

Model Exploration and Case Design for Ideological and Political Construction in Artificial Intelligence Courses

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Abstract: With the coordinated development of education, technology and talent in the new era, all-round education is the basis of youth cultivation in colleges and universities. While theoretic knowledge and professional skills being imparted, ideological and political elements should be throughout integrated into curriculum, which thereby can culture a large number of responsible engineering and technical talents. The construction of ideological and political education of artificial intelligence courses in colleges and universities is explored in this paper, which presents the instructional objectives and exploration models, and designs the specific cases of some ideological and political courses. It provides guidance for the ideological and political construction in artificial intelligence curriculum.

1. Introduction

The ideology of youth is formed in colleges and universities. In recent years, many colleges have carried out ideological and political construction [1-3]. On the view of global strategic development, we need to build a solid ideological and political education system on shaping students' souls, which focuses on the integration of students' ideological awareness and professional knowledge, and insists on infiltrating moral education and national sentiments into course teaching. All lessons in colleges and universities have the multiple functions of imparting knowledge, cultivating abilities, and conducting ideological and political education [4-7]. With the popularization of information networks and artificial intelligence products, facing current complex external environment, we need to deeply understand the era background and real demands of college students' growth, and combine the cultivation of responsibility of national revival and the shaping of core values, to encourage college students implant the patriotism into their personal ideals and beliefs, that even have a lifelong impact on their entire careers.

2. Teaching Objectives

Currently, the deep integration of digital technologies such as data science, the Internet of things, and intelligent manufacturing with artificial intelligence is triggering a disruptive transformation in the computer industry. Cultivating the creative talents in the new age who possess patriotism,

professional ethics, scientific spirit, and innovation capabilities is the cornerstone for serving the national strategy of "Digital China" and addressing international scientific and technological competition and engineering challenges [8, 9]. When we set the teaching objectives of artificial intelligence major in colleges and universities, besides the cultivation of professional competence, the ideological and political education is also the key to course teaching. Through the ideological and political construction, we aim to explore a new teaching model that integrates value shaping, ability cultivation, and knowledge imparting, which cultivates the engineering and technical talents who not only possess professional competence, but also have the sense of patriotism and the strong social responsibility. At the same time, high school graduates should also be high-quality individuals who can adapt to the demands of market economic development, and promote innovation and technological progress.

3. Teaching model Exploration

The ideological and political teaching model is explored from the perspectives of cultural confidence, ethics and morality, and technological strength to enhance the high-level nature of professional teaching. Specifically, we will mine the explicit and implicit ideological and political teaching resources contained in professional courses, and put the idea of ideological and political teaching into practice on the entire teaching life cycle for exploring the teaching scheme called as humanistic wisdom classroom for professional courses.

3.1. Theme Orientation

The curriculum-based ideological and political education has close connection with the current international situation and social environment [10, 11]. We should deeply mine the ideological and political resources contained in professional courses and integrate them into classrooms from both the teaching arrangement and the teaching content. Under the guarantee of an open atmosphere and intelligent devices, a series of open questions intersected with science and philosophy are set up for students to conduct public and practical discussions and debates, which will integrate professional theories with philosophy, ethics, humanities, history, and national conditions. For example, when introducing the current situation of China's computer industry and the development of artificial intelligence, teachers can encourage the students to have a discussion around the following series of ideological themes:

- Cultivate national responsibility and core competitiveness
- Strengthen cultural identity and industry self-confidence
- Build system thinking and global perspective
- Stimulate innovation and inherit tradition
- Face challenges to catch up with the advanced
- Adhere to professional ethics and academic integrity

3.2. Reforming Teaching Methods

From both the theoretical and practical teaching aspects, we will fully mine the ideological and political elements in the specialized courses, and the teaching methods of these elements, meanwhile, will be transformed from the simple lecture mode towards the more experiential and exploratory one.

(1) Case teaching. Through teaching cases, we introduce students the current developing status of main software of artificial intelligence both domestically and internationally. A comparative analysis of the technological development in the field at home and abroad should be conducted,

enabling students to understand the current situation and shortcomings in the domestic artificial intelligence field, as well as the main gaps compared with international standards. Thus, they may clearly realize the direction of their efforts to bridge the technical gaps in this area, which will stimulate students' patriotic enthusiasm.

(2) Guided teaching. Considering the key technologies of artificial intelligence manufacturing, we will provide students a repository of academic papers that closely follows the cutting-edge technology in the current field, and encourage them to independently study and actively consult literature. At the same time, teamwork can be carried out to cultivate students' collaborative skills.

(3) Practical teaching. We set up the experiments related to the implementation of artificial intelligence systems, some of which are designed based on domestic open-source software as much as possible. Students can gain hands-on experience in software development by applying learned principles and technologies to the practice, rather than merely engaging in theoretical learning.

(4) Encouraging innovation. We will explain to students some challenging technical issues in the current artificial intelligence field, guide them to think actively and propose innovative solutions and attempt to conduct scientific experiments for verification and result analysis, thereby cultivating students' innovative ability.

3.3. Establishing an Evaluation System

Taking students as the main body, we construct a suitable evaluation system for the ideological and political courses, by closely integrating value formation, knowledge transmission and ability cultivation. (1) The entire process of classroom teaching is assessed, covering class attendance, after-class assignments, course tests, etc., which require students to abide by the scientific integrity, such as being punctual, not cheating, not copying, etc. (2) In practical teaching, we encourage students to engage in teamwork by setting up the process checks, the periodic reports, the outcome inspections, etc. In the evaluation of ideological and political courses, we pay attention to establishing assessment criteria with multiple dimensions including technological innovation, scheme feasibility, teamwork, social value and so on.

3.4. Implementing Ideological and Political Education in Courses

During the continuous reform and innovation of curriculum, we strive to implement ideological and political education in the teaching of artificial intelligence courses by using scientific research methods. (1) In the design of cases, a multi-level and multi-dimensional ideological and political case repository is constructed to achieve the organic synthesis of knowledge internalization and value enhancement, using the models from scenario creation, problem exploration to multi-dimensional analysis. (2) In the practice of projects, students are required to complete the whole process training from demand analysis, scheme design to technical demonstration, to realize the all-round education that reflects social values by following the principles of authenticity, perspectiveness and openness. (3) Combining with the digital platforms, we use digital teaching resources such as virtual simulation technologies and performance optimization experiments to help students establish a systematic cognitive framework by transforming the abstract principles into the intuitive visual presentations.

4. Case Design

The design of ideological and political cases is underpinned by cultivating students' patriotism and core values. Here, we list the ideological and political teaching cases of some course units of artificial intelligence, as shown in Table 1.

Table 1: Ideological and political cases of main course units

| Courses | Teaching units | Ideological and political cases |
|------------------------------------|--|--|
| Machine learning | (1) The development history of machine learning | Guide students to understand the development history from traditional models to deep models and then to large models, and encourage them to design the more innovative learning models such as DeepSeek for the country's technological progress. |
| | (2) Dynamic programming | Starting from the fundamental properties of dynamic programming, use vivid metaphors to illustrate the value of the optimal choice at the current stage for future life planning, thereby stimulating students' initiative and fostering their ability to keep pace with the times. |
| | (3) Reinforcement learning | Encourage to exploratively think and gradually refine step by step through rewards, getting to the goal. |
| | (4) Large language models | By studying the latest versions of large models, such as GPT-5.1, Liama3.1, Claude2, Gemini, DeepSeek and other open-source or closed-source models, strive to master the most advanced large model technologies, and encourage students to make efforts to break through technical barriers and develop world-leading state-owned large models. |
| Data science | (1) "Data is productivity." | By the introduction of data science projects, explore the mysteries of physical information space, appreciate the immense power hidden within the data that represents all the laws and cognitions of human society, to guide students to develop the ability to identify, analyse and solve problems from data. |
| | (1) Regression analysis | Through the case of housing price prediction, the data science model is strengthened to express the objective laws of data. By integrating the market economy with data science, realize the rational allocation of social resources. |
| | (2) Perceptron models | Through the "roundtable discussion" case, guide students to think about (a) whether are the analysis results of Minsky and Papert arbitrary? (b) How to view the relationship between linear functions, activation functions and human-like intelligence? |
| Generative artificial intelligence | (1) Generative artificial intelligence represented by Chat-GPT | The content manufacturing of artificial intelligence can benefit all of humanity. By thoroughly implementing the "Artificial Intelligence +" action and enhancing the extensive integration of generative artificial intelligence with various fields, it will help transform and upgrade traditional industries and open up new tracks for strategic emerging industries and future development. The development of the country will require a large number of talents in the field of artificial intelligence, thus encouraging students to study the courses of intelligent |

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| | | science diligently. |
| | (2) The development of the digital age | The digital age fundamentally achieves "true individualization": personal choices become more diverse, and individuals can coexist harmoniously with their environment. The talents of the digital age should possess advanced outlooks on life, values, worldviews, thinking patterns, learning methods, knowledge structures and lifestyles. Therefore, it is necessary to encourage students to develop comprehensively. |
| | (3) Text generation technology | AI takes over from humans in content creation, such as writing papers, generating codes, and generating speech drafts. It can produce at a faster rate and can customize the style to meet individual needs. However, AI cannot replace humans in scientific research. We strongly condemn the act of using AI for academic fraud and aim to cultivate students' correct values and academic integrity. |
| | (4) Visual generation technology | Explain how to integrate social requirement, technological innovation, and value orientation into AI content generation products. |
| | (5) Ethics of Artificial Intelligence | By discussing with students on the impact of AI creativity on human well-being and the ethical challenges brought by AI, emphasize the balance between technological progress and human values, as well as how to maintain the moral baseline in the rush of technology and cultivate students' social responsibility and mission for maintaining a harmonious society. |

5. Conclusions

In the construction of ideological and political education in the artificial intelligence courses, through continuous exploration, we have accumulated abundant resources and experience in teaching methods and course practice. This paper states our opinions from teaching objectives, model exploration and case design, proposes the implementation programs of ideological and political teaching, and has achieved practical results in course practice.

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