

Exploration and Practice of the Dual-System Talent Cultivation Mode of “Teaching for Cultivation, Cultivation for Spirits” in Guangdong University of Petrochemical Technology

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Abstract—Based on the OBE education concept and the implementation of the College Students' Quality Expansion Credits Program in Guangdong University of Petrochemical Technology since 2009, the dual-system talent cultivation mode of “Teaching for Cultivation, Cultivation for Spirits” has been innovatively proposed. This article introduces in detail the content, basic principles, organization, implementation, effects and plans for the reform of the dual-system talent cultivation training mode in Guangdong University of Petrochemical Technology.

Keywords—problem oriented; discussion; online teaching; case analysis

I. INTRODUCTION

Education is a task of paramount importance for China. Since the 18th National Congress of the Communist Party, the Party Central Committee, with Chairman Xi Jinping as its leader, have attached great importance to education, and pointed out that it is the common mission of schools at all levels to cultivate the socialist builders and successors with all-round development in terms of virtue, wisdom, physical beauty and labor. The success or failure of the implementation of education policies as well as education and teaching reform for the Party and China is directly related to the long-term national stability. The majority of young students have devoted their most youthful and beautiful years to study in colleges and universities. It is every school's responsibility and obligation to prepare young students for their brilliant futures.

For more than 60 years since its establishment, Guangdong University of Petrochemical Technology has always adhered to the principle of moral education, and has made consistent efforts in carrying out seminars and discussions on education, teaching concepts and reform of the talent cultivation mode, concentrating on the topic of "what kind of people should be cultivated, how to, and for whom?".

The innovative dual-system talent cultivation mode of “Teaching for Cultivation, Cultivation for Spirits” proposed by Professor Rujin Zhou, the vice president in charge of teaching, during long-term exploration and innovative efforts based on the concept of OBE education and the school's implementation of college students' quality expansion credit plan since 2009, etc...The guiding ideology is to build a dual-system infiltration and integration engineering education talent cultivation mode composed of the industry-education integration curriculum education system and multidimensional infiltration quality expansion education system through the comprehensive teaching reform idea based on “Teaching for Cultivation, Cultivation for Spirits” and the engineering education concept to improve the teaching and education mode consciousness, with professional talent cultivation and graduation quality standards as the overall goal of talent cultivation mode, with infiltration and integration of teaching and educating as the general requirements. This article makes initial introduction to the exploration and practice of the dual-system talent cultivation mode in Guangdong University of Petrochemical Technology. The first part introduces the reform of the dual-system talent cultivation mode of “Teaching for Cultivation, Cultivation for Spirits”, and the second part introduces the basic principles of the dual-system talent cultivation mode reform, the third part introduces the organization and implementation of the dual system talent cultivation mode, and the fourth part introduces the preliminary effects of the dual system talent cultivation mode and further plans.

II. REFORM CONTENT OF DUAL SYSTEM TALENT CULTIVATION MODE

The dual-system talent cultivation mode refers to the comprehensive reform ideas of education and teaching characterized by "teaching for cultivation, cultivation for spirits", whole-person education talent cultivation mode with the multidisciplinary infiltration and integration of the dual-

system talent cultivation mode of curriculum education system through integration of industry and education, together with quality penetration.

The dual system includes curriculum education system based on the deep integration of industry and education (including all the individual theoretical and practical courses), the comprehensive quality requirements based on the training objectives, quality expansion project education system consisting of the multidimensional infiltration of curriculum (curriculum; combination or curriculum group) and industry, local or scientific research resources, and implementation of the quality expansion education system in the form of a project. The combination of industry and education curriculum system (including all the individual theoretical and practical courses) is aimed at cultivating and improving application ability and practical ability; the multidimensional penetration of quality expansion education system is aimed at cultivating and tempering ideological quality, humanistic feelings, practical awareness and innovative spirit.

The integration of industry and education curriculum system (including all the individual theoretical and practical courses) is based on National Standards for Undergraduate Professional Teaching Quality in Common Higher Education Institutions, and refers to the corresponding professional certification standards to make full use of corporate and social resources, greatly promote the integration of industry and education (enterprise deeply participates in the whole process of talent cultivation program formulation, theoretical teaching, practical teaching, graduation design (thesis), etc.), integrate teaching content, optimize the curriculum system, cultivate and improve students' professional application ability and practical ability through applied theoretical courses and practical courses, etc..

Multidimensional penetration quality program education system highlights cultivating comprehensive quality of talents. Based on industry, local, scientific research and other practice bases and practice resources, corresponding to the curriculum system, this system infiltrates and designs quality expansion projects (single course penetration, multiple course penetration, course group penetration, teaching and scientific research penetration, comprehensive/multi-quality penetration), combining activities such as launching comprehensive lectures, reading and social practice, applied innovation, skill competitions, feature development, etc., through a series of implementation of quality development projects to promote the growth of students' knowledge and abilities, and at the same time promote the joint improvement of comprehensive quality, ideology and morality, and psychological quality, improve students moral literacy, humanistic feelings, practical spirit and innovative consciousness.

The Quality Expansion System adopts expansion projects from in-class to out-of-class, in-school to out-of-school, complete elective and defense competition credit mechanism. The implementation mechanism of Quality Expansion Education System includes: project setting and implementation mechanism, student elective and competitive defense credit mechanism, and Quality Expansion Education System construction and improvement mechanism. The project can be solicited from teachers throughout the school. The Quality Expansion project can be integrated with the training objectives and needs of the currently available

classroom experiments, hands-on experiments, extra-curricular experiments, theory and practical courses.

The dual-system talent cultivation mode of infiltration and fusion promotes the intersection, penetration and integration of teaching and education, and improves the consciousness of the teaching and education mode.

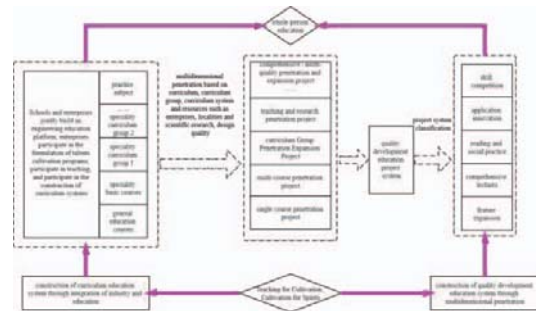


Fig. 1 Dual System Talent Cultivation Mode

III. BASIC PRINCIPLES OF THE REFORM OF THE DUAL-SYSTEM TALENT CULTIVATION MODE

A. To Fully Embody the Most Fundamental Requirements of Cultivating a Student with Morality

The effectiveness of cultivating a student with morality should be taken as the fundamental standard for testing the cultivation of talents in universities. We should truly achieve educating a student with culture and morality and continuously improve students' ideological level, political consciousness, moral quality and cultural literacy to make students know basic moral standards, comply with public ethics and improve private virtue. The idea of cultivating a student with morality should be internalized into all fields, aspects and links of university construction and management. Cultivation of students is the core. Establishment of morality is fundamental.

B. To Carry Out the Basic Concept of "Three-complete Education"

We should carry out the basic concept of "three-complete education", namely "education of all staff, education of the whole process, and education of all aspects", make overall arrangements of education resources, improve the education system, enrich the connotation of educating students, expand educating channels, innovate the education carrier, improve the education environment and enhance the capabilities of education to construct ten educating systems in terms of curriculum, scientific research, practice, culture, network, psychology, management, service, financial aid, and organization.

C. To Embody the Talent Cultivation Concept of "Teaching and Educating"

We should improve teachers' sense of historical mission and social responsibility. So teachers are dedicated to their

jobs, loyal to their duties, consciously fulfill their responsibilities of teaching and educating students, and educate and guide students to develop in an all-round way with noble sentiments and enthusiasm.

D. To Conform to the National Standard for Teaching Quality

Based on the “National Standards for Undergraduate Professional Teaching Quality in General Colleges and Universities” and with reference to the corresponding professional certification standards, in terms of the professional characteristics of the university and the design of talent cultivation programs the dual system of curriculum teaching and quality development education should be considered. The curriculum education system accounts for 70-80% of the total class hours. The quality development project system accounts for 20-30% of the total class hours.

E. Construction of Curriculum Education System

We set up core courses in accordance with “National Standards for Undergraduate Professional Teaching Quality in General Colleges and Universities”. Curriculum system construction takes the cultivation of students' application ability, practical ability and innovation ability as the general requirements and adheres to the following four principles:

- Adhere to the combination of theory and practice and focus on practice
- Learning and application penetrate each other and applications are highlighted.
- Both on campus and off campus and industry-oriented
- Equal emphasis on humanity and quality

Universities and enterprises jointly build an education platform. Enterprises participate in the whole process of students' development in terms of formulating talent cultivation programs, curriculum construction, theoretical teaching, practical teaching, graduation design (thesis), etc. we should deepen the depth of university and enterprise cooperation and enhance the quality of cooperation.

F. The Construction of Quality Development Education System

Taking “the intersection, infiltration and integration of teaching and education” as the general requirement and with the goal of improving students' moral qualities, humanistic feelings, practical spirit and innovative consciousness we try to construct a multi-dimensional penetration (single course penetration, multiple courses penetration, course group penetration, teaching and research penetration, comprehensive/multi-quality penetration) education system consisting of courses, course groups, course systems and enterprises, localities, scientific research and other resources and significantly different from the current quality development activities.

We should develop mechanisms for solicitation of the projects (for teachers in the whole university), project setting and implementation, students' course selection, and credit acquirement by competitive defense in the quality development education system.

G. Construction of Quality Development Project Module

We should build a quality development education project system composed of skills competition, applied innovation,

reading and social practice, comprehensive lectures, feature development and other types, with the characteristics of “respecting morality”, “erudition”, “practicality” and “innovation”. “Respecting morality” is to focus on improving students' moral qualities and humanistic feelings. “Erudition” is emphasizing student-centered and inspiring and cultivating students' application and practical ability. Forging students' comprehensive ability of internalizing in mind and externalizing in action is “practicality”. Stimulating students' scientific spirit of being brave to surpass and creative spirit is “innovation”.

H. Related Mechanism of Quality Development Project System

The quality development project is composed of elective and compulsory projects among which multiple topics can be set for students to choose. The quality development project system can adopt the expansion projects from in-class to out-class or from on campus to off campus, also complete electives mechanism and credit acquirement mechanism by competitive defense. The implementation mechanism of the quality development education system includes: project setting and implementation, students' course selection, credit acquirement by competitive defense and final elimination. Students receive credits for quality development education in the form of electives and competitive replies.

I. Credit Allocation of the Dual System

Based on the “National Standards for Undergraduate Professional Teaching Quality in General Colleges and Universities”, it is recommended that the total theoretical hours of each major be about 2100, and the total credits of engineering majors should not exceed 170 in principle, the total credits of science majors should not exceed 165 in principle, the majors of other subjects should not exceed 160.

According to the requirements of the reform of the dual system talent cultivation mode, and of the curriculum system setting and the allocation of hours and credits of the Dual System, the theoretical course hours can be appropriately reduced and used in the quality development projects of professional ability training. The current classroom experiments, computer operations, and extracurricular experiments can be integrated. The setting of quality development projects can be comprehensively considered in the training goals of theory and practice courses. The curriculum education system accounts for 70-80% of the total hours, and the quality development project system accounts for 20-30% of the total hours. Take the science and engineering major as an example, if the reference credit is 165, the project system hours are about 400 (not less than 20% of the total credits of the theoretical course).

IV. ORGANIZATION AND IMPLEMENTATION OF

THE DUAL-SYSTEM TALENT CULTIVATION MODE

Based on training goals and graduation requirements, the Dual-system Talent Cultivation mode can be built by the Academic Affairs Office with the participation of departments and School of Innovation and Entrepreneurship.

The Academic Affairs Office takes the main management responsibilities. The departments are responsible for the implementation of the curriculum education system in the

form of courses. The School of Innovation and Entrepreneurship and the teaching units are jointly responsible for the implementation of the quality development education system in the form of projects. Students mostly obtain credits for quality development education in the form of electives and competitive replies.

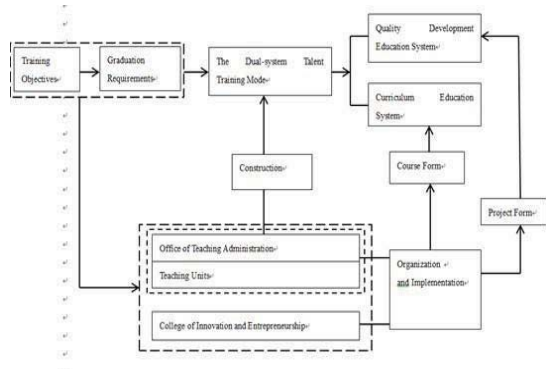


Fig. 2. Mechanism of the Organization and Implementation of the Dual-system Talent Cultivation Mode

According to a recent questionnaire conducted by the Academic Affairs Office, 97.88% of students are in favor of implementation of the dual-system talent cultivation mode, and 93.46% of them are satisfied with the effects of this cultivation mode. Therefore, this cultivation mode is gaining popularity among students, and has proven effective.

I. EFFECT AND PLAN OF

THE DUAL-SYSTEM TALENT CULTIVATION MODE

The Dual-system Talent Cultivation mode of “Teaching must contain education, and education must create spirit” was first implemented experimentally in chemical engineering and technology major in our university. In June 2017, the National Association of Schools and Enterprises for Excellence in Engineering Education in Local Colleges and Universities appraised the results. The expert group agreed that the innovation of the comprehensive reform of education and teaching is obvious. Based on this reform idea, Guangdong University of Petrochemical Technology has built a relatively perfect dual-system infiltration and fusion talent cultivation mode, which has breakthroughs in theory and effective results in practice. It has the demonstration and promotion value for the cultivation of applied and innovative talents in similar universities and disciplines.

On June 22, 2017, China Education News, with the theme of “Teaching must contain education, education must create spirit”, reports on the reform and practical results of the Talent Cultivation mode from six aspects of seizing opportunities and taking on missions, innovating ideas and determining path, integration of industry and education, multidimensional penetration and development of quality, practical test and distinctive features, influencing and driving. This achievement won the first prize of the 9th Education and Teaching Achievement of Guangdong Province. At present, a dual-system talent cultivation program of “Teaching must contain education, and education must create spirit” has been

developed in 15 majors of our university and tried progressively.

The university has vigorously carried out the reform of the Dual-system Talent Cultivation mode of “Teaching must contain education, education must create spirit”, and achieved good results. In recent years, 6 majors such as chemical engineering and technology have passed the professional certification of engineering education from National Ministry of Education or international equivalent professional certification. At the same time, a number of majors have joined the ranks of professional certification, the professional construction has become increasingly standardized, and the quality of talent cultivation has been greatly improved. The vigorous promotion of the reform of the Dual-system Talent Cultivation mode has made contributions to the construction of a high-level university of science and engineering.

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