

Development Model of Artificial Intelligence Education Course Involving High-tech Enterprises

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Abstract

In recent years, China has made important progress in basic research and original innovation, made new strides in strategic high-tech fields and made new breakthroughs in high-end industries. Intelligent manufacturing has made great progress, artificial intelligence and the digital economy are booming, image recognition and voice recognition are leading the world, and 5G mobile communication technology is the first to achieve large-scale application. High-tech companies such as Huawei Hisi, Unigroup, Horizon, Cambrian and Lifei are deeply engaged in the fields of cloud edge, industrial/commercial/home, edge computing and intelligent security of artificial intelligence. Digital chip manufacturers such as Loongson, Feiteng, Huawei Hisi, Unigroup Zhirui and Swischip have also made certain achievements in the research of AI basic hardware. Some of these representative companies are at the top of their game, and some are at the top of their game. These head companies and their surrounding upstream and downstream smes have basically formed a mature industrial chain. As far as the current domestic science and technology ecology is concerned, we have the foundation, confidence, and ability to seize the opportunities of the new round of scientific and technological revolution and industrial transformation and ride the tide. How to cultivate the original and innovative reserve talents, improve the scientific innovation system and the construction of talent echelon, and further improve the cultivation ecology of scientific and technological talents is an important problem at present.

Keywords

Artificial Intelligence Education; Artificial Intelligence Courses; Basic Education.

1. Introduction

In recent years, China has made important progress in basic research and original innovation, made new strides in strategic high-tech fields and made new breakthroughs in high-end industries. Intelligent manufacturing has made great progress, artificial intelligence and the digital economy are booming, image recognition and voice recognition are leading the world, and 5G mobile communication technology is the first to achieve large-scale application. High-tech companies such as Huawei Hisi, Unigroup, Horizon, Cambrian and Intellif are deeply engaged in the fields of cloud edge, industrial applications / business application / home automation, edge computing and intelligent security of artificial intelligence. Digital chip manufacturers such as Loongson, Feiteng, Huawei Hisi, UNISOC and RockChip have also made certain achievements in the research of AI basic hardware. Some of these representative companies are at the top of their game, and some are both soft and hard. These head companies and their surrounding upstream and downstream small and medium-sized enterprises have basically formed a mature industrial chain. As far as the current domestic science and technology ecology is concerned, we have the foundation, confidence, and ability to seize the opportunities of the new round of scientific and technological revolution and industrial

transformation and ride the tide. How to cultivate the original and innovative reserve talents, improve the scientific innovation system and the construction of talent echelon, and further improve the cultivation ecology of scientific and technological talents is an important problem at present.

2. The Current Situation of Artificial Intelligence Course Construction

With the knowledge and innovation project, the strategy of rejuvenating China through science and education, and the strategy of strengthening the country through human resources implemented since the beginning of the new century, the 18th and 19th National Congresses have gradually set the strategic goal of becoming one of the top innovative countries by 2035. With Beijing Normal University, Central China Normal University, South China Normal University and other research academic research team as the core, covering the philosophical discussion of technology and education, education theory and practice research, information technology education, teaching design, teaching mode, learning resources and other fields, for the majority of first-line teachers provides scientific theory thought and experimental methodology guidance education teaching practice, And has achieved fruitful results.

2.1. Artificial Intelligence Education System

Zhang Jianping et al discussed the concept, teacher training and teaching resources of artificial intelligence education in middle schools in China for a long time. Ma Tao [1], Xie Zhongxin [2], Bai Hongquan [3], It provides some practical experience and objective research and analysis on the core content and core quality positioning of artificial intelligence education, classroom activity design, thinking mode and classroom activity experience, and teacher system construction. Sun Lihui [4], Yu Yong [5], Han Qianqian [6-7] made a comparative study of artificial intelligence education in primary and secondary schools in China, Japan, and the United States, emphasizing that artificial intelligence education for children should go beyond tools and focus on the cultivation of children's thinking ability. Pay attention to the deep integration of programming thinking and traditional curriculum, and establish the implementation steps of artificial intelligence education hierarchical curriculum in line with learners' cognitive characteristics; Strengthen the collaboration of multi-functional departments and high-tech enterprises to participate in the top-level design of artificial intelligence education curriculum system.

2.2. The Status Quo of Artificial Intelligence Teaching Materials

Table 1. The basic characteristics of artificial intelligence textbooks for primary and secondary schools issued now

Indicators	Characteristics of the
The development team	The person in charge has multiple identities and cannot focus on the application of specific textbooks for a long time to analyze and update the system
Teaching goal	More attention to the interpretation and interpretation of theoretical knowledge, lack of effective application experience
The content section	The content focuses on the comprehensive balance of theoretical knowledge, and the project instance resources are not rich enough
Activities link	The teaching activities mainly focus on cognitive memory and simple motor skills, but not enough on emotional life experience
Learning evaluation	Emphasis on theoretical knowledge memorization, project application and practical innovation assessment is a weak point
Form a complete set of resources	The research and development funds and technical strength of the academic team are weak points, and the supporting resources are mostly traditional forms
Ethical and moral	The overall education and guidance on the ethics and law of artificial intelligence in real life are obviously insufficient

Zhang Xuejun [8] Zhao Huichen [9] Li Yan [10] et al., demonstrated the teaching objectives, teaching activities, teaching tools and teaching models from different aspects, such as the construction of artificial intelligence teaching materials, the design and development of case resources for artificial intelligence course projects and unit design in China. Zhao Feilong and Wang Dongli made a comprehensive survey of all kinds of artificial intelligence textbooks published on the market, and analyzed the characteristics of high school artificial intelligence textbooks from the aspects of compilation background, textbook objectives, content chapters, activity links, learning evaluation, etc., see Table 1.

3. The Problems in the Traditional Artificial Intelligence Curriculum Development Model

3.1. Problems of the Development Team

The core leader of the traditional student-oriented curriculum construction team generally holds a multi-field identity, and mostly stays at the theoretical level of artificial intelligence-related technology and application, but lacks practical practice. Most of the course content construction is based on theoretical science knowledge.

3.2. The Problem of Curriculum Resources

The development of high-quality AI course cases and resources requires a large amount of capital investment, and the construction of learning tools and platforms is also a rather complex engineering project. At present, most teachers in schools have not been exposed to cutting-edge AI tools or AI application cases.

3.3. Problems in Teaching Design

AI education has high requirements on the breadth and depth of teachers' knowledge reserve. Most of the schools in charge of the development of relevant curriculum resources are lack of project practical experience, and they cannot flexibly use and integrate engineering knowledge and theoretical knowledge effectively in the design of curriculum content and activities.

4. Artificial Intelligence Course Development Model with High-Tech Companies' Participation

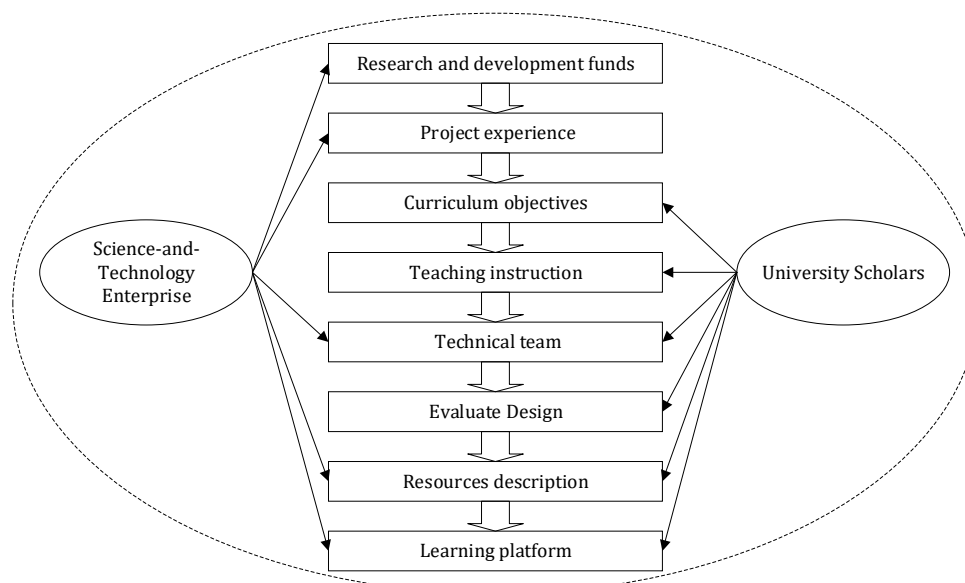


Figure 1. The development model of artificial intelligence course involving high-tech enterprises

See Figure 1, curriculum construction is a systematic engineering that emphasizes scientific methods. Integrating students' life experience into the classroom, or learning theoretical knowledge in the form of project skills, and presenting abstract concepts as an effective carrier, are the nodes of association between students in school and the society outside school. University scholars fully investigate the project experience of enterprises and plan the curriculum objectives scientifically. The curriculum research and development team of the university and the enterprise shall jointly discuss and complete the design and implementation of evaluation technology, resource development specifications and learning platform. The open mode of school-enterprise cooperation mainly has the following advantages.

4.1. Optimize the Talent Structure of the Course Construction Team

There is no shortage of high-quality talents with high technology and high education in high-tech enterprises. Effectively integrating the experience from the front-line technical team of the industry, we can focus on the talent training needs of the artificial intelligence industry, and jointly study and carry out the knowledge education and skill training practice of talents of various positions in the artificial intelligence industry. From the actual production and research and development business of the enterprise, the characteristics and level differences of professional talents are extracted, and then the cultivation program of talents at different levels is constructed and improved.

4.2. Improve the Reliability and Advancement of Teaching Resources

Relying on mature enterprise cases, we set up a number of courses for the key technologies of artificial intelligence, such as computer vision technology, natural language processing technology, autonomous unmanned system technology, intelligent chip technology, cross-media analysis and inference technology, intelligent adaptive learning technology, brain-computer interface technology, and swarm intelligence technology. For different fields of artificial intelligence, such as smart city, intelligent unmanned driving, intelligent unmanned system, intelligent medical treatment, and intelligent justice, a number of practical training courses are set up. It is also possible to combine the two, such as intelligent systems and applications, vision and intelligent unmanned systems. In the practice part, experienced entrepreneurs and senior engineers can be hired to give lectures, to truly realize the combination of theory and practice, to integrate teaching, learning and doing, to ensure the consistency, authenticity and frontier of the course content, and to cultivate students' systems engineering thinking, professional skills and engineering practice ability.

4.3. Strengthen the Connection between Content and Social Life

Make full use of the product resources of high-tech enterprises, and synchronize the organization and research and development of artificial intelligence course content for the development of local artificial intelligence technology and life application problems. Introducing the latest technology products of social life the school classroom, let students experience the relevant product technology implementation process, the depth of the simulation experience participate in the development of the real product link, learn how to communicate with the computer, computer can according to the instructions to complete a specific task, so as to cultivate students understanding and use of information technology and data quality. Optimize the textbook target design, pay attention to the connection with other subject knowledge. Relying on the research and development strength of technology companies, targeted development of high-quality teaching resources and learning platforms, to enrich the curriculum teaching activity design.

In the school curriculum, teaching content and the enterprise synchronous update products, the introduction of artificial intelligence products for real-life ethical and legal issues such as the reflection of infiltration problem, make students form the correct development of artificial

intelligence, know the unreasonable application of artificial intelligence technology may cause negative impact or harm, the formation of comply with the wisdom of social moral, legal consciousness, We will enhance our sense of responsibility for maintaining social information security and promoting the healthy development of artificial intelligence.

5. Conclusion

In this study, based on the characteristics of the education resources in urban area with large bay needs, relying on the GuangDong Songke Intelligent Technology GO.LTD, and cooperating with leading domestic enterprises in artificial intelligence ecology such as Loongson Technology Corporation Limited, Cambrian and Intellif domestic artificial intelligence ecological head enterprises, to jointly study and carry out the artificial intelligence industry talent positions of knowledge education and skills training practice.

From the actual production and R & D business of the enterprise, the characteristics and level differences of professional talents are extracted, and a multi-level and differentiated talent cultivation program is constructed. The research and practice plan from both ends of higher education and youth education to middle, higher vocational and adult education is adopted to open up the full set of artificial intelligence education curriculum system and improve the talent training mechanism. A teaching and research team with both educational theory and scientific research strength has been organized to carry out the course research and development of artificial intelligence education localization, and a local artificial intelligence education brand has been established, which has been put into the market for teaching practice verification. Set up supporting production, education and research teaching practice base in Dongguan. It can provide a large number of internship opportunities for graduates of relevant universities in the long term, and improve the ecological development and construction of the industry. While optimizing and improving the curriculum system of artificial intelligence education, we should further cooperate with related enterprises to build industry-university-research bases, promote collaborative innovation and development of universities, research institutes, enterprises and local governments in the region, and make up for the shortcomings of talent cultivation in the local artificial intelligence industry.

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