

Exploring the Core Competence of Cultivating Applied Talents in Artificial Intelligence under the Background of Industry Education Integration

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Abstract. Education, technology, and talent are the fundamental and strategic support for the comprehensive construction of a socialist modernized country. Artificial intelligence is currently a hot research topic in the field of information technology, greatly affecting and even changing people's production, life, and thinking methods. However, artificial intelligence is still in the weak stage of artificial intelligence. Therefore, our school is actively promoting and continuously innovating the deep integration of industry and education, promoting the reform of applied artificial intelligence talent cultivation mode through school enterprise collaboration, constructing an applied course system, creating a resource sharing platform, and establishing a long-term cooperation mechanism between schools and enterprises. This article provides a deep analysis of the construction of the artificial intelligence major in universities. It should analyze the job requirements of domestic artificial intelligence industry enterprises, clarify the level of talent needs that can be met in the artificial intelligence industry chain, and based on the concept of industry education integration, combine artificial intelligence technology with applied professional skills and professional qualification certification to construct our university's talent training plan and professional curriculum system for the artificial intelligence undergraduate major, Based on the premise of cultivating the core professional abilities of college students, cultivating the needs that meet the development of social economy and the improvement of scientific and technological level, and meeting the needs of college students to achieve self-worth and sustainable development, providing useful reference for the construction and development of artificial intelligence majors.

1. Introduction

Currently, in the context of promoting the construction of new engineering courses in local ordinary undergraduate colleges in China, with the joint efforts of the government, enterprises, and universities, the application scenarios of artificial intelligence are constantly being developed, and the demand for artificial intelligence positions is also increasing^[1]. In 2017, China proposed to "become the world's main artificial intelligence innovation center by 2023, achieving significant results in the intelligent economy and intelligent society, laying an important foundation for joining the forefront of innovative countries and becoming an economic powerhouse."^[2] Talent is the primary factor related to social progress and national development, and being a top AI talent is the fundamental way to enhance national competitiveness. Therefore, cultivating AI talents Promoting the upgrading of the artificial intelligence industry is an important strategic direction for China's economic and social development^[3]. However, at the level of

universities, the construction of artificial intelligence majors is still in the stage of exploration and improvement. It is necessary to explore typical talent cultivation plans at different levels, types, and in line with the characteristics of the school. The core point is what kind of artificial intelligence curriculum system is needed and what abilities are cultivated. Therefore, universities must adapt to the sustained and rapid development of China's social and economic needs, serve local economic development as the guide^[4], and cultivate high-quality applied talents as the goal. They must create a new model of school enterprise cooperation and collaborative education, promote seamless integration of the education chain and the industrial chain, and deepen the integration of industry and education. This is the only way for local universities to improve the quality of applied talent cultivation and also to enhance it^[4].

From the analysis of the core professional abilities of the main positions in artificial intelligence and the talent structure required by the artificial intelligence industry

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chain, the trained artificial intelligence talents can be divided into four layers as follows:

- Innovative talents at the source: able to promote and achieve innovation and breakthroughs in cutting-edge technologies and core theories of artificial intelligence.
- Industrial R&D talents: able to combine cutting-edge theories of artificial intelligence with the development and implementation of practical algorithm models.
- Application development talents: able to combine artificial intelligence algorithm tools with industry needs to promote practical applications.
- Practical skilled personnel: able to understand the basic theories of artificial intelligence and have a grasp of key skills and practical methods.

Talents from the first two levels should be trained in research-oriented undergraduate or graduate level institutions; For the latter two levels of talents, they should be trained in applied undergraduate or vocational colleges, which is also a key research direction for the construction and talent cultivation of our school's artificial intelligence major.

2. Construction of Artificial Intelligence Major and Talent Professional Ability Positioning in Applied Undergraduate Colleges

At present, with the development and application of artificial intelligence technology continuously expanding, a large number of artificial intelligence industry research and development talents, application development talents, and practical skills talents are in demand, presenting a surge trend, making China face a huge challenge of insufficient artificial intelligence talents. However, the current talent cultivation model for artificial intelligence majors in universities is difficult to meet the needs of the industry, mainly manifested in unreasonable structures, mismatched supply and demand, inconsistent talent cultivation standards, and insufficient integration of industry, education, and research. Therefore, how to break this deadlock is the focus of this article's research. The following will analyze and explore how to cultivate high-quality, high-quality, and highly capable artificial intelligence application development talents and practical skills talents in applied undergraduate colleges and universities^[5].

The corresponding job positions for artificial intelligence professionals are industries, professions, or job positions, cultivating talents with practical operation skills, problem-solving abilities, and innovative abilities. Compared to the cultivation of academic talents, the cultivation of applied talents focuses more on the cultivation of practical and applied abilities, cultivating students' ability to master practical operation skills and solve practical problems.

The key to cultivating applied talents lies in combining theory with practice. Through practical teaching methods such as practical training, internships, and project practice, cultivate students' ability to respond

to problems and challenges in practical work environments. In addition, it is necessary to establish close cooperative relationships with enterprises and industries, allowing students to be exposed to real work scenarios, understand industry needs, and provide practical job opportunities to cultivate students' professional literacy and practical abilities. In order to achieve the cultivation of applied talents, schools and educational institutions can take the following measures:

- Design practical courses: Combining theoretical knowledge with practical operations, setting up practical or experimental courses that allow students to personally solve problems and complete tasks^[6].
- Provide practical opportunities: Collaborate with enterprises or industries, provide internships, practical training, and project cooperation opportunities, allowing students to participate in real work projects and exercise practical operational skills.
- Cultivate problem-solving skills: Focus on cultivating students' ability to analyze and solve problems, enabling them to think independently, find solutions, and apply them to practical work.
- Enhance innovation ability: Encourage students to engage in innovative practices, provide opportunities for innovative projects and competitions, and cultivate their innovative thinking and ability.
- Motivating students' practical motivation: Motivating students to actively participate in practical activities and enhancing their emphasis and motivation towards practice.

In summary, the cultivation of applied talents is the combination of theoretical knowledge and practical operation, through practical teaching and cooperation with enterprises, to cultivate students' practical operation ability and problem-solving ability. The talents cultivated through this method are more in line with the needs of practical work and can better adapt and develop in practical work.

2.1 Training Mode for Applied Talents in Artificial Intelligence

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2.2 Construction Plan for Artificial Intelligence Major in Applied Undergraduate Colleges

Place the figure as close as possible after the point where it is first referenced in the text. If there is a large number of figures and tables it might be necessary to place some before their text citation. If a figure or table is too large to fit into one column, it can be centred across both columns at the top or the bottom of the page.

2.2.1 A comprehensive professional construction plan for school enterprise cooperation

At present, with the continuous development and application of artificial intelligence technology, a large number of industrial research and development talents, application development talents, and practical skills talents are in demand, which will present a surge trend, making China face a huge challenge of insufficient artificial intelligence talents. However, the current talent cultivation model is difficult to meet the needs of the industry, mainly manifested in unreasonable structure, mismatched supply and demand, inconsistent talent cultivation standards, and insufficient integration of industry, education, and research. Therefore, how to break this deadlock is also the focus of this article's research content. The school enterprise cooperation model has always been a focus of research in various

higher education institutions. It is not only related to the achievements of education, but also to the development of applied higher education institutions. The talent cultivation model oriented towards the industry will bring vitality to talents, truly achieving resonance and mutual prosperity between universities and enterprises, between universities and industries, and between universities and society.

Our school has been implementing the strategic plan for school enterprise cooperation since 2016. Through the implementation of the "six commons" of two-way intervention and full participation (jointly developing talent cultivation plans, jointly implementing teaching processes, jointly conducting teaching evaluations, jointly writing textbooks, jointly cultivating "double teacher" teachers, and jointly building education platforms), we have established the "four common mechanisms" (co education, co management, sharing, and co responsibility), focusing on intelligent manufacturing. The construction of "Internet plus featured specialty cluster" and the training of order and customized talents; Starting from 2020, comprehensive strategic cooperation between schools and enterprises has been implemented, and a new pattern and characteristic educational model of applied talent cultivation has been established, with the reform of the application oriented talent cultivation model that connects the professional chain with the industrial chain as the main line, and the construction of characteristic industrial colleges and innovation and entrepreneurship education systems as the "two wings", serving the development of local regional economy and the coordinated education of multiple parties.

2.2.2 Construction Plan for Talent Training Program of the Combination of Industry, University and Research

The "integration of industry, academia, and research" model is the breakthrough and key to the transformation of artificial intelligence majors. Applied undergraduate colleges should carry out the cultivation of innovative and entrepreneurial applied talents in the context of transformation, promote the construction of a comprehensive artificial intelligence talent cultivation system in universities, and create an artificial intelligence talent cultivation model that is in line with the actual situation of universities. Create an educational mechanism that reflects industrial integration, design a teaching system that integrates industry and education, and cultivate innovation and entrepreneurship abilities, as well as a practical teaching system that can be used for reference in school enterprise cooperation; Establish a set of efficient teaching operation and management systems that have been verified through practice; Cultivate a high-quality teaching team that meets the requirements of cultivating innovative and entrepreneurial talents in the field of artificial intelligence; Actively promote the construction and development of our school's transformation work through teaching reform research and practice. Schools

and enterprises jointly cultivate, support, penetrate, intervene in each other, complement each other's strengths, utilize resources, and share benefits, in order to achieve true mutual benefit and win-win situation among schools, enterprises, and students. Researching the talent cultivation model of industry education integration and collaborative education, with the focus on professional co construction, we have embarked on a distinctive path of industry education integration and collaborative education, which not only meets the needs of university transformation but also improves the level and quality of school operation.

2.3 Vocational Ability Positioning of Artificial Intelligence Students in Applied Undergraduate Colleges

The cultivation of applied talents is aimed at cultivating students' core professional abilities. The core professional abilities of students majoring in artificial intelligence refer to the key skills and qualities in the field of AI. Through in-depth research on the job requirements of domestic artificial intelligence industry enterprises, combined with the positioning of the artificial intelligence discipline, the training goals for artificial intelligence professionals in applied undergraduate colleges are divided into two aspects: on the one hand, to cultivate students' comprehensive quality and ability to practice, innovate, and solve problems; on the other hand, based on the characteristics of the artificial intelligence industry, Cultivate the core abilities and task solving abilities of talents. Here are some common career core competencies.

2.3.1 Professional knowledge and skills

This is a basic professional ability, and students need to master relevant knowledge and skills in their field of study, and be able to proficiently apply them to practical work.

- Ability to master Python programming and analysis, as well as project development skills.
- Able to understand cutting-edge algorithms and technologies, master the ability to abstract complex real-world tasks into mathematical models, apply algorithms to practical applications, and understand mainstream algorithms and models.
- Able to master the working principles, configuration management, fault management, performance management, safety management, operation and maintenance of large-scale systems.
- Ability to master commonly used open source frameworks and their project development capabilities based on this framework.
- Proficient in commonly used machine learning algorithms such as computer vision, natural language processing, pattern recognition, decision trees, SVM, regression, and deep learning.

2.3.2 Problem solving ability

Students need to develop problem-solving skills through practice and project exercises, be able to analyze problems, find solutions, and implement them.

2.3.3 Communication and collaboration skills

In the workplace, communication and collaboration with others are very important, and students need to cultivate good communication skills, teamwork skills, and cross departmental cooperation abilities.

2.3.4 Innovation ability

Innovation is a key factor in promoting enterprise development, and students need to have innovative thinking and ability to propose new concepts, methods, and solutions.

2.3.5 Critical thinking and analytical skills

Students need to cultivate critical thinking, be able to independently think about problems, analyze information, and make reasonable judgments.

2.3.6 Self management and learning ability

Students need to possess the ability to manage and learn independently, effectively plan their time, manage tasks, continuously learn, and improve themselves.

3. Course Content Design for Artificial Intelligence in Applied Undergraduate Colleges

The core courses and main practical teaching links of artificial intelligence in applied undergraduate universities represent different understandings of artificial intelligence majors among different universities. These settings indicate that accurately grasping the core courses of artificial intelligence and the curriculum system radiating from them is an urgent task for cultivating artificial intelligence talents in current universities^[7].

3.1 Develop a talent training plan for the integration of industry and education, and promote the cultivation of students' innovation and entrepreneurship abilities

Implement the talent training model of "integration of industry and education, integration of industry, academia, and research, and cooperation between schools and enterprises", collaborate with enterprises to integrate industry and education, and jointly develop training models and curriculum systems. The integration of industry and education runs through every aspect of teaching. Enterprises are responsible for providing open platforms and crowdsourcing spaces, displaying and

transforming achievements, implementing projects, and providing employment and entrepreneurship guidance; The school, enterprise, and students will work together to achieve a win-win situation, and carry out in-depth training programs for college students' innovation and entrepreneurship, as well as competitions for college students' innovation and entrepreneurship, to create a good learning atmosphere and innovation atmosphere. Implement a dual mentor system to guide students' professional qualities, technical application abilities, and innovative activities throughout the entire process.

3.2 Implement the talent training plan model for school enterprise integration

- Implement a customized training plan. We will deeply integrate with enterprises, achieve order based training, cultivate high-quality artificial intelligence application development talents and practical skills talents that adapt to the development of the big data and artificial intelligence industry, adopt a half work and half study learning mode, establish a professional campus circle, and introduce the business and projects of the enterprise to the campus. Students can not only complete their own studies, but also receive compensation through labor as "prospective employees", It can effectively exercise students' hands-on skills and promote effective interaction between schools and enterprises. Encourage enterprises to participate in the development of school teaching plans and assign professional technical personnel to guide the school's professional teaching. At the same time, an off campus training base will be established, and the enterprise will provide the internship base and necessary materials for the internship. In practical training, students achieve a five in one order based practical teaching model that integrates enterprises and classrooms, students and apprentices, teachers and masters, theory and practice, and works and products.

- Implement a dual mentor system. Enterprise lecturers guide students in conducting subject competitions on campus, fully leveraging the guiding role of innovation and entrepreneurship competitions, replacing training with competitions and promoting learning through competitions. By regularly organizing academic presentation meetings and hiring highly renowned enterprise technicians and executives to give special presentations to students at the school, students can understand the needs of the enterprise, understand the latest achievements and information in various majors and disciplines, and motivate them to learn theory and skills well, so as to prepare for employment as early as possible.

- Customize cross disciplinary and interdisciplinary integration platforms. With the arrival of the era of Internet plus, the university implements the multi specialty integration of "material, big and intelligent", and realizes the on-demand talent training plan for industrial R&D talents, application development talents and practical skilled talents in the talent structure of the artificial intelligence industry. The specific mode of

talent cultivation plan for school enterprise integration is shown in Figure 1.

3.3 Actively promote vocational skill level certification

The "Implementation Plan for National Vocational Education Reform" released by the State Council in 2019 proposed to launch a pilot program for the "diploma certificate+several vocational skill level certificates" system (1+X certificate system pilot) in applied undergraduate universities. This is an innovation to implement the fundamental task of cultivating morality and talents, improve the high-level applied talent training system, and deepen the integration of industry and education, as well as school enterprise cooperation. Computing is the driving force behind the intelligent world. Huawei Intelligent Computing adheres to strategic investment in the fields of general computing and AI computing, focusing on the "Kunpeng Computing Platform" and "Shengteng Computing Platform", with innovation providing the strongest computing power. Moreover, the "Intelligent Computing Platform Application Development" vocational skill level certificate effectively connects with Huawei certification, providing clear career development paths for college students. Relying on the platform of deep cooperation between schools and enterprises, through the practical course of "Intelligent Computing Platform Application Development Training", the vocational certification examination content is integrated into classroom theory and practical teaching. By applying for vocational certification examination points and providing training for students, students' situational practical abilities are enhanced, helping them improve their employment competitiveness and core professional abilities.

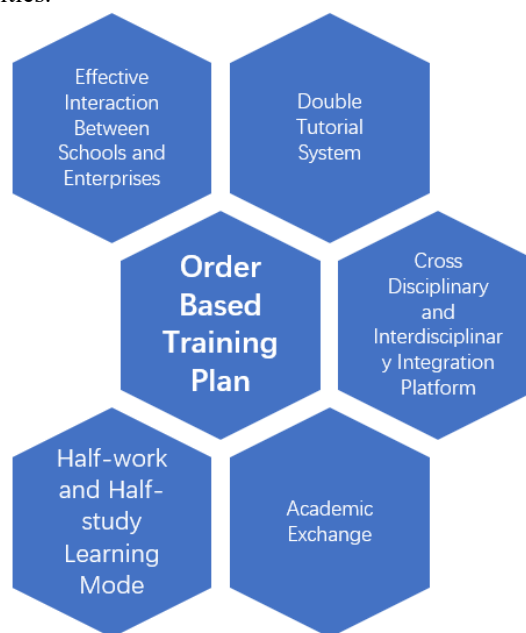


Fig. 1. School Enterprise Integration Talent Training Plan

4. Conclusion

In the context of the integration of industry and education, application-oriented undergraduate colleges should attach importance to deep cooperation between schools and enterprises, continuously improve the professional core abilities of artificial intelligence students, and provide a favorable environment for the cultivation of their practical and creative abilities, in order to cultivate professional talents that meet the needs of social development. The integration of industry and education in collaborative education is a new model for talent cultivation reform in the artificial intelligence major of our school. It is an important way to cultivate high-quality applied professional talents. By creating a "dual teacher and dual ability" teaching team, developing applied course resources, constructing a school enterprise integrated education and teaching platform, and deeply integrating industry and education, To cultivate high-quality applied engineering technology professionals with the ability to engage in research, development, application, and management in intelligent systems, intelligent data processing, intelligent behavior decision-making, and other fields for society. Through three years of unremitting efforts, there are about 230 students majoring in artificial intelligence on campus, and a construction plan for the artificial intelligence major that integrates school, government, industry, and enterprise has been constructed. The plan generally includes the following two aspects:

4.1 The four goals of the construction of the artificial intelligence major

•firstly, relying on the artificial intelligence innovation training platform of school enterprise cooperation, implementing the professional course construction goal of combining online and offline hybrid asynchronous teaching mode, course learning, and 1+X intelligent computing application development certification.

•Secondly, through comprehensive and strategic cooperation between schools and enterprises, we aim to jointly develop professional textbooks and curriculum resources, including micro courses and exercise courses.

•Thirdly, by combining enterprise training with campus training, we aim to create a teaching team with clear research objectives; Fourthly, schools and enterprises should work together to build artificial intelligence innovation centers and Huawei ICT Industry College, as well as build artificial intelligence training platforms.

4.2The three specific contents of the construction of artificial intelligence major

•firstly, curriculum construction and innovation should focus on cultivating students' teamwork and continuous improvement of professional literacy, cultivating students' professional communication and problem-solving core abilities, and relying on Huawei

certification and 1+X certification exams to cultivate students' job core abilities.

•Secondly, the construction of textbooks and teaching resources is mainly achieved through joint development projects between schools and enterprises to achieve the integration of theory and practice in publicly published textbooks. Through the teaching resource platform jointly built by schools and enterprises, the joint construction of online teaching resources and practical platform resources is achieved.

•Thirdly, establish an artificial intelligence professional teaching and research team, with the professional leader serving as the head of the professional team. The members of the team mainly undertake the teaching and training tasks of students, organize Huawei ICT competitions, undertake artificial intelligence 1+X certification training and examination work, and undertake the research and development of school enterprise cooperation projects and the co construction of education and teaching platforms.

To assist in the construction of artificial intelligence majors in application-oriented undergraduate colleges, it is necessary to develop reasonable curriculum implementation plans, scientific graduation requirements, and training objectives. Through a series of specific measures such as school enterprise cooperation, 1+X certification, and promoting teaching through competitions, the quality of talent training can be guaranteed, and the sustainable development of students' career can be promoted. The achievement of training objectives can contribute to the development of society and economy Progress provides strong intellectual support and talent guarantee.

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Liaoning Province 2021 Undergraduate Teaching Reform Research Project "Innovative Research and Practice of Big Data Talent Training Mode Based on Industry Education Integration" (Project No.: 7)

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