

# Artificial Intelligence Major's Ideological and Political Education under the Integration of Industry and Profession

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**Abstract.** In view of the high fragmentation of the ideological and political education (IPE) elements under the combination of Artificial Intelligence (AI) and industry background, and the lack of systematic IPE. In this paper, the IPE of AI is designed under the professional integration. Through a series of methods, such as reshaping the professional training program, constructing the course IPE case database system, setting the entry point of course IPE elements and the course implementation process, and adopting the implementation method of "integration, theory and establishment", the systematic integration of IPE elements of the industry and the knowledge and ability requirements of AI major is realized. In the process of using the professional technology of AI to solve the problems of the industry, the integrated IPE factors are more specific and appropriate, so that the training program and course IPE database are quietly implemented, and more effectively cultivate students' professional ability and industry spirit.

**Keywords:** Artificial Intelligence; ideological and political education; professional integration; curriculum system

## 1 Introduction

The major of Artificial Intelligence (AI) has been established nationwide since 2018. Currently, there are more than 500 universities offering it. The professional courses are mainly electronic information, computer and statistics courses, showing the characteristics of interdisciplinary integration. Based on the technical properties of AI and industry attributes of strong coupling, and discipline basis and key industries, universities explore the "AI + X" talent training mode, and often ignore the industry background course education, lead to the highly fragmented AI ideological and political education (IPE), no form of AI professional and industry under the integration of systematic curriculum education. It is great significance for the IPE to be the same as the industry background. It is great significance to implement the IPE courses under the industry background, and the formulation of the design of talent training plan of AI and teaching practice, which is a major difficulty in the IPE.

From the perspective of profession and industry, on the one hand, the IPE of AI come from all walks of life, such as big data killing, personal information leakage, Huawei 5G events, AI competition, and it is a large IPE database, containing the laws and regulations, industry norms, team cooperation and professionalism required by the industry. In addition, if the teaching is

only based on the IPE elements of AI major, abstract and poor integrity is not as good as the image and logic of IPE teaching under the specific industry background system; if only the IPE elements of industry background are taught, it lacks the depth of professional technical analysis. Therefore, if under the industry characteristics of colleges and universities of AI professional course teaching platform, build into the laws and regulations of the industry, industry norms, team cooperation ideological elements of integration mode, train students with AI professional advanced technology, solve the problem of complex industry, both exercise the students' professional ability, and improve the students' industry practice ability, also subtly implement the IPE, has the effect of "1 + 1 > 2".

For example, in the water conservancy industry, the Ministry of Water Resources key development of water conservancy, to promote the cutting-edge technology in water conservancy industry innovation, strengthening new technologies such as AI and water conservancy business depth fusion, exploration and test with intelligent means to promote water conservancy management, service, decision-making work more fine, high quality, intelligent, to cultivate a new era of water conservancy ideas, practice of the new era of water conservancy spirit high-quality water conservancy talents. Water conservancy involves the safety of social life and property, so it is necessary to cultivate students with a high sense of social responsibility, and train students to master the advanced scientific and technological means of AI, such as achieving the purpose of reducing disaster losses by predicting the impact of disasters. Under the background of water conservancy industry, the AI major contains rich IPE elements, which

The water conservancy industry is selected to carry out the research on the important links, such as the professional training program, case bank and teaching practice related to the IPE department, and has certain reference significance for the IPE construction of professional courses with other industry background.

## **2 Relation Works**

With the continuous improvement of AI technology and the expansion of application scenarios, AI major has become an emerging major attracting much attention. At present, there are an increasing number of colleges and universities offering AI majors in China, so it is urgent to conduct in-depth research on the connotation and connotation of AI majors, and to explore the effective way of integration of professional courses and IPE courses[1]. To this end, Li Ruiqun et al [2] forward a path for deeply integrating AI curriculum and IPE elements: accurate lesson preparation with network evaluation; creating situations to inspire students to think; guiding students to explore independently and cooperate; teacher summary to promote students' knowledge transfer; Patange et al [3] proposed the idea of professional courses and industry and problem-driven teaching method [4]. It posed to improve the IPE quality of professional teachers from the aspects of consciousness, foundation and ability, and to enhance the attraction of IPE content in professional classroom; it integrates Marxist philosophical thinking [5], socialist core values and craftsman spirit in the teaching practice of higher vocational colleges to strengthen the long-term effect of IPE construction of the curriculum. At the specific curriculum level, Gu Ran [6] explore the specific ways to integrate the IPE education content into the course of "Introduction to AI", and also explored the IPE professional courses [7]. In

general, the IPE course of AI is not deep, especially in the aspect of professional technical courses, there is the situation of political teaching in the pursuit of IPE courses.

In addition, with the large-scale implementation of AI applications, enterprises have a more and more urgent demand for industrial research and development, application development and practical skills talents. In this context, colleges and universities should make use of the advantages of enterprises to break through the superficial short-term cooperation behavior, integrate AI majors with industry teaching, and continuously promote it, so as to cultivate engineering application-oriented talents urgently needed by the industry [8]. On the one hand, as the talent supply side, colleges and universities should actively cooperate with enterprises to promote the transformation of their own research and development technology into actual productivity as soon as possible, establish and improve the cooperation mechanism of industry-university-research science and technology innovation, create a joint platform for project innovation of universities and enterprises, and lay a foundation for creating a complete AI senior talent ecosystem [9]; On the other hand, as the talent demand side, enterprises should strive to break the institutional barriers, truly participate in every link of the professional construction and talent training system in colleges and universities, and realize all-round and in-depth integration and multi-subject collaborative education [10]-[12].

### 3 Curriculum IPE department programs

Based on the strong coupling characteristics of AI major and the industry, the IPE sports department of AI major is reconstructed, and the key contents such as professional training program, course IPE database, and teaching practice are carried out. The main contents and schemes are shown in Figure 1.

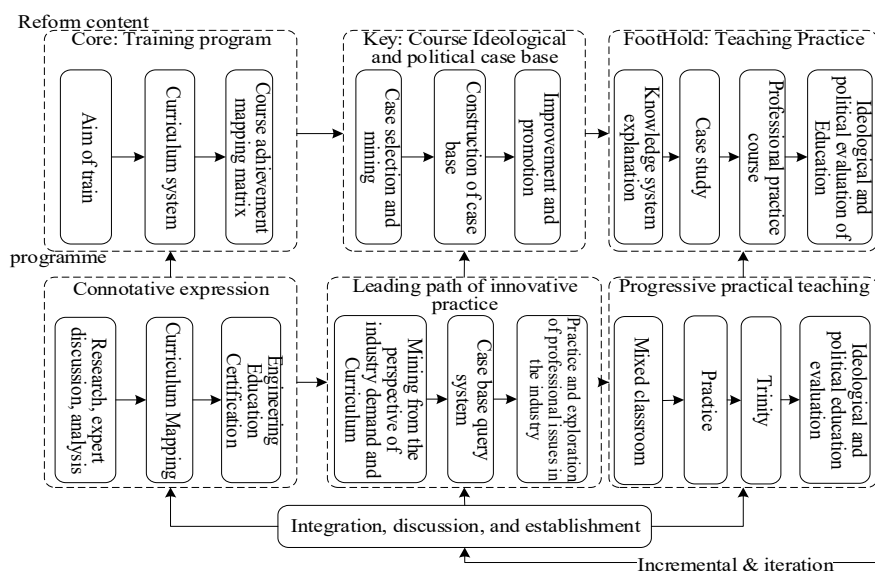


Figure 1. Content and implementation plan structure of the course IPE Affairs Department

### 3.1 The design of the culture protocol

Firstly, through the investigation of industry demand and social demand, preliminary form professional demand report and training program, and invite ai experts from industries and universities to hold training program seminars, based on the training rules of AI professionals, formulate reasonable professional training goals, and then determine the efficient training plan.

Secondly, in the curriculum, the basic professional courses mainly reflect the laws and regulations of the same industry; specialized courses with high industry background integration, supplemented by some professional elective courses; in the practical course, the team project mode is fully adopted to reflect the team spirit.

Then, for reasonable curriculum planning, the cultivation of AI, curriculum syllabus, teaching plans, teaching case and political standards, to ensure that the spirit of the service into the professional course teaching, clear different courses in the industry background of ideological responsibility.

Finally, the IPE requirements of the engineering industry should be further strengthened, and the mapping matrix of the course objectives of the AI training program and the graduation requirements of engineering education certification should reflect the characteristics of the industry, and form an integrated AI professional training program of the industry.

### 3.2 Construction of the course IPE case database system

Firstly, in the mining of IPE elements, fully based on the ai professional and industry needs, set up the case of AI IPE space, and implied the IPE elements of the industry.

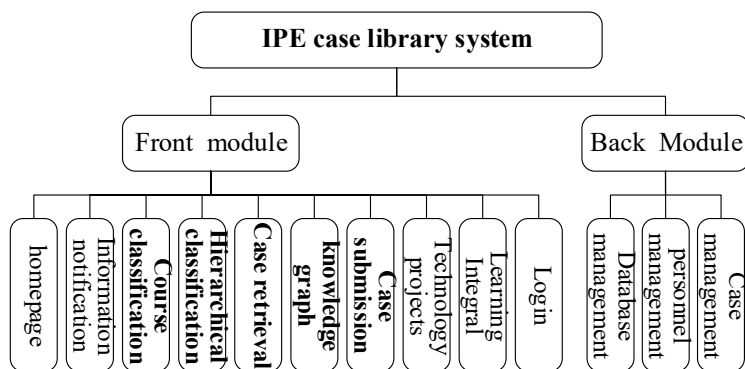
Secondly, in the specific course teaching content, the IPE database of each course is formed based on each knowledge module and based on knowledge points and typical cases. According to the knowledge module of the course, the basic knowledge, basic cases and industry comprehensive examples are hierarchical and integrated into the IPE elements of the industry. The integration of IPE elements of the course is shown in Table 1.

**Table 1.** The main IPE elements of the course

No	knowledge point	IPE elements of the entry point
1	Integrated management	The example of "Digital Platform for Flood Control and Disaster Reduction in Qiantang River Basin" is used to guide students to follow professional ethics and know the importance of project norms.
2	Scope management	Adopt the water conservancy information system cases, guide the students to do things according to the procedures and procedures, and follow the overall structure of the project.
3	Progress control	It implies that students should be responsible and work together, otherwise it will slow down the progress.
4	Cost control	Analyze the reasons for the overbudget in the water conservancy physics Internet of Things project, and guide the students to follow the professional norms and laws and regulations.
5	Quality control	Ensure professional standards for project quality management.

6	resource management	Resource allocation, guide students in daily affairs how to divide labor cooperation.
7	Communication management	How the intra-team communication process promotes team collaboration.
8	Risk management	The example of Mountain Flood Disaster Prediction and Early Warning Management Platform is used to discuss the risk management of advanced technology and guide students to analyze the professional norms of reducing and avoiding risks.
9	Purchasing management	Laws and regulations on bidding and tendering.
10	Department management	Discuss how the project will work together in the spirit of contract.

Then, the computer information system and knowledge graph technology are adopted to construct the course IPE case database WEB system. The main structure is shown in Figure 2.



**Figure. 2.** The WEB system structure of the course IPE case database

Finally, the IPE elements database will be opened to the whole school and even the society, and the update and maintenance mechanism of the IPE case database system will be formed by adopting innovation teams and technology activities such as innovation plan, Internet +, new seedling plan, and science and technology competition.

### 3.3 Course implementation process

In the classroom, Through the "mixed classroom" teaching practice approach, In the early stage of the course, Cases and materials of students' online learning of IPE elements that fit with the knowledge points of the course; Promote the corresponding industry of students in the offline teaching process, conduct a discussion, To stimulate students' enthusiasm for learning in a silent way, Guide them to establish noble moral sentiment and correct values and outlook on life, And always pay attention to the students' listening situation and listening reaction; In the practical class, focus on guiding students to master the main ideas of applying professional ability to solving problems in the industry. Improve the industry practice ability through strict operation norms.

## 4 Teaching implementation method and effect

### 4.1 Teaching implementation method

The implementation method can be summarized as "integration, theory and establishment". "Integration" means to adhere to the unchanged curriculum standard of AI, through in-depth analysis of teaching content, knowledge system explanation and classic industry case analysis as the entry point of the course, IPE elements into the whole teaching process, so as to achieve the integration of knowledge teaching and value guidance, and the unification of teaching and education. "Theory" is the subjective and objective reasons for discussing the problems in teaching cases and industry projects, and guides students to deeply realize the importance of industry laws and regulations, professional norms, teamwork and other elements. We based on integration and theory, to further cultivate good professional ethics quality, establish a correct outlook on life and values. In the teaching process, through the specific knowledge and content, the thinking mode, values and cultural significance behind the knowledge are explored. For example, through the discussion of "why big data & deep learning can make more accurate water conservancy prediction", as shown in Figure 3.

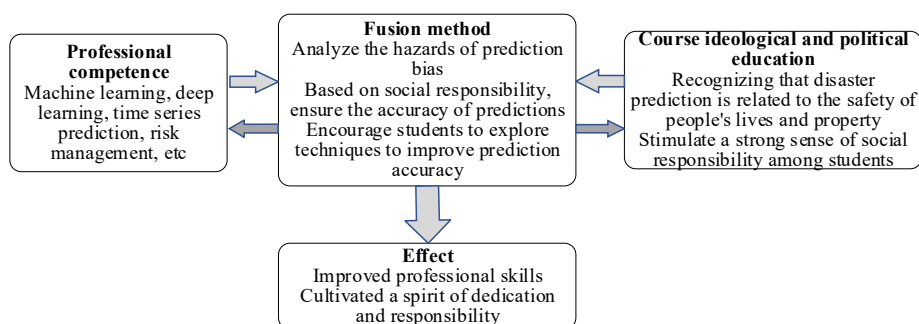


Figure 3. Implementation structure of course IPE case teaching

### 4.2 Teaching effect

Take the course "Software Project Management" of AI and software engineering with the background of water conservancy industry as an example. In recent years, the assessment with attendance as the key factor is reformed, and interactive questions and answers and interactive exercises in class are fully adopted. The connotation structure of IPE case teaching in the course. The results of the assessment process fully reflect the IPE thinking of the course. Some class's scores in the process are shown in Table 2.

Table 2. Process Performance

Class	Study times (5%)	Discussion (5%)	IPE mode of operation (60%)	Attendance (10%)	Classroom interaction (20%)	Process results
1	5	4.5	56.8	10	16.67	92.97
2	5	3	57.06	10	16.67	91.73
3	5	4.5	56.73	10	13.33	89.56

4	5	4.5	55.62	7.71	16.67	89.5
5	5	0	54.01	10	20	89.01

The online system can automatically divide the students in real time, so that students can pay attention to their scores at any time. The course emphasizes classroom discussion and interaction, especially the integration of homework under the IPE mode, and students get good grades. Taking the course of 40 students in the whole class of AI major as an example, the course assessment focuses on the standard degree of the mapping matrix between the course and the graduation requirements, and focuses on the ability of engineering, society, project management and other aspects, and the overall standard degree is high. The evaluation table of the course standard degree is shown in Table 3.

**Table 3.** Evaluation table of course objective achievement degree

Performance distribution	Score segment (grade)	[100-90] (outstanding)	[90-80] (good)	[80-70] (secondary)	[70-60] (pass a test)	[60-0] (fail)
	Number of students		4	19	11	6
Rate		10%	47.50%	27.50%	15%	0
Curriculum target	Graduation requires the observation point to support relationship	Target score value of the assessment content	The assessment content gets the score value	Course objectives are achieved		
1	6.2	20	17.600	0.880		
2	11.1	40	33.427	0.836		
3	11.2	40	32.254	0.819		
Evaluation conclusion				0.8190.6, reached		

Through the implementation of the IPE departments of the AI courses in universities under the "special integration", the main manifestations are as follows:

- (1) It has improved the depth and breadth of the curriculum system construction of AI major, adhered to the organic combination of AI professional education with ideological and IPE education required by the industry, and realized the deep integration of major and industry.
- (2) The precise mining of IPE cases under the background of the industry determines the quality of the IPE sports departments of the AI professional courses. Typical industry cases improve the "ideological content" of teaching content, adhere to the unity of professional requirements and industry needs, dig the combination of case technology and IPE points, support the implementation of IPE with technology, promote the application of technology with IPE, students' soft power is greatly improved, and internship is more popular among enterprises.
- (3) Teachers carry out teaching and scientific research in combination with the IPE thinking of the course, which improves their educational and scientific research ability.

## 5 Conclusions

- (1) The integration of systematic IPE elements of the industry with the professional knowledge and ability requirements of AI. In the process of using the professional technology of AI to solve the industry problems, the integration of IPE factors are more specific and appropriate. The

ethics of the industry promote students to improve their professional ability. In turn, using professional ability to solve industry problems, they also stimulate students' social responsibility and innovative thinking, and feel the power of AI technology. Under the "special integration", the two promote each other, a virtuous circle.

(2) The rich content, convenient query of political case library system, can progressively stages, various ideological teaching, can well promote students to master the necessary knowledge and ability, improve their comprehensive quality, eventually guide students to set up the correct values, cultivate students constantly explore, the pursuit of scientific and technological innovation spirit, become an all-round, sustainable development of high-level talents.

(3) The perfect teaching practice plan and the implementation method of "integration, theory and establishment", combining the whole process before teaching, teaching, performance evaluation and teaching evaluation, so that the training plan and course IPE database quietly implementation, more effectively cultivate students' professional ability and industry spirit.

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