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Exploration of the "New Engineering" Construction Situation and Path

--Take Southwest University as an Example

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Abstract

The construction of 'new engineering' requires the overall consideration of 'new engineering majors and new engineering requirements and accelerates the training of emerging engineering talents, transforms and upgrades traditional engineering majors and actively deploys talent training in future strategically challenged fields.

Keywords

New Engineering; Traditional Engineering; Discipline.

1. Introduction

New engineering majors primarily apply to major emerging industries, with Internet and industrial intelligence at the heart, including big data, cloud computing, artificial intelligence, blockchain, virtual reality, smart science and technology, and other related engineering majors.

2. The main problems of traditional engineering

2.1 Insufficient coordination of educational ideas

Compared to new engineering disciplines, traditional engineering disciplines, such as civil engineering, electrical engineering, mechanical engineering and chemical engineering, fall within the traditional engineering disciplines.[1]

2.2 The structure of disciplines is not suitable for the development of the new economy

There are barriers between traditional engineering sciences and the integration of disciplines is difficult. From the perspective of the development path of the new economy, the new economy emphasizes replacing the traditional specialized division of labor with the integration of industrial chains, and new business formats such as "Internet +" and "Design +" have emerged.

3. The new situation of new engineering construction

3.1 The new economy characterized by new technologies, new industries, new formats and new models calls for "new engineering"

The new economy is a source of new kinetic energy for development. The development of the new economy is guided by a new technological revolution, and an in-depth integration of computerization and industrialization is a breakthrough in the promotion of a new round of reforms in production methods and economic structural change.

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3.2 "New engineering" is needed to enhance the country's hard power and international competitiveness

Today, China is approaching the center of the world stage with unprecedented confidence. A new round of scientific and technological revolutions and industrial revolutions is on the rise. On the new journey of the great rejuvenation of the Chinese nation, the country's scientific and technological strength reflects the hard power of the country and international competition.

4. Practical exploration of new engineering construction

In the construction of new engineering disciplines, it is necessary, on the one hand, to set up and establish a number of emerging engineering majors and to strengthen construction and improve quality; on the other hand, it is necessary to encourage the upgrade of established engineering majors and to strengthen the integration of development, education and research.

4.1 Carry out research and practice of new engineering disciplines and promote the deepening of new engineering disciplines[2]

In order to respond effectively to the new round of science and technological developments and industrial change, to accelerate the training of engineering and scientific talent in emerging fields, to transform and upgrade conventional engineering majors and to actively deploy talent training in future strategically challenging fields, the Ministry of Education identified 612 new engineering research.

4.2 Constructing majors based on industry needs and constructing a new structure of engineering majors

Driven by the demand for engineering and technical talent for industrial growth, we will do a good job of gradual optimization and stock adjustment, plan the construction of emerging engineering majors, encourage the cross-integration of disciplines and specialties, and improve the training of compound engineering talents.

5. Policy recommendations

In a new age and a new journey, as a "double first-class" construction university, the school must not only retain current school-leading characteristics but must also establish other disciplines to support the layout of a comprehensive university. In 2018, in response to a call from the Ministry of Education "Four Return" the school adopted a first-class action plan for undergraduate education.

5.1 Implement broad-based training based on the academic department

The reform of the large-scale training model under the Ministry of Science and Technology, optimizing the talent training program, and building a new talent training model featuring "universal and professional integration, cross-border training" as the main feature, to cultivate students' "deep basic theory and strong sense of innovation" To recreate general education for the goal, implement broad-based enrollment and broad-based training in related majors in the Faculty of Engineering, the Faculty of Resources and Environment, the Faculty of Physics, Chemistry and Materials, and the Faculty of Mathematics and Information Science, construct a broad general education curriculum system, and lay a solid foundation for students' mathematics and physics Foundation of Literature, History and Philosophy.

5.2 Implement professional connotation construction and create superior engineering majors

Strengthen the construction of engineering majors, pay attention to the construction of technical connotations, use the credential of engineering education, strengthen the quality of construction, and develop school professional standards and appraisal mechanisms. In 2019, the school launched the "First-Class Professional Program" key cultivation project, identified 40 majors such as "Material Physics" as the school's "First-Class Undergraduate Professional Program" key cultivation program,

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and formulated the "Southwest University "First-Class Undergraduate Professional Training Program" (the first batch) Construction Guidelines 2019-2020.

Build a new platform for joint training. The Faculty of Engineering Science and the Faculty of Mathematics and Information Science strengthen cooperation with enterprises to create a new platform for joint training of cross-industry and cross-field talent. Explore the "3+1" talent training model that implements on-campus study, dual tutor system, and enterprise top-level internship.

5.3 Building a team of teachers with high comprehensive quality and strong engineering ability[3]

In the context of the rapid development of new technologies and the new economy and new industries, the new engineering subject has higher requirements for teachers in terms of knowledge, industrial experience, industrial capabilities, and overall quality.

In 2020, the Ministry of Education and the Ministry of Science and Technology will intensively issue documents to break the "paper-only" and "SCI first" as a breakthrough, guide the academic community to establish the correct evaluation orientation, and will change the situation of teachers "emphasizing scientific research and neglecting teaching".

New engineering construction is a long-term process of exploration and practice, based on the current and facing the future, the establishment of a new west features of engineering education system, build the comprehensive research university with distinct characteristics.

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