

Research on Curriculum System Planning and Construction of Energy and Power Engineering Specialty

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Abstract: The energy and power engineering is based on the development of new energy and the application of the traditional energy as the purpose of the research. How to utilize the new and old energy efficiently is the key analysis of the project. In order to promote the steady and rapid development of energy and power engineering, it is necessary to deeply study and plan the curriculum system of this major. This paper will study the implementation strategy of the project by analyzing the present challenge of the current thermal energy and the professional course of the power engineering, and finally, combine the characteristics of the course and set up the related course system. Through the planning and construction of curriculum system, in order to meet the needs of society and provide effective reference for the teaching reform and practice of related majors.

Keywords: Energy and power engineering; Curriculum system; Curriculum characteristics; Educational model

1. Introduction

The purpose of training students in colleges and universities is to provide high-quality talents for China's economic construction and scientific and technological development. In this process, we have been thinking about the types of talents and how to cultivate talents more suitable for the high requirements of social development. Thermal and power engineering plays an important role in energy industry. On the premise of innovation of the construction of teaching system, we actively explore how to cultivate the professional talents of energy and power engineering, and achieve the expected results.

2. Challenges in the Curriculum Construction of Thermal and Power Engineering Specialty

In the course of curriculum construction of thermal energy and power engineering, colleges and universities still face some problems and challenges that need to be solved urgently. Therefore, when constructing curriculum system, we need to start from the root and analyze the problems existing in the planning and construction of curriculum system. At present, the problems are as follows:

The caliber of personnel training is wide and the degree of specialization is low. In order to adapt to the rapid growth of China's economy and the process of global integration, domestic colleges and universities began to advocate a comprehensive talent training mode of "desa-

lination of major, broadening of caliber, consolidation of foundation, emphasis on comprehensive quality and innovation ability". However, the society and market require talents who have strong professional quality, and most enterprises have not yet established an independent system of professional skills training [1], making them unable to quickly cultivate talents with excellent professional skills required by the industry after college training. The "professional" engineering and technical talents who can quickly adapt to the requirements can solve the problems in production, technology and other aspects more effectively, meet the market demand for products, greatly shorten the R & D cycle of products, and improve the development speed of the whole industry. The purpose of colleges and universities is to cultivate comprehensive talents who can better meet the overall requirements of social development, while enterprises need more professional talents with strong professional quality. Thus the cultivation of wide caliber talents conflicts with the demand of professional talents.

The enrollment mode of the school is "wide" and the employment selection of students is "narrow". The traditional mode of "enrolling students according to specialty" is not in line with the idea of "desalinating specialty, broadening caliber, consolidating foundation, emphasis on comprehensive quality and innovation ability" advocated by colleges and universities. Colleges and universities have begun to transition to the mode of "enrolling students according to departments", and the mode of "enrolling students according to disciplines" has also

become the trend of college enrollment mode. The study of the university is based on the major and discipline, with the aim of comprehensive quality education, general education and wide caliber education. However, college students are faced with a “professional” market with strong demand for specialization when they are employed. Enterprises often take “major direction” as the primary consideration when choosing graduates. Therefore, there is a contradiction between the mode of school enrollment and the employment of students.

The education industry has a unique market prospect. University reputation, discipline strength and other factors determine the quality of students. Today’s education system gives students more choices and freedom. For the major of thermal energy and power engineering, it is necessary to guide the students to be interested in the major study and establish their sentiment. Therefore, colleges and universities should integrate modern science and technology, combine traditional specialty with modern science and technology, integrate “market” demand into teaching reform, establish a teaching system more in line with market demand, update the existing education mode, improve the teaching management system to make it meet the market demand more and improve the quality of education and teaching [2]. The major of thermal energy and power engineering has a wide research scope, a traditional and single major content, and an old and incomplete curriculum system. Therefore, students in this major will encounter great obstacles in their employment. We need to carry out all-round teaching reform, develop a new and unique training mode, improve the theoretical teaching content, carry out practical teaching, and update teaching materials, in order to meet the challenge of talent training in the new situation.

3. Implementation Strategy of Research Projects

With the rapid development of science and technology, China’s socialist market economy system is gradually establishing and improving, and the reform of higher education system and teaching is also gradually deepening, which requires higher standards and quality for personnel training. Therefore, it is very important to cultivate professional talents with solid foundation, profound knowledge reserve, excellent ability and high quality with innovative spirit. Therefore, we must abandon the outdated educational ideas, renew the old educational ideas, adjust the setting of specialties and disciplines scientifically, improve the teaching contents of specialties, and make the curriculum system more complete.

In China’s higher education system, some unsolved historical reasons and limited ideological understanding make the reform of China’s education system unable to make substantive progress, and the development of education industry is slow, especially in the engineering edu-

cation system. The past experience of education reform shows that the “knowledge education” mode of engineering education is stubborn and difficult to break through. With the rapid development of science and technology, the development of politics, economy and culture puts forward rigid requirements for talent training mode: to reconstruct the structure of students’ knowledge ability and quality. On the basis of emphasizing the requirement of solid foundation, gradually broaden students’ scope of knowledge, and take the cultivation of innovation ability as an important aspect. Under the new framework of the national catalogue of majors, according to the general requirements for the development planning of colleges and universities, and based on the basic principle of “actively expanding, scientific innovation, maintaining characteristics, and daring to be the first”, the course system planning of “Thermal Energy and Power Engineering” is formulated after careful discussion on the subject construction. The new curriculum system planning breaks the limitations of the original professional system of thermal energy and power engineering, endows the new professional system with new vitality and pays attention to the cultivation and development of its own characteristics. For example, pay attention to practical links, actively reflect the latest technological progress, and highlight the traditional advantages of energy and power engineering.

4. The Basic Characteristics of the Curriculum System of Thermal Energy and Power Engineering

To master the basic knowledge of heat transfer, fluid mechanics, power machinery, thermal engineering and power engineering is the basic training objective of the thermal and power engineering specialty, and the talents who can engage in the design, manufacturing, management, experimental research, installation, development and other work are trained. In order to plan and build a curriculum system of energy and power engineering that conforms to the development of the times and the needs of the society, it is necessary to formulate a reasonable teaching plan based on its basic characteristics, which are as follows:

Greatly reduce the teaching hours of comprehensive theory. In the research of teaching plan construction of this major, in order to reduce the burden of students, it is necessary to reduce the class hours, put the reform of teaching methods and contents in the first place, integrate the quality training into the teaching practice, and adjust the overall structure of teaching plan greatly;

Optimize the system structure of the course and retain the basic theoretical knowledge and skill training. The new teaching plan divides the whole system into several structural modules according to the level of curriculum knowledge, semester sequence and the characteristics of dis-

cipline association under the advanced modular structure design idea, so that different stages and sequence are connected with other related professional courses. In the new planning of the specialty, the original thermal power engineering and water conservancy and hydropower power engineering still exist in the two major directions, that is, the module of professional direction elective course is limited in the elective course. This structure design maximizes the utilization rate of teaching resources, makes different disciplines (including professional direction) contact, penetrate and influence each other, and provides a new exploration path for the later renewal of teaching plan.

Deepen the curriculum and content of the latest technological development. Under the strong impetus of science and technology renewal, modern electric power engineering is accelerating to realize the automation and intelligence of production. With the development trend of high technology and high quality in modern industry, many domestic enterprises like power plants and hydropower stations use different levels of computer monitoring system to monitor and manage production. The inadaptability of engineering education limits the cultivation of talents in China, which cannot meet the needs of engineering production. Technicians have a certain understanding of energy and thermal sources and power engineering, but they are unfamiliar with the field of automatic monitoring. In the teaching plan of the new major, the theoretical training links of engineering monitoring are added, such as power plant detection system, intelligent instrument, computer monitoring and other courses, so that the teaching plan of the new major is more in line with the latest progress of science and technology, and more able to meet the needs of professional training, making it dynamic and fresh.

5. Conclusion

The major of energy and electric power engineering is oriented by the development of the industry and social needs, and adheres to the teaching reform and practical

exploration according to the development and changes of the industry. Facing the new industrial revolution, the construction of undergraduate course system in the field of new energy will reshape the course structure, enrich the course content, optimize the whole course system, integrate the cutting-edge knowledge of new energy technology, power plant manufacturing and sales, and build an intelligent public service network course system, so as to lay the educational foundation to cultivate a large number of high-quality innovative talents with solid foundation, excellent ability, strong adaptability and comprehensive development ability. It leads the development of the new industrial revolution, perfectly meets the great challenges of the new industrial revolution, and becomes the "leader of the post energy economy era" on the express of new industrial revolution.

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