Research on Cultivation Mode of Innovative Talents in Colleges and Universities

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Abstract. As China has entered the ranks of an innovative country, it is necessary to raise the level of education for all and the level of training creative personnel. As an incubator of knowledge innovation and personnel training, colleges and universities must solve and realize the cultivation of innovative talents. This paper puts forward four training models for innovative talents in colleges and universities and fully demonstrates the mode of cultivating creative talents with examples. The goal is to provide practical and theoretical methods and realistic basis for solving the training problems of innovative talents in colleges and universities.

Keywords: Innovation ability · Higher education · Practice · Internet

1 Introduction

The development of our country depends on the progress of science and technology and the improvement of science and technology depends on the innovation of talents. Innovation is the soul of a nation's progress and an inexhaustible motive force for the development of a country. At present, the contribution of China's scientific and technological progress to economic growth has risen sharply and has entered the ranks of innovative countries. Therefore, the full implementation of quality education, deepen the comprehensive reform in education, focus on improving the quality of education, cultivate students' sense of social responsibility, innovation, practical ability is imminent. The development of a country relies heavily on the development of education. Only by cultivating innovative talents can we promote the improvement of economy and overall national strength so that the great motherland will stand in the forest of peoples of the world [1]. Therefore, countries need innovation, talent must follow up.

2 The Importance of Training Creative Personnel in Colleges and Universities

In today's world, with the ever-changing science and technology, the competition among various enterprises in the international market reaches the level of chalkiness and the competition is fiercer and fiercer. As an incubator of knowledge innovation and

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personnel training, colleges and universities should fully realize the importance of training creative talents.

(1) The Importance of Cultivating Innovative Talents in the Construction of Talent Team in China
The quality of our talented people is not high, weakened our ability to innovate, and our market awareness is poor. Second, the knowledge is relatively narrow, a large number of lack of compound talents; Third, the concept of lifelong education is relatively weak, the power and ability of system learning after leaving school is lacking; Fourth, combining learning, learning to use enough, practical ability is weak. Therefore, China's overall ability to innovate and research are not up to the level of developed countries [2]. The scientists and engineers engaged in research and development in every 10,000 laborers in our country are only equivalent to one-fifth of the medium-developed countries and one-ninth of the developed countries, while the average per capita number of patents and patents for science and technology is far less than that of the developed countries. Therefore, it is imperative for our country's innovative talents to cultivate that we can speed up the economic and civilized progress of the entire society and accelerate our country's attainment to the level of developed countries by accelerating the training of scientists and technicians and high-level innovative personnel.

(2) Innovative talent training in the international competition in the importance of talent
The development of an enterprise, can not be separated from the introduction of talent. In today's world, rapid advances in science and technology have led to faster and faster knowledge updates, shorter and shorter product replacement cycles, more and more types of talent needs and higher and higher levels. The shortage of qualified personnel has become a common problem faced by all countries in the world. Nowadays, many countries, especially the developed countries, are making policies and policies to train and attract talented people, especially high-level innovative talents. The United States regards education as the basic national policy of the country and constantly improves its education system according to the changes in the situation and increases its investment in education. At the same time, the use of education and financial advantages to attract foreign scholars and students for their effectiveness. Japan has actively strengthened the training of high-tech personnel and introduced and implemented a new type of education reform program. Promote transnational schooling mode and promote the flow of talents. Multi-party for the world's best talent. Both the French and German governments attach great importance to education and personnel training. In order to meet the requirements of the information age, they have made great efforts to develop the multimedia education industry and funded enterprises to organize training centers to strengthen personnel training. It can be seen that fostering more high-tech personnel through strengthening education and educational reform has become a trend set by the world and the established policy of most countries. Therefore, our choice can only be to meet the challenges and participate in the competition. We must take measures to control the brain drain

and actively seek the return of talents. We must also take effective measures to enhance the cultivation of innovative talents.

(3) Cultivation of innovative talents is the inevitable choice for the development of higher education

The fundamental task of higher education is to train qualified personnel. Talents trained by colleges and universities must realize the all-round development of people's quality with the emphasis on innovation and practical ability. Therefore, the cultivation of innovative talents is the inevitable choice for the development of higher education in the new era, which reflects the correct direction and development trend of higher education reform. The cultivation of innovative talents is an objective requirement to achieve the goal of higher education. Higher education should attach importance to cultivating university students' innovative ability, practical ability and entrepreneurial spirit.

To achieve the goal of higher education, we must actively implement quality education and innovative education, strive to cultivate students' ideological and moral qualities, scientific and cultural qualities, physical and mental qualities. In particular, we must fully develop and release the talents and innovative potential hidden in the educated, have a strong sense of innovation, cultivate innovative capabilities and innovative character. Therefore, the cultivation of innovative talents, that is, the objective requirement of higher education, is also the fundamental task of higher education.

3 The Contemporary College Students Innovative Personnel Training Mode

The cultivation of innovative talents for contemporary college students in colleges and universities can be considered as follows. On the basis of strengthening overall quality education of students, we must highlight the cultivation of students' innovative qualities. Including the sense of innovation, innovative thinking, innovative ability, innovative character and so on [3] (Fig. 1).

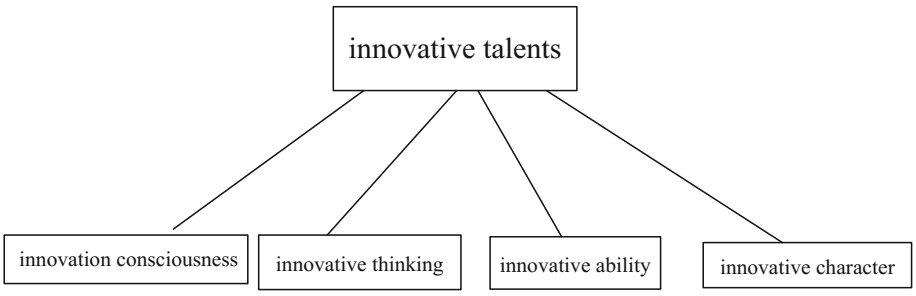

Fig. 1. Innovative talent quality structure

Colleges and universities can effectively use and optimize the allocation of various innovative resources, through knowledge innovation, technological innovation, the achievement of transformation and innovation, management innovation and other innovative activities, training high-quality innovative talents [4]. In this paper, how to cultivate the innovative quality of college students, enhance the creative ability of college students, combined with the advantages of colleges and universities, put forward four kinds of innovative mode of cultivation of college students to demonstrate the correctness and feasibility of training mode.

3.1 Internet Innovation Education Training Mode

There are many shortcomings and problems in the traditional mode of education: First, the teaching effect is poor, teaching methods are outdated; Second, students are not focused; Third, the lack of students can not keep up with the overall teaching schedule; Fourth, information technology has not been effective and rational use of teaching methods; Fifth, the effect of student learning is not ideal; Sixth, students are more passive learning, most of the students are in a passive environment, rather than take the initiative to participate in learning for interest; seven is after class time students and teachers can not communicate and interact in a timely manner. Eighth, students can not independently study the courses they are interested in, especially in other specialized courses. Nine is the university education curriculum system is relatively fixed and rigid closed, there is no strong content updates and flexible course selection mode. Due to the defects and problems of the traditional education mode, it has seriously hindered the cultivation of college students' innovative qualities [5].

Using the Internet innovation education training mode, can solve the problem well. The advantages of the Internet, combined with traditional education, can fully enhance the creative awareness of students and innovative thinking, improve the creative ability of college students [6]. First, the Internet updates knowledge faster. In the ever-changing science and technology today, only through the Internet, we can understand the level of development of some technologies at home and abroad, research status and other information. Second, the Internet has enabled domestic and foreign university students to exchange ideas and learn from each other, open up the horizons of college students, improve the level of scientific research, innovative awareness and innovative thinking of university students, and cultivate the innovative character of undergraduates. Third, the Internet is an indispensable tool for college students to innovate and start their own business. With Internet technology, university students can quickly access information and grasp information at any time and place, which is conducive to the development of innovative thinking of college students. Fourthly, using the online education of college majors and setting up the curriculum platform, the university strongly supports the traditional education mode and arouse the enthusiasm and creativity of students. Students can pass the lesson platform for course preparation, learning knowledge [7]. Through the teacher pre-recorded a good lesson short video learning point of knowledge. If you have any questions, you can share and ask questions in the physical class online. You can also exchange information with teachers online at any time to complete the homework assignments online and complete the exam online. More importantly, students through the Internet online education platform, to achieve a free learning model, to stimulate student enthusiasm for learning. Free learning frees students from

the traditional learning paradigm and chooses the ones they like and are willing to learn across disciplines. But also fully meet the purpose of learning and training, which will play an active role in the cultivation of innovative ability of college students [8].

For example, Inner Mongolia University for Nationalities, where I live, through the establishment of online education platform so that students can choose any course on the platform to communicate with teachers on the platform. Teachers upload the course video to an online platform for students to study autonomously. Students use the online platform to improve their academic performance. And students can be connected to the school network through the campus network, free communication with the outside world. You can log CNKI, Wanfang database and some other academic platforms free access to a large number of scientific papers. The open online teaching environment enhances students' research ability and creativity. The creativity of students has been improved, which has led many students to achieve excellent results in the National University Science and Technology Competition. Visible, the introduction of the Internet education model to promote the cultivation of innovative ability of college students, to achieve the improvement of college students' innovative quality.

3.2 Science and Technology Activities as the Guide to Innovative Education Model

For engineering innovation professionals, we can adopt the education mode guided by science and technology activities and social practice. Science and technology activities in various forms, such as participation in domestic and international scientific and technological competitions, science and technology exchange, or regularly organize overseas study tours to well-known foreign universities for exchange and study. Through science and technology competition, science and technology exchange is conducive to the cultivation and promotion of college students' innovative quality. Therefore, colleges and universities should support and encourage college students to participate in all kinds of science and technology competitions. They should fully support university teachers in their financial and technical efforts to guide student competitions, and support teachers to lead students to universities in other parts of the world for study tours and academic exchanges and learning [9]. Here are two examples of my school:

(1) Under the guidance of the instructor, the students from the Robotics Research Institute of Inner Mongolia University for Nationalities participated in various national robot science and technology competitions and trained a batch of applied talents in the robot technology field. Many of the students trained by the institute not only gain full honor by participating in the competition, but also get the attention and employment opportunities of many enterprises after graduation. Some students have become the technical backbone of enterprises.
(2) Inner Mongolia University for Nationalities Institute of Mechanical Engineering, School of Economics and Management, College of Life Sciences, etc. have conducted academic exchanges and learning with overseas universities. For example, in 2017, the School of Mechanical Engineering took the summer vacation to lead students to Okayama University in Japan for Sino-Japanese university student exchange activities and achieved satisfactory results. Chinese

students learned about Japanese university education and Japanese culture through exchanges with Japanese university students and visited the laboratory of Okayama University. Okayama University professors made relevant professional academic reports for Chinese students. Through this academic exchange and interaction, students can learn about foreign cultures and education, open up students 'horizons and further enhance students' innovative qualities.

3.3 To Social Practice as the Guide to Innovative Education Model

Social practice refers to the cooperation between colleges and enterprises, the realization of school-enterprise joint education, the establishment of a joint school-enterprise training mechanism for students to practice their businesses and participate in various social activities of enterprises. Through the study and training in the enterprise, students are exposed to the knowledge they can not learn in the school, especially the corporate culture of some excellent enterprises. Through cooperation with enterprises running schools, so that students can study the learned expertise to solve the practical problems of enterprises and enhance students' innovative awareness and innovative thinking. Enhance students 'understanding of the profession, so that students no longer confused during school learning idle nothing, but targeted learning and research, improve students' ability to innovate. At the same time, contacts with enterprises have tempered students' ability to adapt to society, enabling students to quickly integrate into society and serve the community after they leave school.

For example, Inner Mongolia University of Nationalities Academy of Fine Arts and the Chinese occupation education giant education group within the cooperation of education, training art students. Starting from the real business enterprises, college students to accept the actual combat training before graduation to enhance the innovative ability and quality of college students. The computer college and the soft group cooperation in running schools, the students sent to the soft group internships, so that students get exercise and ability to upgrade. The Inner Mongolia University for Nationalities Institute of Mechanical Engineering and Changchun FAW, Tongliao Huo Coal Group, Tongliao new energy bus and other enterprises to cooperate, students regularly to the enterprise training internship, production practice. Some outstanding students also participated in the technical research and development of new energy buses. These school-enterprise cooperation modes dominated by social practice have tempered students' practical ability and improved their innovative quality.

3.4 Innovative Education Mode Guided by Practical Teaching Projects

Based on the practical teaching, the innovative education mode guided by practical teaching projects should break the limitations of the traditional basic courses and specialized courses in the curriculum system setup, and organize the corresponding curriculum practice content from the realization of the basic skills, to practice teaching projects based on the necessary teaching content optimization and integration. Course content can be college teachers scientific research projects or scientific research achievements into practical teaching projects. Because college teachers have the experience of hosting or participating in some research projects. Teachers do scientific

research project process, but also on their own scientific research ability and teaching ability to improve the process. Teachers can transform their research projects or achievements into one or more student innovation projects to incorporate new theories and techniques into teaching.

Moreover, many colleges and universities are implementing mentoring system. Tutors are students' learning and living guidance teachers, and are generally based on full-time teachers [10]. Can be combined with the university tutor system, the use of research content of the mentor, design and planning a certain innovative practice projects to instruct mentors mentoring students for innovation and research group, the implementation of innovative practice projects. By participating in these activities that transform research projects into innovative practice projects, students have enhanced their knowledge level and achieved the goal of cultivating students' innovative qualities.

For example, for the mechanical engineering profession, breaking the traditional theory of mechanics, material mechanics, mechanical theory, mechanical design, engineering materials, mechanical manufacturing technology and computer-aided design and manufacture of CAD/CAM and other mechanical engineering basic courses and specialized courses of the boundaries, starting from the need of realizing the basic skills, organizing the corresponding course content learning, based on the practice teaching projects, to achieve the ability to cultivate students' mechanical system and structure model building, Mechanical system and structure of the comprehensive analysis capabilities, mechanical analysis and innovative design capabilities, basic components and structural design capabilities, computer-aided design and manufacturing capabilities, tolerances, manufacturing process capabilities, engineering project operational capacity. Taking a subject researched by a teacher as an example, we design a practical teaching program (Table 1).

Table 1. "Mechanical design and manufacture of integrated combat" innovative practice project

Ability training	Corresponding knowledge point	Mission name
Mechanical system and structure of the mechanical model building ability	1. According to design specifications and standards to determine the load 2. Mechanism movement diagram, degree of freedom calculation 3. Common constraint types, force analysis, rigid body motion analysis 4. Use kinetic equations to solve the problem	Mission object: castor harvester drive mechanism 1. Mechanism parameters mapping and exercise diagram drawing 2. Institutional movement analysis 3. Institutions dynamic static analysis
Mechanical systems and structures of mechanical comprehensive analysis capabilities	1. Mechanics, the establishment of three equations and three variables analysis 2. Engineering materials performance and selection 3. Strength theory and other design criteria	Mission: castor harvester mechanical structure 1. Statics analysis 2. Intensity check 3. Stiffness check

(*continued*)

Table 1. (*continued*)

Ability training	Corresponding knowledge point	Mission name
Structural analysis and innovative design capabilities	1. Agency selection method 2. Institutional innovation methods 3. Structural innovation	Mission: contrast of key structural design of castor harvester 1. Fruit picking mechanical structure design 2. Fruit transport hydraulic structure design 3. Workbench up and down adjustment mechanism design 4. Innovative structures and methods
Basic part design ability	1. Transmission structure design 2. Connector design 3. Axis system components design 4. Structure technology	Mission: castor harvester 1. Headstock parts design 2. Operating mechanism components design 3. Transmission parts design
Tolerance knowledge use ability	1. With the system, tolerance level, with the choice of nature 2. Geometric tolerances and the principle of tolerance selection 3. Surface roughness selection	Mission: castor harvester Shaft parts
Electro-hydraulic control ability to use knowledge	1. Control Engineering Foundation 2. Innovative application of modern control methods	Mission: castor harvester control system 1. Control program development 2. Component selection
Simulation ability	1. System dynamics simulation 2. System Control System Simulation	Mission: castor harvest machine 1. Mechanical structure 2. Electronic control structure
Hands-on ability	1. Experimental principle and experimental design 2. Test techniques	Mission: castor harvest machine Structural performance test, test performance
Engineering project operational capacity	1. Project organization and planning principles and methods based on customer needs 2. Product cost, profit model, marketing strategy 3. Trade secrets, intellectual property protection	Mission: castor harvester 1. Prototype promotion 2. Patent application 3. Market analysis

4 Summary

This article has carried on the theoretical research and the example demonstration to the innovative talents cultivation mode in colleges and universities, expounds the characteristics, the content and the realization methods of the four innovative talents cultivation modes. Innovative Talent Training runs through the university's entire four-year study life. In the university education which will be four modes of organic combination is more conducive to the cultivation of innovative talents to enhance the innovative ability of college students and lay a solid foundation for future employment and entrepreneurship of college students.

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