



Based on the Origin Analysis of the Innovative and Entrepreneurial Talent Training Mode of Artificial Intelligence Majors in Applied Undergraduate Colleges

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Abstract

Relied on artificial intelligence major, the importance of innovation and entrepreneurship education in applied undergraduate colleges were analyzed. The problems and reform measures of the innovation and entrepreneurship talent training model for artificial intelligence majors in applied undergraduate colleges were proposed and expounded. Innovation and entrepreneurship education was promoted through four aspects: target orientation, curriculum system construction, industry-teaching integration and competition promotion, which could comprehensively improve students' innovation and entrepreneurship ability and comprehensive quality. Origin was mainly used to analyze the artificial intelligence curriculum system. Compared with the traditional talent training mode, the proportion of practical courses in the training program had been significantly improved, and more attention was paid to the cultivation of students' innovation and entrepreneurship ability. Other engineering majors could also get reference from this paper.

Keywords: *Origin analysis; Application Type; Artificial intelligence; Talent training mode; Innovation and entrepreneurship education*

1 INTRODUCTION

At present, the external environment of engineering education reform in China has been changing rapidly. Internationally, major developed countries are promoting the development of the new economy to seize the commanding heights of the industrial and scientific revolution. "Industry 4.0", sharing economy, virtual reality and artificial intelligence technology are developing rapidly [5]. Domestically, major strategies such as innovation-driven development, "Made in China 2025" and "Internet Plus" have been implementing in China. In the "Internet Plus" era, new technologies such as big data, blockchain and artificial intelligence are developing rapidly.

Talent training is of great importance to the development of new economy and new industry. It is necessary for colleges and universities to rearrange the existing teaching mode of engineering specialty, focus on the construction of new engineering entrepreneurship practice teaching mode, innovate entrepreneurship education mechanism, and form a set of perfect entrepreneurship practice teaching system. From the

perspective of the new economy, colleges and universities, especially application-oriented colleges and universities, urgently need to develop innovation and entrepreneurship education, update the traditional engineering teaching mode, and meet the needs of talent support in the development of the new economy. The development of new industries depends more on the combination of talent education, engineering education and innovation and entrepreneurship education to cope with the industrial transformation and upgrading in the future. Under such a background, it is imperative to explore the talent training mode of innovation and entrepreneurship practice teaching, which requires us to further deepen the talent training mode of industry-education integration and school-enterprise cooperation, and establish and improve the talent training mode mechanism of innovation and entrepreneurship [5].

Based on computer science, artificial intelligence has been widely used in various professional fields and has the characteristics of wide coverage, rapid technological update and strong sustainable development. Artificial intelligence (AI) is a strategic technology that leads the future and has far-reaching impact on human economic development, social progress and daily life. All countries

are paying great attention to it. Therefore, training high quality and compound talents to adapt to the era of artificial intelligence is an inevitable requirement for the sustainable development of Artificial intelligence in China [1]. Our goal is to cultivate talents with original innovation ability in the field of artificial intelligence and the ability to solve key technical problems of enterprises.

At present, the studies on creative personnel training mode were most in higher vocational colleges, undergraduate colleges and universities study is relatively few. A large number of undergraduate course colleges and universities in the education idea, education target, education pattern, curriculum, teaching methods and the relationship between universities and social issues still stay in the traditional model, which can't meet the needs of the current social development. This paper takes applied undergraduate universities as the foothold, focuses on the research of talent training mode of innovation, entrepreneurship and artificial intelligence, forms characteristic majors and disciplines with distinctive characteristics of its own, and promotes the training of new engineering talents.

2 PROBLEMS IN THE TALENT TRAINING MODEL

2.1 Little Research on the Training Mode of Artificial Intelligence Professionals

At present, research data shows that only a few colleges and universities have specialized research on the training of artificial intelligence undergraduate talents, such as Xi'an Jiaotong University, Nanjing University and other general undergraduate colleges and universities, while application-oriented undergraduate colleges have never conducted research in this regard. The "New Generation Artificial Intelligence Development Plan" clearly proposes to "grasp the trend of high integration of artificial intelligence technical attributes and social attributes". In the process of artificial intelligence professional training, it is necessary to strengthen the application of artificial intelligence and empower the real economy [6].

2.2 The Construction of Curriculum System is not Reasonable Enough, and Students' Practical Ability is Poor

At present, the course system of artificial intelligence major in some application-oriented universities is unreasonable, too theoretical, and students' practical ability is poor. As applied undergraduate colleges and universities should pay more attention to technology application, should be to foster the social demand for talents as the goal, to develop technology application ability as the main line design students' knowledge, ability and quality structure and cultivation scheme, in

order to "application" for the purpose and characteristics of construction of curriculum and teaching content system, attention to the cultivation of students' technical application ability [4].

2.3 Students' Awareness of Innovation and Entrepreneurship is not Strong, and Their Ability Cannot be Improved

Applying undergraduate education with practice and innovation as the guide, although in the present practice teaching has been slowly and course teaching is combined with the theoretical knowledge, but the education concept of innovative undertaking started relatively late. After all, most colleges and universities while consciously cultivate the innovative entrepreneurial talent, but do not know exactly what kind of goals or standards to develop talent, also don't know how to measure. As a result, although colleges and universities have the heart of training, but students have not been effectively trained. At the same time, it is difficult to effectively combine innovation and entrepreneurship education with professional theoretical knowledge in many colleges and universities' talent training programs, which leads to the failure of the implementation of innovation and entrepreneurship education and the inability to improve students' abilities [3].

3 MEASURES TO REFORM THE MODE OF PERSONNEL TRAINING

3.1 Based on Application-oriented Universities, Positioning Innovation and Entrepreneurship Talent Training Target

In the process of transformation from information to intelligence, the task of cultivating artificial intelligence talents is arduous and glorious. For application-oriented universities, we are required to cultivate high-quality application-oriented talents with humanistic quality and scientific accomplishment, solid foundation, strong practical ability, innovative spirit and innovative ability. Technical application-oriented engineering and technical talents who can be engaged in intelligent product design and development, intelligent system integration and operation and maintenance management in the fields of artificial intelligence technology application, intelligent manufacturing, big data analysis and application, intelligent service robot and so on. Ai talents should be trained with broad adaptability and sustainable competitiveness to cope with the new era of rapid change.

3.2 Adjust Course Structure, Strengthen Practice System Construction

3.2.1 Curriculum System Group

The current artificial intelligence professional curriculum system offers eight major course groups. Among them, the basic course group contains basic knowledge related to mathematics and computer science, which lays a good foundation for students; the subject professional course group ensures that students have a solid basic theory and professional knowledge of artificial intelligence, strengthens professional awareness, and avoids artificial intelligence knowledge system. Fragmentation and hollowing; the professional direction course group provides three training directions for students, including "artificial intelligence + intelligent manufacturing", "artificial intelligence + image processing", "artificial intelligence + speech recognition", reflecting "artificial intelligence + X" Innovative and entrepreneurial talent training mode; the optional professional course group is mainly divided into five modules, and students can further choose the subdivision direction according to their own interests; the public basic practice course group includes social practice of innovation and entrepreneurship, labor education practice, so that students can establish a sense of innovation and entrepreneurship. The basic practice course group of disciplines and majors transforms the previous professional theoretical knowledge into

practical operations, and combines artificial intelligence technology to carry out innovative practice in the field of intelligent design [2]. The professional ability practice course group learns how to use the basic theories such as design cognition and design thinking to improve algorithm ability, system ability and artificial intelligence application ability; professional comprehensive practice course group includes professional comprehensive practice, graduation practice, graduation design, mainly improving and other The integration of disciplines, innovation and entrepreneurship, analysis and problem-solving skills.

As shown in Figure 1, the proportion of credits of different course platforms can be obtained through Origin data analysis. The main courses include compulsory public basic courses, basic specialized courses and compulsory specialized courses. Compared with the traditional training model, figure 2 shows that the talent training program with innovation and entrepreneurship as the training goal pays more attention to practical operation. In this talent training model, practical teaching credits account for 40.53% of the total credits. From the perspective of the curriculum system, it is conducive to the cultivation of students' practical ability, which is in line with the training goals of innovative and entrepreneurial talents. The teaching arrangements of each practical course are closely linked, so that students' practical operation ability and professional level can be effectively improved. The specific arrangements are shown in Table 1.

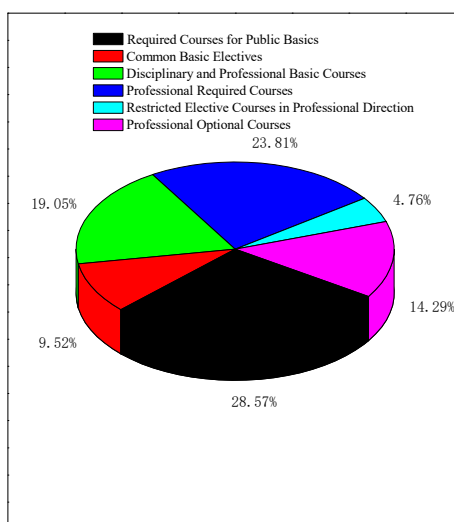


Figure 1: Course credit ratio

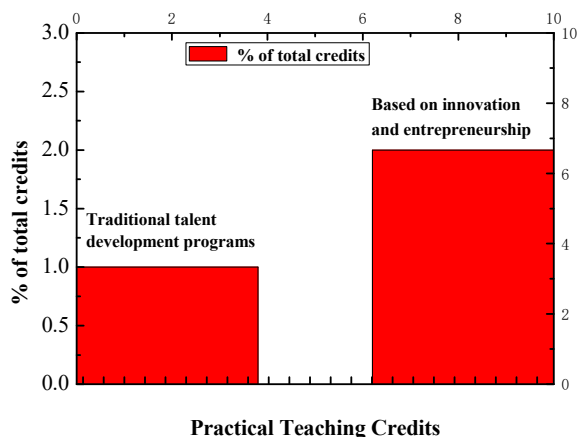


Figure 2: Percentage of credits for practical courses

Table 1: The arrangement and requirements of the intensive practice teaching

| Course Category | Serial Number | Course Title | Week Number | Credit | Semester and Number of Weeks | | | | | | | | | |
|----------------------------------|---------------|---|-------------|--------|---|---|-------------|---|------------|---|-------------|---|--|--|
| | | | | | First year | | Second year | | Third year | | Fourth year | | | |
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| Public Basic Practice | 1 | Entrance Education and Military Training | 2 | 2 | 2 | | | | | | | | | |
| | 2 | Labor Education Practice | 4 | 1 | One week is set up as the labor week in each academic year, for a total of 4 weeks. | | | | | | | | | |
| | 3 | Innovation and Entrepreneurship Social Practice | / | 6 | Semester 1-7, at least 6 credits. | | | | | | | | | |
| Discipline Basis | 1 | Intelligent System Application Practice | 4 | 4 | | | 4 | | | | | | | |
| | 2 | Electronic Technology Course Design | 1 | 1 | | 1 | | | | | | | | |
| | 3 | Deep Learning Application Practice | 3 | 3 | | | | | 3 | | | | | |
| Professional Competency Practice | 1 | Comprehensive Practice of Big Data Projects | 2 | 2 | | | | 2 | | | | | | |
| | 2 | Comprehensive Practice of | 2 | 2 | | | | | | 2 | | | | |

| | | | | | | | | | | | | |
|--|---|--|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | | Intelligent Robot Operating System | | | | | | | | | | |
| | 3 | Smart Manufacturing Engineering Practice | 1 | 1 | | | | | 1 | | | |
| Professional Integrated Practice | 1 | Professional Integrated Internship | 8 | 4 | | | | | | 8 | | |
| | 2 | Graduation Internship | 4 | 2 | | | | | | | 4 | |
| | 3 | Graduation Project (Thesis) | 12 | 6 | | | | | | | 12 | |
| Total number of weeks and total credits | | | 43 | 34 | 2 | 4 | 1 | 2 | 3 | 3 | 2 | 16 |

3.2.2 Professional Curriculum

The curriculum system of artificial Intelligence major is based on electrical and Electronic Technology, Data Structure and Algorithm, Python programming, advanced Mathematics, Probability theory and Mathematical Statistics, linear algebra and other courses. The core courses include basic artificial intelligence, operating system, microcomputer principle and single chip microcomputer interface technology, machine learning and deep learning, Basic design of TensorFlow, digital image acquisition and processing, data communication and network, robot Programming (ROS)

and so on, and the corresponding practical content is added. Students will learn and practice according to this training program, and acquire theoretical knowledge, good practical ability, innovation and entrepreneurship ability in electronic information and computer application, program design and algorithm optimization, artificial intelligence technology, intelligent device interaction technology and other aspects. Knowledge emphasizes application, ability emphasizes basic skills and application, and professional quality emphasizes team engineering consciousness. The curriculum system of this major is shown in Figure 3:

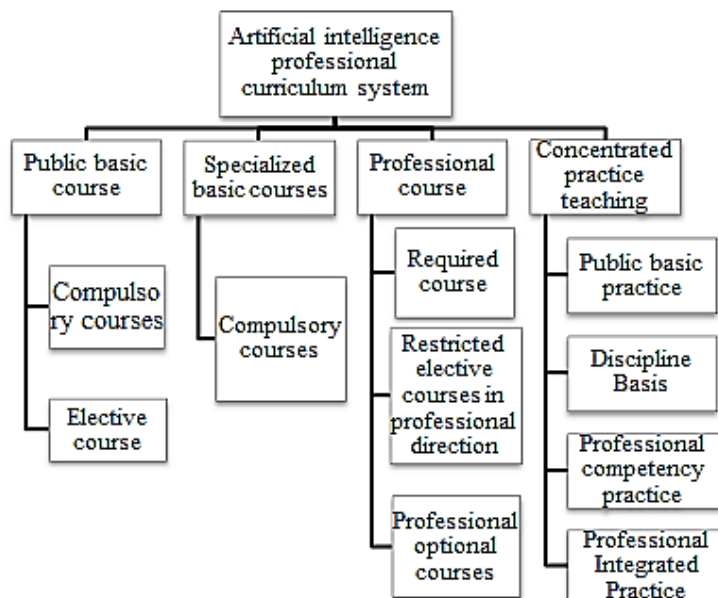


Figure 3: Course system of artificial intelligence major

In the course design, it is necessary to teach students the basic ideas and methods of artificial intelligence and related knowledge points, as well as the application practice, and run through the "computational thinking" characterized by "design and construction", so that when students encounter practical problems, they can be able to further expand their learning on the basis of their edified general knowledge, find solutions in a directional way, and design specific solutions.

3.3 Deepen the Integration of Production and Education, Strengthen the Cultivation of Innovation Ability

Nowadays, artificial intelligence has penetrated into all walks of life and is constantly improving the quality and efficiency of the development of real economy. At present, many leading IT enterprises not only master rich application scenario data, but also master advanced development tools and cutting-edge technologies. Application-oriented colleges and universities should cooperate with these IT enterprises to establish cooperative bases and form a good industry-education integration relationship. Change the traditional theoretical teaching methods, introduce enterprise real projects into classroom teaching, and let students actively participate in the research and development, design and operation of enterprise projects, so that the cultivated talents can play their due role in the rich scene application and major realistic problems. Stimulate students' innovation and entrepreneurship consciousness and improve their innovation ability.

In the process of talent training, we should cooperate with artificial intelligence-related enterprises to set more courses on artificial intelligence chips, tools, systems and platforms, and strengthen the cultivation of technology application ability and application scene innovation ability. The cultivation of artificial intelligence talents should be upgraded from "speaking and teaching" to a large platform of "practice and innovation" constructed by the joint efforts of production and learning, and new mechanisms should be explored in theoretical teaching, practical training and technological innovation.

Innovation and entrepreneurship platform should be built. The school has cooperated with enterprises to build an innovation and entrepreneurship internship base and incubation center, and set up a number of incubation projects such as robot studio, 3D printing studio and e-commerce entrepreneurship hut. Each project is equipped with 1-2 professional guidance teachers to guide students to self-education, self-management, self-service, and cultivate students' ability of organization and management, teamwork and innovative practice.

3.4 Promote Learning through Competition and Enhance the Project Construction of Students' Innovation and Entrepreneurship Ability

We encourage students to participate in enterprise projects and various types of science and technology innovation competitions, and improve students' comprehensive practical and innovative ability by relying on enterprise projects and science and technology innovation competitions. At present, the construction of five laboratories has been completed, including Tehang Intelligent vehicle Innovation Studio, Turing Innovation Studio, Yunchuang Design Innovation Studio, Song Yongshi Innovation Studio and AI comprehensive training platform, and other experimental platforms will be built in cooperation with IFLYTEK later. Some enterprising students with excellent academic performance, strong hands-on ability, and strong interest in competitions are selected to enter the laboratory, and they are guided and trained to participate in teacher projects or college competitions, so as to improve their innovation and entrepreneurship ability.

4 CONCLUSIONS

Based on the application-oriented undergraduate colleges and universities, this paper focuses on the integration of innovation and entrepreneurship education and the training mode of artificial intelligence professionals. The methods and approaches of artificial intelligence talent training mode are put forward from four aspects, which can provide reference for other engineering majors.

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