Research on Innovative Education of Computer Specialty Rely on Computer

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Abstract. With the development of computer technology, computer industry needs more and more talents. Therefore, colleges and universities design computer majors to train talents for the computer industry. Integrating computer technology into the teaching of computer majors can break the traditional education deadlock. It brings innovation and entrepreneurship teaching mode to computer professional education.

Keywords: Innovative Education, Educational Model, Teaching Reform

1. Introduction

In recent years, due to the disconnect between university teaching and social needs, a large number of computer graduates cannot directly enter the enterprise to create value. We must take the subject competition as the guide and strive to create a computer science and technology professional talent training model. This has great significance on universities and society.

2. Research status of innovation and entrepreneurship education at home and abroad

2.1. The status quo of foreign innovation and entrepreneurship education research

Innovation and entrepreneurship education has a history of more than half a century. The Massachusetts Institute of Technology in the United States was the first to include creativity in the content of university education. Stanford University, Harvard University, University of California and other famous universities have successively launched activities and courses related to innovation and entrepreneurship education. In the late 1960s, several well-known economists from Babson School of Business proposed entrepreneurship education for the first time. In the 21st century, some EU countries have issued a series of guidelines and policies for innovation and entrepreneurship education in universities, which have had a significant impact on innovation and entrepreneurship education in Western countries. The development of innovation and entrepreneurship education abroad is becoming more and more mature, especially the innovation and entrepreneurship education in developed countries such as the United States has achieved good results. The innovation and entrepreneurship education system in the United States is relatively complete [1]. It has clear talent training goals, a complete discipline system, strong teaching staff, and systematic curriculum. It focuses on cultivating students' innovative and entrepreneurial spirit. The education content covers a wide range of junior
high schools and high schools. Undergraduate and postgraduate level. Innovation and entrepreneurship education is mainly application-oriented, focusing on the effective combination of educational achievements and the market, and most people choose high-tech projects for entrepreneurship, and the success rate is relatively high.

2.2. Status quo of domestic research on innovation and entrepreneurship education
In the 1980s, Shanghai Jiaotong University first introduced the concept of creativity. The holding of the first Tsinghua Entrepreneurship Design Competition in 1998 marked the beginning of innovation and entrepreneurship education in my country. In early 2002, the Ministry of Education established entrepreneurship education pilot sites in 9 universities, including Tsinghua University, Shanghai Jiaotong University, Renmin University of China, and Beihang University. In recent years, colleges and universities have paid more and more attention to innovation and entrepreneurship education. Many schools have focused on innovation and cultivated their innovative and entrepreneurial qualities; the third is a comprehensive model represented by Tsinghua University and Shanghai Jiaotong University, through science and technology parks, practice platforms, and entrepreneurship education. The course cultivates students' innovative and entrepreneurial spirit and improves their entrepreneurial skills [2].

Compared with the United States, Germany, the United Kingdom, Japan and other countries, the main problems of China's innovation and entrepreneurship education are as follows: First, the education system is not well established and the orientation is not strong. Although many innovation and entrepreneurship competitions have been carried out, most of the competition projects are lacking. The technological content, innovation and entrepreneurship achievements and market demand are not high; second, the curriculum design is not reasonable enough, innovation and entrepreneurship education is marginalized, most schools' innovation and entrepreneurship courses are set as elective courses or public courses, lacking professionalism, and some schools' innovation and entrepreneurship Education is carried out in the form of competitions, with only some students participating, and most students don't know much about innovation and entrepreneurship education. Third, students do not have a thorough understanding of innovation and entrepreneurship concepts. Many colleges and universities have failed to guide students to correctly understand the connotation of innovation and entrepreneurship education. Innovation and entrepreneurship education is about cultivating successful entrepreneurs; fourth, there is a lack of practical training. Most college innovation and entrepreneurship courses still adopt traditional teaching methods, and assessments are also carried out in the form of paper examinations. Although some colleges and universities choose to cooperate with enterprises to give students practice However, most of the internship positions given by companies stay at the technical level, and there are few positions that can cultivate students' innovative thinking [3,4].

3. Practice of innovation and entrepreneurship education for computer majors
The basic process of computer professional innovation and entrepreneurship education practice is based on professional development and social needs, guided by subject competitions, through teaching reforms, building an innovation and entrepreneurship training system, and building an industry-university-research cooperative education platform to cultivate students' innovative research capabilities And entrepreneurial application capabilities, and ultimately achieve the goal of cultivating high-quality talents in computer science [5]. The specific process is shown in Figure 1.
3.1. Teaching reform
1) Improve the curriculum system. On the basis of the existing curriculum system, Liaoning University has increased the types and numbers of innovation and entrepreneurship education and practical courses. From 2013, the summer semester will be added for a period of 4 weeks. We set the corresponding practical courses, such as course design, computer advanced language programming, etc. in the summer semester, so as to ensure the integrity of the course. Among them, some courses are open to all students, such as course design, students can freely combine, design the website system according to the language and interest they master; some courses are optional courses for some students, such as computer advanced language programming specifically for participating in ACM programs Design competitions created by students [6]. Figure 2 is a schematic diagram of the curriculum system of our school as an example.
2) Update teaching content. In terms of teaching content, increase the teaching of innovative and entrepreneurial examples, increase the proportion of experimental teaching, and increase practical courses. For basic courses, such as data structure, increase the proportion of experimental teaching and strengthen students' hands-on ability under the premise of guaranteeing the teaching of theoretical courses; for elective courses, such as practical software and new technology, transfer the teaching from the classroom to the computer room, teaching while experimenting.

3) Improve teaching methods. Fully consider the learning foundation and interests of computer majors, flexibly arrange student composition and learning content, focus on combining actual technical scenarios, explain in a simple way, and let students face real technical problems, thinking and exploring are scientific, pertinent and feasible Operational solutions. In particular, the application of the project guidance method is emphasized. Through the guidance and explanation of the actual project, the teacher enables students to truly understand the development process of the project and truly master the development method [7].

4) Strengthen the teaching team. Invite engineering and technical personnel and management personnel with rich practical engineering experience in IT companies to serve as part-time teachers to undertake some professional curriculum teaching tasks, and focus on imparting knowledge and experience related to actual engineering project management and development.

3.2. Constructing an innovation and entrepreneurship training system

1) Special training. Taking the ACM programming competition, computer design competition, college student innovation and entrepreneurship competition, challenge cup, innovation and entrepreneurship competitions as an opportunity, combined with the training mechanism of computer professionals, and using the winning teams of previous competitions as the blueprint, special trainings are set up. This part is the focus of the entire education model, which can be specifically constructed from the following two aspects.

1."Curriculum" of subject competitions. If students cannot truly master knowledge, they will not be able to achieve excellent results in subject competitions, and the main way for students to learn knowledge is the classroom[8]. Therefore, subject competitions must be "curricized" and subject competitions can be infiltrated into daily course teaching. In addition to the above-mentioned teaching reforms, according to the characteristics of subject competitions, organically integrate them with related courses, such as integrating ACM programming competitions into high-level language programming, data structures, discrete mathematics and other courses, especially experimental courses and comprehensive courses. Arouse students' enthusiasm and strengthen relevant knowledge by
introducing real topics; integrate computer design competition into database application technology, network practical technology and other courses, especially by implementing a real project to guide students into a simulated practice situation. The "curriculization" of subject competitions not only stimulates students' enthusiasm and initiative, but also improves the quality of courses.

2."Convergence" of discipline competitions. As a special test beyond the scope of textbooks, subject competitions are very difficult. Therefore, every subject competition needs a tutor; but at the same time it is a long-term job, and it is difficult for tutors to follow up for a long time. Therefore, it is necessary to achieve the subject reference: the "convergence" of the competition includes both vertical and horizontal cohesion. The former refers to the formation of a complete team among students to bring the new with the old, especially the ACM programming competition. Many colleges and universities have oj platforms, and strive to make the old students lead the freshmen to do problems on the platform; the latter refers to the students of different majors We should cooperate with each other to maximize strengths and avoid weaknesses. Now many discipline competitions also encourage interdisciplinary cooperation. For example, computer design competitions encourage computer majors to serve other professions and develop projects with other professional characteristics[9].

2) Joint training. Select professional backbone teachers to exercise in specific projects of the cooperative company during holidays or spare time to gain a deep understanding of the company's business management concepts and increase practical experience; at the same time, hire engineers with rich engineering experience in the company as part-time teachers.

3) Participate in teacher projects. Teachers’ scientific research projects play an important role in cultivating students’ innovative abilities. We actively apply for vertical research projects and horizontal topics around the dominant research direction in this major, and through the campaign mechanism, we allow outstanding students to participate in the project topics of instructors to cultivate their scientific research and innovation capabilities.

4) Frontier exploration. Closely integrate research hotspots at home and abroad, and encourage teachers to introduce cutting-edge innovative ideas, research results, academic disputes or doubts into the teaching to stimulate students' pursuit of exploration.

3.3. Build an education platform for industry-university-research cooperation

Cooperate with off-campus IT companies to build an internship practice base and build an education platform for students and companies that combines innovation and entrepreneurship with production, education and research. The education platform can be used as an "incubator" to serve students' entrepreneurial projects and actively transform suitable entrepreneurial projects[10].

4. Conclusion

In recent years, new teaching models have stimulated students’ interest in learning. We need to conduct cooperative teaching in three aspects: teaching reform, training system and a platform for industry-university-research cooperative education, this greatly improves the teaching quality of computer majors in universities.

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