

Research on the Innovation of the Construction Mode of "New Engineering" in Local Universities under the Background of "Double First-Class"

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Abstract—New engineering colleges have placed more emphasis on the combination of theory and practice, and the emphasis on practice has reached an unprecedented height. The major areas of new engineering are mainly electronic technology, computer technology, network and information engineering, safety engineering, new energy, functional materials and other specialties. Local colleges and universities should be based on their own characteristics and advantages and focus on accumulating the advantages of adapting to regional development, creating a major that meets the needs of the industry, strengthening the system to ensure the quality of teaching and cultivating talents with craftsmanship.

Keywords—double first-class, new engineering, construction mode, innovation

I. INTRODUCTION

Since the introduction of the "New Engineering" in 2016, the Ministry of Education has organized colleges and universities to conduct in-depth discussions, which is a major strategic choice for engineering education reform under the background of the new economy, and also a new thinking and new way for the development of engineering education in China in the future. The "new engineering" corresponds to emerging industries, including artificial intelligence, robots, and cloud computing, etc. The "new" of the main research contents of the new engineering are reflected in five aspects: the new concept of engineering education, the new structure of disciplines, the new model of talent cultivation, the new quality of education and teaching, and the new system of classification development.

China has the largest engineering education in the world. In 2016, there were 5.38 million undergraduate students in engineering, 1.23 million graduates, and majors a total of 17037. Engineering students accounted for about one-third of the total number of students enrolled in higher education. However, "The goal orientation of engineering talent training in China is not clear and the engineering teaching is biased towards science. There is a vague understanding of the relationship and difference between liberal education and engineering education, practical education and experimental teaching. Engineering education and industry enterprises are really out of touch. Engineering students have defects in comprehensive quality and knowledge structure", Professional knowledge must not only be spiritual, solid, but also "new."

II. THE CONNOTATION AND CHARACTERISTICS OF NEW ENGINEERING

Guided by the cultivation of noble talents, The new engineering cultivate future diversified and innovative outstanding engineering talents, which takes the coping with change, shaping the future as the construction concept and the inheritance and innovation, cross-integration, coordination and sharing as the main ways.

A. The Connotation of New Engineering Construction

Relatively new concept: Innovation is the first driving force for development. The fundamental challenge of innovation is to explore constant change. New engineering should step out of the conceptual limitations of "accommodating the society" and become a revolutionary force to promote economic and social development.

Relatively new requirements: As a new type of engineering education, the new engineering science has not changed the nature of its education, but the requirements for the cultivation of talents have changed. New talent structure, the engineering personnel training structure requires diversification. According to the quality and ability requirements of future engineering talents, the transformation and upgrading of engineering education oriented to changing demand and based on industrial adjustment will be established.

Relatively new way: The new engineering reflects the form of future engineering education. It is an innovative engineering education program that keeps pace with the times and requires the construction route of inheritance and innovation, cross-integration, coordination and sharing.

B. The Necessity of New Engineering Construction

The construction of new engineering is required by serving the new needs of national strategic development: Major strategic needs (such as Internet Plus) are an important starting point for engineering education reform and innovation; to adapt to the new economy, it is necessary to deepen the reform of higher engineering education; higher engineering education has an important mission in personnel training and scientific research.

The construction of new engineering is required by building a new advantage in international competition: In the final analysis, international competition is the competition between talents and education; innovation is the core strategy for many countries to seek competitive advantage; under the emerging technology trends such as big data analysis, talent cultivation is the key.

Implementing the new requirements of cultivating noble talents requires the construction of new engineering: Cultivating noble talents is the fundamental task and central link of higher education; The new engineering construction follows the development law of engineering education and the law of engineering innovation talent development.

III. NEW ENGINEERING CHARACTERISTICS

Strategy: It stands at the height of the overall strategy and deepens engineering education reform with strategic vision and strategic thinking.

Systematization: In response to social changes and needs, local colleges and universities should develop new engineering as a system and design a complete program of education, research, practice and innovation and entrepreneurship.

Innovation: Innovation is the inexhaustible motive force for the development of engineering education.

New Engineering is a higher level of open engineering education, forming a large pattern of joint construction and sharing that opening to the outside world the inside are deeply integrated.

IV. THE WAY TO CONSTRUCT "NEW ENGINEERING" IN LOCAL APPLIED UNIVERSITIES UNDER THE BACKGROUND OF "DOUBLE-CLASS"

A. Reform Path of New Engineering Construction

- Build a number of industrialized colleges with multi agent co-construction;
- Build a new batch of emerging engineering majors that are urgently needed by the industry;
- Build a number of new courses that reflect the latest developments in industry and technology;
- Build a batch of practical platforms integrating education, training and research and development;
- Build a number of interdisciplinary new technology research and development platforms;
- Build a number of technical service centers directly facing the local industry;
- Cultivate a group of high-level professional teachers with strong engineering practice ability;
- Form a batch of new engineering construction reform results that can be promoted.

B. Thoughts on the Construction of Local Application Universities

- Establish an organization based on school-enterprise cooperation, as shown in Figure 1.
- Form a set of application-oriented talent training programs, as shown in Figure 2.
- Build a research project library, as shown in Figure 3.
- Form a "double structure" faculty, as shown in Figure 4;
- Construct a science and technology innovation and talent training platform, as shown in Figure 5.

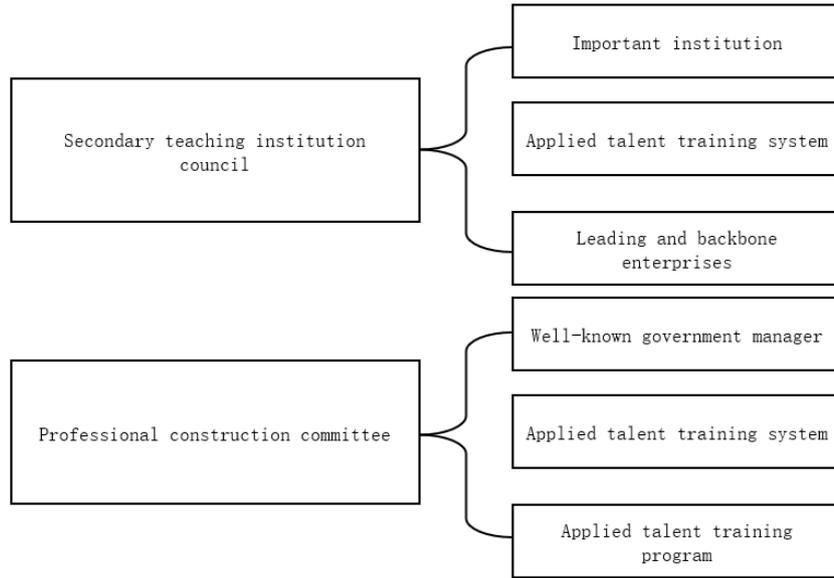


Figure 1 Organization chart based on school-enterprise cooperation

1) *Applied Talent Training Program*

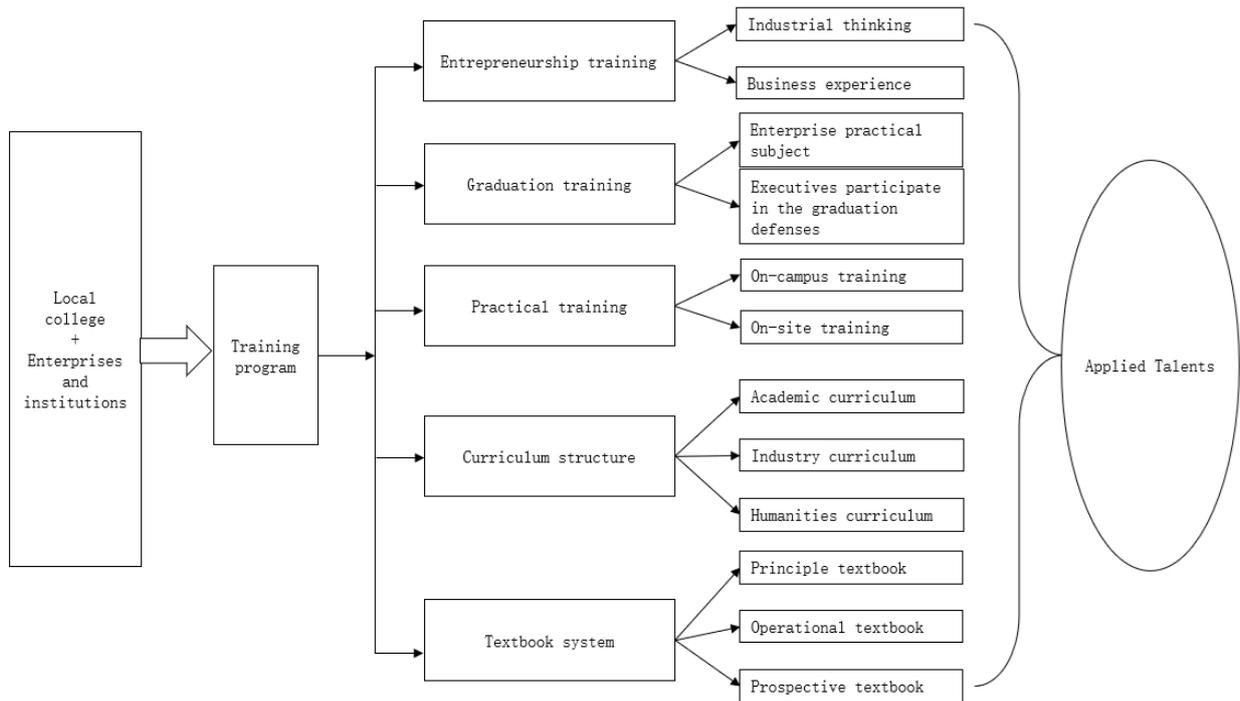


Figure 2 Applied talent training program

2) *Building a Research Project Library*

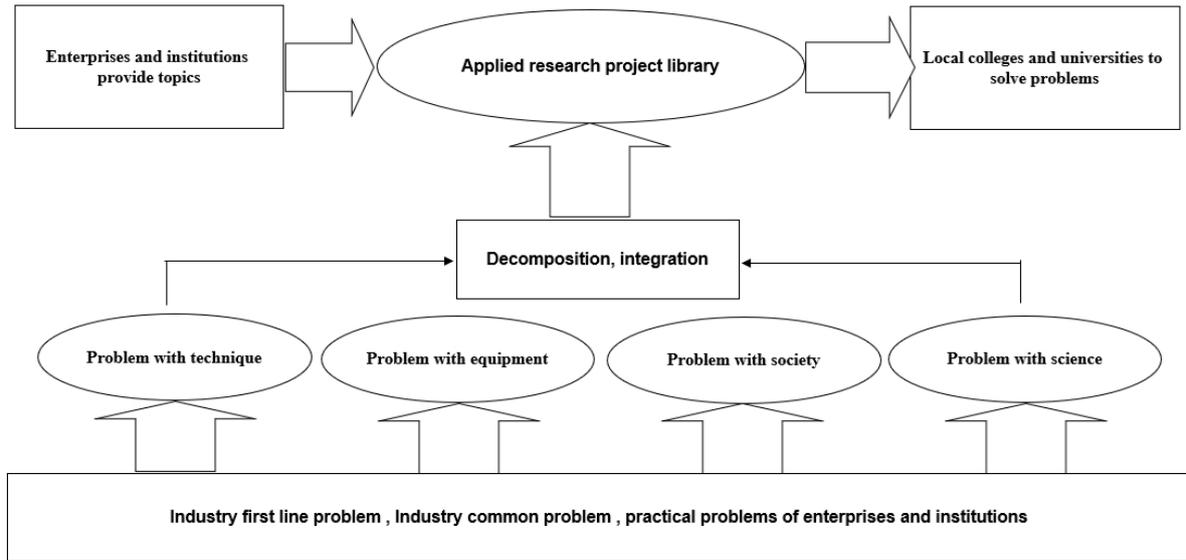


Figure 3 building a research project library

3) Forming a "Double Structure" Faculty

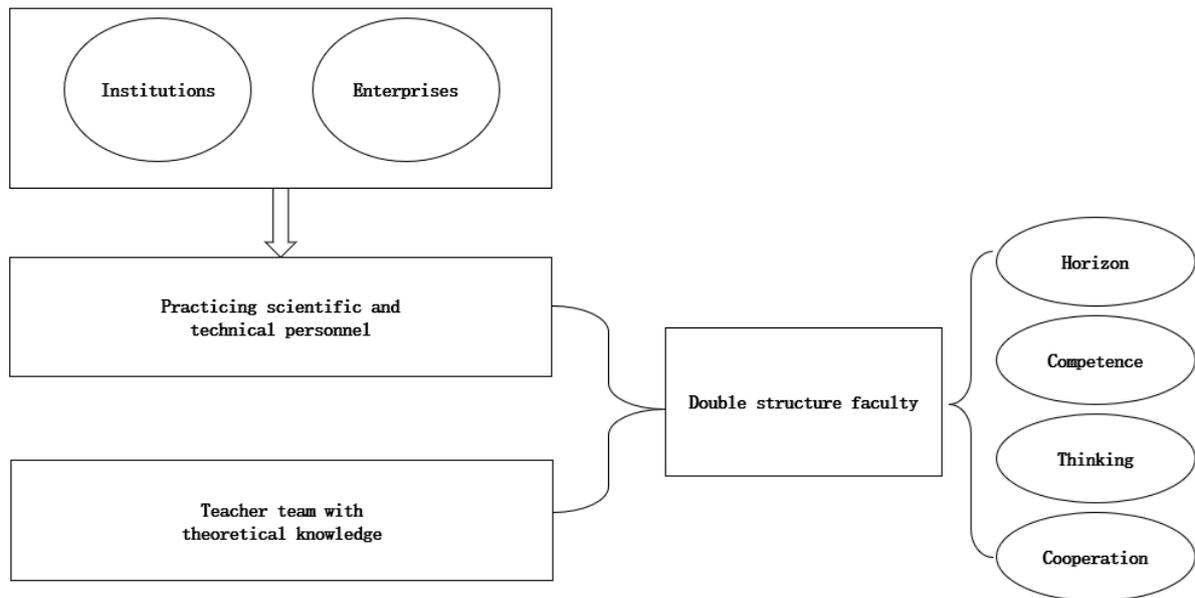


Figure 4 Forming a "double structure" faculty

4) Construction of Science and Technology Innovation and Talent Training Platform

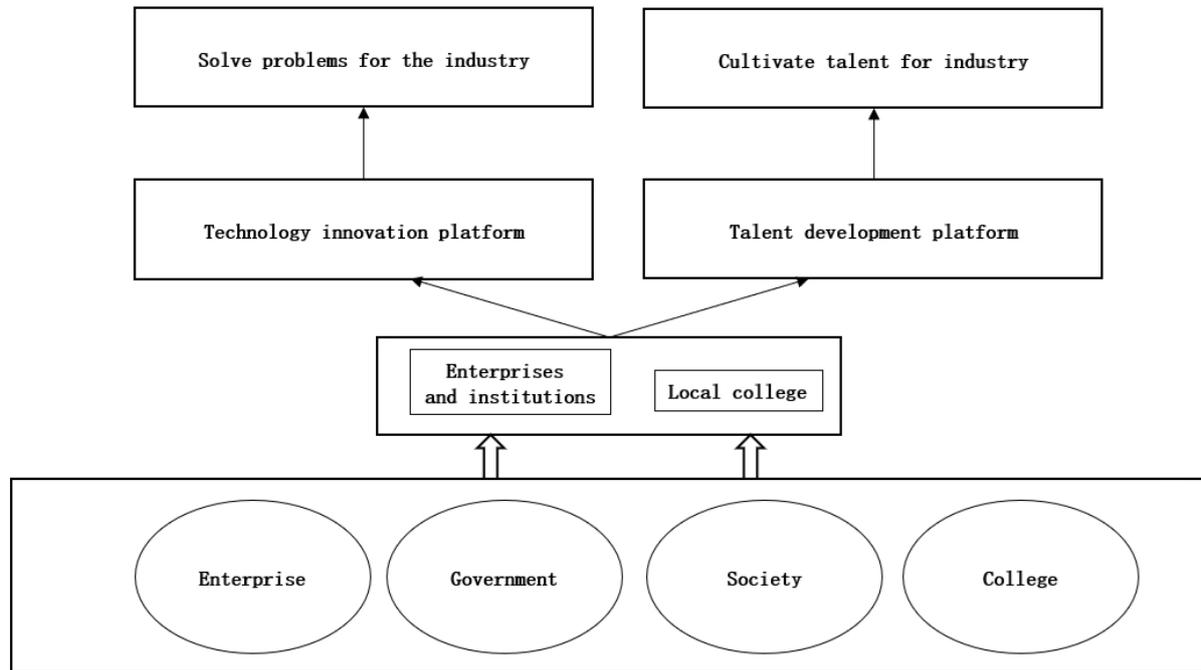


Figure 5 Construction of science and technology innovation and talent training platform

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