

Research on Excellent Talents Training Pattern

LIU Zhanzhu ¹, YAO Dan ²

1. Office of Teaching Affairs, Jilin Agricultural University, P.R.China, 130118

2. School of Life Science, Jilin Agricultural University, P.R.China, 130118

Abstract: In recent years, in order to promote the connotation development, enhance the quality of talents training, and implement what the spirit of the national relevant documents suggests, colleges and universities have made a variety of plans to foster excellent talents. This paper, while illustrating the overseas training pattern for excellent talents, summarizes ten domestic excellent talents training patterns by the research of the training plans in colleges and universities, analyzing their advantages and disadvantages, and offering some suggestions as well.

Keywords: Excellence scheme, Talent training, Pattern

1 Introduction

“Excellence” means an outstanding feature and quality of excelling. “Excellence Scheme” is a reform program which aims to train top-notch innovative talents, fosters a large number of high quality talents who have great innovative ability, and who can rapidly meet the demands of economic and social development. Therefore, in order to cultivate excellent talents, “Excellence Scheme” puts forward a series of reform in talents training, whose patterns are different at home and abroad, and even different within domestic colleges and universities in that some focusing on cultivation of application-oriented talents while others on top-notch innovative talents. There are also differences in forms and the education systems both at home and abroad.

2 Brief Introduction of Excellence Scheme

2.1 Initiation of excellent scheme

It's proposed in major projects and pilot reforms of *State Guidelines for Medium-to-Long-Term Education Reform and Development Plan (2010-2020)* that the pilot scheme should be implemented to foster top-notch innovative students of basic sciences subjects and educational training program for talents, such as excellent engineers and doctors, in order to improve the quality of higher education. Subsequently, in *Suggestions on the Implementation of the Project of Improving and Reforming Undergraduate Teaching at Institutions of Higher Learning during the 12th Five-Year Plan Period Issued by the Ministry of Education and Ministry of Finance*, related major construction was put forward to support plans for educating and training excellent engineers, excellent doctors, excellent talents of agriculture and forestry, excellent legal personnel, and excellent talents of liberal arts.

2.2 Purposes of excellence scheme

It is required in *Suggestions on Comprehensively Improving the Quality of Higher Education* by Ministry of Education that the innovative talents training patterns of colleges and universities include plans for implementation of pilot scheme to foster top students of basic sciences subjects, construction of a number of national training base for youth talents, and exploration of patterns for training the top-notch innovative talents, and for implementation of cultivating excellent engineers, doctors, and outstanding talent of legal personnel, emphasizing the improvement of their practical ability to explore joint cultivation of talents with the relevant departments, research institutes, and industry enterprise, so that the talents training patterns of integrative development of scientific foundation, practical ability and humanistic quality can be explored. It's also required that education and teaching methods be innovated—advocating the heuristic, exploratory, discussion-based, and participatory teaching, promoting the

interaction between the scientific research and teaching, applying timely the scientific research to teaching, and keeping the key laboratory, and research base open to the students to support undergraduates to participate in scientific research, leading them to the scientific subject, lab and team early.

2.3 Goals of excellence scheme

Hu Jintao, general secretary of Communist of China, in celebrating the 100th anniversary of Tsinghua University, put forward “four musts” to improve the quality of higher education in all round way, which include promoting personnel training level, strengthening the ability of scientific research, serving to economic and social development, and boosting culture inheritance and creation. The requirements concerning talent training in the “four musts” have become the goal of Excellence Scheme—attaching great importance to cultivating top-notch innovative talents; actively creating favourable environment to encourage independent thinking, free exploration, and innovation; inspiring students’ creativity; contributing to fostering more creators of new knowledge, inventors of new technology, and founders of new subjects; grasping the cultural achievements accumulated by predecessors, creating new knowledge, spreading it to the society, and passing it down to future generations; constantly cultivating the ideology of respecting and promoting science, and pursuing truth.

3 Overseas Patterns for Talents Training

3.1 University-enterprise cooperation education of foreign universities

Originated from the American university of Cincinnati, cooperative education, also called the university-enterprise cooperation education, refers to the cooperation between university and enterprise. It is a talents training pattern which combines the students’ learning and work together. In other words, students study in university and work in the corresponding field for a period of time. Through practical experience accumulated in the workplace, a good opportunity is provided for students to connect the classroom learning with social needs. This talent training pattern cycles from theory to practice for many times.

3.2 Classifications of talents training pattern of foreign universities

According to the different roles the enterprise and university play in the process of cooperation, talents training pattern can be basically classified into two categories: one is that the enterprise plays a leading role in university-enterprise cooperation education and the university assists. For example, German due education system, Japan’s industry cooperation and British work-and-study alternating training all belong to this category; the other is that the university plays a leading role in university-enterprise cooperation education while enterprise in a subordinate position. Cooperative education program in the United States belongs to this pattern.

British university-enterprise cooperation in general can be divided into long-term education and short-term training. Long-term education is formed by two kinds of different educational system — “2 + 1 + 1” and “1 + 3 + 1”. The education system “2 + 1 + 1” means that the students study in the first two years in school, work in the enterprises in the third year, and go back to school again and complete their studies in the fourth year. “1 + 3 + 1” is that students in the first year work in enterprises, and in the following three years study in school, and in the fifth year return to the enterprise. While the short-term training usually needs only 6 months. Whatever the form is, the enterprise needs to pay the remuneration. In conclusion, British companies play an extremely important role in university-enterprise cooperation. Not only should the university set up the specialty in accordance with the requirements of the enterprise, but also the composition of leadership, the vocational qualification standards, various evaluation, and so on must be determined by the participation of relevant enterprises finally.

4 Excellent Talents Training Patterns in Domestic Universities

In order to implement the national policy and improve the quality of talents training, universities increasingly introduce new policies and put forward their own excellence scheme, adjusting training objectives, course arrangement, and curriculum structure of the relevant majors at the undergraduate stage. More attentions are paid to foundation and broad-caliber education, shortening the classroom learning of the courses at undergraduate and graduate stages. The patterns are summarized as follows:

4.1 Practical talents training patterns for undergraduates

The practical talents training patterns are mainly to foster excellent engineers, doctors, and outstanding talent of legal personnel. Objectives of majors are to develop technical personnel who have solid foundation in his major, with good professional quality, practical ability, the explorative spirit and innovative ability. This type of talents training pattern lays emphasis on students' ability of application of knowledge to solve the problem. To put the students' subjective initiative into full play, students-centered teaching activities are organized. Students are encouraged to learn how to integrate theory with practice, and how to change from factual knowledge learning to knowledge exploration and discovery. Thus, students are cultivated and trained in their ability to raise new questions, discover new knowledge and solve practical problems. The basic four patterns are as follows:

- (1) "3 + 1" pattern: 3 years on campus learning, 1 year on production practice and graduation design (paper), based on university-enterprise cooperation training.
- (2) "4 + 1" pattern: During 5 years, 1 year for production practice.
- (3) "1.5 + 2.5" pattern: Students are recruited by the general categories of admission. After 1.5 years of general education, students then determine their majors and have 2.5 years of professional education and practice.
- (4) "2 + 2" pattern: Students are recruited by the general categories of admission. After 2 years of general education, students then determine their majors and have 2 years of professional education and practice. The most important part of these talents training patterns is the internships and social practice. Through education and industry, and close cooperation between universities and enterprises, setting in the practical work, regarding technology needed in the job as the main line, focusing on improving the students' working consciousness, professional quality and practical ability, various types of engineers and technicians are further trained and cultivated. The better the students did internships, the stronger practical abilities they have; then the quicker working ability they have, and the better they will finish the tasks. In this sense, the talents training pattern reform is successful, otherwise it is a failure.

4.2 The training patterns for top-notch and innovative talents of Bachelor-Master-Doctor program

The cultivation pattern for talents of Bachelor-Master-Doctor program is mainly to train the top-notch and innovative talents, choosing top students to train their innovation ability. College students' innovation ability includes many aspects of their abilities and qualities of self-studying, researching, thinking, expressing, organizing managing, and willpower. The purpose of major cultivation is to train academic talents—researching objective laws, concentrating on the academic discussions, and finding scientific theory. Six main Modes as follows:

- 4.2.1 "3+1+2" Bachelor-Master-Doctor Program Pattern: 3 years for undergraduates' courses, 1 year for postgraduates' courses, and 2 years for postgraduates' experiments and theses.
- 4.2.2 "3+3" Bachelor-Master Pattern: 3 years for undergraduates' courses, 3 years for postgraduates' courses, experiments and theses.
- 4.2.3 "3+1+1+3" (3+2+3) Bachelor-Master-Doctor Program Pattern: 3 years for undergraduates' courses; 1 year for postgraduates' courses; 1 year for postgraduates' experiments; 3 years for doctors' experiments and theses.

4.2.4 “4+2+3” Bachelor-Master-Doctor Program Pattern: 4 years for undergraduates’ courses and theses, 2 years for postgraduates’ courses and theses, 3 years for doctors’ experiments and theses.

4.2.5 “4 +4” Bachelor direct to Doctor’s degree Pattern: 4 years for undergraduates’ courses and theses, 4 years for doctors’ courses, experiments and theses.

4.2.6 “4+M+3” Bachelor-Master-Doctor Program Pattern: “4” refers to the cultivation in the undergraduate stage, “M” refers to the cultivation in the master stage and different majors for different studying time: 2 or 2.5 years, “3” refers to the cultivation in the doctor stage.

Many colleges and universities pay more attention to the cultivation of top-notch and innovative talents, and actively create good environment, where independent thinking, free exploring and brave innovating are encouraged to inspire students’ innovative wisdom, and make contributions to cultivate more creators of new knowledge, inventors of new technology, and founders of new subject.

5 Advantages of Excellent Talents Training Pattern

5.1 The core of “Excellence Scheme” is to improve students’ professional comprehensive quality. Whether knowledge required or ability training for students, what “Excellence Scheme” reflects is not the solidification of knowledge or ability, but are the requirements for students’ development, including how to get knowledge, how to learn, and how to master the abilities of finding, analyzing and solving problems.

5.2 “Excellence Scheme” of talents training is a quality-oriented education under the condition of our country’s engineering education, which aims to carry out the quality-oriented education based on national and university’s conditions, and appropriately expend the content of education around the professional education. The quality-oriented education is permeated through each course of professional education through specific training standard, which neither increase too much burden on the students, nor lose contact with existing teaching practice, having both strong scientific and good operability.

5.3 The excellent talents training patterns of colleges and universities adjusted the training objectives, curriculum setting and structure, etc. of relevant majors at the undergraduate stage, which emphasizes the cultivation on basic knowledge and students with diverse background, and reduces the length of schooling at the graduate and master stages to give students more time to practice and train their practical skills.

5.4 Through strengthening the practical training on engineering in the applied “Excellent Talents” training system, the measures of university-enterprise cooperation “3+1”, curriculum replacement and the introduction of tutor system, a satisfying effect has been achieved—the quality of talent cultivation has been improved apparently; graduates generally have solid basic theory and good basic skills; their innovation spirit and practical ability are strong.

5.5 Bachelor-Master-Doctor Program Pattern, which sets up the innovative classes at the undergraduate stage, and introduces students’ competition and elimination mechanisms to improve their learning motivation, can create good learning atmosphere.

5.6 The outstanding undergraduates or postgraduates have the opportunity to study postgraduate’s or doctor’s curriculum a year in advance and take part in their tutors’ subjects and scientific research projects early, which lay the root for finishing a piece of master’s thesis or doctoral thesis and can promote the construction of “Hundred Excellent Theses of Masters and Doctors” in some degree.

6 Disadvantages of Excellent Talents Training Pattern

6.1 In the applied excellent talents training, students are required to practice in enterprises, which are required in return to participate in the talents training of colleges and universities, to realize, in a real sense, the talents training by university-enterprise cooperation, resource sharing, complementary advantages, win-win interaction and mutual support. However, according to the current system, few enterprises are willing to participate in talents training, because they don't see "profit", and it is usually hard for colleges and universities to attract good enterprises to join it completely.

6.2 The applied talents training needs a high-level practice teaching base to realize their great practical ability. However, the practice teaching base within colleges and universities is still not constructed enough at present. Therefore, it is not easy to train students' practical ability.

6.3 It hasn't built up a unified standard of excellent talents training. Research on quality assurance lacks coherence and systematicness. Internal quality supervision and information feedback system are not sound enough. The effective external quality assurance system should be set up to monitor and evaluate it.

7 Conclusion

"Excellence Scheme", as a major engineering education reform that the nation focuses on, is attached great importance by every participating university or college. Each of them has done a lot of exploration on teaching reform to provide students with more opportunities of participating in practical activities. In the education process, by a variety of ways and means, the excellent talents make full use of various education resources inside and outside school or class. In the interaction, cooperation and communication between teachers and students or between students, they are promoted to develop, pursue excellence and become successful then. The starting and standing points of "Excellence Scheme" are based on intrinsic requirements. Thus universities not only follow the original professional concept, principle, and principle of the system, but pay more attention to the construction, integration and application of knowledge and skills. What the Scheme emphasizes is not the duck-stuffing process of passively accepting ready-made knowledge, but is to improve students' ability of seeking, finding, analyzing and solving problems, which is one of the most important abilities the excellent talents should have.

To improve the quality of talents training, colleges and universities should, according to its own school-running characteristics, do research on making the training plan for excellent talents classification and focus on the implement scheme and management methods. This is particularly true in colleges and universities with school-running characteristics of "multidisciplinary combination", where they should further highlight the advantages of existing professional training plan and establish the standard of training excellent talents based on the compound and applied talents training goal, to improve the quality of talents training and shorten graduates' adaptation time in jobs. Thus the talents cultivated in colleges and universities can adapt to society and make more contributions to economic construction of our country.

References

- [1]. Wang Najun, Wang Jie, Li Dan, etc. The Exploration of Experiment Teaching Reform Based on Engineering Ability Training. *Education Exploring*. 2011 (10): 49-50
- [2]. Lin Jian. On the Professional Training Program of "A Plan for Educating and Training Outstanding Engineers" [J]. *Tsinghua Journal of Education Research*. 2011, 32 (2): 47-55
- [3]. Liang Bo, Tan Tao. Analysis of Training Method of Science and Technology Innovation Ability

- for Top-notch Talents on Civil Engineering. 2012 (4): 95-97
- [4]. Gong Fuhai, Fan Shouxin. On the Integration of Distinguished Talent Training Program and Quality Education. China Agricultural Education. 2011 (6): 5-8
- [5]. Yang Chunxia, Song Zhiwei, Kang Jian. Research of the Quality Assurance System of the Coal “Outstanding Plan” Talent Training: Taking Mining Engineering Specialty of Heilongjiang University of Science and Technology as an Example. Value Engineering. 2013 (29): 211-213