

# A Study on the Construction of New Engineering in Local Universities

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**Abstract.** Ability-oriented education mode, results-oriented education mode and cooperative education personnel training mode are of great significance to the reform of China's new engineering education mode. The new engineering education mode should focus on the cultivation of college students' independent thinking ability, learning methodology and engineering technical literacy. Focus on cultivating students' self-career planning awareness, pay attention to the integration of school and enterprise, so as to cultivate the core competitiveness of engineering college students; To promote the implementation of the mode of combining work with study from two aspects of top-level design and auxiliary education.

**Keywords:** New engineering; training mode; construction approach; local colleges and universities.

## 1. Introduction

Since the reform and opening up, China's higher engineering education has made unprecedented exploration and development, and gradually formed a multi-category and multi-level engineering education system, which has trained a large number of engineering and technical personnel for the country's modernization. With the rapid development of the new economy, the adjustment and iteration cycle of new technology, new industry and new business model will continue to shorten. In the future of the country and industry, the change of new engineering specialty and its talent demand will become the norm. It is necessary to establish a dynamic adjustment mechanism for the new engineering major, adjust the setting of the new engineering major in a timely manner, and improve personnel training direction, objectives, standards, schemes, models, courses and teaching contents, etc., so as to ensure that trained engineering and technical personnel will not lag behind, or even surpass the requirements of national and industrial development for new engineering talents.

## 2. The Current Engineering Education System in China

At present, China's higher engineering education has made remarkable achievements and formed a complete engineering education system through the implementation of quality engineering, excellent engineer education and training program and other major reform measures. The ongoing engineering education certification makes our country's engineering education truly integrated into the world. However, it should be noted that China's higher engineering education is still a big problem, engineering education in the training of excellent engineering personnel has some shortcomings: first, the concept does not adapt. At present, there exists the problem of concept lag in the field of engineering education. For example, the concept of student-centered, results-oriented and constantly improving engineering education has not been popularized, the concepts of lifelong learning and personalized learning have not been fully integrated into the education process, the concept of multidisciplinary integration has not been strengthened, and the concept of green engineering education has not been established. Second, the knowledge system does not adapt. In today's society, new knowledge is growing exponentially, interdisciplinary and interdisciplinary disciplines keep emerging, and the transformation period of knowledge achievements is shortened. But in terms of content, engineering education courses are outdated and out of touch with practice and social needs. From the structure point of view, the subject is divided according to the existing knowledge system hierarchical structure, the division of labor is too fine [1]. From the perspective of mechanism, discipline adjustment is flexible, but it lags behind the needs of market and industrial development.

Third, the training model is not suitable. A series of disruptive technological developments, represented by globalization and the Internet, have changed the way education, learning, and information are shared. This brings about the incompatibility between teaching methods and models, teaching environment and conditions, as well as the needs and structures of teachers. Therefore, to accelerate the deepening of engineering education reform and build "new engineering" is a profound proposition based on China's strategic development needs and the trend of international competition, which is related to the country's future and national rejuvenation [2].

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### **3. A New Engineering Model has been Started**

Our understanding of new engineering project construction is to promote the transformation of new engineering talent training mode to sustainable competitiveness in response to the changes of new technologies, new industries and new forms of society. In addition, the new characteristics of "new engineering" can be described from four aspects: new concept, new talent, new knowledge and new model.

First, take the new concept as the guidance. As a higher education reform action, the new engineering discipline needs to introduce new educational ideas. Training strategic emerging industries talent, leading the industry demand. Pay attention to the integration of multi-discipline and multi-industry, carry out the teaching reform according to the law and characteristics of the new engineering discipline. Second, target new talent. The purpose of the new project is to cultivate all kinds of new talents for the development of new technologies and new industries, such as new engineering science and technology talents, r & d talents, emerging industries talents, excellent engineers and engineering talents, cross-combination talents and international competitive talents, and sustainable competitive talents. Third, build on new knowledge. The new future-oriented engineering major will inevitably have new knowledge, including new technologies (such as information technology) and new contents (such as interdisciplinary content) related to strategic emerging industries, so as to build a new knowledge system and curriculum system. Fourth, take the new model as the approach [3]. The new engineering department needs to adopt new education and teaching modes, such as course learning and project learning, combination of exploration and small-class seminar learning, school-enterprise cooperative education and enterprise internship, cross-border exchange learning and international joint talent training mode. Therefore, to accelerate the deepening of engineering education reform and build "new engineering" is a profound proposition based on China's strategic development needs and the trend of international competition, which is related to the country's future and national rejuvenation.

### **4. Approaches to the Construction of New Engineering**

The first step in building a new engineering discipline is to grasp the future needs and development direction of the country and industry. On the one hand, it depends on the discipline construction and the period of professional personnel training; on the other hand, it depends on the decision-making nature of the new engineering discipline[4]. The understanding of the future demand and development direction of the country and industry needs to be obtained through in-depth research and prediction, rather than just simple market research and analysis as the traditional discipline construction. Specific research can be accomplished through the establishment of specialized teams of experts in different disciplines on campus and the cooperation with external industry institutions and enterprise experts. Based on the research of the national development strategy and the prediction of national strategic emerging industry development planning, industry development frontier and the future development of international trends, compared with the developed country industry development, etc., clearly

grasp the direction of the future development needs and national and industry, and put the focus of the research university disciplines related industries and direction.

Faced with the clear future demand and development direction of the country and industry, colleges and universities need to comprehensively analyze the current situation and development potential of college disciplines and majors, and understand which new engineering and majors can be improved. Specifically, two major tasks need to be accomplished: one is to determine what the school can do, and the other is to answer what the school can do. First of all, according to the needs and analysis of national and industrial development, we will analyze the new engineering disciplines that can be established by universities from the perspective of interdisciplinary expertise. It is necessary to break the boundaries of the existing disciplines in the university, comprehensively consider the various educational and scientific research resources in the university, and determine which new engineering disciplines can be arranged and set up by the emerging engineering disciplines. Secondly, we need to compare these preliminary new projects with those that may be set up in similar institutions in China, focusing on the advantages and characteristics of the university, and then identifying the obvious advantages, potentials and resources.

(1) new project plan. For the new engineering disciplines, colleges and universities must first make clear the position of the new engineering disciplines in the development of the school, and make overall planning according to the new engineering disciplines and talent demand as well as the actual situation of the university and the school. Develop new engineering disciplines at the university. The development strategy is broken down into the school's annual work highlights and put into practice. (2) new project Settings. The new engineering setup involves the work of relevant colleges, disciplines and specialties as well as multiple departments of the university. Therefore, coordination at the school level, communication between relevant departments and the establishment of a holistic consciousness are essential. (3) a new engineering department was established. In this regard, it is a matter for colleges and universities to decide whether to build new engineering projects based on the traditional structure of departments or the characteristics of new engineering departments. This requires universities to conduct analysis and research according to their own conditions and set standards for development and cultivation according to the factors that are most conducive to the construction of new engineering disciplines [5].

Subject research and development are a task that needs to be started as soon as possible after the establishment of a new engineering discipline. In addition to the similar work with traditional disciplines, the construction of new engineering disciplines also needs to pay attention to the following points: first, to establish the relationship between disciplines and external industrial sectors and industrial enterprises; Second, introduce or invite industry experts from industry departments, industry companies and scientific research institutes as experienced teaching staff; Third, seek policy, financial and other educational resources from governments, industry and communities at all levels; Four is to start studying new engineering disciplines at the same time.

In the above tasks, discipline research is not only the basic work for the construction of new engineering disciplines, but also involves many aspects such as professional construction, development of training plans, formation and selection of course contents. It is also the subject development and professional construction of new engineering disciplines, so that it can continue to serve, support and guide the development of emerging industries an important guarantee. Interdisciplinary research institutions or academic organizations should be established to promote the layout, construction and development of new engineering disciplines through scientific research.

## **5. Summary**

The smooth implementation of the national strategy and the smooth development of the new economic industrial model cannot be achieved without the strong support of the new engineering talents who are diversified and compound, systemically innovative, with international vision and national feelings. Therefore, the construction and development of new engineering is the national strategy implementation, the inevitable requirement of economic and social development, is a new

era of Chinese to improve international competitiveness and influence, the inevitable requirement of soft power, as well as deepening the reform of the current engineering education personnel training mode, improve the engineering technology talents to meet the needs of the new era of social reality needs.

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