Construction and Practice of Innovation and Entrepreneurship Education System for Computer Major Based on OBE Concept

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Abstract. With the country's emphasis on innovation and entrepreneurship, domestic colleges and universities are constantly exploring how to cultivate innovative and entrepreneurial high-skilled talents, and have made many achievements in the process of training, but also found many problems. This paper analyzes the current situation and problems of college students' innovation and entrepreneurship education, from a professional point of view, taking the training of computer majors as an example. Based on the core concept of OBE, this paper puts forward the idea of constructing the educational practice system of the integration of innovation and entrepreneurship with specialty, and explores the practice system of innovation and entrepreneurship education and the practice of curriculum teaching strategies for computer specialty with students as the center and various achievements as the guidance.

Keywords: OBE · innovation · entrepreneurship · education system

1 Introduction

The country attaches great importance to talent cultivation in innovation and entrepreneurship education, and has issued a lot of policies to point out the ideas and objectives of cultivation. For example, "The Guiding Opinions on Further Supporting College Students' Innovation and Entrepreneurship" in 2021 focuses on supporting college students' innovation and entrepreneurship activities, especially those with innovative ideas and abilities, which is an important force in China's innovation and entrepreneurship activities. Colleges and universities are actively exploring high-quality "entrepreneurship and innovation" talent cultivation. Therefore, how to improve the effectiveness of innovation and entrepreneurship education has become an urgent issue for universities to study and solve.

2 Current Situation Analysis and Existing Problems

In the implementation of innovation and entrepreneurship practice education for college students in China, there are common problems such as insufficient teaching atmosphere and too single dimension of teaching evaluation mechanism [1]. Ma Yingzhuo focuses on results oriented innovation and entrepreneurship practical education activities to improve students' innovation ability [2]. Wang Youze proposed to use the advantages of OBE concept to enrich the innovation and entrepreneurship ability training system and enhance the innovation and entrepreneurship ability of college students [3]. Zheng Yudie promotes school-enterprise cooperation and feedback on training results by constructing a training evaluation of student monitoring and multiple process evaluation [4]. Zhou Fengze Constructs an Evaluation System for Innovation and Entrepreneurship Education in Application-oriented Undergraduate Universities Based on OBE Concept [5]. Song Yang discussed the importance of top-level design and strengthening teachers from the perspective of curriculum ideology and politics [6]. Peng Xiuyan and others have integrated the "OBE education concept + innovation and entrepreneurship education + curriculum ideological and political" model into their professional core courses [7].

Therefore, most of the current research on innovation and entrepreneurship education mainly focuses on practical paths and innovation and entrepreneurship courses, and there are few achievements in research and practice from the perspective of professional education. Therefore, starting from the characteristics of professional education and based on the OBE education philosophy, this article aims to address the common problems in innovation and entrepreneurship education, building a student centered, results oriented, and practice based education system for computer majors, exploring the cultivation path of innovation and entrepreneurship education for professional talents, promoting the reform of traditional education models and personalized development of students, and cultivating high-quality innovation and entrepreneurship talents.

3 Construction of Educational Practice System

In view of the innovation and entrepreneurship education of computer specialty, starting from the actual needs, under the guidance of the educational concept of OBE, the innovation and entrepreneurship education system in Colleges and universities is reformed and practiced, and the framework of the training system for innovative and entrepreneurial talents is designed, as shown in Fig. 1. It mainly includes four aspects: the integration of specialty and innovation and entrepreneurship, the construction of curriculum knowledge system, the integration of curriculum ideological and political and the combination of post, course, competition and certificate.

3.1 Integration of Specialty and Innovation and Entrepreneurship

Innovation and entrepreneurship courses are arranged in the second semester of freshman year in the training program of computer professionals. The public courses in the early stage include ideological and political education, professional and technical basic
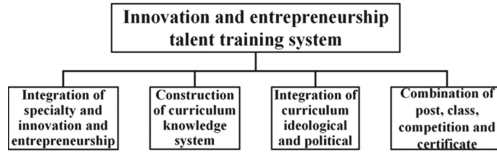
Fig. 1. Framework of Innovative and Entrepreneurial Talents Training System
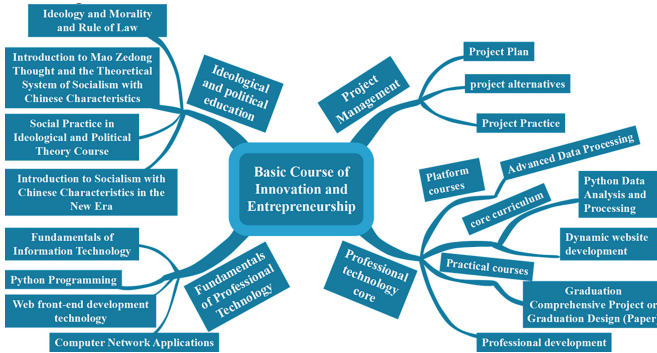

Fig. 2. Cohesion of courses in personnel training

courses, which can pave the way for future innovation and entrepreneurship; The subsequent core professional technology courses and project management courses will further strengthen students' professional skills and project management abilities.

Therefore, the "basic course of innovation and entrepreneurship" plays a connecting role in the talent training program of computer major. When students have a certain professional and technical foundation, the introduction of innovation and entrepreneurship education focuses on cultivating students' innovative thinking and entrepreneurial awareness, planting the seeds of innovation and Entrepreneurship for students, combining with ideological education, imperceptibly cultivating students' entrepreneurial spirit and national feelings. This is shown in Fig. 2.

3.2 Construction of Curriculum Knowledge System

In the knowledge system of the course, we should firmly grasp the characteristics of the computer specialty, take the entrepreneurship project of the computer industry as an example, integrate the knowledge points of innovation and entrepreneurship, set training projects and tasks, take the ability goal and quality education goal as the guidance, adopt different teaching methods, and focus on innovation and entrepreneurship. Let students quickly master the relevant knowledge points and skills, as shown in Table 1.

3.3 Integration of Curriculum Ideological and Political

In the course of innovation and entrepreneurship education, ideological and political education and content are integrated, and the construction of ideological and political

Table 1. Design of some curriculum systems

Total projects (activities)	Sub-project (Active)	Name of the training program	Training mission	Ability objectives and quality objectives	Training methods and steps
Computer Industry Entrepreneurship Project	1 Analysis of opportunities and resources of Xiaomi Corporation	1.1. Cultivate innovative quality	Understanding the Connotation of Innovation and Entrepreneurship	Stimulate innovation vitality	Flipped classroom teaching + classroom interaction
		1.2 Build an entrepreneurial team	Understand the role and function of entrepreneurial leaders	Emotional ability Management ability	Role-play teaching method + classroom interaction

education runs through the course of innovation and entrepreneurship. Therefore, based on the students majoring in computer science, we should integrate the ideological and political spirit into the teaching of innovation and entrepreneurship education, innovate the teaching concept, and integrate the ideological and political elements such as the feelings of home and country, the spirit of the times, the socialist core values, the scientific development concept, the modern concept of rule of law and the concept of professional accomplishment into the course of innovation and entrepreneurship. In the process of innovation and entrepreneurship education, the key points of ideological and political education should be highlighted in curriculum teaching, practical training and entrepreneurship competition, so as to further enhance the educational role of innovation and entrepreneurship education.

(1) Integrate the value concept of moral education into the curriculum objectives of innovation and entrepreneurship education. In the context of national information and network security, innovation and entrepreneurship education activities need to combine personal development with the revitalization and hope of the nation, educate students to have a sense of overall situation, improve security awareness, and cultivate "three innovation" talents with innovative spirit, entrepreneurial awareness, and entrepreneurial ability.

(2) Combine the experience of excellent IT entrepreneurs with the educational content of innovation and entrepreneurship. In innovation and entrepreneurship education, it is necessary to promote excellent entrepreneurship, learn from the deeds of scientists, demonstrate the deep interaction between humanistic spirit and scientific research, and help students broaden their world perspective, develop strategic thinking, and increase their innovation awareness.

(3) Effectively combine the major strategy of national development with innovation and entrepreneurship education. Lead students to correctly understand the needs of national development strategies, understand the urgency and importance of core

information technology in China, and cultivate students with a broader perspective to explore and cultivate entrepreneurial projects from the perspective of national development and revitalization.

3.4 Combination of Post, Class, Competition and Certificate

Higher vocational colleges must closely integrate talent cultivation with current economic activities, and improve the quality of talent cultivation through on-the-job courses, competitions, and certifications.

(1) Aim at the direction of "post". The training of computer professionals is oriented towards innovation and entrepreneurship, based on industry market demand, and aims to cultivate both moral integrity and talent. Curriculum development and setup must conform to the direction of the development of the new generation of information technology industry, with the job standards of the information technology industry as the goal of student skill training, so that curriculum teaching meets actual needs.

(2) Change the mode of "class". Taking students as the center, the teaching methods are "project + cooperation" and "simulated entrepreneurship". To broaden the teaching methods through multiple channels, we should promote the "classroom revolution", adapt to the diverse characteristics of different students, and improve the student-oriented professional and curriculum teaching evaluation system, as shown in Fig. 3.

(3) Improve the performance of "competition". Relying on the curriculum to promote the in-depth development of the "Internet + " College Students Innovation and Entrepreneurship Competition, through the establishment and improvement of the national, provincial and school three-level teacher-student competition mechanism, improve the teaching level and student participation, and exercise students' comprehensive ability.

(4) Develop the content of "certificate". Actively develop and integrate various types of vocational skill appraisal certificates, qualification certificates and grade certificates, integrate the comprehensive abilities needed for vocational activities and personal career development into certificates, and expand students' employment and entrepreneurship skills.
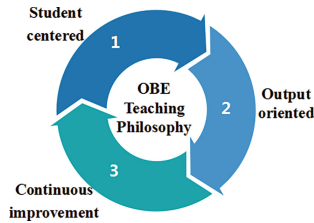

Fig. 3. Student Simulation Roadshow

Fig. 4. OBE Teaching Philosophy

4 Course Teaching Strategy Practice

4.1 Teaching Philosophy

The core of this course is the teaching concept of OBE, which is mainly reflected in the expected learning outcomes of students. Through OBE concept, it emphasizes learning outcomes (effectiveness of teaching objectives), carries out teaching reform and exploration on the innovation and entrepreneurship curriculum system, and makes fundamental changes in multiple aspects such as teaching methods and content through curriculum goal design and phased reform, Realizing the transformation of curriculum teaching from "teacher centered" to "student centered", truly implementing the student centered education concept, improving students' professional ability, learning ability, and basic quality, effectively enhancing students' autonomy and enthusiasm in learning innovation and entrepreneurship courses, and effectively promoting the promotion and development of students' professional skills in innovation and entrepreneurship. As shown in Fig. 4.

4.2 Practice of Teaching Methods

(1) **Flipped Classroom Pedagogy Incorporating OBE Ideas.**

Combining the OBE concept with intelligent vocational education cloud platform, superstar platform, etc., to create a classroom cultural environment for curriculum reform and vocational ability cultivation, and formulate specific content and requirements for students' basic ideological and professional qualities, physical and psychological qualities, so as to improve classroom quality. In the specific teaching process, the construction of multiple real scenarios provides a basis for computer majors to experience innovation and entrepreneurship norms, innovation and entrepreneurship processes, and innovation and entrepreneurship efficiency in a real environment. As shown in Fig. 5 and 6.

(2) **Practical Teaching Method of "Project + Competition".**

Through the project organization teaching, the theory and the real practice project are effectively integrated, and the students are actively encouraged to participate in the "Internet+" innovation and entrepreneurship competition, which can realize the application of theory and guide the practice teaching, so as to achieve " doing by learning, learning by doing", and then enhance the students' ability to write business
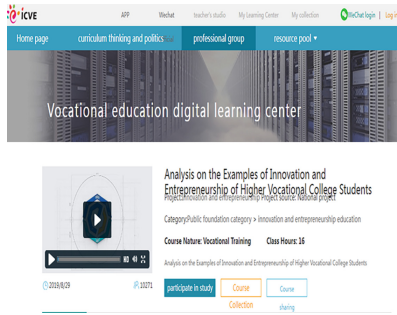
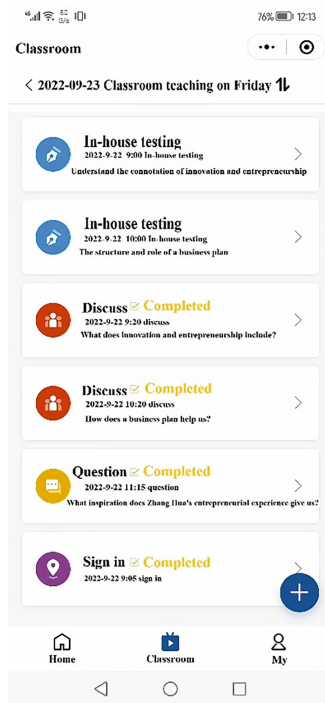**Fig. 5.** Digital Learning Center for Vocational Education

Fig. 6. Online and offline mixed teaching

plans and implementation, and enhance the students' practical skills of innovation and entrepreneurship.

4.3 Practice of Teaching Mode

The course adopts heuristic teaching strategy, according to the idea of "case preparation → guidance → explanation → transformation → application", Before class, let students watch videos related to the course and search for information. During class, based on the

characteristics of the case, guide students to actively ask questions and think about the problem. The teacher will provide guidance from the side, allowing students to actively explore and independently find solutions to the problem. Then, the teacher will explain and answer questions about the knowledge points in this lesson, which can take various forms such as discussion and hypothesis, Then, through questions and assignments to strengthen the mastery of classroom knowledge. Finally, using the preparation and presentation of the comprehensive course assignment - Entrepreneurship Plan, fully mobilize students' initiative and enthusiasm in learning, promote students' innovative thinking, enhance their learning interest, cultivate their ability to discover, analyze, and solve problems, and strengthen their awareness of innovation, collaborative spirit, and practical application ability.

5   Conclusions

In the training of computer professionals in innovation and entrepreneurship education, the introduction of OBE education concepts, improvement of innovation and entrepreneurship education methods, and strengthening of student development as the center, ability cultivation as the core, and continuous improvement as the focus have greatly improved students' practical skills, cultivated highly skilled talents that better meet market demand, and provided solutions to problems in the development process of innovation and entrepreneurship education.

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