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Exploration and practice of curriculum ideological and Political Construction Reform——Take "information security" course as an example

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Abstract: According to the goal of "Curriculum ideological and politics", taking information security course as an example, focusing on the leading ideology facing the frontier of international scientific application, facing the national major needs and facing the main battlefield of economy, through the penetration of Frontier Science and technology and national security regulations into the curriculum practice, the teaching cases in the information security course are excavated, and a set of Curriculum System Integrating Ideological and political and curriculum content is formed. Cultivate and practice the socialist core values and guide students to be human and do things correctly.

Index Terms: Curriculum ideological and Political Education, information safety, Curriculum system.

1. Introduction

China's current chairman emphasized at the National conference on ideological and political work in colleges and universities: "we should make good use of the main channel of classroom teaching. We should persist in improving the ideological and political theory course, enhance the affinity and pertinence of Ideological and political education, and meet the needs and expectations of students' growth and development. So that all kinds of courses and ideological and political theory courses in the same direction, forming a synergistic effect" [1]. Information security is the core course of information management and information system major. The course group adheres to the teaching concept of cultivating morality and talents, organically unifies professional knowledge and curriculum ideology and politics, implements the fundamental task of cultivating morality and talents, imperceptibly integrates curriculum ideology and

politics elements, and stimulates students' sense of responsibility and patriotism, guide students to establish a correct outlook on life and values. At the same time, the ideological and political elements of information security course should be deeply explored to promote the transformation from "the course of ideological and political" to "integrating professional courses into ideological and political education", so as to make ideological and political education run through the whole process of information security personnel training, so as to deeply implement the spirit of the national conference on ideological and political work in colleges and universities, the national education conference and the national conference on undergraduate education in the new era, comprehensively promote the construction of first-class undergraduate [2].

2. Problems in integrating professional courses into Ideological and political education at the present stage

Under the guidance of the national education reform, professional course teachers actively promote the integration of Ideological and political education into the classroom. However, due to the deliberate addition of relevant content, ideological and political education and professional courses are "two skins" phenomenon [3]. The transition of content is blunt, which affects students' acceptance of ideological and political content to a certain extent. Therefore, it is necessary to study the transformation of Ideological and political courses and professional courses from "two layers" to "a game of chess", so as to achieve the effect of education.

At present, there is a strong randomness in the integration of ideological and political elements among teachers of various subjects. They rely more on the self-exploration and development of professional curriculum teachers, which may lead to the repetition of ideological and political contents and arouse students' disgust [4]. Therefore, starting from the overall professional courses, considering the goal of ideological and political education for each course, the integration of ideological and political elements forms a part of the curriculum teaching system.

3. Professional curriculum and curriculum ideological and political collaborative reform

3.1 Keep up with graduation requirements, and clarify teaching objectives and education objectives

In the traditional talent training program, the focus is on the orientation of knowledge goal and ability goal. At present, we should combine the graduation requirements, clarify the education goal, and implement the education goal of the curriculum by taking the curriculum syllabus as the starting point. Through the theoretical teaching and experimental links of the course, students will have the basic theory, knowledge, skills and comprehensive application of cryptography, computer system security, network attack technology and defense foundation, virus analysis and prevention, firewall technology and VPN, security scanning and intrusion detection, and master the basic knowledge of computer network information security, preliminary ability of information security maintenance technology; to cultivate

students' ability of independent thinking and innovation, and the ability of basic network information security setting; cultivate students to have good ideological and moral quality, have a certain ability of information management [5]. The educational goal is to be familiar with the national guidelines, policies, laws and regulations in the field of information security, pursue scientific truth, love the motherland, firmly establish the concept that "the development and application of information security technology can not harm the interests of the state and legal individuals", clarify the boundaries between legal and illegal behaviors, and understand the professional ethics and professional norms of honesty, justice and integrity, and consciously abide by it in real life, study and work. In addition, combined with facing the international science application frontier, facing the national major needs and facing the main economic battlefield [6], we should infiltrate the frontier science and technology into the curriculum practice, educate students to study hard and resist the neck project.

3.2 Persisting in problem orientation and reforming teaching methods

This course mainly adopts the teaching method of combining theory teaching, classroom discussion and computer experiment, pays attention to heuristic teaching, takes the problem as the guidance, continuously guides the students to think independently, designs the information security framework independently, and gradually cultivates their ability to analyze, solve and innovate. At the same time, it is necessary to strengthen the interaction with students in the classroom, as well as team work to do a good job in classroom discussion, timely analysis and evaluation of the effect. The ideological and political teaching system of professional courses is designed from the course content, experimental links, interactive communication and group discussion, so as to arouse students' emotional resonance and encourage students to generate learning motivation, so as to effectively promote the cultivation of high-end technical talents with patriotism and sense of responsibility.

4. Specific case studies

By positioning the teaching objectives and education objectives of the course, it penetrates into the specific contents of the syllabus and effectively achieves the integration of professional courses and ideological and

political courses. Taking the information security course as an example, the teaching objective of this course is to master the basic concepts of computer internet information security, understand the basic means and common methods of designing and maintaining secure network information and its application system, and be able to use theoretical knowledge to solve practical network security problems in life. The goal of Ideological and political education is to cultivate high-end information security talents who shoulder the national and historical mission, persist in facing the forefront of world science and technology, the major

national needs, and the main economic battlefield, and constantly march to the breadth and depth of science and technology. The specific implementation process is shown in Fig.1.

4.1 Case study of Ideological and Political Education

Course content: cryptography and public key infrastructure

Teaching objectives and requirements: The basic concepts of cryptography, traditional cryptography, public key cryptography and public key infrastructure are mastered.

Fig.1. The specific implementation process

The starting point of ideological and political elements: In view of the elaboration of traditional cryptography and public key cryptography, the rapid development of quantum technology is introduced, which has an impact on the existing cryptography schemes. Under the strong computing power, considering that the adversary may use quantum algorithm, many cryptography schemes based on number theory assumption are no longer applicable. In 2006, Re-gev

proposed that lattice based cryptosystem can resist the attack of quantum algorithm [7]. At present, there is no quantum algorithm that can significantly improve the solution of lattice problems. It is known that the best algorithm can only be completed in the running time of sub index, or it can only give a bad approximate result, which can guide students to think and explore, and cultivate students' craftsmanship and research spirit.

Educational goal: Through students' understanding of traditional cryptography and public key cryptography, the impact of the development of quantum technology on existing technology is introduced, and the spirit of craftsmanship and research is guided.

Implementation process:

First, teachers teach. Teach the mathematical basis of cryptography; basic concepts of cryptography; Symmetric cryptography; asymmetric cryptography; public key infrastructure and other knowledge, interspersed with ideological and political elements.

Secondly, the discussion between teachers and students. Can we construct a quantum attack resistant location-based service scheme under the standard model? Can this scheme avoid key abuse? This paper discusses this problem, guides students to think, explores students' exploration and research, and cultivates students' craftsmanship spirit and ability to think and analyze problems.

Finally, expand after class. After class, we will further study the quantum algorithm technology, understand the promotion of the development of quantum word algorithm technology to the existing technology, enhance the authority of Ideological and political education, and arouse students' thinking and exploration.

4.2 Case study of Ideological and Political Education

Course content: Network attack technology and defense foundation

Teaching objectives and requirements: Hacker concept and hacker attack mode are understood, network attack technology and principle are mastered, network attack tools and attack prevention are mastered.

The starting point of ideological and political elements: On March 22, 2014, the domestic vulnerability research platform exposed that the ctrip system has enabled the debugging function of the user payment service interface, so that all data packets transmitted to the bank to verify the cardholder interface are directly stored in the local server, including the credit card user's ID card, card number, CVV code and other information may be arbitrarily stolen by hackers, It leads to a large number of users' bank card information leakage [8], which leads to a heated discussion about "e-commerce websites store user information, use

cards and other sensitive information, and there is a risk of leakage". In view of the ctrip vulnerability incident, guide students to be familiar with the "network security law", which requires network operators to be responsible for network security operation, remedy the product vulnerability in time, slack in performing legal obligations, resulting in personal information leakage, will face a maximum fine of 500000 Yuan, if it is the operator of key information infrastructure, it will be a maximum fine of 1 million Yuan [9].

Educational goal: Through the integrated teaching mode of "teaching, learning and doing", on the one hand, it introduces the relevant knowledge of network attack to students; on the other hand, combined with specific cases, it naturally integrates the legal knowledge of "network security law" to convey to students the idea of correctly learning and using network security and defense technology, strictly regulating their own network behavior, maintaining the information security of individuals, enterprises, organizations and countries, and actively constructing network security [10].

Implementation process:

First, teachers teach. Talking about hackers; network attack technology and principle; network attack tools, network attack prevention knowledge, interspersed with ideological and political elements.

Secondly, the discussion between teachers and students. Students are divided into groups to discuss the cases of network security law. Each group appoints a student to make a summary speech, and teachers and students comment on it, so as to expand the scope of knowledge, and let students build the awareness of network security in the whole process of discussion.

Finally, expand after class. After class, we can provide the students with the relevant reports of the network security law, enhance the security awareness and standardize the network behavior.

5.Conclusion

The effective integration of ideological and political education in the curriculum makes students enhance their awareness of national security and national crisis, and deeply realize that they will be beaten if they fall behind. They should forge ahead bravely and study hard, so that they are

full of enthusiasm for their professional knowledge and skills. In addition, while mastering their professional knowledge and skills, they have a good understanding of information security industry standards and standards moral responsibility has a clear understanding, so as to improve students' ability to solve practical problems of information security.

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References

- [1] Hu Aiqun, Li Guyue, Peng linning, Li Tao. Teaching exploration of Cyberspace Security Frontier Technology integrated with ideological and Political Education [J]. *Journal of network and information security*, 2019, 5 (3) :54-66.
- [2] Xu Jianguang. Adhere to the whole curriculum education and deepen the curriculum ideological and political reform [J]. *Shanghai Education*, 2017 (12):14-14.
- [3] Liu Lei, Liu Li. Connotation and significance of "Three Orientations" science and technology policy [J]. *Global science and technology economy outlook*, 2018, 33 (11):25-30.
- [4] Si Jin. Exploration and practice of Ideological and political education in professional and technical courses [J]. *Computer age*, 2020, 332 (02):98-100.
- [5] Ding Zhiguo. Exploration on the teaching reform of science and engineering courses from the perspective of "Curriculum Ideology and politics" -- Taking "software quality assurance and testing" as an example [J]. *China information technology education*, 2020, 334 (10):101-103.
- [6] Feng Jianwen, Miao Liming. Reform and practice of Ideological and political education of software engineering course in Colleges and universities [J]. *Education modernization*, 2020, 7 (01):29-31.
- [7] Lu Yulin. Thinking on the collaborative education of various courses and ideological and political theory courses [J]. *Science and education Wenhui*, 2017, 12 (34):32-33.
- [8] Bai Yinhua. Effective ways to enhance the affinity of Ideological and political theory courses in Colleges and

Universities under the new situation [J]. *Changjiang series*, 2017 (28):250.

- [9] Hu Aiqun, Li Guyue, Peng linning, Li Tao. Teaching exploration of Cyberspace Security Frontier Technology integrated with ideological and Political Education [J]. *Journal of network and information security*, 2019, 5 (3) :54-66.
- [10] Xu Jing. Teaching reform and practice of Ideological and political education in the course of introduction to information security guided by law-abiding [J]. *Education modernization*, 201 , 6 (59):66-68.

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