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The Teaching Practice and Exploration of Ideology and Politics in Embedded Application Technology Course

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Abstract: The Embedded Application Technology course is a core course of the computer science and technology major. It aims to cultivate students' basic theories, knowledge, and skills in embedded computer hardware and software, so that they can become practical talents who can design, develop and test embedded products, and provide after-sales technical support and service. Integrating the ideological and political education concept into the embedded application technology course is an indispensable requirement for cultivating talents in the field of computer science, and it is also an important way to enhance students' professional knowledge and skills and promote their all-round development. In this regard, colleges and universities should actively integrate professional courses with ideological and political education, fully tap the ideological and political elements contained in course teaching, innovate teaching methods, and build a course content system of combining German and technical training, to enhance students' professional identity and social responsibility, cultivate students' professional application ability and professional quality, and lay a solid foundation for their future development.

Keywords: Curriculum ideological and political education; Embedded application technology; Professional competence; Computers

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1. Introduction

The Guiding Outline for the Ideological and Political Construction of Curricula in Colleges and Universities highlights the importance of incorporating ideological and political education into the entire teaching process, tailored to the features of specific professional courses and real-world teaching scenarios. Building on this foundation, effectively merging professional curricula with ideological and political education concepts while enhancing educational outcomes has become a pivotal focus of teaching reform. As a foundational course in computer science and technology majors, embedded application technology not only strengthens students' technical expertise but also plays a crucial role in fostering their overall development. By integrating embedded application technology with ideological and political education, theoretical instruction, practical learning, and

value-based education can align harmoniously. This approach enables students to acquire knowledge and skills while nurturing their craftsmanship spirit, patriotism, and sense of social responsibility. Furthermore, it aids in shaping their worldview, values, and ethical perspectives, significantly contributing to achieving higher education's overarching objectives.

2. The necessity of integrating curriculum ideology and politics into Embedded Application Technology course teaching

2.1. It is conducive to cultivating students' craftsman spirit

As a professional attribute, the craftsman spirit emphasizes students' focus, seriousness, and rigor in their work, which plays a critical role in their future career growth. With ongoing advancements in science and technology, students studying computer science and technology are encountering increasingly higher and stricter societal demands. The embedded application technology course is characterized by strong logical reasoning and comprehensiveness, making it a key factor in nurturing students' professional qualities [1]. Integrating ideological and political education into embedded application technology courses helps reinforce students' value orientation, fosters their professional competence, and effectively promotes the alignment of ideological and political education with professional skill development, encouraging students to achieve both moral integrity and practical expertise. Thus, incorporating ideological and political concepts into the embedded application technology curriculum is an inevitable requirement for cultivating specialized talent in the field of computer science.

2.2. It is conducive to the implementation of the fundamental task of moral education

Education, science and technology, and human resources serve as foundational and strategic pillars for advancing comprehensive socialist modernization [2]. Institutions of higher learning bear the noble responsibility of nurturing individuals on behalf of the Party and the nation. Political and ideological education plays a crucial role in fostering young people in the new era—individuals who possess ideals, take initiative, endure hardships, and are willing to strive. Against the backdrop of recent educational reform, integrating political and ideological education into curricula has emerged as a critical approach for colleges and universities to fulfill their core mission of cultivating both moral integrity and intellectual capability. This is essential for developing well-rounded socialist builders and successors excelling in morality, intellect, physical fitness, aesthetics, and labor [3]. Higher education institutions must actively incorporate the principles of political and ideological education into professional course instruction, guiding students to elevate their ideological awareness, shape values, and enhance both moral character and cultural refinement. With the rapid advancement of computers, information, and integrated circuit technologies, embedded application technology is being utilized more extensively. This trend has increased societal and industrial demand for professionals skilled in embedded application technology. Consequently, cultivating highly qualified and skilled personnel with virtue and talent has become a new objective in college training programs [4]. Integrating political and ideological education into embedded application technology courses not only enhances students' overall quality but also supports the fulfillment of the fundamental task of cultivating morally upright and talented individuals.

3. The problems existing in the teaching of embedded application technology courses

3.1. Single teaching mode

In the conventional teaching approach, instructors often depend on a single method for delivering lessons, which overlooks students' active participation. Through traditional lectures, students can passively grasp the fundamental concepts and principles of embedded application technology, learn basic operational procedures, and handle some straightforward applications. However, this does not effectively promote the overall development of students' skills. Additionally, it struggles to highlight the cutting-edge nature of higher education or align with current mainstream technological advancements [5]. As the social economy evolves, society's demand for skilled professionals in embedded applications has grown significantly, making it challenging for traditional teaching methods to fulfill the objective of cultivating high-quality, advanced technical talent. Moreover, certain educators in institutions are still influenced by outdated teaching philosophies, failing to incorporate diverse ideological and political education cases into their curriculum. This neglects the significance of integrating real-world examples, ideological elements, and practical activities. Consequently, if teachers merely present ideological and political theories without context, it could negatively affect the effectiveness and quality of course-based ideological and political education.

3.2. Changes in students' ideological consciousness

In the context of the modern era, universities and colleges bear a social responsibility that extends beyond merely teaching professional knowledge and skills. More crucially, they are tasked with nurturing well-rounded individuals who embody moral integrity and competence, enabling them to contribute effectively to societal progress [6]. Today's college students are immersed in an age of information overload, where the Internet offers access to a multitude of information sources. This complex ideological landscape influences students' thoughts and values, leading to the rise of ideologies such as hedonism and materialism. As a result, some students question or reject traditional values and exhibit apathy toward social responsibility and collective interests, posing significant challenges to higher education's ideological and political guidance [7]. Additionally, the current educational framework often prioritizes students' theoretical accomplishments while overlooking their personality development and holistic growth, making it difficult to fulfill their developmental needs and negatively affecting the evolution of their ideological perspectives.

3.3. Lack of ideological and political awareness among teachers

In order to meet the requirements of quality education, although some colleges and universities have carried out ideological and political teaching and included it in the goal of talent training, there are serious "superficial" phenomena in the concrete implementation process. For example, due to the lack of ideological and political awareness in the curriculum, some colleges and universities have not formulated targeted teaching plans and education mechanisms for curriculum ideological and political construction, which means teachers have no support in carrying out educational activities [8]. In the traditional professional education in colleges and universities, the educational attributes of professional teachers and ideological and political teachers are different. Professional teachers mainly impart professional knowledge and skills, while ideological and political teachers need to pay attention to students' ideological consciousness and quality education promptly, and the two educational focuses are different. With the deepening of education reform, the work content of teachers of professional courses has changed, and the cultivation of students' comprehensive quality is the focus of college

education and teaching at present. However, some teachers of professional courses lack ideological and political awareness, and it is difficult to integrate ideological and political teaching into professional classes.

4. Embedded application technology courses into the ideological and political education teaching practice strategy

4.1. Based on the content of the course materials, in-depth exploration of ideological and political elements

The extraction and integration of ideological and political elements in course materials can both diversify the content of courses and strengthen the relevance and appeal of embedded application technology instruction. Course materials for embedded application technologies are rich in both technical knowledge and ideological-political components, offering valuable educational resources that support the enhancement of students' professional skills and overall personal growth [9]. During classroom instruction, educators should establish clear educational objectives based on current teaching conditions and student cognitive traits, embedding these goals within the curriculum. By teaching specialized knowledge, instructors can identify appropriate ideological and political examples that naturally align with professional content, thereby extending educational aims organically. Selecting cases that resonate closely with everyday life can further engage students and invigorate their enthusiasm for learning. Through targeted professional case studies, students can explore the evolution of self-developed hardware components, recognize the societal significance of serial communication in national development, and foster improvements in innovation capabilities, a dedication to craftsmanship, perseverance, and the establishment of sound worldviews and value systems.

4.2. Enhance the ideological and political awareness of teachers and establish a professional team

Expert teachers play a central role in curriculum instruction, directly influencing the quality and outcomes of integrating ideological and political education into courses. The effectiveness of ideological and political education largely depends on teachers' awareness of ideological and political concepts and their professional competence. Consequently, under the framework of implementing ideological and political education within curricula, enhancing teachers' professional qualities, reinforcing the development of their ideological and political teaching capabilities, and building a specialized teaching team are essential prerequisites for successfully conducting ideological and political education in courses [10].

First, colleges and universities should assume an active role by organizing and forming mutual support groups, primarily involving ideological and political educators and subject-specific instructors. These groups should foster collaborative learning and enhancement in the realm of ideological and political education through consistent communication and dialogue. Additionally, institutions can establish a "support and mentorship" framework where ideological and political educators deliver structured training sessions for teachers specializing in embedded application technologies, thereby elevating their theoretical understanding and teaching proficiency in ideological and political education.

Secondly, as key figures in curriculum-based ideological and political development, instructors of embedded application technology courses must heighten their awareness of ideological and political education. They should proactively engage with relevant theoretical concepts and pedagogical strategies, continuously refining their ideological and political literacy and instructional capabilities.

Lastly, colleges and universities can arrange for faculty members to deepen their comprehension of ideological and political theories [11]. For instance, they can reinforce educators' grasp of these theories via activities such as teaching research conducted by specialized faculty, peer interactions, corporate training programs, and lectures delivered by experts in ideological and political education.

Furthermore, institutions can schedule regular discussions among teachers to evaluate course teaching outcomes. These evaluations should focus on students' mastery of professional knowledge, the integration of ideological and political components, and the formulation of educational objectives. Through this process, educators can identify their deficiencies in teaching practices and consistently update their approaches to ideological and political education.

4.3. Innovate teaching methods and cultivate students' comprehensive literacy

Embedded application technology course content contains circuit knowledge, assembly language, and C language, and other programming knowledge, with a strong professional, practical, and applied. Compared with other course content, the embedded application technology course teaching content is more abstract, making it more difficult for students to learn. In this regard, to change this situation and promote the integration of ideological and political education more deeply, college teachers can carry out some diversified teaching methods in the teaching process, integrate the teaching methods of the new era, and show some esoteric theoretical knowledge more vividly in front of students [12].

First of all, before the classroom teaching of embedded application technology, teachers need to base on the characteristics of embedded application technology curriculum, take the goal of education as the center, and adopt mixed teaching methods [13]. Online learning platforms, social software, micro-videos, etc., and videos and new media platforms are used as carriers to impart ideological and political knowledge. Offline, specific ideological and political education materials can be integrated into classroom teaching, so that students can enhance their ideological awareness and values in the process of learning professional knowledge, and achieve the cultivation and shaping of students' comprehensive literacy and moral quality. To further enhance their professional identity and social responsibility.

Secondly, teachers can make full use of multimedia platforms to play videos about "the history of Chinese chip development" and the revitalization of "national enterprises" in class teaching, so that students can deeply understand and master the relevant knowledge of "microprocessor" and the importance of social development: After the video is played, teachers can set up problem situations and implement group cooperation teaching method, so that students can have a group discussion on "How microprocessors change our lives", stimulate students' curiosity and desire to explore, and deepen their understanding of technology application through the exploration of electronic products, computer technology development, medical equipment and other fields. And enhance students' national pride.

Finally, colleges and universities can deepen cooperation with computer-related enterprises to develop professional literacy by introducing specific projects that allow students to apply professional knowledge to practical operations. At the same time, teachers can introduce relevant cases and projects of enterprises into classroom teaching in real time and simultaneously, to deeply explore the ideological and political elements contained in them, and cultivate students' social responsibility, professional accomplishment, craftsman spirit and value concept.

4.4. Formulate curriculum evaluation standards to improve the effectiveness of ideological and political education

The concept of integrating ideological and political education into the curriculum serves as a crucial foundation for colleges and universities in nurturing high-caliber talents [14]. In this context, institutions should emphasize student-centered approaches, continuously refine their teaching philosophies, and achieve seamless fusion between specialized knowledge and ideological and political education. As a subject matter instructor, it is essential to align the instruction of professional knowledge and skills with educational objectives during interactive teaching processes. This approach facilitates the successful incorporation of ideological and political education into embedded application technology courses, thereby enhancing students' overall competence more effectively.

The primary objective of constructing a college curriculum system is to foster high-quality talent. Guided by the concept of integrating ideological and political education into courses, universities should reinforce students' ideological and political development while enhancing their professional skills. Based on the evolving trends of the times and industry standards [15], universities can establish comprehensive curriculum evaluation criteria. As quality-oriented education continues to evolve, the professional teaching objectives, educational goals, and assessment systems of universities have undergone corresponding changes. Institutions must conduct holistic evaluations of students' learning processes. To effectively incorporate the concept of ideological and political education into curricula, universities need to redesign evaluation standards, embedding elements such as students' quality development, emotional expression, and value formation into these standards to create a scientific and all-encompassing teaching evaluation framework. For instance, university instructors could assess students based on their classroom participation, learning outcomes, innovative thinking, practical skills, and technical application, while integrating ideological and political components tailored to each area. This approach not only motivates students but also enhances teaching effectiveness and facilitates the seamless integration of ideological and political education into the curriculum.

5. Conclusion

In conclusion, with the swift advancement of the social economy and science and technology, the demand for professionals in computer science and technology is progressively rising. As a core course, embedded application technology plays a crucial role in education. Incorporating curriculum ideology and politics into professional course instruction aligns with the educational requirements of colleges and universities in the new era. To achieve this, higher education institutions can facilitate the deep integration of curriculum and ideological-political education by leveraging course material content, enhancing instructors' ideological-political awareness, innovating teaching approaches, and establishing curriculum evaluation criteria. This will further elevate students' overall qualities, enabling them to better adapt to changing environments.

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