

# RESEARCH ON INNOVATIVE TOP-NOTCH TALENT TRAINING METHODS FOR LOCAL UNIVERSITIES

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**Abstract:** The cultivation of innovative top-notch talents is crucial to solving the problem of foreign countries imposing their necks in certain key fields. Currently, in the process of cultivating top-notch innovative talents in my country, there are rigidity in the education system, insufficient interdisciplinary cooperation and practical experience, and a lack of international vision. and the singleness of the evaluation system. In view of the above shortcomings, this article studies innovative top-notch talent training methods in local universities in terms of curriculum design and teaching methods, innovative practice and internship opportunities, academic tutors and other mentor systems, interdisciplinary and multi-field cooperation, and international perspective and social responsibility.

**Keywords:** Innovation at the forefront; Interdisciplinary; International perspective; Social responsibility

## 1 INTRODUCTION

On April 16, 2018, the U.S. Department of Commerce issued a notice prohibiting the supply of sensitive products to some high-tech companies in my country. The U.S. government has successively introduced a series of measures to restrict the development of certain fields in my country, such as lithography machines, core industrial software, chips, operating systems, and high-end capacitors and resistors. In other words, my country lacks innovation in key core technologies, and innovative talents are the key [1]. In today's rapidly changing global society, innovation is the engine that drives social progress and economic development. In order to gain an advantage in this highly competitive era, countries are actively exploring effective ways to cultivate innovative and outstanding talents. Innovative and outstanding talents, as individuals with outstanding creativity and leadership, are the backbone of promoting social, scientific and cultural progress [2]. The rapid development of science and technology has led to the emergence of emerging fields, and outstanding talents with innovative thinking are needed to cope with unknown challenges. Local universities encourage students to conduct innovative research in scientific research to serve local economic development and innovation achievements.

## 2 THE BACKGROUND AND SIGNIFICANCE OF CULTIVATING INNOVATIVE AND OUTSTANDING TALENTS

Innovative talents play a key role in the field of science and technology. They promote the development of science and technology by proposing new ideas, developing new technologies, and promoting scientific research. The close relationship between science and technology and innovative talents drives the continuous progress of society in science and technology and innovation [3]. The progress of science and technology provides a broader stage for innovation, and innovative talents play a key role in this stage through their unique insight and creativity.

### 2.1 Innovation and Top Talents

Innovative top talents Innovative top talents are individuals who demonstrate outstanding creativity and leadership in a specific field or interdisciplinary field, and can make outstanding contributions to society and the country in a certain field or industry. Such talents have deep professional knowledge and comprehensive ability structure in a specific field, can think independently, put forward novel ideas, have firm beliefs and social responsibility, and can promote innovation in science and technology, culture, society or business.

### 2.2 The Significance of Cultivating Innovative Top Talents

Innovative top talents play a key role in promoting technological innovation, industrial upgrading and business model innovation. Their innovative ability and entrepreneurial spirit help to cultivate emerging industries and promote the development of the entire economic system to a higher level. In the field of science and technology, the cultivation of top talents is the key to achieving technological and industrial upgrading [4]. They drive the entire industry forward by proposing new ideas, developing new technologies, and promoting scientific research. Innovative top talents are often pioneers of entrepreneurs. Their innovative spirit and entrepreneurial experience promote the prosperity of the entrepreneurial ecosystem and help start-ups succeed.

Global issues such as climate change, public health crises and food security require top talents with innovative thinking and interdisciplinary cooperation to find innovative solutions to complex global challenges. A country with a training

system for innovative top talents will gain higher competitiveness internationally. These talents not only have an impact domestically, but also lead the innovation trend on the international stage. Innovative top talents play a leading role in promoting changes in social culture, politics and social systems. Their independent thinking and leadership help shape the future direction of society.

Innovative and outstanding talents are the cultivation of future leaders. This training system helps to cultivate future leaders with leadership, teamwork and strategic thinking. They will be able to play a leading role at all levels of organizations, enterprises and society. Innovative and outstanding talents also play a unique role in cultural inheritance. They can inherit and innovate traditional culture and promote cultural development.

In short, exploring a mechanism for cultivating innovative and outstanding talents for local universities is an important requirement for building an innovative country and realizing the great rejuvenation of our Chinese nation. It is also an urgent need for current education reform.

### 2.3 Cultivation of Innovative and Outstanding Talents at Home and Abroad

At the National Science and Technology Conference in 1985, President Deng stressed that “we must create an environment that allows outstanding talents to stand out” [1]. In 1996, my country promulgated the “Ninth Five-Year Plan for National Economic and Social Development of the People’s Republic of China and the Outline of the Long-Term Objectives for the Year 2010”, which once again stressed the importance of the strategy of building a strong country through talent and strengthening the country through science and education, and the necessity of cultivating urgently needed innovative talents for the Party and the country. At the suggestion of Chinese-American physicist Tsung-Dao Lee, the University of Science and Technology of China established the “Junior Class” in 1978 in order to cultivate outstanding talents in the fields of science and technology, marking the first time that my country has cultivated outstanding talents [5]. Peking University established the Yuanpei Plan Experimental Class in 2001. Students of the Yuanpei College can freely choose courses and majors of their interest at Peking University, and determine their major direction in their sophomore year. Yuanpei College “strengthens the foundation, de-emphasizes the major, and teaches students in accordance with their aptitude to cultivate talents with international competitiveness. Yuanpei College respects students’ free choice and allows them to freely choose any course from all majors in the school under the conditions that the school’s teaching resources allow. Students trained by Yuanpei College have strong patriotic feelings, a pioneering and innovative spirit, strong practical ability, and a broad international perspective, and are high-quality leading talents in the new era [6]. Zhejiang University’s Zhu Kezhen College implements an excellent education plan for undergraduate education in philosophy and mathematics and science ability training, which has laid a solid foundation for cultivating high-quality, top-notch innovative talents with global competitiveness and future leaders in various fields in related fields [7]. Wuhan University Hongyi Academy relies on its strong disciplinary advantages and high-level faculty to implement the policy of broad caliber, solid foundation, and strong ability, and boldly explores and gradually forms a training model with distinctive characteristics [8].

The United States, Europe and other countries have always had strong advantages in cultivating innovative and outstanding talents. Their universities and research institutions not only have abundant resources, but also focus on cultivating students’ practical and innovative abilities. The Center for Talented Youth (CTY) of Johns Hopkins University in the United States has established a method of cultivating innovative and outstanding talents from primary and secondary schools to university systems to “help talented people take off” [2, 9]. In order to discover gifted students early, the top 5% of outstanding students recommended by teachers and principals from grades 2 to 8 in 15,000 primary and secondary schools sign up for examination selection (high-ability test) for admission. CTY has created a supplementary summer education for the Gifted Education Center, allowing outstanding primary and secondary school students to go to university campuses in advance to contact masters, learn knowledge, and get in touch with well-known teachers. Teaching and modern laboratories, feeling the atmosphere of the university, and inspiring their strong desire for knowledge. Germany cultivates top innovative talents, respects the individual differences of gifted students, implements differentiated teaching models based on students’ talents and interests, provides targeted adaptive learning arrangements, carries out personalized teaching, promotes the integrated cultivation of top innovative talents in primary, secondary and tertiary schools, and forms cross-grade study groups based on the same interests. Achieve specific learning goals through teamwork. Encourage gifted students to choose exploratory questions, collect relevant information, coordinate learning progress, encourage gifted students to face challenges with a positive attitude, overcome difficulties, and improve their cognitive and innovative abilities [10]. France, as a major European country, attaches importance to cultivating top innovative talents in the basic education stage and promotes elite education like Germany. Instead of enrolling students in nearby schools, France selects talents in primary and secondary schools based on personal talents, learning interests and other factors, accurately selects highly gifted students, allows gifted students to enter elite education, and provides high-quality educational resources. France pays attention to the effective connection of gifted education at different stages [3, 11]. The United States has established a diversified curriculum system and carried out personalized education based on the individual circumstances of outstanding students, thus forming a systematic education system for outstanding innovative talents[15].

In order to cultivate more comprehensive innovative talents, many schools at home and abroad are emphasizing interdisciplinary education and encouraging students to accumulate knowledge and experience in different fields. Schools and research institutions promote an innovative culture, encourage students to come up with new ideas, solve practical problems, and cultivate innovative thinking and entrepreneurial spirit. The specific situation of cultivating

innovative talents varies among different countries, regions, disciplines, and institutions, and the education system and training model may also change in the future [16].

### **3 THE CURRENT SHORTCOMINGS IN THE TRAINING OF TOP INNOVATIVE TALENTS**

Some significant achievements have been made in cultivating innovative and top-notch talents, but there are still some shortcomings in practice. The following are some possible problems:

#### **3.1 Rigidity of the Education System**

The traditional education system may be rigid and difficult to flexibly adapt to the needs of cultivating innovative and top-notch talents. Reform and innovation in the education system may be limited by administrative levels and curriculum settings. In addition, students face long-term pressure from standardized tests, causing them to focus more on test-taking skills and less on cultivating innovation and independent thinking. Innovation ability is difficult to comprehensively evaluate through the traditional examination system [12].

#### **3.2 Insufficient Interdisciplinary Cooperation and Practical Experience**

Innovation often occurs at the intersection of different subject areas, but the boundaries between disciplines in the traditional education system limit interdisciplinary cooperation opportunities for innovative top talents. In addition, the training program may focus too much on the transfer of theoretical knowledge and lack practical projects and practical experience. Practical problem-solving experience is crucial to the cultivation of innovation capabilities [13].

#### **3.3 Lack of International Vision**

In the era of globalization, top innovative talents need to have an international vision. Some schools or training programs focus too much on local educational resources [14] and lack content covering international issues and cases in their curriculum. The lack of exchange opportunities with international students, scholars, and practitioners makes it difficult for students to be exposed to innovative ideas and practices in the international field [16].

#### **3.4 Singleness of the Evaluation System**

Academic evaluation systems usually place too much emphasis on academic papers and research results, while under-evaluating actual innovation projects and social impact [17]. Aspects such as innovation ability, interdisciplinary cooperation, practical experience, international vision and social influence are ignored, which affects the comprehensive development of innovative top-notch talents [15].

#### **3.5 Insufficient Connection between the Social Environment and Industry**

Some training programs may lack in-depth connection with the social environment and industry, resulting in students' limited understanding of practical applications and industrial needs [18-19].

### **4 LOCAL UNIVERSITIES INNOVATE THE MODEL OF CULTIVATING TOP TALENTS**

To improve the deficiencies in the training of innovative and outstanding talents, it is necessary to comprehensively consider factors such as curriculum design, teaching methods, and innovative practices, so that the training model can better meet the actual needs of innovative talents.

#### **4.1 Increasingly Improve Curriculum Design and Teaching Methods**

To improve the training of innovative and outstanding talents, it is necessary to adopt diversified and flexible curriculum design and teaching methods to stimulate students' creativity, problem-solving ability, and motivation for independent learning. With projects as the core, students can learn theoretical knowledge and practical skills in the process of solving practical problems, and cultivate students' teamwork and problem-solving abilities. By asking open-ended questions, students are encouraged to work together in groups to solve problems, which encourages them to explore independently, think critically, and actively participate. Design thinking methods allow students to iteratively propose, test, and improve solutions by observing and understanding the essence of the problem. Provide learning resources in advance, and use class time for discussion, practice, and problem solving. This method emphasizes that students actively learn outside of class and that they actively participate in class.. In-depth discussion and practice.

#### **4.2 Focus on Innovative Practice and Internship Opportunities**

The cultivation of innovative talents needs to focus on innovative practice, so that students can learn knowledge in practical application and cultivate practical ability and innovative thinking by solving complex problems. Design projects in the training process and require students to solve engineering projects, scientific research projects and social

service projects to cultivate students' team collaboration and innovation ability. Through entrepreneurial experience, let students participate in the whole process of entrepreneurial market research, business model design and financing to cultivate students' innovative thinking and entrepreneurial experience. Encourage students to participate in innovation competitions such as "Internet +" and "Challenge Cup" to exercise their innovative ability.

#### **4.3 Promote the Mentor System Such as Academic Mentors**

The mentor system plays a key role in cultivating innovative talents. A good mentor system can provide personalized guidance, professional support and motivation to help students better develop their innovative ability. Students can be equipped with academic mentors, career mentors and industry mentors. Academic mentors are responsible for academic research and project guidance, career mentors focus on students' career planning and market adaptability, and industry mentors assist students in setting project goals, providing advice and solving problems.

#### **4.4 Promote Interdisciplinary and Multi-Field Cooperation**

Interdisciplinary cooperation is an important part of cultivating innovative talents. By collaborating with professionals in different disciplines, students can gain a more comprehensive knowledge perspective, broaden their thinking boundaries, and play a synergistic role in solving complex problems. Design professional interdisciplinary courses, invite experts from different disciplines to conduct joint teaching, improve students' ability to use knowledge from different fields when solving practical problems, and encourage students to participate in interdisciplinary teams, such as natural sciences, social sciences, and humanities, to discuss problems in a unified manner and give full play to their respective professional advantages. Encourage students to cooperate with the industry and carry out interdisciplinary industry-oriented projects. Better meet the needs of practical problems and cultivate students' ability to carry out interdisciplinary cooperation in actual work scenarios.

#### **4.5 Cultivate International Vision and Social Responsibility**

Cultivating innovative and outstanding talents requires focusing on international vision so that they can better adapt to the challenges and opportunities of globalization. Create conditions to establish international exchange programs and encourage students to participate in overseas internships, exchange studies or research projects, so that they can have a deep understanding of different cultures, academic systems and working environments, and improve their cross-cultural communication skills. Encourage students to participate in international academic conferences and seminars to enhance their influence in the international academic field and expand their professional horizons. At the same time, guide students to pay attention to global issues such as climate change and sustainable development, and cultivate students' ability to solve global problems and social responsibility.

### **COMPETING INTERESTS**

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