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Exploration on the Practical Application of AIGC Fraud Cases in the Ideological and Political Teaching of Data Visualization Course

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Abstract

In response to the security risks and governance challenges posed by AIGC technology, as well as the current status and existing problems in ideological and political education within data visualization courses, this study integrates course content to explore how cybersecurity and AIGC-related fraud can be incorporated as teaching materials into classroom instruction. It further investigates a practice-oriented approach to ideological and political education that is guided by values, empowered by technology, and driven by real-world application. The aim is to refine the ideological and political teaching system of the Data Visualizationcourse, achieve an organic integration of professional knowledge transmission and value shaping, enhance students' sense of professional identity and historical mission, improve their professional competence and innovative practical abilities, and strengthen their awareness of technological ethics and capacity to identify fraud. This research provides strong support for cultivating high-quality talents of the new era who not only master advanced professional skills but also possess a high level of social responsibility. It also offers theoretical guidance and practical references for the ideological and political construction of other specialized courses in the context of emerging engineering education.

Keywords

Data Visualization; AIGC Fraud; Ideological and Political Education in Courses; Teaching Practice.

1. Introduction

With the rapid development and popularization of Artificial Intelligence (AI) technology, deep learning-based Artificial Intelligence Generated Content (AIGC) has been widely applied in finance, healthcare, education, transportation, and other industries [1-3]. However, the double-edged sword effect of technology has become increasingly prominent. Among them, new types of AIGC fraud, represented by deepfake, AI voice and face swapping, and generative phishing emails, occur frequently. Their high technical content, strong deceptive nature, and social harmfulness not only pose a severe new threat to cybersecurity but also cause serious damage to people's property safety [4]. Addressing such high-tech crimes requires not only advanced technical means but also the cultivation of high-quality intelligent application talents who master core technologies and possess a strong sense of social responsibility and security awareness. As the main front for talent cultivation, universities must undertake this mission by deeply integrating the cultivation of anti-fraud awareness, the strengthening of social responsibility, and the forging of scientific and technological ethics and practical capabilities into the entire process of professional teaching, thereby achieving the deep integration of professional education and ideological and political education [5-6].

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Against the backdrop of comprehensively advancing the construction of ideological and political education in courses and fulfilling the fundamental task of fostering virtue through education, it is imperative to make good use of the "great ideological and political courses" and firmly integrate them with real-world practices. Curriculum-based ideological and political education is a key link in realizing the work pattern of whole-person, whole-process and all-round education, whose goal is to integrate value shaping, knowledge imparting and ability cultivation into an organic whole [7-8]. In the era of rapid development of artificial intelligence and big data technologies, the data visualization course is one of the essential skills that students must master. It shoulders the important responsibility of helping students understand big data systematically and comprehensively and improve their big data application skills, and it is also a compulsory course for realizing the Chinese Dream of a data-powered nation in the digital intelligence era. Therefore, based on the above analysis, this study takes emerging AIGC fraud as the core material for ideological and political education, takes the data visualization course as the carrier of teaching practice, and leverages digital intelligence technologies to construct an ideological and political education model that takes value guidance as the core, technology empowerment as the foundation and practice-driven approaches as the path. This model achieves the in-depth integration of knowledge imparting, ability cultivation and value shaping, and promotes the collaborative education of curriculum-based ideological and political education and ideological and political courses to a higher level, broader fields and higher standards.

2. Realistic Challenges in Ideological and Political Education in Courses

2.1. Value Guidance and Clarifying the Educational Goals of Ideological and Political Education in Courses

Data visualization is one of the core courses for emerging engineering majors such as big data and artificial intelligence. It aims to leverage the perceptual ability of the human eye to conduct interactive visual expression of data, reveal the hidden values and laws behind data, and lay a solid foundation for students to engage in work related to data analysis, data mining and visualization. However, in the current practice of ideological and political education in classrooms, several problems still exist that require further research and discussion.

First, the teaching content is superficial and disconnected from epochal propositions. In the current teaching implementation, most of the teaching cases are derived from traditional fields such as e-commerce sales and meteorological data analysis, failing to proactively integrate cutting-edge and strategic practical issues related to national security and social stability, such as the governance of AIGC security. This runs counter to the construction requirements of emerging engineering—i.e., the spirit of proactively responding to the new round of scientific and technological revolution and industrial transformation—and at the same time makes it difficult to effectively stimulate students' intrinsic learning motivation and resonance with patriotism in class.

Second, ideological and political elements are labeled in a superficial way. In the actual teaching process, value guidance is often not integrated into the entire process of professional and technical practice, but is simplified to rigid indoctrination in the form of "labeling" after the explanation of knowledge. Whether it is ethical norms in data cleaning, the principle of impartiality in chart selection, or the value orientation in visual narrative, they fail to form an organic and unified teaching community with professional skill training. This results in a separation between knowledge transmission and value guidance, which deviates from the inherent requirement of ideological and political education in courses that all courses move in the same direction as ideological and political theory courses.

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Third, the teaching effect is superficial, and the educational function fails to be deeply internalized. The course evaluation system mostly focuses on the technical realization of visual works, but lacks effective consideration of dimensions such as whether they contain profound data thinking, can reveal the essence of complex social issues, and reflect the public value of technology for the good of humanity.

3. Reconstructing the Educational Model for Ideological and Political Education in Courses

3.1. Value Guidance and Clarifying the Educational Objectives of Ideological and Political Education in Courses

The course of Data Visualization is designed for junior students who have systematically taken professional foundational courses such as Python Programming and Database. It features "a large number of knowledge points, diverse methodologies, and wide applications", with strong theoretical and practical attributes. Therefore, classroom teaching adopts the approach of integrating theory with practice, centers on practical needs, incorporates representative visual application cases, and elaborates on data visualization tools, methods, and applications. Through graphical means, it develops data information that addresses user concerns or reveals hidden content, establishes an effective internal link from data acquisition and processing to visualization functions, realizes the value of data, and fulfills the construction of knowledge objectives.

Based on disciplinary characteristics and in response to the new requirement of "advancing the construction of ideological and political education in courses in a classified manner", the construction objectives of ideological and political education in this course are focused on two dimensions: value pursuit and scientific spirit. It aims to achieve the collaborative education of "enlightening wisdom" and "cultivating virtue", and establish a three-dimensional educational system ranging from knowledge transmission, ability cultivation to value guidance. Core socialist values, awareness of data security, conviction in serving the country through science and technology, innovative spirit, and sense of responsibility are subtly integrated into professional teaching. Efforts are made to achieve in-depth integration of ideological and political connotations with teaching content, enabling students to possess a rigorous scientific attitude, firm ideals and beliefs, a sense of mission to serve the national digital strategy, an innovative spirit of daring to explore, and noble professional ethics. This enhances the appeal and effectiveness of ideological and political education in courses and cultivates interdisciplinary emerging engineering talents who meet the needs of the digital and intelligent era.

3.2. Forging the Soul and Nurturing Talents: Innovating a Characteristic Educational Path for Ideological and Political Education in Courses

To avoid the "two separate layers" problem between professional knowledge and ideological and political content, the course team, in response to the requirements of emerging engineering construction, takes the talent training paradigm of "fostering morality and cultivating people" and "integrating five educations" as the main line. It focuses on efficiently and deeply mining ideological and political materials from professional content, refining ideological and political connotations, and organically integrating cutting-edge social issues, core professional technologies, and lofty value guidance. By adopting diversified teaching methods, it enhances students' independent inquiry, classroom participation, critical thinking, and innovative practical abilities, subtly shaping their awareness of scientific and technological ethics and social responsibility through value resonance, thereby fundamentally realizing the

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transformation from knowledge-oriented to competency-oriented education. The distinctive features of ideological and political construction are reflected in the following aspects:

First, based on the OBE (Outcome-Based Education) philosophy, the course team reconstructs an ideological and political educational model featuring "forging the soul through value guidance, laying the foundation through technology empowerment, and enhancing effectiveness through practice-driven approaches". Taking the governance of AIGC fraud—a major practical issue of national and social concern—as the entry point, the course team integrates real AIGC fraud cases into teaching to guide students in ethical reflection on "why we visualize", fostering their lofty sense of mission and social responsibility to use professional technologies to serve national and people's security. In addition, a visual system for monitoring, early warning, and countering propaganda against new types of AIGC fraud is designed as a core teaching case, guiding students to face the realistic challenges to national cybersecurity in project practice, deeply understand the harm of technology abuse to national security and social stability, and thus consciously establish patriotism and social responsibility to safeguard a clean cyberspace and protect people's property security. Meanwhile, it enhances students' awareness of cybersecurity and ability to defend against telecom fraud, and cultivates correct professional values.

Second, forging the soul of ideological and political education with the spirit of educators is the core goal of ideological and political education in courses. Whether a course has a "soul" hinges on whether teachers have a "soul". Therefore, the course team works closely with regional anti-fraud centers, proactively learns anti-fraud knowledge, participates in anti-fraud promotion campaigns on campus, and learns first-hand anti-fraud experience and real cases. Fraud data collected from these activities and from the national anti-fraud center platform are transformed into visual teaching materials, and fraud routines are analyzed in class combined with technical principles. In teaching, professional skills are imparted, and the value concept that "technology should have warmth and professionalism should assume responsibility" is conveyed through sharing personal anti-fraud practice experiences, making teachers' ideological and political guidance more persuasive. It also achieves in-depth integration of the "soul" of ideological and political education with the "form" of professional teaching, subtly cultivating students' social responsibility.

Third, responding to the policy orientation of "promoting learning and teaching through competitions", the course team builds a competency training chain integrating course learning, subject competitions, and innovative practice, transforming classroom projects and students' excellent works into entries for competitions such as college students' innovation and entrepreneurship. Through the theme of AIGC anti-fraud visualization, students deepen their professional skills such as data analysis model establishment and visualization design in competition preparation, while strengthening the expression of ideological and political connotations. Through the circular mechanism of "promoting learning through competitions, promoting reform through innovation, and improving quality through reform", students optimize their works based on real anti-fraud needs, demonstrating both technical application capabilities and the value pursuit of safeguarding cybersecurity and serving the public. Taking competitions as a link, the course team guides students to combine their professional strengths with national cybersecurity needs, and cultivate a sense of responsibility and innovative thinking in team collaboration and scheme design. Through course foundation building, competition quality improvement, and practice empowerment, ideological and political education and innovation and entrepreneurship education run through the entire process of competency training, enhancing the practicality and innovation of course teaching. It also enables students to deeply understand the meaning of "serving the country through science and technology" in competitions and practice, achieving the coordinated improvement of professional abilities and value literacy.

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4. Practice of Ideological and Political Education in Courses

4.1. Collaborative Educational Mechanism of Problem Guidance, Project Practice and Value Sublimation

To avoid the issue of "two separate layers" between professional knowledge and ideological-political content, the course team, in alignment with the requirements of Emerging Engineering Education (New Engineering) construction, takes the talent cultivation of fostering virtue through education and promoting the "Five Educations" simultaneously. The focus is on efficiently and deeply excavating ideological-political materials within the professional content, condensing the ideological-political connotation, and organically integrating cutting-edge social issues, core professional technologies, and noble value guidance. Diversified teaching methods are employed to strengthen students' independent inquiry, classroom participation, dialectical thinking skills, and innovative practice abilities, subtly shaping their awareness of technological ethics and sense of social responsibility through value resonance. This fundamentally achieves a transformation from a knowledge-based orientation to a competency-based orientation. The specific features of the ideological-political construction are primarily reflected in the following aspects.

Adhering to the principle of "student-centered and teacher-led" and following the guideline of "objective-oriented and value-led", the course designs teaching activities from four modules—pre-class, in-class, after-class and the second classroom—based on the OBE (Outcome-Based Education) philosophy and the integrated theory-practice teaching framework. In the teaching process, the BOPPPS teaching model is adopted, combined with online-offline hybrid teaching. Through teaching strategies such as problem-driven learning, project practice and group discussion, the emerging AIGC anti-fraud issue is integrated throughout the entire teaching process to achieve the coordinated advancement of knowledge internalization, ability improvement and value sublimation.

In the pre-class stage, guided by problem-driven learning to achieve value perception and cognitive preparation, teachers send pre-class materials including news cases of AIGC fraud, data reports and anti-fraud-themed courseware to students via the Chaoxing Xuexitong online platform, and assign guiding questions such as "Exploring the spread of AI face-swapping fraud from a data perspective". Alternatively, students are asked to analyze the data characteristics of a specific AIGC fraud case and attempt to propose ideas for visual presentation. After completing the pre-class tasks, students establish a preliminary understanding of data visualization serving anti-fraud governance through pre-class assessment, exercise feedback and reverse questioning sessions, stimulate their thinking on technical ethics and social security, and arouse their learning interest.

In the in-class stage, teaching activities are organized as follows. First, a test on pre-class content is conducted to strengthen students' theoretical understanding of the data dimensions of AIGC fraud and visualization principles. Second, a project assignment is carried out to clarify the core teaching task of "Visual Design of Monitoring and Early Warning System for Emerging AIGC Fraud", guiding students to establish the value pursuit of using technology to serve social security. The task implementation is carried out in four processes: task understanding, scheme optimization, practice enhancement and summary evaluation. In the task understanding phase, students discuss in groups the data dimensions such as the communication links of AIGC fraud and the characteristics of victim groups, complete the demand analysis of data visualization, clarify the visualization objectives and data analysis ideas, and design a preliminary framework for data visualization analysis. When optimizing the design scheme, data ethics issues are introduced, and the user interaction logic of AIGC fraud visualization works is demonstrated through interactive sessions, enabling students to think about how to enhance public anti-fraud awareness and identification ability through visualization design. In the project practice phase,

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teachers guide students to conduct multiple rounds of debugging on the color warning effect, information readability and interactive fluency of visualization works, ensuring the deep integration of technical presentation with ideological and political goals such as cultivating patriotism and assuming responsibility for cybersecurity. In the summary and evaluation phase, teachers provide comprehensive evaluation and feedback based on the technical completion and ideological and political connotation expression of students' works, guide students to reflect on the social value of the project, achieve the unity of professional evaluation and value evaluation, and realize the resonance between ideological and political education and professional teaching.

In the after-class stage, value sublimation is used to promote achievement transformation and literacy internalization. The teaching outcomes are consolidated through a combined assignment of project implementation and defense. Students are required to complete the iterative optimization of anti-fraud visualization works and deliver a defense, elaborating on the embodiment of the concept of technology for the good in their works. In addition, the course extends learning outcomes to the second classroom, encouraging students to transform the optimized anti-fraud visualization works into community publicity materials or guiding them to convert classroom projects into competition entries for innovation and entrepreneurship contests such as the "Internet +" Competition. Through competition preparation, debugging and challenge training, students continuously deepen their sense of mission to support anti-fraud governance with professional capabilities, and ultimately achieve the coordinated improvement of professional literacy and ideological and political literacy.

4.2. Digital Empowerment and Innovative Evaluation System for Ideological and Political Education in Courses

To scientifically evaluate the effectiveness of ideological and political education in the teaching implementation process, this course introduces AI teaching assistants to construct an intelligent and diversified evaluation system. A comprehensive evaluation approach, which combines formative assessment with summative assessment as well as qualitative evaluation with quantitative evaluation, is adopted to conduct a comprehensive assessment of students' learning outcomes and the development of their ideological and political literacy. The specific implementation methods are shown in Table 1. The diversified evaluation system enables the more scientific achievement of the educational objectives of ideological and political education in courses.

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Table 1. Evaluation System for Ideological and Political Education in Courses

Evaluation Methods	Core Connotation	Implementation Methods
Formative Assessment	Focus on the complete record and dynamic development of students' learning process	1. Launch in-class thematic discussions and phased questionnaires via Chaoxing Xuexitong to monitor students' feedback and recognition of key ideological and political points such as technical ethics; 2. Use the AI assistant of Chaoxing Xuexitong to analyze students' learning behaviors and evaluate their learning attitudes and course participation.
Summative Assessment	Focus on students' learning outcomes and comprehensively understand their learning effectiveness and development trajectory	1. Evaluate students' learning effectiveness and comprehensive abilities from multiple dimensions such as classroom performance, technical application ability, and the social value orientation of works; 2. Establish personal learning portfolios for students.
Qualitative Evaluation	Describe the development of students' ideological and political literacy and observe the process of ideological transformation	1. Evaluate students' explanation of the value of technology for the good in project defense through classroom observation and thematic reports; 2. Understand the real changes in students' anti-fraud awareness and social responsibility through interviews.
Quantitative Evaluation	Transform the effectiveness of ideological and political education into quantifiable indicators to achieve objective evaluation	1. Design scales and questionnaires; 2. Collect data through standardized tests, structured questionnaires and other methods to quantitatively evaluate students' ideological and political literacy.

5. Summary

Ideological and political education in courses is an important approach to fulfilling the fundamental task of fostering morality and cultivating people, and to realizing the all-round education of students in three aspects—whole-process, all-around and all-staff education. While the development of AIGC technology benefits society, it also facilitates criminal activities, and anti-fraud education is therefore a compulsory course. Facing the severe social security challenge posed by emerging AIGC fraud, this study integrates anti-fraud education into the professional curriculum system, and takes the Data Visualization course as the carrier of teaching practice to explore a practical ideological and political education model that takes value guidance as the core, technology empowerment as the foundation, and practice-driven approaches as the path. Adopting diversified teaching methods such as group discussion, project-based learning, and online-offline hybrid teaching as the implementation strategies for ideological and political education in courses, it stimulates students' subjective consciousness, and guides them to improve their professional skills and ideological and political literacy simultaneously in the process of solving the practical problem of AIGC fraud. In addition, the diversified evaluation system combines formative assessment with summative assessment, and complements quantitative analysis with qualitative evaluation. Meanwhile, with the aid of AI intelligent analysis, it comprehensively assesses students' mastery of technical abilities, innovative thinking, and sense of social responsibility. In the future, the course team will continue to optimize teaching content and methods, keep pace with the development trend of

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AIGC technology, dynamically update teaching cases, and maintain the cutting-edge nature and effectiveness of the course.

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