

Research on the Optimization of the Through-type Training Model for International Cooperation in Higher Vocational Education

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Abstract. Deepening the comprehensive reform in the field of education, adapting to the needs of national and capital economic and social development, industrial transformation and upgrading, requires cultivating high-quality applied skilled talents with international perspectives, and optimizing the teaching staff of vocational colleges. This article conducts research on the international cooperation talent cultivation mode in higher vocational colleges. Based on the analysis of the issue of cultivating international students in the integrated class, this paper describes how Beijing Polytechnic conducts international cooperative integrated training. Practice has proven that strengthening overall planning, valuing innovation, and continuously optimizing models are key measures to effectively improve the level of international talent cultivation in vocational colleges.

Keywords: Higher vocational education, International cooperation, Through talent cultivation

1 Introduction

In order to deepen the comprehensive reform of the education sector, adapt to the needs of economic and social development, industrial transformation and upgrading of the country and the capital, and implement the spirit of the "Decision of the State Council on Accelerating the Development of Modern Vocational Education" (Guo Fa 2014 [19]), the Beijing Municipal Education Commission conducted a comprehensive training experiment for high technical and skilled talents in 2015, exploring new paths for cultivating high technical and skilled talents.

Beijing Polytechnic is one of the first three vocational schools to participate in the comprehensive training program. In 2015, the school planned to admit 1000 students in seven major categories, including 26 major directions. The major categories include electronics and information, machinery and numerical control, automation and electrical, etc. Professional directions include automation production lines and mechanical and electrical equipment design and debugging. The actual admission was 915, of which 500 through the proposed admission. Students admitted in advance will enter the the joint training class for foreign universities (referred to as "external training class"), which connects with foreign applied technology universities such as Germany, France, etc. How to carry out personalized training based on the characteristics of students in the "external training class" is an urgent problem that needs to be solved.

2 Analysis of the Current Situation of Talent Training in the "External Training Class" for International Cooperation in Higher Vocational Education

The integrated training program is a new reform, especially for the training of "external training class", which faces a series of problems and challenges.^[1-6]

(1) The foundation of English is weak, and the thinking mode and cultural awareness need to be improved.

The students who participate in the through training program are mostly from junior high school graduates who are about to enter regular high school, and their grades are average. Most students have a relatively weak foundation in English, with a lack of oral English expression ability, limited reading and vocabulary. So it is urgent to improve their language skills. In addition, the significant differences in life, customs, ideas, and culture between China and foreign countries also require students to further understand. At the same time, for the differences in learning thinking between China and foreign countries, including language expression thinking, logical thinking, etc., students need to constantly adapt during the learning process.^[7,8]

(2) The internationalization level of teaching management and teacher teaching is insufficient.

In terms of teaching management for students, the domestic teaching system is adopted, and teachers are accustomed to using a four stage teaching method, which is not conducive to students' integration with mainstream interactive teaching abroad. For professional courses, English learning materials and Chinese teaching methods are mainly used, without truly achieving bilingual teaching, which will make it very difficult for students to study professional courses abroad. As a result, some students switched to humanities majors and did not continue their studies in this major.^[9,10]

(3) Undergraduate studies have tight schedules and heavy tasks, which is a great challenge for students' learning ability.

The undergraduate education for students is mainly focused on the last two years. Ordinary undergraduate students have four years to familiarize themselves with and complete the undergraduate teaching process. However, through class students only have two years to complete this process, which includes a series of links such as familiarization with the environment after enrollment, course learning, graduation design, employment and further education. Thus, the ability requirements for comprehensive students may be higher than ordinary undergraduate students, while their actual ability level cannot be achieved.

3 The Establishment and Optimization of the Talent Training Model for International Cooperation in Higher Vocational Education

(1) Establish a joint training mechanism, design an integrated talent training plan, and attach importance to the integrated training of "language and culture+theoretical founda-

tion+professional knowledge"

Beijing Polytechnic establishes a joint training mechanism with foreign cooperative universities, constructs an integrated talent training system that integrates high school education, technical education, and undergraduate education. Based on the characteristics of vocational college students, the college has constructed an integrated training plan of "language and culture+theoretical foundation+professional knowledge".

When collaborating with The University Institute of Technology (IUT) for training, teachers on campus have a further communication with French experts to determine the training plans. "2+2.5+2.5" integrated training model is proposed to adopt, with 2 years of basic education, 2.5 years of domestic vocational education and 2.5 years of foreign undergraduate education. The model is shown in Fig. 1.

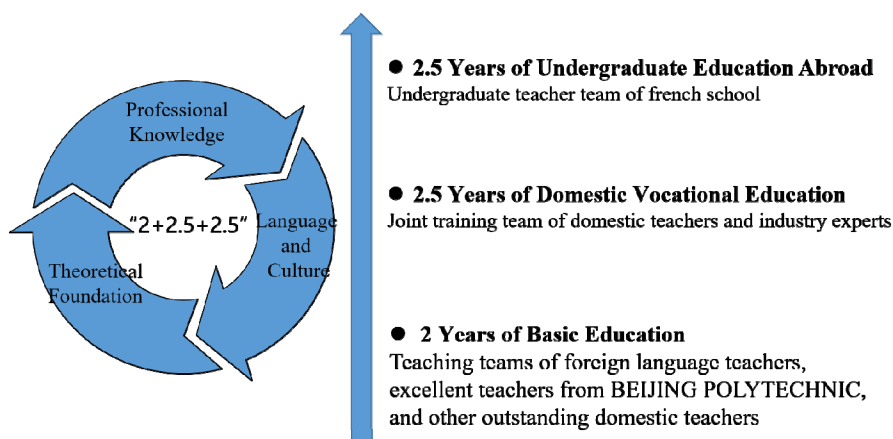


Fig. 1. Trinity Integrated Through Training Mode

In teaching organization terms of the 2.5 years vocational education stage, students need to conduct four semesters of study and one semester of summary review, as shown in Table 1.

Table 1. Allocation of Training Topics in Vocational Education

Course	Semester 1 Introduction	Semester 2 Development	Semester 3 In-Depth	Semester 4 Reinforcement	Total
	Class Hours	Class Hours	Class Hours	Class Hours	Class Hours数
Theme 1: Components, Systems, And Applications	240	240	240	0	720
Theme 2: Technology And Project Innovation	150	135	150	180	615
Theme 3: Science And Humanities Education	120	135	120	90	465
(Module 41: Practice)					
Total Supervision Class Hours	510	510	510	270	1800

After 2.5 years of learning in domestic vocational education, students have mastered core vocational skills and completed undergraduate education courses equivalent to three semesters in France, preparing for subsequent undergraduate education abroad.

In the 2.5 years undergraduate education abroad, the first semester is a transitional period abroad. The following four semesters are normal undergraduate education semesters for the French side.

(2) Coordinate and integrate resources to enhance the international teaching ability of the teaching team

A "local internationalization" and "dual teacher" teaching team with an international perspective, understanding of international rules, is an important guarantee for international cooperation in cultivating innovative and high-quality vocational education talents. Beijing Polytechnic actively coordinates and integrates resources, takes multiple measures to build international exchange platforms, promotes the internationalization of the teaching staff.

- Arrange professional teachers to study in France in advance, invite French experts to guide classes, and deeply experience advanced teaching concepts and cultural atmosphere.
- Actively communicating with French experts, discussing educational and teaching issues, and jointly developing talent cultivation plans;
- Carefully plan and connect with high-quality education and teaching resources overseas, and collaborate with French experts to focus on creating three core courses: C language and data structure, electronic system theory and practice, power network and energy practice.

(3) Design innovative courses and practical projects driven by projects to enhance students' comprehensive literacy

In the process of cultivating integrated students, higher education institutions should be more inclined to seek key points of cooperation with enterprises in various fields from the perspective of engineering application practice, adhere to the principle of "resource sharing, mutual benefit", provide practical application platforms for integrated students, combine industry and enterprise environmental characteristics, and combine professional undergraduate integrated training plans to design innovative courses and practical topics driven by projects. For example, in the field of electrical engineering, the setting of project courses and topics is an innovative application research project in the field of electrical technology, which can effectively solve the technical problems faced by enterprises. These projects have clear research objectives, technical roadmap, research background, and application value, which can ensure the innovation and practicality of the project. At the same time, it is necessary to strengthen deep communication and information feedback between university teachers, enterprise technicians, and students, in order to explore and revise training plans and projects.

(4) Innovative and distinctive teaching, where students independently choose suitable teaching modules based on their personal career plans

Personal career plans help students gain a specific understanding of the content of each profession and the personal skills required for each profession, so the concepts related to profession and skills must be deepened, not only to understand diploma and salary issues. Students are the leaders of their personal career plans. Students will independently choose appropriate teaching modules based on their personal career plan, which is conducive to their diploma

acquisition, career planning, and further education planning. In the collaborative training process with IUT, students are personalized learning content through supplementary modules based on their personal career plan, expanding their key skills, and preparing for employment or continuing their studies. The supplementary modules for employment preparation are explained in the national education plan, and the supplementary modules for continuing education preparation are developed by IUT based on the recommendations of the National Teaching Council.

4 Conclusion

At present, Beijing Polytechnic has collaborated with foreign countries to train over a hundred students. Among the 2015 through training for external students, three have won the second prize in the National College Student Mathematical Modeling Competition, three first and second prizes in the Beijing Mathematical Modeling Competition, one outstanding graduate student in Beijing, four second and third prizes in the Beijing Vocational School Innovation and Entrepreneurship Competition, and so on.

With the expansion of international cooperation, the number of students trained through cooperation has increased, and the education and training models are constantly being improved through continuous practice. In short, vocational colleges should be based on social demand orientation, integrate into the international and industry, continuously improve education and training programs, innovate curriculum and teaching methods, optimize the teaching team, and cultivate more high-quality applied skilled talents with an international perspective.

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