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Yujin Zhang (Corresponding author)
School of Electronic and Electrical Engineering,
Shanghai University of Engineering Science,
No. 333, Longteng Road, Songjiang District, Shanghai 201620, China
Tel: +8615216712378, E-mail: yjzhang@sues.edu.cn

Shuxian Dai
School of Electronic and Electrical Engineering,
Shanghai University of Engineering Science,
No. 333, Longteng Road, Songjiang District, Shanghai 201620, China

Guilian Wang
School of Electronic and Electrical Engineering,
Shanghai University of Engineering Science,
No. 333, Longteng Road, Songjiang District, Shanghai 201620, China

Fei Wu
School of Electronic and Electrical Engineering,
Shanghai University of Engineering Science,
No. 333, Longteng Road, Songjiang District, Shanghai 201620, China

Yujun Ren
School of Foreign Languages,
Huaibei Normal University,
No.100, Dongshan Road, Xiangshan District, Huaibei, Anhui Province

Abstract

According to the development and construction of the "new engineering disciplines", the training requirements for talents and the construction of digital content security course are discussed in this paper. Based on the current development situation, this paper clarifies the tightness of digital content security and the development of "new engineering disciplines". The digital content security course has both a complete frontier theoretical system and close correlation with various new engineering disciplines. Combining these two characteristics, this paper proposes three aspects of construction: comprehensive social resources, the formation of a new curriculum teaching system, and the creation of a digital content security gold course; further introduction of school-enterprise cooperation, promotion of the combination of production and education, practical and targeted activities; training of students' ability to master and

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1. Introduction

With the advancement of "Industry 4.0" and "Made in China 2025", science and industry have quietly changed. In order to better cope with the technological development under the information age, "new engineering disciplines" emerged as the times require. There is no explicit stipulation on the boundaries of the "new engineering disciplines", but there is a basic consensus on the types of industries it covers. "New engineering disciplines" is developed in the era of Internet information. Compared with the characteristics of "old engineering", "new engineering disciplines" is more closely related to the development of the times, meeting the needs of the society for talents, emphasizing the practical application and comprehensive development of the subject, especially the engineering industry related to the Internet, and bringing new industries such as information security technology, software engineering and electronic information into play. It will be combined with the traditional engineering specialty. The new subject includes but is not limited to: computer science and technology, cloud computing, data science and big data technology, machine learning, intelligent robots, cyberspace security, etc. It also includes the upgrading and transformation of traditional engineering such as mechanical manufacturing, control engineering, vehicle and so on. The era of "new engineering disciplines" is closely related to the development of digital content, and the development of technology provides a guarantee for the dissemination of information. At the same time, digital content also accelerates the process of the information age. Digital content is based on digital equipment to disseminate information, which is closely related to the development of informatization and digitization. It connects many fields, such as communication, control, signal processing and analysis, and the technologies related to these contents are playing an increasingly important role in many other fields of science and new technology. Therefore, taking the construction of talent cultivation requirements of "new engineering disciplines" as an opportunity, we should improve the teaching quality of digital content security. Starting with teaching content, teaching form and teaching resources, we should introduce the educational form of school-enterprise cooperation, further integrate theory with practice [1], create the education gold course under "new engineering disciplines", and take the road of developing applied undergraduate program [2].

2. Educational impact of "new engineering disciplines"

According to "the Guidelines for Talents Development Planning" in Manufacturing Industry issued by the Ministry of Education of the People's Republic of China, it is expected that in the future, robotics, materials, intelligent control, information network security and other industries will face a serious shortage of talents. In this case, a number of "new engineering disciplines" have emerged. In order to promote the training of talents and the development of science and technology, since February 2017, the Ministry of Education of the People's Republic of China has carried out three major discussions in turn: "Fudan Consensus", "Tianda Action" and "Beijing Guidelines". It has determined the direction and objectives of education at the present stage, emphasized the guarantee of education quality, combined with internal and external resources, promoted the reform of education structure, and opened a new chapter of talent training

under new challenges [3].

The development of science and technology in the era of "new engineering disciplines" is changing with each passing day. Disciplines such as deep learning, intelligent manufacturing, cloud computing, artificial intelligence and robotics are all centered on the Internet or artificial intelligence, and their iteration speed is much faster than that of traditional disciplines. For this kind of science and technology, students are required to have rich creativity and understanding, to master their theoretical knowledge and to have strong practical ability, to adapt to the rapid development and innovation of technology. At the same time, the development of these emerging industries cannot be separated from the dissemination of information, without information, there will be no modernization. Digital content occupies an unshakable position. With the rapid development of the information age, digital content and its security have attracted great attention.

3. Digital content security in an interdisciplinary context

The rapid development of "Internet +" has brought about the explosive propagation and iteration of information. As a part of information, digital content widely exists in the Internet, computer vision, artificial intelligence and other fields. Diffusion through the Internet is an inseparable part of the development of modern science and technology. The contents of digital media (text, image, sound and other information in digital form) are a part of information. U-disk, CD-ROM, hard disk and so on can be carriers of digital content, and they can be widely disseminated through the network.

3.1 Classification of digital content

With the advancement of global information technology, digital content has covered people's daily life extensively. Common digital content includes text publishing, communication, news, video, announcement, entertainment activities, etc. It covers many fields such as education, science, finance, culture, entertainment, commerce, communication and so on. It provides support and guarantee for the development of Internet, artificial intelligence, machine learning and other fields. From the form of expression, digital content can be subdivided into digital text, image, audio and video content. Digital text often appears in mail, engine search, news, papers, microblog, WeChat and various announcements in our life; digital images include photographs taken by digital cameras or digital images spread on the network, and often appear with text to describe news facts; in addition, audio and video are also full of this people's life, and are also more common forms of digital content in News and TV. From the technical level, digital content can be divided into three parts: the development of digital content, the transmission of digital content and the security of digital content. The development of digital content and software and hardware are inseparable. The hardware devices and processing software will leave traces in the digital content. Different transmission modes will also have a certain impact on the digital content. Digital content security is based on the characteristics and traces of digital information to judge its credibility and authenticity. The development of communication technology has further expanded the influence of digital content. 5G communication has been implemented. People are crazy to receive all kinds of information. If its authenticity is not guaranteed, it will cause great waves in society. Therefore, it is of great significance to protect the privacy, integrity and authenticity of digital content.

3.2 The impact of digital content security

With the wide spread of digital content, whether in life, work or government management, people often need to make decisions based on the content they get. However, in the current Internet, there are many false

information, tampered pictures, edited videos and modified voice, which make people question the authenticity of the dissemination of information. For example, during the 2004 U.S. political party election, a photo of Senator John Kerry and American anti-Vietnam war actress Jane Fonda appeared online, causing a great disturbance. In fact, it's a splicing version of two photographs taken at different times, but people who don't know the truth are misled. In scientific papers, pictures should accurately reflect experiments, data and other information, but now the phenomenon of tampering of data and pictures is becoming more and more serious. Michael Roberts, an American scientist, admitted on December 7, 2006 that there was a problem of falsification in a research report he wrote. The image of mouse embryonic cells in the report was falsified. He hoped that the Science Journal withdrawn the corresponding paper, this matter has caused a great sensation in the academic circles. Each coin has two sides. The development of Internet and media processing tools brings us convenience and at the same time makes false content spread wantonly. In the era of public participation, it becomes increasingly important to ensure the security and authenticity of digital content.

Digital content security is mainly divided into two parts: one is to protect the generated digital content, which can be guaranteed by watermarking, encryption, information steganography, message authentication and digital signature; the other is digital forensics technology, which is used to identify whether digital information has been tampered or not. Digital forensics can be divided into active forensics and passive forensics. Active forensics is based on the information identification embedded into the original content in advance, so it will be greatly limited [4]. Passive forensics is also called blind forensics, and it can judge the authenticity of the content without any additional information. Generally, for digital information from unknown sources, some algorithms are needed to determine the authenticity of its content, such as the detection of digital content tampering, source identification and so on.

Digital content tampering forensics is generally based on its characteristics, equipment, noise or format information, etc., to study the law of its tampered features or noise changes, so as to draw identification conclusions. Different forms of digital content contain different characteristics. Specific forensic content can be based on the needs of different majors, teaching and practice. Digital source forensics is based on the assumption that all information from the device contains the intrinsic information of the device, which is related to the generated device and has nothing to do with its content. Hardware devices are unlimited, such as mobile phones, cameras, recorders, computers or other hardware equipment.

4. The realistic path of training digital content security-related talents under the new situation

In higher education, digital content security is a gap at present. In order to meet the development needs of the "new engineering disciplines", we should not simply create a general course, but aim at the relevant "new engineering disciplines" specialties, such as artificial intelligence, intelligent manufacturing and robotics, so as to cultivate the concept of cross-border compound talents and create a gold course model of digital content security; condense the professional needs into cases, and integrate them into digital content security analysis, artificial intelligence and other aspects. We should combine professional needs with enterprise cooperation to achieve skilled application.

4.1 Innovating teaching methods to create practical "gold course"

In June 2018, the Ministry of Education of the People's Republic of China convened the National Conference on Undergraduate Education in Colleges and Universities in the New Era in Chengdu, China, which emphasized the need to turn the "water course" in teaching into a "gold course" with depth, difficulty

and challenge. "Water course" means a closed, cramming and exam-oriented course, while "gold course" is an open, thoughtful and practical one. University may be the last step before a person goes to society. Students can benefit directly from the course. In the course of university, we should realize not only the study of theoretical knowledge, but also the mastery of practice and the way of thinking about research problems. Compared with the previous emphasis on teaching and neglect of thinking, the practical "gold course" should bring students more possibilities, the ability to find and solve problems.

For the construction of digital content security course, we can create the combination of online and offline, integrate the resources from home and abroad on the Internet [5], implement the "new engineering disciplines construction needs to learn from international experience and strengthen international cooperation mentioned in the "Fudan Consensus"[6]. Similarly, "Tianda Action" also pointed out that students' interests, innovative engineering education methods and means [7] should learn from the teaching videos all over the world and improve the teaching content system. There are different research methods in different forms of digital content. University should discuss and apply their characteristics according to the needs of each specialty, and carry out targeted teaching. We should focus on the practical application of teaching, break the boundaries between classroom and school. Changing the relationship between teachers and students in traditional teaching, such as the reference in "Beijing Guidelines" that "more attention should be paid to concept guidance"[8]. Teachers are not blindly playing the role of speakers, but as a planner, leading students to find problems, solve problems, combine theoretical knowledge with practical application, and draw relevant theoretical interpretations from practical cases and software and hardware operations, so as to enable students to combine theory with "new engineering disciplines" industrial technology, realize constantly innovate practical ability, and the combination of science and education.

4.2 Enriching teaching resources and promoting school-enterprise cooperation

In order to create a high-quality digital content security "gold course", we introduce school-enterprise cooperation in the whole teaching mode and combine research with practice in depth. School-enterprise cooperation focuses on students' practical ability, so that theory can be thoroughly understood and mastered through practice. According to the needs of enterprises, schools can cultivate students' knowledge and ability of digital content security, form school-enterprise interaction, and train students to adapt to the development of enterprises, so as to promote the progress and perfection of the "new engineering disciplines" era and achieve a positive cycle effect.

Just as the consensus of "Fudan Consensus" that the construction of "new engineering disciplines" needs the active participation of social forces and the construction of "new engineering disciplines" needs the strengthening of research and practice [6], students can learn theoretical knowledge and basic practice in schools, experience the cases and projects of digital content security in enterprises, feel the importance of digital content security for life and society. Students can actually apply and get rid of the phenomenon of high knowledge and low ability in the past.

In the "Tianda Action", "creating conditions for internal and external resources, creating a new ecology of open integration of engineering education" is advocated. It focuses on the combination of school and enterprise resources, and information sharing win-win mode [7]. School-enterprise cooperation achieves the innovation of school teaching mode, which can well integrate the society, market demand and school education. School-enterprise cooperation opens up a new idea of combining practice with theory, realizes the combination of production and education, and opens a broader vision for digital content security education.

4.3 Change the teaching structure to realize the applied undergraduate

In the "Tianda Action" and "Beijing Guidelines", it is emphasized that "the main body of the school should push forward the reform, explore the independent development of new subjects, self-motivation mechanism" and "pay more attention to structural optimization", and refine the orientation and training of talents. Drawing on the construction of "new engineering disciplines", we should promote professional transformation and upgrading, formulate strict digital security teaching system and curriculum system, and adapt to the development of the new situation. Through upgrading classroom education, optimizing curriculum resources, effective participation of enterprises and other measures to continuously promote applied undergraduate.

Exploring the "gold course" construction of digital content security and introducing school-enterprise cooperation can also promote the construction of Applied Undergraduate education. On the contrary, applied undergraduate education can also meet the needs of personnel training under the development of "new engineering disciplines", and can cultivate high-quality talents who can meet the needs of economic development and have the ability of innovation and entrepreneurship.

5. Conclusion

In view of the rapid demand for digital content security talents in society, colleges and universities should formulate a long-term talent teaching plan to cultivate "political, industrial, academic, research, creative" cross-disciplinary talents to adapt to the rapid development of the information age. For the construction of curriculum content, we should start with the curriculum itself and the cooperation between schools and enterprises, and take the road of application-oriented undergraduate course.

(1) Colleges and universities can add digital content security courses to many "new engineering disciplines" to strengthen the integration of students and the development of the times. Since digital content security involves many disciplines and specialties, it can provide specific teaching and guidance according to the characteristics of different specialties and the needs of the market for talents.

(2) Closely cooperate with enterprises in teaching, so as to cultivate talents with high knowledge and ability. According to the needs of the market and enterprises, we should cultivate talents in a targeted and classified way. Schools lack a practical environment for digital content security, so the way of school-enterprise cooperation is conducive to cultivating talents who really meet the market demand.

(3) Intelligent interconnection is used to build learning mode in the era of "new engineering disciplines", share everything connected in Internet, connect lecturers and students in series, connect different regions and enterprises in series, and build a better application-oriented undergraduate road.

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