Exploring Pathways for Reforming Ideological and Political Education in the Course of Fundamentals of Digital Electronic Technology

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Abstract

Against the backdrop of the construction of new engineering disciplines, ideological and political education within courses has become crucial in deepening the reform of engineering education and cultivating engineering and technological talents with both moral integrity and professional competence. The course "Fundamentals of Digital Electronics" plays a key role in the teaching system of electronic information disciplines due to its theoretical abstraction, rich concepts, and strong practicality. This paper, in accordance with the guiding principles of national professional course ideological and political education reform, discusses the challenges of ideological and political education in the "Fundamentals of Digital Electronics" course and proposes corresponding improvement strategies. It suggests strengthening the value identification of teachers, enhancing teachers' ideological and political education literacy, continuously updating teaching philosophies, optimizing the entry points of ideological and political elements, and improving the evaluation system, to strengthen the realization path of ideological and political education construction in the "Fundamentals of Digital Electronics" course, thereby enhancing the quality of ideological and political education within the curriculum.

Keywords

Digital electronics technology; Ideological and political education within courses; Teaching reform; Teaching philosophy.

1. Introduction

As an educational practice, ideological and political education within courses utilizes ideological and political elements from various disciplines, with classroom teaching as the primary means, aiming to cultivate students. In the field of higher education, this approach not only addresses the task of training qualified talents for and the country but also becomes the core pathway to achieve the goal of moral education[1]. Against the backdrop of the development of new engineering disciplines, effectively integrating teaching and education to cultivate talents with both moral integrity and professional competence, in line with the needs of the times, is a significant challenge faced by professional education.

The course "Fundamentals of Digital Electronics," as a foundational course for undergraduate students majoring in electrical and electronic information engineering, is characterized by its emphasis on practicality, engineering, and application[2]. The rapid development of the information industry further strengthens the importance of enhancing students' scientific literacy through this course, which is particularly critical for cultivating technical talents for relevant industries in the country[3]. This paper explores the challenges faced by the "Fundamentals of Digital Electronics" course in ideological and political education within the

context of the development of new engineering disciplines and proposes targeted improvement suggestions.

The paper puts forward five main suggestions: firstly, enhancing teachers' understanding of the importance and value of ideological and political education within courses; secondly, improving teachers' professional literacy in ideological and political education; thirdly, continuously updating teaching philosophies to adapt to the needs of educational development; fourthly, optimizing the entry points of ideological and political education within the course to ensure the practicality and attractiveness of teaching content; and finally, improving the course evaluation system to comprehensively assess teaching effectiveness and educational outcomes[4]. These suggestions aim to comprehensively enhance the quality of ideological and political education work in universities and provide strong support for cultivating high-quality talents.

2. Practical Difficulties Faced by Ideological and Political Education in the "Fundamentals of Digital Electronics" Course

Many teachers have not fully established the core concept of "ideological and political education within courses," leading to a lack of deep understanding. In this situation, teachers of professional courses tend to focus excessively on knowledge dissemination, neglecting the initiative and importance of ideological and political education in the process of educating students. This results in a widespread lack of ideological and political education atmosphere in professional course teaching and research offices, thereby affecting the depth integration and effective implementation of ideological and political education[5].

Although rich resources for ideological and political education exist in various courses, how to effectively explore and apply these resources in the "Fundamentals of Digital Electronics" course remains a challenge. Some teachers possess solid professional knowledge and skills, but lack systematic understanding of Marxist theory, humanities and social science knowledge, and ideological and political education theory. Meanwhile, limited class hours and heavy workload, coupled with outdated traditional teaching materials, make it more difficult to both teach professional knowledge and skills and explore ideological and political elements within limited time.

Effective ideological and political education should be subtle and penetrating, achieving an effect of imperceptible influence. However, some teachers of professional courses encounter two main problems in the implementation process. First, improper integration of ideological and political elements leads to a disconnect between the course and ideological and political content, disrupting the teaching rhythm and even sparking negative emotions among students. Second, although they can explore ideological and political elements related to the course, they lack effective teaching methods and means, resulting in superficial ideological and political education content that fails to convey worldviews, outlooks on life, and values deeply, thus failing to achieve the teaching goal of moral education [6].

3. Reform Practices of Ideological and Political Education in the "Fundamentals of Digital Electronics" Course

Comprehensive educational objectives. In contemporary socialist construction, the goal of education extends beyond mere knowledge dissemination to encompass the holistic development of morality, intelligence, physical fitness, aesthetics, and labor skills. This requires education to not only focus on cultivating knowledge and skills but also encompass moral education, physical development, aesthetic ability, and labor skills[7].

Core role of ideological and political education within courses. Ideological and political education within courses, as an educational method, is centered around integrating ideological and political education into professional teaching[8]. This approach aims to shape students' ideological consciousness and cultivate their values through teaching professional courses.

Transformation of teachers' roles. In the context of new engineering disciplines, teachers are not only knowledge disseminators but also guides of values. Therefore, enhancing teachers' recognition of the importance of ideological and political education within courses is crucial. They need to establish the educational concept of "small classrooms, big ideological and political education," deeply understand how to integrate ideological and political education elements into professional courses, and expand the depth and breadth of course content.

Establishment of teachers' awareness of nurturing students. As implementers of ideological and political education within courses, teachers need to possess a strong awareness of nurturing students and a sense of responsibility[9]. They should establish a course ideological and political education concept centered on nurturing students and naturally integrate ideological and political education into the teaching process.

Thematic training and theoretical learning. Universities should provide teachers with thematic training related to ideological and political education within courses and strengthen their political theoretical learning to enhance their professional abilities and theoretical levels in implementing ideological and political education within courses [10].

Team collaboration and the inheritance of teacher ethics. Emphasis should be placed on the importance of teamwork and the promotion of the inheritance of teacher ethics. Through organizing experience exchange activities and seminars, promote mutual learning and support among teachers, and jointly promote the development of ideological and political education within courses.

Updating educational concepts. Teachers should update their educational concepts, transitioning from traditional teacher-centered approaches to student-centered approaches. This requires teachers to consider students' needs more in teaching and create conditions for students to play a leading role in learning[11].

Utilizing diversified teaching methods. Teachers should employ diversified teaching methods, such as case-based teaching, heuristic teaching, and discussion-based teaching, to enhance classroom interaction and student engagement.

Respecting students' subject status. Teachers should fully respect students' subject status in teaching, encourage independent thinking, and cultivate their investigative interests and critical thinking.

4. In-Depth Exploration and Optimization of Ideological and Political Education Elements within the Curriculum

Exploring ideological and political elements combined with current events. To achieve this goal, teachers need to delve into ideological and political elements related to current social hot topics. For example, when teaching "Fundamentals of Digital Electronics," teachers can introduce the latest technological advancements, national policies, and international situations as entry points to integrate theoretical knowledge with practical situations. For example, in the "Fundamentals of Digital Electronics" course, particular emphasis is placed on the importance of the integrated circuit industry. Integrated circuits are not only the foundation of the information industry but also an important indicator of a country's technological level and economic strength. Teaching content should include the historical development of electronic technology and integrated circuits, especially focusing on domestic progress and achievements. Teachers can introduce breakthroughs in China's chip manufacturing and intelligent

technology, emphasizing the importance of the domestic chip industry and its position in the global industrial chain. This enables students to better understand and analyze the relationship between current social and technological trends and national development, cultivating their aspirations for revitalizing science and technology and fostering patriotism. Furthermore, the integrated circuit industry, as the core of the information technology industry, bears important missions for the country's economic and social development and national security. Especially when facing external pressures such as international technological blockade and challenges, how China responds to challenges through independent innovation and policy support emphasizes the necessity of independent research and development of key technologies. Through teaching, combined with practical cases such as the external pressures faced by China's integrated circuit industry, the importance of independent innovation in science and technology is demonstrated, cultivating students' spirit of facing difficulties bravely.

Achieving consistency in educational content. Additionally, integrating ideological and political education elements into professional knowledge teaching is key to achieving consistency between ideological and political education and professional knowledge education. This integration not only enhances the attractiveness of teaching content but also improves its practical effectiveness. This requires teachers to fully consider how to naturally integrate ideological and political elements into professional knowledge during course design, rather than treating them as additional or independent components[12]. For example, in teaching cases, the development of China's Beidou satellite navigation system can be used as a case to show students the country's efforts and achievements in technological innovation. Moreover, in teaching semiconductor memory, integrating the application of big data health codes in COVID-19 epidemic prevention and control further emphasizes the important role of technological innovation in national governance. Through such teaching content, not only professional knowledge is imparted, but also students' patriotism and national pride are aroused. In the teaching of digital electronics technology, the combination of theory and practice is particularly emphasized. By teaching basic knowledge such as logic circuits, students understand the interdependence between individuals and collectives, parts and wholes. In experimental teaching, designing projects that require teamwork allows students to learn cooperation and communication in practice, strengthening team spirit. This not only helps students understand technical knowledge but also enables them to experience the power of collective cooperation in practice.

Cultivating a spirit of excellence. The current youth represent the future of the country, so cultivating their spirit of craftsmanship and patriotism is key. The "Fundamentals of Digital Electronics" course should become a platform for cultivating practical abilities and innovative thinking. In practical teaching, such as building logic circuits, students are encouraged to use innovative methods, emphasizing the standardization and creativity of experiments. In course design, the importance of the practical process is emphasized, cultivating students' professional literacy and rigorous attitude. When evaluating students, not only technical capabilities are considered, but also students' professional ethics, teamwork, and safety awareness are valued, comprehensively enhancing students' overall quality.

5. Establishing a Scientific and Rational Evaluation System for Ideological and Political Education within the Curriculum

Effective implementation of ideological and political education within the curriculum requires a scientific and comprehensive evaluation system to ensure the achievement of teaching objectives and enhance teaching effectiveness. This system should cover various aspects of assessment for both teachers and students, as well as comprehensive considerations of teaching content and methods.

Construction of an educator evaluation system. For educators, higher education institutions need to establish sound supervision and evaluation mechanisms based on the characteristics of each major. This includes clearly formulating teacher management measures, strengthening teacher evaluation and management, and conducting quantitative assessments. Teacher evaluation should include testing professional capabilities, assessing teachers' professional skills and knowledge mastery to ensure their effective delivery of professional knowledge; evaluating teachers' professional ethics and ideological and political literacy, focusing on teachers' moral qualities and their understanding and practical abilities in ideological and political education; comprehensive quality assessment, including teachers' ideological status, teaching performance, dedication to work, and the effectiveness of ideological and political education within courses[13].

Evaluation of the effectiveness of ideological and political education within the curriculum. For evaluating the effectiveness of ideological and political education within the curriculum, the ultimate outcomes of talent cultivation should be emphasized. Higher education institutions should establish comprehensive pre-, in-, and post-course assessment systems, including pre-course preparation stages focusing on teachers' preparation and design of ideological and political elements, involving the appropriateness of teaching content and integration of ideological and political elements; during-class teaching stages, focusing on teaching methods, classroom interaction effects, and student participation[14]; post-course nurturing stages, emphasizing students' active participation and the effectiveness of ideological and political education, conducting comprehensive assessments through questionnaire surveys, and student evaluations.

Improvement of the learner evaluation system. In advancing ideological and political education within professional courses, it is necessary to continuously improve the student evaluation system. Compared to traditional engineering education evaluation systems, the new assessment mechanism should pay more attention to diversification and scientificity. For example, in the ideological and political assessment of the "Fundamentals of Digital Electronics" course, process-based assessment should be implemented, reflecting the integration and implementation effects of ideological and political elements in teaching. With the application of the holistic principle, the evaluation system should include a comprehensive design of evaluation subjects, evaluation indicator composition, and assessment dimensions. Particularly emphasizing the depth of student understanding of teaching content, mastery of basic operations, as well as the cultivation of emotions, values, and so forth. Comprehensive assessment of practical sections should evaluate compliance with regulations, standardization of operations, safety awareness, and innovative thinking.

Through such an evaluation system, improvements in teaching methods can be directly influenced, promoting the enhancement of teachers' ideological and political consciousness and abilities, ultimately achieving comprehensive improvements in students' professional knowledge, skills, and moral qualities. This evaluation system not only enhances the scientificity and diversity of teaching but also strengthens the goal orientation of education. Establishing a scientific and rational evaluation system for ideological and political education within the curriculum is crucial for achieving the objectives of ideological and political education in higher education. This requires continuous improvement and innovation in institutional systems by universities, as well as active participation and adaptation from teachers and students to ensure the effectiveness and far-reaching impact of ideological and political education within the curriculum.

6. Conclusion

"The fundamental mission of education is to cultivate virtue and nurture talent." In the context of the new engineering disciplines, professional course instructors, as the main force in curriculum development, must transform traditional teaching methods. They need to further enhance the initiative and proactiveness of ideological and political education within the curriculum, systematically explore the ideological and political elements of professional courses, delve into reforms in educational philosophy, and fully tap into students' subjective initiative in the learning process. Teaching should align with and accompany professional education in guiding ideology and shaping values, providing subtle guidance for students' comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor. This aims to cultivate a group of skilled individuals with comprehensive qualities in virtue, intelligence, physical fitness, aesthetics, and labor, contributing to the development of the nation as great craftsmen.

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