Exploring the Construction of Innovative and Applied Talent Cultivation System of Intelligent Science and Technology Major under OBE Concept

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Abstract

The major of Intelligent Science and Technology is based on consolidating computer science and technology, strengthening theoretical methods and application techniques of intelligent science as the core, promoting the overall development of students' knowledge, ability and quality as the goal, and focusing on cultivating students' good scientific research literacy and technical application ability. Based on the OBE results-oriented talent training system of intelligent science and technology, it focuses on the cultivation of high-quality application-oriented talents with innovative spirit who can meet the needs of the industry and serve the local economic and social development in the field of intelligent science.

Keywords

OBE Concept; Intelligent Science and Technology; Innovative and Applied; Cultivation System.

1. Introduction

Accelerating the cultivation of intelligent talents and promoting the development of intelligent industries is the inevitable way to occupy the high ground of future science and technology and talent competition, and to accelerate the establishment of the highland of independent innovation in the field of artificial intelligence in China. The market demand for talents of intelligent science and technology-related majors is large, but many colleges and universities in the development of intelligent science and technology majors are still in the stag e of groping for improvement due to the complexity and difficulty of their disciplines, and for the and universities that have just established intelligent science and technology majors appear to be inexperienced, th colleges e faculty strength of intelligent science and technology majors in colleges and universities is weak, the cultivation of talents is based on a book and postgraduate The education system is not yet sound, and many other problems. For such an independent undergraduate institution as our college, which is dominated by cultivating application-oriented talents, taking practical teaching as an important part of the training system of intelligent science and technology talents, focusing on cultivating students' practical hands-on ability, scientific and technological innovation ability and engineering practice ability, and cultivating engineering composite application-oriented talents is the cultivation goal of intelligent science and technology majors.

OBE is a competency, goal and demand-oriented education model. As an advanced education concept, it has become the mainstream concept of education reform in many countries, and its connotation includes education goal theory, competency-based education, refined education and criterion-referenced assessment. And innovation and entrepreneurship education is the strongest driving force to promote the progress of the times, adhere to innovation-driven development, comprehensively shape the new advantages of development, and emphasize on strengthening national strategic scientific and technological forces, enhancing the technological

innovation capacity of enterprises, stimulating the innovative vitality of talents and improving the institutional mechanism of scientific and technological innovation. As one of the majors needed for the construction of new engineering disciplines, it is of great significance and application prospect to adopt the education model based on result-oriented OBE and to conduct research and practice on the training mode of innovative and applied talents in intelligent science and technology.

2. The Study of the Reform Program

2.1. Reforming the Talent Development Programme with the Objective of OBE Outcome Orientation

The major of Intelligent Science and Technology is one of the ad hoc majors in computer science, and the construction of the major is still under continuous exploration. Therefore, the development of the training program needs to be completed through a lot of research, and according to the school's orientation, development goals and service orientation, further clarify the talent training objectives and graduation requirements, scientific and reasonable design of the curriculum system, to ensure that the curriculum system to form an effective support for graduation requirements, training objectives can be effectively achieved.

Our intelligent science and technology major was approved in 2019 and enrolled in September 2020, and the construction of the discipline is still in the groping stage, so the training objectives formulated by the major must meet the laws of education and teaching of our university, our school ideology and school orientation, and according to the needs of the industry and employers, which is also the main basis for formulating the positioning and objectives of talent training for constructing professional education knowledge, ability and It is also the basis for the construction of the knowledge, competence and quality structure of professional education. Combined with the OBE result-oriented student-oriented education concept, the training objectives are set with a focus on the competencies that students acquire after being educated in this major. Combined with the research of relevant enterprises, the training objectives are set in line with the positioning of the college, suitable for the development needs of local economic needs and with obvious professional characteristics.

In order to promote the construction of intelligent science and technology in our college and ensure the quality of talent cultivation, the major launched a research on talent cultivation by deeply understanding the needs of employers, the summary of training programs of major universities, and the existing problems of talent cultivation. The program of intelligent science and technology is aimed at cultivating talents who can meet the requirements of the national standards of teaching quality of undergraduate majors in general higher education institutions and have local characteristics. The major of intelligent science and technology aims to cultivate qualified builders and reliable successors for the socialist cause who can adapt to the needs of the intelligent information industry and serve the local economic and social development, and who are well-rounded in moral, intellectual, physical, social and aesthetic development. They will be able to work in the analysis, development, maintenance and technical management of computer vision and intelligent systems in enterprises and institutions in fields related to intelligent science, and will be competent to work as computer vision engineers, data analysts, algorithm engineers, intelligent system development engineers and system test engineers. "This course is designed to train high quality applied talents with a certain degree of innovation.

2.2. Building a Curriculum System for the Cultivation of Applied Talents Oriented to OBE Results

The curriculum system is both an important support to achieve the training objectives and the core of improving the quality of talents. According to the cultivation objectives, the curriculum

system is built with general education and cultivation - education and cultivation of basic subject knowledge - cultivation of professional foundation and professional knowledge - quality development and innovation The main line is the cultivation of entrepreneurial ability, and the basic modules are general education, teaching of professional basic knowledge, teaching of professional skill knowledge, quality expansion and innovation and entrepreneurship education, which integrate and strengthen the cultivation direction of professional ability of intelligent science and technology and form the curriculum group of applied intelligent science and technology major. The courses of the general knowledge module and the professional basic knowledge module are set in accordance with the relevant national requirements and the standards of the intelligent science and technology major. The professional skills knowledge module, quality development knowledge module and innovation and entrepreneurship knowledge module are designed according to the actual situation of our university and have professional characteristics. Intelligent Science and Technology Course Mapping is shown in Fig. 1.
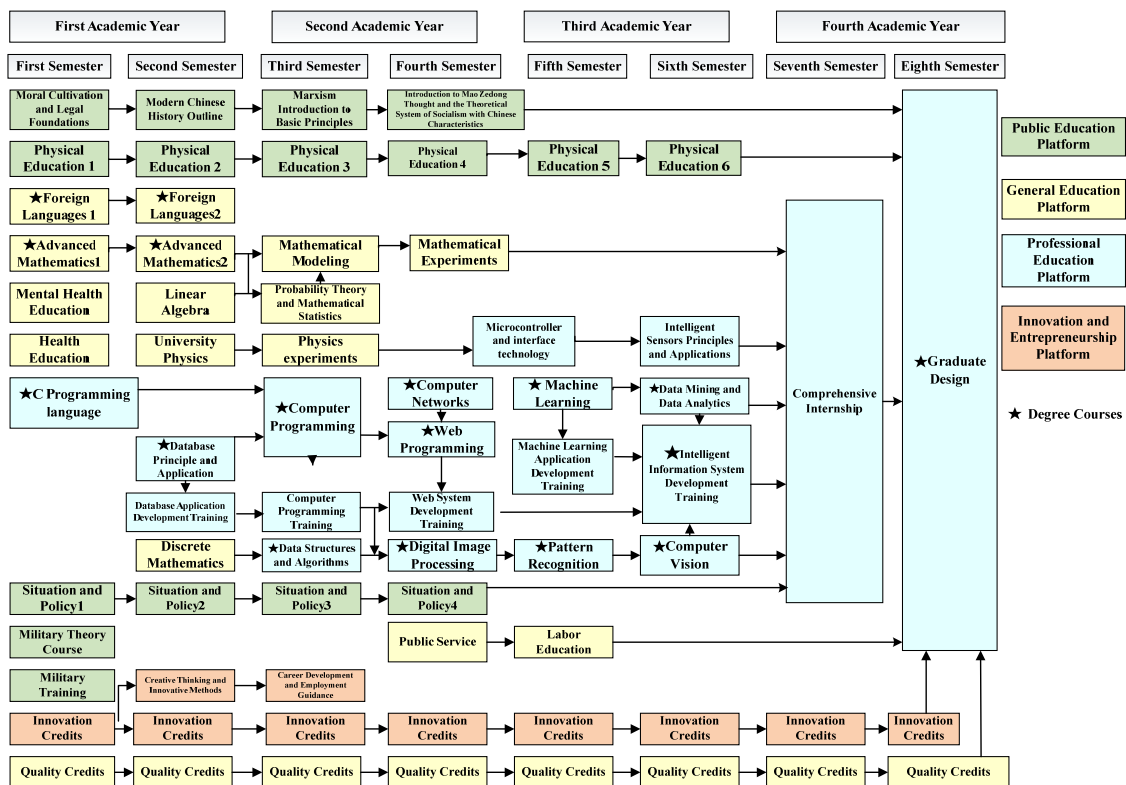

Fig 1. Intelligent Science and Technology Course Mapping

2.3. Strengthening the System of Practical Courses

Practical teaching courses are an important part of the training programme for intelligent science and technology majors. Practical courses can strengthen students' practical hands-on ability, scientific and technological innovation ability and engineering practice ability, and are also one of the important means to cultivate innovative and application-oriented talents.

The professional practice training curriculum of Intelligent Science and Technology is based on the development of information systems and computer vision, and innovation and entrepreneurship education is integrated into the teaching stage, so that students can systematically learn and practice the teaching practice content with software development as the main focus and hardware application as the supplement. The practice system is mainly divided into professional foundation practice, professional core practice, professional expansion practice, comprehensive practice and innovation training and other parts.

Professional foundation practice requires students to understand and master basic computer knowledge; professional core practice is the operation of the core curriculum practice, so that students can gradually master the courses related to information system development and computer vision; professional extension practice is the expansion of the curriculum for other fields such as artificial intelligence and engineering system development, so as to expand students' learning horizons; comprehensive practice is the practical education around the core curriculum. Integrated practice is a practical education based on the core curriculum system, which strengthens students' practical operation and innovation ability cultivation; innovation training is based on different perspectives such as clubs, innovative and entrepreneurial training projects and various competitions in the second classroom to strengthen students' innovative education. In the whole practical ability training system, through the concept of project teaching and integration of science and practice, students receive practical training from enterprise engineering and team work, so as to have the ability to solve practical problems and create applied talents with solid theoretical foundation, outstanding practical ability and excellent professionalism. Practice system in Intelligent Science and Technology is shown in Fig. 2.
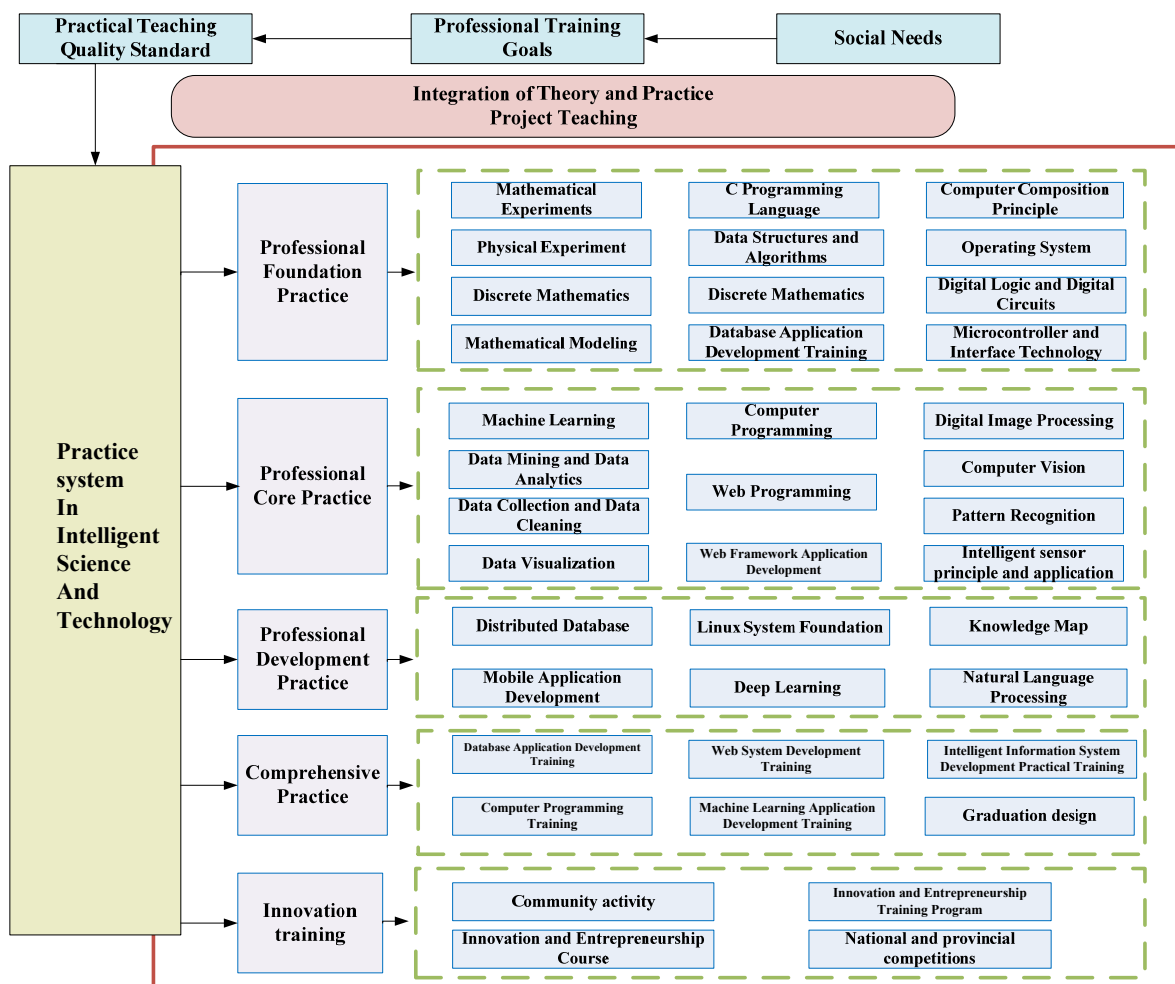

Fig 2. Practice system in Intelligent Science and Technology

2.4. Forming a Professional School-Enterprise Cooperation Model and Strengthening the Teaching Staff

Insufficient teachers for the cultivation of engineering application-oriented talents is a common problem in local application-oriented undergraduate institutions. Although some teachers have solid professional theoretical knowledge and rich experience in theoretical teaching, they lack

engineering training and are deficient in teaching engineering knowledge, which is not conducive to the implementation of the result-oriented education mode.

An effective way to solve this problem is to continuously enrich the professional double-teacher and double-competent teacher team through the cooperation and co-construction between schools and enterprises. On the one hand, the research group establishes a team of enterprise teachers, with project managers, senior engineers and technical experts with rich experience in engineering implementation serving as lecturers for professional courses, and jointly formulates and optimises and improves talent training programmes with professional teachers, jointly develops teaching materials, builds high-quality courses and constructs practice platforms. On the other hand, it adopts the teaching management and competence training mode with enterprise characteristics, through joint teaching between schools and enterprises as well as various teaching seminars such as listening to classes, trial lecture observation, internal training, joint innovation of teaching methods and exchange of teaching experience. By forming professional school-enterprise cooperation teams, using outstanding talents from enterprises to improve the teaching team, and carrying out the long-term cooperation model of enterprise technicians to implement practical education in schools and teachers to work in enterprises, the practical teaching ability of teachers is constantly improved.

2.5. Improving the Construction of Teaching Laboratory Centres and Practical Training Bases

The laboratories start from the actual school and build advanced high-level comprehensive laboratories. It follows the direction of cutting-edge technology development, creates professional characteristics and provides software and hardware environment support for practical and skillful talents training. The laboratory supports the courses of digital image processing, pattern recognition and computer vision carried out by the major of intelligent science and technology, and supports comprehensive technical practical training. The laboratory is built through a combination of hardware and software mode, and is used to improve the teaching and support resources of the major of intelligent science and technology, so as to ensure that students not only master the basic theoretical knowledge, but also have the ability to apply the knowledge to solve problems, and also make students have It also enables students to have certain self-learning ability to adapt to the needs of the profession and the changing needs of society, and truly cultivates high-quality applied talents with a certain innovative spirit who "know the profession, have strong skills, can cooperate and are good at doing things".

In terms of practice bases, follow up the currently existing practice bases and continue to explore in depth other practice bases suitable for intelligent science and technology majors. These bases provide students with more room for choice, and students can choose suitable practice contents, practice locations and practice positions according to their needs, and enhance students' employment competitiveness by providing them with a good practice environment and practical skills.

2.6. Strengthening the Training of Students' Professional Application and Innovation Skills

Due to the continuous improvement of the society's requirements for talents, the demand for innovative application-oriented talents in computer-related fields is gradually increasing. Students, as the main body of learning and the army of talents in demand, are also the main body of innovation in computer-related professions. In applied universities, they should adhere to the concept of nurturing students' development as the centre of their education, and teach with the concept of people-oriented and learning to apply.

In practical teaching, teachers should actively act as leaders of students' innovative thinking by understanding the current and future state of development in the field of intelligent science, and by conveying for students the state of development in the field of intelligent science and the popular fields in the use of teaching, so that students can quickly understand the development trend of intelligent science. Students strengthen their professional knowledge and enhance their ability to think creatively and operate practically by learning and generalising their knowledge in the relevant areas of intelligent science. Through the combination of teaching and learning, students will have a more correct concept of innovation, achieve bold innovation and be active, making the development of students in intelligent science and technology more promising and bursting with dazzling light on the platform of innovative ideas.

In the promotion of the competition, students are actively encouraged to participate in innovation and entrepreneurship competitions at national, provincial or university level. The College should increase the publicity and promotion of the value function of the competition. By participating in the competition, students should have a sense of gain and achievement, in addition to their own knowledge, thinking and ability enhancement. Improve the sense of service in all stages of the competition and increase the reward mechanism, so as to drive and influence more students to participate in the competition and form a good atmosphere of promoting learning through competition

3. Summary

An investigation into the use of the OBE concept to build an innovative and applied talent training system for intelligent science and technology majors aims to build an OBE-targeted applied talent training programme and curriculum system to achieve continuous construction and development of the major and ensure the quality of talent training. Through in-depth school-enterprise cooperation, the faculty will be strengthened and the practical teaching ability of teachers will be enhanced, thereby leading students to strengthen their practical learning and enhance their innovative thinking and operational ability. In the teaching system, the construction of teaching experiment centres and practical training bases is improved to train students to adapt more quickly to changes in vocational needs and social demands. By promoting learning through competitions, we cultivate applied talents in the field of intelligence and enhance students' competitiveness in employment. The cultivation of talents in intelligent science and technology has a long way to go and needs to be explored in continuous practice to gradually improve the innovative application ability of students.

Acknowledgments

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