

Research on the Connotation, Difficulties, and Implementation Strategies of Ideological and Political Education in Artificial Intelligence Curriculum

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Abstract: The construction of ideological and political education in the artificial intelligence curriculum represents a significant challenge to China's educational reforms. This paper explores the connotation of ideological and political education in artificial intelligence curriculum, analyzes and summarizes the difficulties of integrating ideological and political education into artificial intelligence courses, and presents implementation strategies from the perspectives of content design, teaching improvement, and evaluation and feedback. This paper aims to provide insights and references for higher education institutions in cultivating comprehensive talents in artificial intelligence.

Keywords: Artificial intelligence; Ideological and political education; Implementation strategies

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1. Introduction

As a primary arena for cultivating high-level talents, higher education institutions emphasize the curriculum construction of artificial intelligence (AI) majors, as a pivotal aspect of China's educational reforms^[1-3]. The design of AI courses should closely follow the pace of educational reforms and fully reflect the significance of ideological and political education. For example, several higher education institutions in China have begun integrating ideological and political content, such as Marxist philosophy and socialism with Chinese characteristics, into AI courses to enhance students' ideological and moral qualities. These initiatives not only contribute to students' breakthroughs in technical fields but also promote their comprehensive development and sense of social responsibility. Effectively integrating ideological and political elements into AI courses has become one of the critical issues in current China's educational reforms. Therefore, this paper focuses on ideological and political education in the AI curriculum. Specifically, this paper explores the connotation

of ideological and political education in AI curricula, identifies the difficulties of integrating ideological and political elements into AI courses, and proposes implementation strategies based on actual teaching experience. These efforts aim to align ideological and political knowledge with professional AI knowledge, nurturing AI talents that meet the demands of contemporary development.

2. Connotation of ideological and political education in AI curriculum

Ideological and political education in AI curriculum refers to actively incorporating ideological and political elements into the teaching process of AI courses, aiming to achieve the organic integration and mutual development of professional AI knowledge and ideological and political knowledge^[4-7]. Understanding the connotation of ideological and political education in AI curricula should focus on the three aspects:

(1) Cultivation of AI talents with high ideological and political literacy and moral integrity

This requires students to not only master advanced AI technology but also possess high ideological and moral qualities and social responsibility. Through AI courses, students should be able to deeply understand and address the ethical and social issues brought about by AI technology, develop an awareness of independent thinking on how to solve these problems and demonstrate responsibility and commitment to society in their learning and application of technology.

(2) Collaborative teaching

It aims to achieve the organic integration and mutual development of professional AI knowledge and ideological and political knowledge. This requires teachers to carefully integrate ideological and political content into course design and teaching practice, ensuring that ideological and political content and technical content complement and promote each other. For example, methods such as case studies, group discussions, and writing reports can be used to guide students in analyzing and thinking critically about the ethical and social impacts of technological innovations, thus fostering their critical thinking and social responsibility.

(3) Integration of explicit and implicit elements, restructuring courses to incorporate ideological and political elements

This includes explicitly arranging ideological modules or units in course structure and implicitly embedding ideological and political content into technical content. For instance, when teaching AI algorithms, students can be guided to consider ethical issues such as data privacy, the impact of AI algorithms on social equity, and the relationship between technological progress and societal employment stability. In summary, teachers should not only impart technical knowledge but also guide students to reflect on the ethical and social issues behind technological developments, thereby cultivating their ability to face the complexities of the real world and their sense of social responsibility.

In conclusion, the construction of ideological and political education in AI curriculum not only contributes to students' comprehensive development but also promotes a positive interaction between AI education and social development. By adhering to the principles and practices of ideological and political education, universities can cultivate AI talents that better meet the demands of the era, which are the individuals who possess not only technical application and innovation capabilities but also correct ethical and social values, injecting more positive energy into the development of AI technology.

3. Difficulties of ideological and political education in AI curriculum

As a highly technical discipline, AI encompasses complex mathematics, algorithms, and engineering. Students

need a solid technical foundation and logical thinking skills to succeed in this field. However, integrating ideological and political education into these technical studies presents a balancing act for teachers in curriculum design and teaching practice. AI courses, typically categorized as engineering courses, face several difficulties in constructing ideological and political education^[8-10], primarily in the following three aspects:

(1) Difficulties in integrating ideological and political elements

In terms of digging out ideological and political elements, AI courses emphasize techniques, focusing on practical applications and problem-solving skills. However, ideological and political education emphasizes the cultivation of humanistic qualities such as ethics and social responsibility, to guide students to maintain humanistic care and social responsibility in technological development. The content, structure, and systems of the two have significant differences, requiring targeted integration efforts. In terms of integrating ideological and political elements, the difficulties lie in bridging the gap between AI technology and ideological and political elements during teaching discussions. On one hand, technical courses prioritize rational thinking and practicality, often leading students to focus on skill acquisition and application while overlooking ethical considerations. On the other hand, ideological and political education emphasizes guiding students' thoughts and developing their sense of social responsibility, requiring students to examine the impacts of technological advancements on society's overall interests from a higher humanistic perspective. The different educational objectives and methods pose difficulties in course design and teaching implementation. Ways to integrate AI technology with ideological and political elements such as policies, social development, and the concept of a community with a shared future for mankind, enabling students to delve deeply into technical details while understanding its profound impacts on society, economy, and culture, is one of the crucial tasks of ideological and political education in AI curriculum.

(2) Difficulties in teachers' cognitive inertia

AI development involves deep-seated issues such as ethics, social impacts, and concerns like data privacy, algorithmic biases, and human-machine relationships. These issues require not only technical discussions but also the ability for students to think and solve them from an ideological and political perspective. This further requires that teachers not only possess interdisciplinary knowledge but also cultivate students' comprehensive analytical abilities and their sense of social responsibility. In other words, ideological and political education in AI curricula requires teachers to break through long-standing cognitive inertia. Specifically, teachers should not only have a solid foundation in theoretical and technical AI knowledge but also systematically grasp ideological and political education concepts and methods. This means that teachers need to flexibly apply both technical education and humanistic education perspectives in teaching practice. Through innovative teaching methods and deep ideological and political guidance, teachers can lead students to enhance their social responsibility, ethical awareness, and values while developing their professional skills. In this sense, with the progress of society and technology, teachers' roles involve knowledge transmitters and moral guides, necessitating adaptation to new educational challenges to better meet the diverse needs of modern talents.

(3) Difficulties in ideological and political evaluation and feedback

On one hand, the cultivation of ideological and political qualities is a progressively deepening process, where traditional quantitative assessments often fail to fully reflect students' development in ideological and political aspects. Furthermore, ideological and political education emphasizes the subtle influence of ideological concepts and moral qualities, which are not easily measured accurately through simple numerical indicators. On the other hand, teachers find it challenging to promptly obtain students' genuine feedback on ideological and political content during classes. The impact of ideological and political education often gradually manifests

in students' daily behaviors and actions rather than immediately during classes, complicating the accurate assessment of students' acceptance and understanding of ideological and political education and the timely adjustment of teaching strategies based on students' feedback. That is to say, there exists a conflict between the need for timely feedback and the inherent characteristics of this education. In teaching practice, effectively balancing the implicit nature of ideological and political education with the need for timely feedback requires serious consideration and resolution. Perhaps a solution lies in employing diverse evaluation methods, combining quantitative metrics with qualitative analysis, and encouraging students' self-reflection and interaction to comprehensively understand and assess their development in ideological and political qualities.

3. Implementation strategies of ideological and political education in AI curriculum

3.1. Dig out ideological and political elements from multiple angles

In teaching AI courses, teachers can dig out ideological and political elements from multiple angles^[9,13].

- (1) They can use cutting-edge advancements in AI technology, the stories of scientists, and current hot topics as starting points. For example, based on the news of Wuhan City launching the "Carrot Run" driverless taxi, teachers can guide students to discuss the societal issues triggered by AI technology, such as unemployment, prompting students to reflect on and accurately position the relationship between humans and machines.
- (2) Teachers can use significant social issues and the practical needs of AI technology as starting points. For instance, introducing challenges of high costs, long cycles, and low success rates in pharmaceutical research and development and discussing the tremendous advantages brought by AI technology in the biopharmaceutical field. This teaching method not only sparks students' interest in learning AI technology but also enhances their sense of social responsibility.

Through these teaching strategies, teachers can effectively impart AI technology knowledge and deepen students' ideological and political education, cultivating their comprehensive development capabilities and literacy. This integrated educational approach helps students achieve a more balanced development in academic and humanistic fields, laying a solid theoretical and ethical foundation for their future careers.

3.2. Continuous enhancement of ideological and political teaching skills

Ideological and political education in the AI curriculum is a long-term and continuous task, requiring teachers to continually update course design and enhance teaching skills^[11,12]. First, teachers for AI courses need a profound understanding of the connotation, value, and urgency of ideological and political education, change the previous cognitive inertia of focusing on technology and neglecting ideological and political education, and actively promote comprehensive development and implementation of ideological and political education in AI courses.

In addition, teachers should regard ideological and political education as an ongoing iterative process rather than a one-time task. Teachers need to continually enhance their ideological and political education design, teaching capabilities, and ideological and political levels, through teaching practice and academic research, and continuously optimize and improve course content to adapt to changes in societal development and students' employment needs.

This continuous teaching innovation and ideological and political practice not only improve the quality and effectiveness of teaching but also effectively cultivate students' moral and ethical qualities and their

sense of social responsibility. Teachers' efforts and commitment will provide richer and more comprehensive educational experiences for students in AI-related majors.

3.3. Establishing a sound evaluation mechanism for ideological and political education

Establishing a sound evaluation mechanism is crucial for the construction of ideological and political education in the AI curriculum^[14,15]. In the evaluation process, teachers should adopt a combined qualitative and quantitative evaluation approach. On one hand, teachers can assess students' ideological and political qualities through open-ended essay questions, such as: What do you think of price discrimination by using big data technology? Please discuss from the perspectives of causes, social problems, solutions, etc. This approach helps evaluate students' depth of thought and analytical skills. Simultaneously, fostering students' critical thinking and moral judgment promotes their deep understanding and internalization of ideological and political education content, facilitating more effective interaction and growth through evaluation and feedback.

On the other hand, teachers can carefully design and provide relevant videos and case materials for students to learn and discuss in online course communities. Teachers can design quantitative indicators for students' viewing behavior of ideological and political materials, thereby assessing their effectiveness in ideological and political learning. This method not only objectively reflects students' understanding and absorption of ideological and political content but also helps teachers adjust teaching strategies on time to further enhance teaching effectiveness and students' comprehensive qualities.

Through such a comprehensive evaluation mechanism, teachers can more effectively monitor and evaluate the implementation effectiveness of ideological and political education in the AI curriculum, providing strong support for students' comprehensive development and their sense of social responsibility.

4. Conclusion

The construction of ideological and political education in the AI curriculum is a key and difficult point in China's educational reforms. This paper deeply analyzes the connotation, difficulties, and implementation strategies of ideological and political education in the AI curriculum. By analyzing the positioning and implementation of ideological and political education in the AI curriculum, this paper provides important references and guidance for cultivating comprehensive AI talents that meet the national development needs in the new era.

In addition, against the backdrop of rapid technological development and social change, the construction of ideological and political education in AI curricula faces many challenges:

- (1) Ways to effectively integrate ideological and political elements into teaching and guide students to maintain correct values and social responsibility in technological development is a critical issue.
- (2) Teachers often face problems such as cognitive inertia and insufficient feedback in teaching practice, which need to be addressed through innovative teaching methods and evaluation mechanisms.

Finally, to address these difficulties, this paper proposes multi-level implementation strategies, including the cultivation of teachers' ideological and political capabilities, innovation and improvement in curriculum design, establishment and optimization of evaluation mechanisms, etc. Through the effective implementation of these strategies, the construction of ideological and political education of AI curriculum can be better promoted and deeply developed, providing solid educational support for cultivating high-quality and comprehensive AI talents in China.

Disclosure statement

The authors declare no conflict of interest.

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