

The research of training modes and approaches for top innovative personnel in Chinese universities

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Abstract

The construction of innovative country needs to cultivate and foster a large number of top innovative talents. The top innovative talents should be those compound talents in the fields of technology, management and engineering application, with a solid foundation of specialty, broad international perspectives, super practice abilities and excellent comprehensive qualities. The cultivation of top creative talents should resort to these methods such as a combination of cultural quality education and intellectual property right education, the cultivation of "undergraduate-graduate-doctor long" schooling and the collaborative innovation cultivation by colleges and enterprises. By fostering advanced innovative educational culture, building innovative faculty, optimizing the curriculum system and creating the environment of promoting the growth of talents, a large quantities of topmost level innovative talents may be cultured and forged.

Keywords: top innovative talents; innovation education; mode; approach; system

In recent years, our country's top comprehensive university have done some beneficial attempt and exploration in the top-notch innovative personnel training, and achieved remarkable effect. But comparing with building the innovative country and enhancement of international

competitiveness, There are certain gap about bring top innovative personnel in the comprehensive quality and innovation ability into play. *The outline of national medium and long-term education reform and development plan (2010-2020)* points out that innovative talents training modes need to adapt to the state and society development, follow the law of education and talent growth pattern, deepening the education teaching reform, innovate education teaching methods, explore a variety of cultivation mode, then form the situation of all kinds of talent coming forth in large numbers, top innovative personnel constantly emerging. We should pay attention to combination of learning and thinking, unification of knowledge and behavior, teaching students in accordance with their aptitude. Researching top innovative personnel training mode and exploring the top-notch innovative personnel training methods have very important theoretical and realistic significance to top innovative personnel training.

1. The intension of top innovative talents

Top innovative talents refer to the talents who have ability about innovative consciousness, good originality, creative, solving practical problems, contribution to social material civilization and spiritual civilization construction, especially the technology leader, academic leader, strategic scientists and skilled innovative talents. They are the heir of human out-

standing cultural heritage, creator of frontier science and technology achievements, raiser of future of high-end talent. For the university, Top innovative personnel Refer to the people who have solid professional foundation, broad international vision, practical ability. They can lead the discipline construction and the development of scientific research. They also have the characteristics of complete knowledge structure, ability structure and quality structure.

2. The research of top innovative personnel training mode

For training top innovative personnel, first of all we should change the education mode. The traditional education mode is not good for top-notch innovative personnel training and outstanding students' growth. The innovative talents training need personalized education. We should pay attention to the students' different characteristics to develop each student's potential advantage, make their personality and skills bring into play. So we must actively explore top innovative personnel training to adapt to the new education pattern.

2.1. Building a combination training mode of cultural quality and intellectual property rights education

The university is the cradle of top-notch innovative personnel training. College students shoulder the mission of China's future development of science and technology innovation. The accepting education stage is the most important stage to build outlook on life, enlighten life wisdom, cultivate the innovative consciousness, and show personality. When college students go to work, knowledge became innovative power, and their own have become the subject of innovation. They will lead the direction of the development of

science and technology, and they are the representative of whole nation's cultural quality, knowledge level and the innovation ability. It also can promote the progress of human society and development. So, it is necessary to educate college students something about *The national intellectual property strategy* to improve college students' consciousness of intellectual property. We can blend intellectual property education in the college students' ideological and political education and daily cultural quality education. It has very important practical significance to train top-notch innovative personnel.

2.2. Developing the "bachelor-master-doctor" long continuous training mode

It means training mode of reading the Ph.D. directly that developing the "bachelor-master-doctor" training mode. Setting up innovation experimental class, strengthen basic theoretical knowledge learning in experimental class in the undergraduate stage. Cultivating the practical innovation ability and creative spirit, taking in professional skills training, participate in college students' innovative research project. Strengthen the base of the discipline and the basis of professional course in the master's stage, carry out the basic scientific research ability and software development ability training. And we also should strengthen the scientific research and innovations in the doctoral. Finally we make this three stages optimization reasonable and arrangement plan as a whole.

2.3. Constructing base of combination of government, production, study and research, implying university and enterprise collaborative innovation training mode

Build a collaborative innovation base

combined with government, production, learning and research; construct experimental class which is combined university with enterprise and training plan of outstanding engineers' education. Junior students accept the knowledge theory education. The senior students go to enterprises, scientific research institutes, design institute, and some other internship units. The major theoretical knowledge is applied to handle the specific technical problems of production practice. To form the trinity "inquiry" learning method of learning, working and researching. Train students' creative spirit and practice innovation ability.

3. The research of training ways for top creative personnel

Building the innovative country needs to train and bring up a large quantities of topmost level innovative talents, however the innovation education is the key to the growth of top creative talents. We must take the cultivation of high quality talents with innovative spirit and innovative ability in the first place, establish the education concept of taking the innovative spirit as the value orientation, strengthen the consciousness that only the innovation education can cultivate top innovative talents and only top innovative talents can build the innovative country. So carry on the innovation education roundly, cultivate a large quantities of topmost level innovative talents the society needs.

3.1. Fostering advanced innovative educational culture

Traditional culture is the origin of a nation, and the moral support of a nation. Chinese traditional culture is our precious wealth and even the whole mankind's, has been an unflinching driving force for the Chinese nation to keep its unity and make progress from generation to generation. Cultural concept has the pro-

found influence to the cultivation of top creative talents. Some aspects of Chinese traditional culture have negative influence to innovative education. However innovation itself contains negation, criticism, creating, discovery and exceeding. Therefore in the cultivation of top creative talents, firstly we should have the courage to treat the traditional culture idea critically, to surpass the part of the traditional culture which prevent innovative education develop from value attitude and cultural emotion. The outstanding part of traditional culture can motivate our country and nation to survive, strive and develop; on the contrary the dross part will hinder the progress of history. We must inherit the traditional culture critically and make it become a part of socialist culture.

3.2. Building a team of innovative faculty

Carrying out the innovative education, the teacher is the key. It is the fundamental guarantee for fostering innovative talents to building a team of innovative faculty. Therefore, we must attach great importance to the construction of the teaching staff, to construct the teaching incentive mechanism in favor of the teaching team construction and the growth of young teachers. Increase the strength of innovative teachers' training, especially the training of "dual-qualification type" teachers, and strengthen teachers' engineering practice ability and the ability of the international exercise. Build a tutor team composed of tutors in different disciplines. There are at least one school teacher and one enterprise cooperation teacher in each subject area. The tutor team establishes the cultivation plan of top innovative talents commonly.

3.3. Optimizing the curriculum system

The cultivation of top innovative talents needs to optimize the curriculum system. It needs to construct the course system of "platform +module". Platform course includes public degree courses and professional degree courses, it focuses on the strengthening of the professional basic theoretical knowledge, lays the theoretical foundation of solving practical engineering and technical problems, the learning and assessment are completed in the school. Modular curriculum pays attention to the application of theoretical knowledge and the training of engineering practice ability, tutors in the team commonly design elective courses according to students' various factors, and they are completed in team training base.

3.4. Creating the environment of the growth of talents

To cultivate top creative talents, good external environment is very important. The formation of the environment is to create the rigorous, realistic, and active academic atmosphere. Innovative education and teaching methods must be helpful to the cultivation of students' innovative consciousness and thinking, cultivating the students' intelligence factor, at the same time, we should pay attention to the cultivation of students' non-intelligent factors, such as "motivation, interest, will and character" and so on. Non-intelligent factors on the innovation process play important roles of "initiating, orientation and guide, maintain, reinforcement, regulation and compensation". Secondly, good teaching and experimental environment is the basic condition of cultivate top innovative talents. Reform the teaching management system, and attach im-

portance to the development of students' personality. Reform education concept, and pay attention to the cultivation of their practical ability. Downsize the teaching content, teach students according to their aptitude, and pay attention to the cultivation of the students with special expertise. Through a series of reform measures, build external environment beneficial to the growth of top innovative talents.

All in all, it is a Long-term and arduous task of training top innovative personnel, and it is also a systems engineering. The training of top innovative personnel should be adapted to national and social development needs, follow education law of development and talent growth pattern. deepening education system reform, accelerate the update of teaching content and teaching method. Universities should be based on their own school conditions and characteristics, and establish scientific and effective top innovative personnel training mode.

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