Exploration and Practice of the Model of Entrepreneurial Compound Talent Based on Innovation and Entrepreneurship Training

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Abstract: In this paper, a four-layer system is designed for the characteristics of the teaching of computer major in colleges and universities with the "interest inspire innovation" as the starting point, which is based on the entrepreneurial talents majoring in computer science in college training program, and explain its application effect in practice.

1. The influence of the "Innovation and Entrepreneurship Education" in the teaching of computer major in colleges

In July 2015, the State Council issued the "Guiding Opinions on Actively Promoting the 'Internet Plus' Action Plan", which not only marks that "Internet Plus" has been included in the national strategic level, but also marks a new social form [1]. The arrival of the "Internet Plus" era will inevitably lead to an educational information revolution in the field of education. How to realize the integration of the Internet and education and improve the quality of "teaching and learning" is not only the appeal of education in the new era, but also the urgent problems which current educational reforms of universities face.

Under the background of "Internet Plus" era, innovation and entrepreneurship education has been included in the content of college education and teaching. The "College Students' Innovation and Entrepreneurship Training Program" project has become one of the important contents of the "Excellence Plan" for college students' innovation and entrepreneurship education conducted by the Ministry of Education [2]. China "Internet Plus" College Students Innovation and Entrepreneurship Competition was personally proposed by Premier Keqiang Li. It has been held since 2015 and has been held for three times. The competition aims to deepen the comprehensive reform of higher education, stimulate the creativity of college students and cultivate "mass entrepreneurship and innovation" students. The essence of the " innovation and entrepreneurship" is that college students apply the theory of studying in universities to the practice of enterprises [3]. Cultivating the ability of college students is the need of clarifying the orientation of talent training in universities, enhancing the pertinence of quality evaluation of higher education and promoting the continuous improvement of talent training mode in universities [4].

2. Problem analysis in the cultivation of entrepreneurial talents for computer major in colleges

With the wide application of new generation information technology such as artificial intelligence and big data technology, computer major acts as a discipline that closely combines information technology, in addition to basic professional knowledge and computer application ability training, the core concern is how to improve students' ability to solve problems independently, cultivate their innovative consciousness and innovative ability, that is, the "innovation and entrepreneurship" ability. Based on vigorous promotion by the state, universities only break the traditional education model, reconstruct the innovation and entrepreneurship curriculum system and promote the reform of innovation and entrepreneurship education, they can achieve the goal of mass entrepreneurship and

innovation [5-6].

The existing teaching mode in China, in the practice of innovation ability training, in the face of students' individualization, specialization and professional socialization, is difficult to adapt to the changing requirements of talent training, which is reflected in the following four aspects.

2.1. Traditional teaching ecology

In China, classroom teaching has always been regarded as an activity that guides students to master scientific and cultural knowledge. And the main task of teachers is to instill standardized knowledge into students. Students' learning is mainly the memorization and memory of knowledge [7]. Traditional practice teaching pays attention to basic professional teaching. Although there are a lot of practices, such as production internships and cognitive internships in the extracurricular internships, the time ranges from 1 to 4 weeks. It is limited to visit and understand the direction of professional development, and only some parts of internship experiments can participate in the simple understanding of enterprise projects, so the vast majority of students are not easy to get the actual project development exercise. There are fewer opportunities for students to apply the theoretical knowledge they have learned to practical research problems, and they only stay at the shallow level of “I know that”.

2.2. Traditional teaching modes and learning modes

In the general sense of computer experiment teaching, teachers limit the time and content according to the experimental plans, so the experiment time is short and the content is fixed. In a uniform classroom, all students can only pursue the same goal and achieve it in the same way, method and speed [7]. In addition, the time on the experimental rooms is related to the teaching arrangements and cannot be dynamically adjusted, which cause the devices to be "busy" and "free" to conflict with the student's planned practice time. The above traditional teaching modes and learning modes are not enough to inspire students' innovative thinking, and the desire of students to carry out a large number of practices is difficult to achieve at the laboratory level.

2.3. Impact of the entrepreneurial models -- the cultivation of innovative talents

In recent years, all kinds of training schools in China have blossomed everywhere. To a certain extent, they have provided students with rich practical environments and certain practical guidance, and universities also have many practical links to cooperate with them to conduct practical education. Although the programming training schools provide a fast-advancing platform for many students, these trainings are highly targeted and standardized, which can’t meet the diversified needs of enterprises. In the practice process, the training requirements of applied innovative talents are to improve learners' sense of innovation based on knowledge. The “entrepreneurship” of “Innovation and Entrepreneurship Education” is based on “innovation” and focuses on knowledge content. The marriages between entrepreneurship and technology companies are all based on innovative knowledge. It is necessary to distinguish between high-knowledge entrepreneurship and low-knowledge employment. Entrepreneurship is talent cultivation rather than artificial technical training [3].

2.4. Impact of the entrepreneurial models -- the business consciousness

The goal of entrepreneurial talent training is to cultivate the entrepreneurial quality of the educated, including entrepreneurial consciousness, entrepreneurial psychological quality, entrepreneurial knowledge and entrepreneurial ability, to better adapt to work needs and social changes [8]. The student training model that stimulates students' interest through competitions has a long history, which can effectively improve students' comprehensive quality and ability to deal with problems independently. At the same time, students lack business sense, and their commercial operations are immature, resulting in insufficient protection for personal innovation in some competitions or exhibitions, which reduces their enthusiasm for innovation.

3. Model practice research on the cultivation of entrepreneurial talents in computer major in colleges

In order to adapt to the situation of teaching reform, carry out innovation and entrepreneurship education, we have changed the original teaching modes, transformed the previous single model of imparting knowledge into a "innovation and entrepreneurship" talent training model of cultivating innovation consciousness and innovation ability, which provides a good atmosphere for further improve college students' innovative and entrepreneurial ability. For the reform that computer teaching is faced with, we analyze and research some key elements in the innovative entrepreneurial talent cultivation and their inherent logical relationship, continue to explore and summarize the practical work, and propose the following four reform methods for the above problems.

3.1. Realize the cultivation of professional and technological innovation ability by establishing ACM training team and establishing software society

In the teaching of computer science, it is especially important to train students in professional skills. In the classroom, need to cultivate students' thinking patterns, solve problems with computational thinking, and ensure that the practice reaches more than 60% of the total class hours through in-class experiments, course design, production internships and cognitive internships. Outside the classroom, the "innovation and entrepreneurship" talent training plan takes the college students' competitions as the entry point of the work, to establish competition training teams to guide students to participate in the competitions, establish software development communities, improve students' hands-on ability through exercise, summarization and conciseness of the basic projects, and according to the needs of the project, dynamically adjust the employment direction and strategy, so as to enhance the enthusiasm of college students to start a business, as a basis for verifying the validity of the theoretical guidance model.

We have designed a profession innovation mechanism, to improve students' comprehensive ability based on basic knowledge ability training, cultivate students' innovation and competition consciousness based on competitions and cultivate students' entrepreneurial and employment ability based on internship, employment and entrepreneurship guidance, as shown in Figure 1.

In practice, we set up professional competition training teams such as ACM to guide students to participate in the competitions, and established software society with the IT lab of the Engineering Training Center. Keeping technology development as the central task and taking account of planning and promoting the scientific and technological activities, commit to scientific and technological innovation practice in computer related fields.

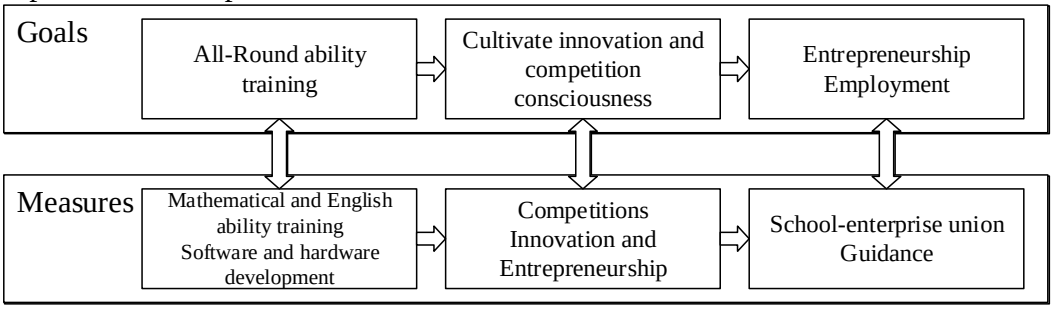

Figure 1. Profession innovation mechanism framework

3.2. Build and improve the four-layer architecture of "innovation and entrepreneurship" talent training in computer science and technology

Taking the "Internet Plus" and other competitions as the opportunities to participate in them, we explored a four-layer entrepreneurial talent training model based on "Innovation and Entrepreneurship Education", which is Platform Construction -- Consciousness Motivation -- Thinking Development -- Business Incubation.

Through constructing experiment platforms, practice bases, student teams and guidance teams,

realize the basic platform construction. Through students' wonderful thoughts, brain storming, technology search and subject determination, complete the consciousness motivation. In the thinking development, break away the mindset through divergent thinking, realize knowledge sharing by combining the concept of Internet and finally enter the convergent thinking, achieve the creative point cohesion. In the business incubation, need to cultivate business sense, build entrepreneurial environment, choose partners and then enter the entrepreneurship stage. As shown in Figure 2.

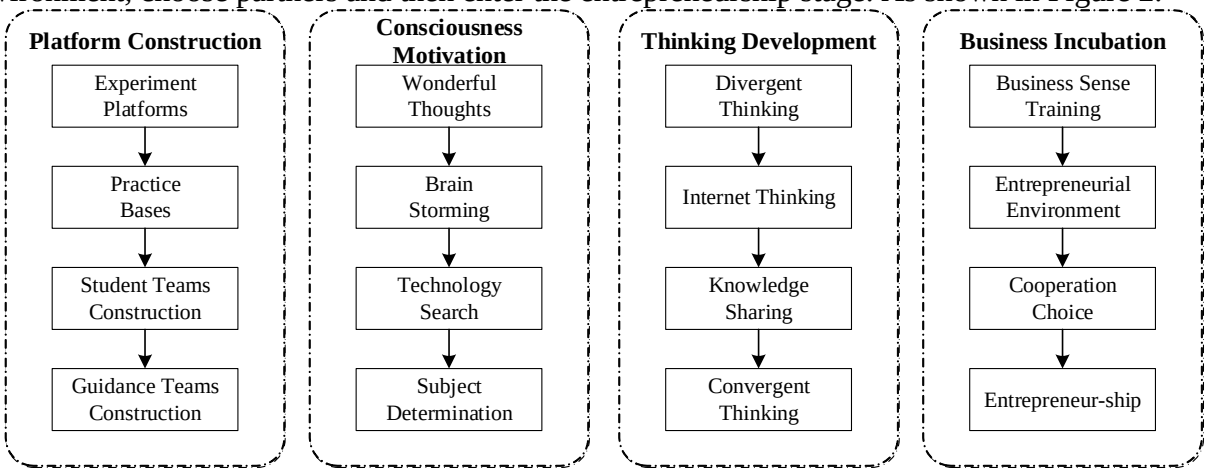

Figure 2. Four-layer entrepreneurial talent training model

3.3. Implement “interests stimulate innovation”, to foster a sense of innovation

Take students’ interests as the starting point of work, combine with literature search, brainstorming and other methods and regard developing students' subjective ability as a means, to stimulate students' innovative thinking, which is taken as the theoretical guidance and direction of teaching reform work.

Implement “interests stimulate innovation”, mine students' innovative potential. The teaching mode of cultivating students' innovative consciousness takes developing students' subjective ability, forming students' innovative thinking gradually and promoting scientific research as the base, lets students participate in project research and competitions actively. In the teaching, strengthen the intersection and penetration among disciplines and promote the integration of knowledge, which are taken as the theoretical guidance and direction of teaching reform work. Adopting the dual tutor system - class teacher + student personal tutor, open the growth model of innovative talents in the wisdom era. The teaching process of students' innovative ability training is shown in Figure 3.

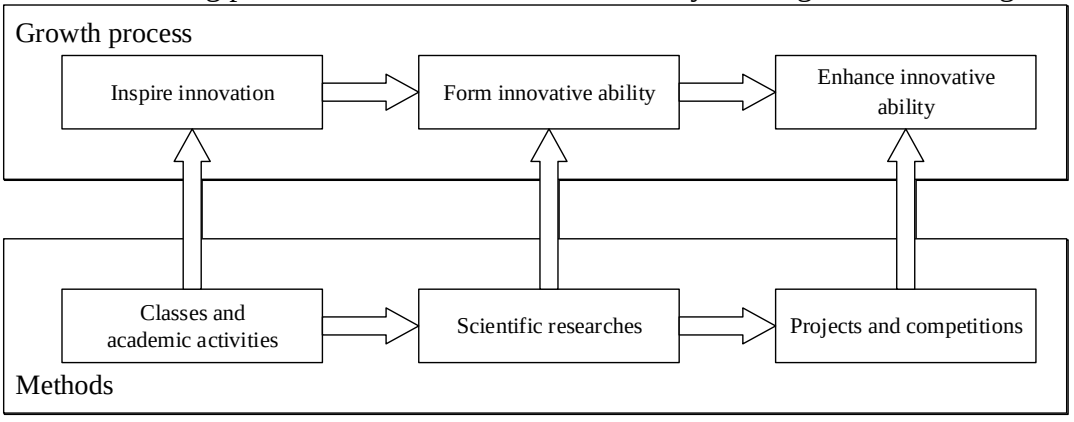

Figure 3. Innovative ability talent growth model

In the innovative talent training mode, discover students’ characteristics through academic activities, inspire students' sense of innovation according to characteristics, enable students to form basic innovation skills by leading students to conduct research activities, strengthen student work foundation through projects and competitions, and enhance the ability to innovate.

3.4. Develop students' business awareness and ability

Business awareness is an understanding of how a company is profitable, how to target customers and competitors, and how to improve itself in the future. Based on the two-level training mechanism of the school, in terms of business awareness, we will carry out relevant trainings about bidding, project management, acceptance and intellectual property protection. The training methods include lectures, participation in courses, teacher guidance, practical training, etc. And establish a new course -- computer innovation ability training. From the perspective of ensuring students' self-learning and effective practical training in the after-school time, based on the undergraduate dual tutors system -- a class teacher and a supervisor, combined with the college's scientific and technological activities, we will comprehensively create an environment and atmosphere for the cultivation of innovative talents, expand the extension of classroom teaching, and cultivate students' creative ability as a powerful guarantee for consolidating the results of classroom teaching reform.

4. Application

Based on the "innovation and entrepreneurship" training mechanism, we explored the professional innovation mechanism and the talent cultivation mode of innovation ability, and formed a teaching practice system for computer major students--based on the "innovation and entrepreneurship education" four-layer entrepreneurial talent training model. On the basis of this system, the undergraduate students have applied for and been approved 17 national-level and 7 provincial-level college students' innovation and entrepreneurship projects during 2015-2018, and 4 of which are excellent completions. Among the teachers who participated in the teaching practice research work, one teacher guided students to win the national finals third prize of the Second National Graduate Mobile Application Design Innovation Competition (undergraduate participated), one teacher guided students to win the second prize of 2016 College Students Innovation and Entrepreneurship Competition in Shaanxi Province, and one teacher guide students to win the national second prize of the 2016 “Next Generation Internet Technology Innovation Contest”. Also established professional training associations such as ACM training team and software society. With this work as the core, 20 patents were applied and above 3 of which have been authorized, 107 software copyrights were registered. In the past 4 years, there have been 5 students who were instructed and trained establishing more than 5 companies.

5. Conclusion

Combining the needs of the "Internet plus" era, we take the "Innovation and Entrepreneurship Education" theory as the guide, combine the professional innovation mechanism and the innovative ability talent training mode, adopt the foundation framework of "Platform Construction -- Consciousness Motivation -- Thinking Development -- Business Incubation", and explore the training mode and approach of the Internet revolution entrepreneurial talents. From the perspective of talent cultivation, explore and apply entrepreneurial talent training modes and methods based on "Innovation and Entrepreneurship Education", in order to enrich the teaching reform and innovation practice results of entrepreneurial talent training. Practice has shown that, this model has significantly improved the project practice ability and entrepreneurial awareness of undergraduates majoring in computer science.

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References

[1] Liu YongChun, Information network security in the "Internet+" Age [J]. Network Security

Technology & Application, 2015(8): 67-68.

[2] Qian Xiaoming, Rong Huawei, Qian Jingzhu, Practice and thinking of education of “College Students’ Innovative and Entrepreneurial Traning Pogram” based on tutor system [J]. Experimental Technology and Management, 2014(7): 21-24

[3] Li Zhengxin, On the Value of Double-Gen Education Projects and its Implementation Path [J]. China Higher Education Research, 2016(10): 88-92.

[4] Du Ruijun, Zhou Tingyong, Zhou Zuoyu, the Construction of Competence Model of College Students: Conception, Orientation and Principle [J]. Educational Research, 2017(6): 44-57.

[5] Huang Zhaoxin, Wang Zhiqiang, On the Integration between Entrepreneur Education and Professional Education [J]. Educational Research, 2013(12): 59-67.

[6] Li Weiming, Li Chunyan, Du Xiaohua, Research on Ten-year Entrepreneurship Education in Chinese Universities: Evolution, Problems and System Construction[J]. Educational Research, 2013(6): 42-51.

[7] Li Taiping, Wang Chao, On the Individuality Claseroom and its Construction [J]. Journal of Higher Education, 2015(12): 63-70.

[8] Xu Zhiqiang, Zhejiang Wanli University, Double Helix Model of Cultivating Talents with Entrepreneurial Skills in Higher Education[J]. Research in Educational Development, 2015(5): 30-34.