

Research and Practice of Ideological and Political Education in the Course of Fundamentals of Artificial Intelligence for Normal Majors

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Abstract: As humanity enters the era of artificial intelligence, "Fundamentals of Artificial Intelligence," a public basic course for teacher education majors, plays a crucial role in integrating ideological and political education to cultivate qualified teachers. Taking Foshan University as an example, this paper explores the construction of ideological and political education in the "Fundamentals of Artificial Intelligence" course for teacher education majors from three aspects. First, in terms of the construction strategy of ideological and political education in the curriculum, we should correctly grasp the meaning of ideological and political education in the curriculum, focus on the core of cultivating morality and talents, combine the characteristics of artificial intelligence curriculum, and deepen the content and structure of the curriculum based on classroom teaching rules. Three key points for curriculum ideological and political construction have been identified: teacher literacy, ideological and political elements and resources, and the design of teaching methods that integrate curriculum with ideological and political education. The second is to explore relevant curriculum ideological and political resources around the elements of learning to be an excellent teacher, acting as an exemplary person, cultural confidence, patriotism and law-abiding, and standardized teaching; The third is to integrate teaching content with ideological and political education through classroom teaching, practical teaching, post class discussions, and course evaluation. From the perspective of practical effects, the above methods are generally effective and have gained recognition from the majority of students. However, there is a need to further explore ideological and political education resources within the course and refine teaching methods, ensuring students can comprehensively benefit from the course in a subtle and effective manner.

1. Introduction

Foshan University is a comprehensive local university located in Guangdong Province, with seven teacher education majors including English, Chinese language and literature, preschool education, ideological and political education, physics, mathematics, and educational technology. Starting from 2022, in response to the arrival of the artificial intelligence era, our university has launched the course "Fundamentals of Artificial Intelligence" for non computer majors. In today's era of vigorously developing educational informatization and intelligence, exploring the ideological and political construction of the course "Artificial Intelligence Fundamentals" in teacher education majors can help learners shape good professional ethics and moral character, and provide a large number of qualified teachers for society. Therefore, systematic exploration, research, and practice of the guiding ideology, construction strategies, ideological and political resources, and teaching design of the course "Fundamentals of Artificial Intelligence" for students majoring in teacher education are of significant value.

This article constructs an ideological and political system applicable to the course of "Fundamentals of Artificial Intelligence" for teacher education majors in our university. It organically integrates the cultivation of excellent qualities such as learning to be an excellent teacher, acting as an exemplary person, patriotism and law-abiding, and standardized teaching into curriculum teaching[1]. It forms a curriculum ideological and political teaching case that can be referenced and promoted. It enables students to adapt to the requirements of the artificial intelligence era for normal university students in their future studies and work. It lays a solid foundation for the correct, reasonable, and full application of computing and intelligent methods in educational and teaching practice, as well as subject research innovation.

2. Strategies for the Construction of Ideological and Political Education in the Course of Fundamentals of Artificial Intelligence for Teacher Education Majors

The design and planning of ideological and political courses must follow the operational rules of the course itself. The key and core to achieving the organic integration of ideological and political education and curriculum lies in finding the right point of fit, establishing a generative internal fit relationship through seamless integration and organic integration. This article is based on the special perspective, theory, and methods of the course "Fundamentals of Artificial Intelligence", and innovates the curriculum discourse system to achieve the organic unity of knowledge imparting and value guidance in the teaching of artificial intelligence basic courses. At the same time, taking into account factors such as the semester of the course, the characteristics of the teacher education major, and the progress of the curriculum, the ideological and political education content designed should be reasonably set, achieving both close adherence to the curriculum and scientific orderliness, emphasizing the cultivation of different dimensions of knowledge, ability, emotional attitude, and values, from shallow to deep, from knowledge to action, from knowledge mastery to endogenous emotional attitude and values.

2.1. The Course Features of Fundamentals of Artificial Intelligence

The total class hours of the course are 48, including 24 classroom teaching and 24 experimental teaching each. The classroom teaching content consists of four modules, namely: 1) Computer Fundamentals; 2) Python programming; 3) Artificial intelligence application technologies such as text recognition, image recognition, and speech recognition; 4) Concepts and theoretical knowledge related to artificial intelligence and applications.

The main characteristics of the course are as follows: firstly, the course content is relatively new,

in line with the development and application needs of contemporary technology, and many knowledge are developing and updating rapidly both domestically and internationally. The second is to improve the skills and literacy of teacher trainees in applying artificial intelligence in education and teaching through course learning. Thirdly, it has strong operability, and many knowledge needs to be practically operated through programming, which can cultivate students' practical abilities. Fourthly, it has strong applicability and general knowledge, and the course content is closely related to learning and life. It is also an indispensable knowledge and skill in the professional work of teachers. Number five is the large number of learners and wide influence. This course is a mandatory public course for first-year university students, and it is the first computer related course for every student in university, which has a significant impact on their future learning[2].

2.2. Characteristics of Students Majoring in Teacher Education

The main characteristics of first-year university students who have just entered teacher education majors are as follows[3]. One is that the physiological and psychological development has entered a more mature stage, and the self-control ability in learning activities has gradually increased. There has been significant improvement in thinking ability, learning attitude, learning motivation, willpower, emotional control, and other aspects. Secondly, the development of intelligence is more mature, with higher abstraction and theoretical thinking, enhanced purposefulness and systematicity in observing things, and the ability to grasp the detailed characteristics of the essential attributes of things according to procedures; The organization, profundity, and criticality of thinking have developed, independence has been strengthened, and attention has become stable. Thirdly, there is a clearer set of values, a growing awareness of social participation, and a clearer motivation for learning. Fourthly, students have a certain level of computer knowledge and skills in word processing, data processing, and image processing, but their level of operation is not very high, and there are significant differences in the computer foundation level among students from different regions. Fifthly, students generally have a high interest in learning artificial intelligence courses, and have a strong interest and expectation in the application of artificial intelligence in education and teaching.

2.3. Guiding Ideology and Strategies for Ideological and Political Construction in the Course of Fundamentals of Artificial Intelligence

The main guiding ideology includes: correctly grasping the meaning of ideological and political education in the curriculum, focusing on the core of cultivating morality and talents, combining with the characteristics of the course "Fundamentals of Artificial Intelligence", based on classroom teaching rules, deepening course content and structure. Ultimately, the design of teaching methods that integrate teacher literacy, ideological and political elements and resources, and curriculum with ideological and political education will be identified as the three key points of curriculum ideological and political construction.

In terms of specific methods, based on the characteristics of learners, we should seize the opportunity of students' strong thirst for knowledge, strong sense of social participation, dominant ideals and beliefs, and the formation of independent thinking ability. We should give full play to the exemplary role of teachers and guide students to establish correct professional ethics.

By exploring the specific elements of curriculum construction, the ideological and political concepts of the curriculum are organically integrated with the learning of subject knowledge and skills. By further optimizing the curriculum objectives, the ideal education of learning to be an excellent teacher, acting as an exemplary person, patriotism and law-abiding, and standardized teaching should be organically integrated into the training objectives. In the teaching process, it is

necessary to encourage students to pay attention to both subject knowledge and skills, as well as the values and emotions implied in knowledge and skills. This will achieve an organic combination of explicit and implicit education, subtly improve students' ideological cultivation, promote the unity of talent cultivation and moral education, knowledge imparting and value guidance, and make "Fundamentals of Artificial Intelligence" and ideological and political education go hand in hand.

3. Teacher Literacy

Teacher literacy refers to the basic qualities and conditions that enable teachers to engage in teaching activities smoothly. Students majoring in teacher education will mainly engage in the teaching profession in the future[4]. The good teaching ethics, high-quality teaching design and behavior, and values and opinions consistent with the ideological and political education of the curriculum of course teachers will subtly guide and infect learners' future teaching behavior, promote the formation of learners' correct career ideals, values, and outlook on life. Therefore, the construction of teacher literacy is a crucial aspect of ideological and political education in the course of "Fundamentals of Artificial Intelligence".

According to the guiding ideology of ideological and political education in the curriculum, teacher literacy needs to strengthen the construction of knowledge, personality, and professional ethics. In terms of knowledge, subject teachers need to have a high level of theoretical and applied knowledge in the field of artificial intelligence, understand the latest developments in the discipline, and be competent in course teaching; Having good teaching design and practical skills, able to explore the ideological and political elements in the course of "Fundamentals of Artificial Intelligence", and reasonably combining the teaching of artificial intelligence knowledge and technology with ideological and political education in teaching design. In terms of personality, subject teachers need to have independent personalities and noble moral sentiments, establish correct academic thinking, and reject academic misconduct. In terms of teacher ethics, we have good socialist ethics and pursue the teaching profession as a sacred cause, which reflects the spirit of dedication to the cause of education while pursuing self-value realization, and sets a good example for students to learn.

4. Exploration of Ideological and Political Elements and Resources in the Course of Fundamentals of Artificial Intelligence for Teacher Education Majors

The ideological and political elements refer to the elements with clear ideological and political education values integrated into the teaching process, including Chinese spirit, core values, and excellent traditional Chinese culture. These elements aim to cultivate students' comprehensive qualities such as moral character, patriotism, and social responsibility, and influence their ideological consciousness and behavior through subtle influence, thus constructing a pattern of educating all staff, the whole process, and the whole curriculum.

The method of mining ideological and political elements and resources in the course of "Fundamentals of Artificial Intelligence" for teacher education majors is to combine the teaching content of the course, and explore typical examples and material examples from five elements: learning to be an excellent teacher, acting as an exemplary person, cultural confidence, patriotism and law-abiding, and standardized teaching. From the technical principles, the philosophical ideas behind them and the methods and principles of being a person and doing things in the era of artificial intelligence are discovered, extended, and summarized. The goal is to change students' way of thinking and enhance their personal cultivation.

4.1. Learning to Be an Excellent Teacher

"Learning to be an excellent teacher" refers to the requirement for teachers to possess rich knowledge and skills, and be able to become role models for students' learning [5]. Related ideological and political resources:

(1) From the perspective of servers in C/S and B/S architectures, this thinking can be extended: one must first become powerful in order to provide better services. Teachers need to respond to students' requests anytime and anywhere, which is the best way to experience good service. Teachers should have professional ethics and service capabilities similar to servers.

(2) From AIGC generative artificial intelligence, it can be inferred that in the era of artificial intelligence, the requirements for teachers have increased, and purely knowledge-based content can be provided and trained by machines; From recognition to generation, artificial intelligence typically becomes a "teacher" rather than a student, possessing rich knowledge and requiring deep learning of a large amount of knowledge.

(3) How does artificial intelligence possess intelligence? It requires powerful computing power, a large amount of knowledge, extensive training, and continuous real-time updates of knowledge.

(4) Machine learning: There are forms of supervised learning, unsupervised learning, etc., but ultimately it needs to gradually transition to unsupervised autonomous learning in order to continuously enrich itself.

4.2. Acting as an Exemplary Person

"Acting as an exemplary person" emphasizes that teachers have good conduct and moral standards, and requires them to be honest and upright in their daily lives, and become role models for society [6]. Related ideological and political resources:

(1) Ethics of Artificial Intelligence. A powerful system must comply with laws, regulations, and social ethics. AIGC cannot produce content that is reactionary, violent, pornographic, or racially discriminatory.

(2) Students should follow grammar rules during the programming process and not plagiarize in their assignments.

4.3. Cultural Confidence

"Cultural confidence" is a high level of confidence in a nation, a country, or a political party's cultural ideals and values, as well as their cultural vitality and creativity[7]. Related ideological and political resources:

Our country has achieved great success in the field of artificial intelligence. Huawei, Zhongke Loongson and other companies have achieved brilliant results in the field of AI chip manufacturing. Companies such as China National Software and Dameng Data have made breakthroughs in bottleneck technologies such as operating systems, databases, and core algorithms. China has a world leading position in the field of AI applications such as intelligent driving.

4.4. Patriotism and Law-abiding

"Patriotism and law-abiding" are one of the basic moral norms for citizens. Patriotism and law-abiding mainly refer to patriotism and compliance with laws and regulations, emphasizing that citizens should cultivate a noble spirit of patriotism, consciously learn, understand, use, abide by and protect the law[8]. Related ideological and political resources:

(1) Software developed during learning and work cannot engage in illegal activities. The

development and application of artificial intelligence technology must adhere to the principles of patriotism and the rule of law.

(2) China has been blocked and choked by some Western countries in high-tech fields such as artificial intelligence, which will inspire young students to be self-reliant, strive hard, and bring glory to the country.

4.5. Standardized Teaching

"Standardized teaching" refers to being diligent and dedicated in the teaching process, willing to contribute, consciously resisting negative practices, and not participating in non-compliant profit-making activities. Related ideological and political resources:

(1) The development of artificial intelligence requires compliance with laws and regulations to ensure the legitimate use of technology.

(2) The application of artificial intelligence technology also needs to pay attention to ethics and social responsibility. On the one hand, artificial intelligence should be used reasonably in future teaching and educational activities. Artificial intelligence cannot be used for unethical behavior. On the other hand, the developed artificial intelligence software itself needs to comply with ethical standards and avoid AI applications that discriminate based on race, gender, and other factors.

5. Design of Teaching Methods for the Integration of Ideological and Political Education in the Course of Fundamentals of Artificial Intelligence for Teacher Education Majors

5.1. Classroom Teaching

The classroom teaching design that integrates ideological and political education in this course mainly includes the following two aspects: firstly, according to students' knowledge background, learning habits, interests, abilities, thoughts, attitudes, and values, to achieve individualized teaching in the implementation of ideological and political education in the course. Secondly, while creating an environment and atmosphere for ideological and political education in the curriculum and stimulating students' interest, teachers effectively carry out ideological and political education in the curriculum through heuristic, exploratory, and discussion-based methods, guiding students to think and explore, in order to ensure the effectiveness of ideological and political education in the curriculum. At the same time, teaching tools such as "Ketangpai" should be used in conjunction with the needs of the course, and online course resources should be utilized to fully realize their educational value. Based on the different knowledge points and ideological and political elements, teachers design appropriate teaching methods to integrate into various aspects of teaching, form an organic integration of "knowledge points+ideological and political elements" and diversified teaching methods, achieve the silent integration of ideological and political elements throughout the course teaching process.

5.2. Practical Teaching

In order to ensure that students have a certain level of hands-on ability through course learning, domestic independently developed platforms such as Baidu AI Open Platform and Tencent AI Open Platform are introduced to carry out course project practice. Both teachers and students can register for free accounts on the platform. Teachers can independently create practical projects and utilize the existing resources on the platform to create their own classrooms. By joining the classroom created by the teacher, students can complete various projects within the course under the guidance of the teacher. Through project practice, students can experience a sense of achievement in using

their own skills to solve practical problems. It effectively stimulates students' enthusiasm for scientific research and enhances their ideological and political qualities.

5.3. After Class Tutoring and Discussion

During the process of self-directed learning and completing experiments after class, students often encounter many unexpected problems. Teachers can promptly answer students' academic questions by establishing WeChat groups. At the same time, in response to the problems and confusion of students, encouragement, guidance, praise and other methods are used to enable students to truly experience the exemplary role of the teacher's "Learning to be an excellent teacher" from the teacher's tutoring process.

5.4. Exam Evaluation

Teachers assess students from three different perspectives and directions to ensure the scientific nature of the assessment, effectively enhance students' sense of teaching achievement, and improve the effectiveness of ideological and political education. Firstly, there is daily assessment. In daily teaching, simple assessments are used to scientifically grasp students' learning and ideological and political education outcomes. Next is experimental evaluation. Students are required to independently complete a certain experimental project and submit an experimental report after learning relevant knowledge. The teacher tested the students' practical skills based on the experimental report. It allows students to further experience the importance of 'learning as a teacher'. The third is the final evaluation, which involves conducting practical tests and assessments on students' content knowledge intensity and density. It enables students to eliminate daily laziness and strengthen their understanding of core competencies and ideological and political content.

6. Evaluation of Implementation Effectiveness

To test the effectiveness of ideological and political education construction and implementation in the curriculum, we conducted a questionnaire survey among students. A total of 754 valid questionnaires were collected through online and anonymous methods. The questionnaire sets multiple questions from the dimensions of course content and ideological and political education to evaluate the effectiveness of education and teaching. Due to space limitations, it is not possible to provide them one by one in this article. Figure 1 shows a comparison of students' overall gains in three aspects: their personal thinking style, personal cultivation, and course content. From the graph, it can be seen that 57.1%, 55.4%, and 75.5% of the respondents believe that the overall gains from personal problem-solving style, personal cultivation, and course content are significant and relatively significant, respectively. 9.7%, 11.2%, and 8.0% of the respondents believe that the gains are relatively small or almost non-existent, respectively. It can be seen from this that although good achievements have been made, about 10% of students still have relatively small gains and there is considerable room for improvement. It is necessary to reflect on various problems encountered in order to timely improve teaching work and promote the development of ideological and political education in the curriculum.

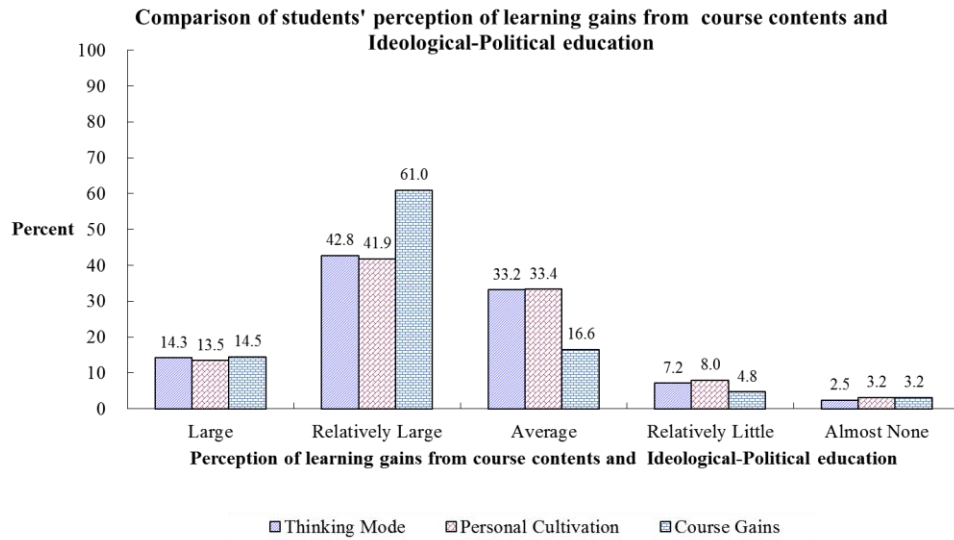


Figure 1: Perception of gains in three aspects.

7. Conclusions

This article presents a preliminary design, practice, and exploration of the ideological and political elements, resources, teaching methods, and evaluation system used in the course of "Fundamentals of Artificial Intelligence" for teacher education majors. The expected results have been achieved, but there is still significant room for improvement. The next step will be to further explore ideological and political resources, improve teaching methods, and make the integration of teaching content and ideological and political resources more appropriate, reasonable, and logical, truly achieving a subtle and silent educational effect.

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References

- [1] Ma Yunli, Li Jinhai. (2024) *Research on the Construction of Curriculum Ideological and Political Teaching Resource Library*. *Computer knowledge and technology*, 16, 150-152.
- [2] Wang Shuai. (2024) *Ideological and Political Teaching Practice of Artificial Intelligence Programming Language Course*. *Journal of Electrical and Electronics Teaching*, 4, 76-78.
- [3] Yue Rentian, Wang Hongyong. (2023) *Reform and Practice of Ideological and Political Teaching in the Basic Course of Machine Learning*. *Journal of Higher Education*, 23, 193-196.
- [4] Liu Xin, Wen Pengbo, Lu Enhui. (2023) *Ideological and Political Exploration and Practice of Machine Learning and Pattern Recognition Course*. *University Education*, 10, 121-124.
- [5] Liu Chen. (2022) *Exploration and Practice of Ideological and Political Education in Artificial Intelligence Course*. *Computer Knowledge and Technology*, 22, 142-143.
- [6] Jiang Yongsheng. (2020) *Exploration on the Strategy of Ideological and Political Construction of College Computer Foundation Course in Normal Colleges*. *Modern Computer*, 35, 91-95+100.
- [7] Liu lijue, Yang Chunhua. (2020) *Exploration and Practice of Ideological and Political Education in Artificial Intelligence Course*. *Computer Education*, 8, 63-66.
- [8] Yang Zhengmei. (2023) *Opportunities, Challenges and Countermeasures of AI Enabled Patriotism Education*. *Journal of Kunming University of Science and Technology (Social Science Edition)*, 5, 139-145.