementation Strategies of Ideological and Political Education Content in College Physics Courses. Physics and Engineering, 32(2): 182–187.

[14] Yang K, Li X, Sun X, 2021, Techniques and Methods for Introducing Ideological and Political Elements into College Physics Teaching. Physics and Engineering, 31(6): 109–113.

[15] Wang X, Li H, Ge X, 2020, Implementing "Ideological and Political Education in Courses" in Physics Teaching: Reflecting the Cultivation of Scientific Spirit in College Physics Teaching. The Guide of Science & Education (Mid-Month Edition), 2020(14): 116–117.