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Research on the Ideological and Political Reform in the Practical Course "Computer Equipment Repair and Maintenance"

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Abstract

Universities are vital institutions for nurturing talent, and the cultivation of talent should not only focus on imparting disciplinary knowledge but also emphasize the development of humanistic qualities and ideological morality. This study centers on the labor practice course Computer Equipment Repair and Maintenance, refining the course content and modularizing the teaching process. Each module is structured around four components: theoretical explanation, operational demonstration, operational verification, and experimental summary, ensuring a close integration of theory and practice. This approach enables students to master knowledge while standardizing operations, identifying problems, and solving them. The course not only emphasizes the development of technical skills but also ingeniously integrates ideological and political elements into the teaching process. Through the design of experimental content, the course combines ideological and political themes such as craftsmanship, teamwork, innovation, safety awareness, patriotism, integrity, and academic ethics with operational explanations, thereby fulfilling the fundamental educational mission of fostering virtue and cultivating talent.

Keywords

Ideological and Political Reform, Education methods, Cultivating Morality and Nurturing Talent.

1. Introduction

"Computer Equipment Repair and Maintenance" is a practical course for computer-related majors in engineering colleges and universities. It serves as a foundational course for the proper use and maintenance of computer equipment. This course plays a significant role in cultivating students' abilities to install and maintain operating systems, drivers, and various application software, as well as to identify and resolve faults through critical thinking and hands-on practice. Additionally, it helps students develop good habits in using computer equipment. In the classroom, students are required to complete various experimental tasks according to the lab instructions and write lab reports. Their operational process reflects moral integrity such as honesty and trustworthiness, habits of using public equipment, and the professional ethics of computer practitioners. In order to enable students to adopt the spirit of model workers as their value orientation, understand the professional ethics and norms of honesty, fairness, and integrity in engineering, and consciously adhere to them in computer engineering practice, the course content should be structured to balance both the development of technical skills and the guidance of ideological depth.

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2. Related Works

The curriculum ideology and politics proposed by Chinese President Xi Jinping emphasize the importance of utilizing the main channel of classroom teaching effectively. All types of courses should align and progress in the same direction as ideological and political theory courses [1]. Integrating moral education into the entire process of education and teaching, and embedding ideological education and the cultivation of cultural quality throughout the educational process of all courses [2]. The ideology and politics of the curriculum prioritize educating students with a focus on moral development, guiding them to grasp scientific theories and policies, and to establish a correct worldview, outlook on life, and values. This aims to cultivate them into qualified builders and reliable successors of socialism who possess both moral integrity and professional competence, or who are well-rounded in moral, intellectual, physical, aesthetic, and labor development [3]. The educational objectives of this course align closely with the value connotations of curriculum-based ideological and political education. To more effectively implement the ideological and political aspects of the curriculum and enhance students' ideological quality, the teaching content has been reformed based on the syllabus.

3. Discussion

3.1. Reform of the teaching content

The course content covers the basic components of computer equipment, daily maintenance, troubleshooting, and security protection. To better cultivate students' practical hands-on abilities, the course is centered around experiments. The experimental content is divided into four modules: computer hardware assembly, BIOS setup, remote boot and remote desktop login, and USB drive installation on a virtual platform. Each module consists of four parts: theoretical explanation, operational demonstration, operational verification, and experimental summary, closely integrating theory with practice[4]. Figure 1 shows the teaching process. During the operational demonstration, standardized procedures are explained, while operational verification involves collecting both correct and incorrect implementation methods. The experimental summary provides feedback and discussion on identified issues, followed by corrective measures. This approach not only enhances teaching quality but also facilitates the integration of ideological and political elements into the classroom.

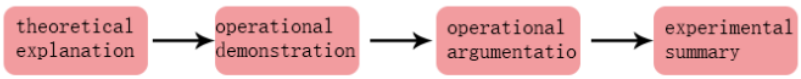

Fig. 1 Teaching Process

3.2. Integration Methods of Ideological and Political Content

The ideological and political content includes, but is not limited to, the spirit of craftsmanship, teamwork and communication, innovation and practical skills, safety awareness and legal consciousness, patriotism and technological self-reliance, as well as integrity and academic ethics[5]. Oral or written expressions of ideological and political content can easily be misunderstood as empty preaching, which may not leave a deep impression and could even lead to student resistance. Through the design of the four experimental activities, the ideological and political content is integrated with the operational explanations, subtly prompting students to reflect on these concepts during hands-on learning.

In the experimental module of computer hardware assembly, during the theoretical explanation segment, the history of computer hardware development is discussed to introduce the manufacturing process of chips and the significance of lithography technology to the chip industry, along with the evolution of lithography technology. From the early contact

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lithography to today's EUV lithography, each technological breakthrough embodies the wisdom and effort of countless researchers[6], guiding students to recognize the challenges of technological advancement and fostering a spirit of hard work and a lifelong learning mindset. The current market landscape of high-end lithography machines, though dominated by a few companies like ASML, Nikon, and Canon, is seeing rapid growth from domestic companies such as SMEE, NAURA, and AMEC[7]. This inspires students' patriotic sentiments, encouraging them to support domestic technology and establish a belief in self-reliance and strength in science and technology. During the operational demonstration segment, students are reminded to pay attention to electrostatic protection and equipment safety. By explaining safety operation protocols, students are guided to establish a sense of security. In the operational verification segment, the assembly completion status is checked, and the integrity of the equipment is inspected. Students are taught to take care of public equipment and adhere to operational norms, fostering their sense of responsibility and professional ethics. After students gain an in-depth understanding of the components of computer hardware through hands-on operation, the experimental summary segment emphasizes the proper handling of electronic waste. Students are guided to pay attention to the environmental treatment of electronic waste, cultivating their environmental awareness and social responsibility, and advocating for the concept of green technology. Figure 2 demonstrates the ideological and political elements integrated into the computer hardware assembly experiment module.

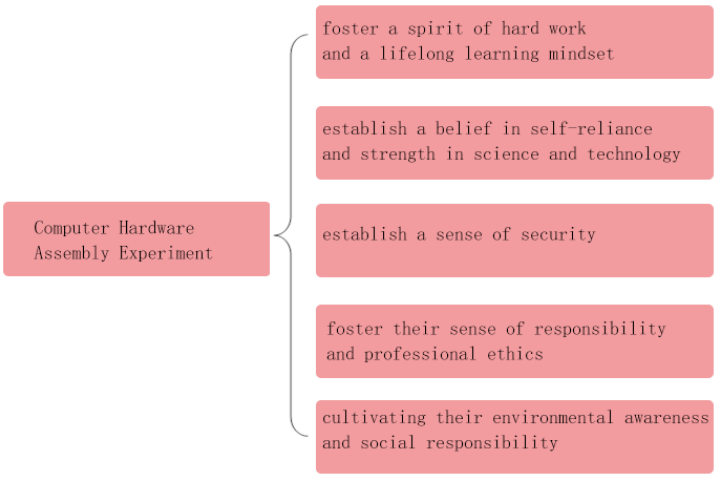

Fig. 2 Ideological and Political elements of Computer Hardware Assembly Experiment

In the experimental module of BIOS setup, while theoretically explaining the functions and roles of BIOS, the efforts and achievements of China in the field of core computer technologies and chip development are highlighted to emphasize the importance of independent innovation. For example, introducing breakthroughs made by domestic enterprises in BIOS firmware and underlying computer technologies, such as Kunlun Firmware and China Electronics Technology Group Corporation, which have successfully developed independently intellectual property-based BIOS/UEFI firmware, breaking the long-term monopoly of foreign manufacturers (e.g., AMI, Phoenix, Insyde) in this field[8]. Domestic BIOS firmware is now well-adapted to domestic CPUs like Loongson, Phytium, and Kunpeng, as well as domestic operating systems such as Kylin and Tongxin UOS, providing foundational technical support for the development and mass production of domestic computers. Students are encouraged to build a belief in self-reliance and self-strengthening in science and technology and to support the development of domestic technologies. During the operational demonstration segment, students can be guided to pay attention to energy conservation and green technology concepts by explaining BIOS settings such as power management and energy-saving modes[9]. In the operational verification segment, students can work in groups to complete hardware configuration and system debugging tasks together. Through division of labor and collaboration, students can

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learn effective communication and teamwork, fostering a sense of collective consciousness and responsibility. In the experimental summary segment, further emphasis is placed on the fact that BIOS settings involve the core configuration of computer systems, and any carelessness may lead to system failure to boot. Highlighting the rigor and importance of BIOS operations, students are guided to develop a meticulous and serious work attitude, cultivating their sense of responsibility and professional ethics. Figure 3 demonstrates the ideological and political elements integrated into the BIOS setup experiment module.

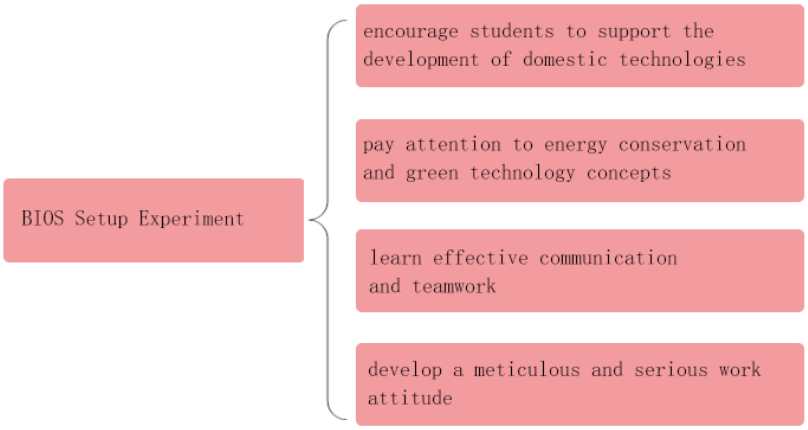

Fig. 3 Ideological and Political elements of BIOS Setup Experiment

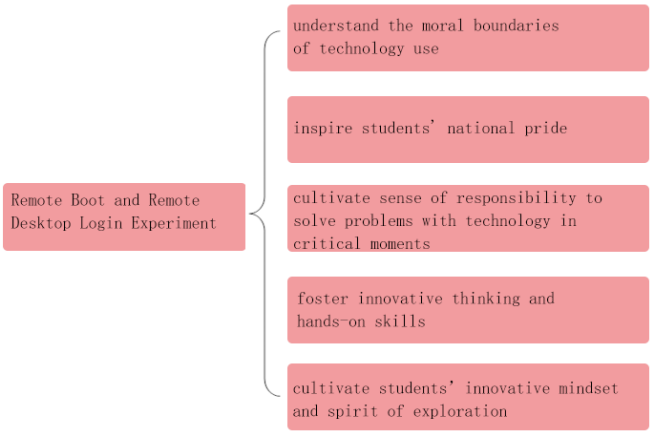

Fig. 4 Ideological and Political elements of Remote Boot and Remote Desktop Login Experiment

In the experimental module of remote boot and remote desktop login, the dual nature of remote technology is emphasized during the explanation: it can improve work efficiency but may also be misused, such as through unauthorized remote access. Students are guided to establish a correct ethical view of technology and to understand the moral boundaries of its use. Mainstream remote control software from both domestic and international markets is introduced and compared, such as Germany's TeamViewer and AnyDesk, America's Splashtop and LogMeIn, and China's Sunflower and ToDesk[10]. Using ToDesk as an example, the operational steps for remote desktop control are explained, inspiring students' national pride and awareness of supporting domestic technology. During the operational demonstration phase, students are guided to reflect on the social value and ethical issues behind technology. For instance, leveraging remote technology to create social value, examples of its application in pandemic control and disaster relief scenarios are introduced[11], helping students recognize the social value of technology and cultivating their sense of responsibility to solve problems with technology in critical moments. In the operational verification phase, students are guided to understand that "practice is the sole criterion for testing truth," encouraging them to identify

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and solve problems through practice, thereby fostering innovative thinking and hands-on skills. In the experimental summary phase, students experience the convenience of remote technology through practice, realizing that technological innovation can transform people's work and lifestyles. They are guided to recognize that innovation is a vital force driving social progress, cultivating their innovative mindset and spirit of exploration. Figure 4 demonstrates the ideological and political elements integrated into remote boot and remote desktop login experiment module.

In the experimental module of USB drive installation on a virtual platform, while explaining virtual machine technology, the concept of green technology is integrated by introducing how virtualization technology can reduce the number of hardware devices and lower energy consumption through resource consolidation and sharing. Students are guided to pay attention to energy conservation and emission reduction, fostering their environmental awareness. When discussing the development history of virtual machine technology, the focus is on how China has gradually broken the monopoly of foreign companies such as VMware and Citrix in the field of virtualization. Through cases of domestic virtualization platforms like Huawei's FusionSphere and ZTE's TECS[12], students are encouraged to support domestic technology and establish a belief in self-reliance and strength in science and technology. During the operational demonstration phase, the USB drive installation involves multiple steps such as system booting, partition setup, and file copying. The importance of rigorous and standardized operations is emphasized, guiding students to develop a meticulous and responsible work attitude, cultivating their sense of responsibility and professional ethics. In the operational verification phase, students are encouraged to try different virtualization tools such as VirtualBox, VMware, and KVM and methods to complete tasks, fostering their spirit of exploration and innovative capabilities. They are also encouraged to independently troubleshoot and solve problems encountered during the installation process, enhancing their hands-on skills, problem-solving abilities, and resilience. In the experimental summary phase, it is emphasized that when using virtual machine technology, students must respect others' privacy and intellectual property rights, and must not unauthorizedly copy or distribute others' data, cultivating their professional ethics and sense of humanistic care. Figure 5 demonstrates the ideological and political elements integrated into USB drive installation on a virtual platform experiment module.

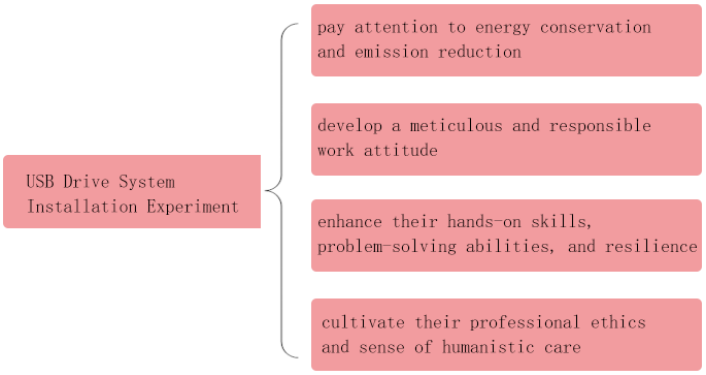

Fig. 5 Ideological and Political elements of USB Drive System Installation Experiment

4. Conclusion

The course has undergone reforms in both its content and delivery methods. Based on key knowledge points such as the basic components of computer equipment, daily maintenance, troubleshooting, and security protection, four experimental modules have been designed: computer hardware assembly, BIOS setup, remote boot and remote desktop login, and USB drive installation on a virtual platform. Each module verifies learning outcomes and ensures

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practical application through four aspects: theoretical explanation, operational demonstration, operational argumentation, and experimental summary. During the explanation of knowledge points, ideological and political elements are integrated by comparing domestic and international technological statuses and encouraging the use of domestic software for experiments, thereby fostering a belief in technological self-reliance and self-strengthening. Through hands-on team collaboration, students' collective consciousness, exploratory spirit, and problem-solving abilities are cultivated. By emphasizing the reasonable and correct use of technologies such as BIOS and virtual machines, their sense of responsibility, professional ethics, and humanistic care are nurtured. The course not only helps students master professional skills but also has a certain effect on cultivating high-quality talents with both moral integrity and professional competence.

References

[1] Xi Jinping emphasized at the National Conference on Ideological and Political Work in Higher Education Institutions: "Ideological and political work must be integrated throughout the entire process of education and teaching, paving the way for new developments in the cause of higher education in China.", People's Daily.[N],2016.12.9.

[2] Liang Xian: Some Thoughts on Curriculum Ideology and Politics, Education and Teaching Forum, (2018)No.30: 42-43.

[3] Zhang Chengshi: On the Relationship Between Ideological and Political Education and Knowledge Education in Curriculum-Based Education, Journal of China Youth University for Political Sciences, (2007)No.3: 104-108.

[4] Li Ye: Theoretical Exploration of the Development of Ideological and Political Education in Applied Undergraduate Institutions, Journal of Changchun Normal University, Vol 36(2017)No.9: 120-122, 2095-7602.

[5] Xuan Wenfang,Dai Zhaoqi,Yang Xirui: Exploration and Practice of Integrating Ideological and Political Education into Pastry Production Technology Courses, Food Industry,(2025)No.02: 41-43.

[6] Xu Lukui, Fan Zixiong, Wang Luwei: Advances and Future Trends in Lithography Technology and Photoresist Materials, Chinese Journal of Lasers,(2025 prepublish).

[7] Zhang Longzhao, Liu Qihui, Zou Jianjun.: The Impact of the New U.S.-China Landscape on China's Independent Innovation in Scientific Instruments and Countermeasures, Research and Exploration in Laboratory. Vol 43(2024),No.12: 223-228.

[8] Wu Jiangxing, Ji Xinsheng, He Lei: The Current State, Trends, and Prospects of Cybersecurity Strategies and Methodologies, Strategic Study of CAE, (2025 prepublish).

[9] Liu Mingyuan, Xiao Bei: Green Productivity, New Quality Productivity, and State-Guided Ecological Development, Nankai Economic Studies,(2024)No.12: 36-49.

[10] Tong Guoxiang: Comparative Analysis of Mainstream Cloud Desktop Technologies in University Computer Labs, Journal of Liaoning Teachers College (Natural Science Edition),Vol 25(2023)No.01: 64-68.

[11] Lai Yongchen, Lu Qingjun: Practices and Typical Cases of Informatization Construction in Medical Alliances(People's Medical Publishing House.China 2023).

[12] Cai Hanfeng: Research on the Application of Virtualization Technology in Computer Laboratory Management, Information and Computer (Theoretical Edition),Vol 36(2024)No.12: 9-11.