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NATIONAL DEVELOPMENT IN THERMAL ENERGY & POWER ENGINEERING CHARACTERISTIC SPECIALTY

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Abstract—According to the demand of the power and refrigeration industry, the theoretical and practical teachings of the Thermal Energy and Power Engineering characteristic specialty in china are studied. The teaching reform and practice of the Thermal Energy and Power Engineering specialty have been carried out, including construction and reform measures, teaching reform and practice, features, and achievements. Proved by practices, the theoretical and practical teaching effects are obvious. The study results can provides certain reference experience for theoretical and practical teachings of the related specialties in china.

Keywords—Theoretical teaching, practical teaching, Thermal Energy and Power Engineering, characteristic specialty, teaching reform.

I. INTRODUCTION

IN recent years, the enrolling scale of colleges and universities has enlarged continuously. However, the relevant teaching methods and resource are lagged behind, especially the teaching models, methods and plans of the Thermal Energy and Power Engineering specialty; they mostly follow the same pattern which makes the top-notch innovative talents lacking to some extent. In order to solve the above-mentioned problem, it is necessary to emphasis the theoretical and practical teaching of the Thermal Energy and Power Engineering characteristic specialty. In recent years, we have made lots of researches and practices on how to effectively emphasis the characteristics of our major and train the urgent need talents. In order to keep to the scientific concept of development and the open-school concept, for national and local socio-economic development needs, based on social status and demand trends of talents, according to the school location, we adjusted direction of the college and amended the training schedules. On the basis of maintaining the basic objective and the training talents standard, we further optimized the content of the curriculum and teaching, and strengthened the practical teaching. In order to improve the quality and effectiveness of talents training, and the competitiveness of

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talents; to raise the overall level of major construction, we should pay attention not only to basic theoretical teaching, but also to practical ability teaching; not only made students to grasp the basic theory, basic knowledge and basic skills, but also made them have the ability of innovation, creativity and entrepreneurship [1].

II.CONSTRUCTION AND REFORM MEASURES

A. Established and Formed the Personnel Training Research Mechanism

According to the national demand for talents to develop and adapt the different major direction of modular and hierarchical training programs, through the School Board on a regular basis to carry out energy power, power generation (thermal power, gas power, wind power and nuclear powered.)And environmental protection and other related professionals in demand in the research and graduate employment status of discussions and analysis, established and formed a personnel training research mechanism [2].

B. Basic Theory Research and Practicality Applications The second classroom is an indispensable organic part in the educational system in universities. Now it had be taken as an independent classroom, complementary to the first classroom and built into a wide and firm platform for quality education. In order to strengthen the students' practical ability, we establish the opening and optimized management systems of laboratory. The open laboratory will stimulate our students to active for making some products themselves, to improve their innovative and confidence ability. The students are awarded in relevant contests which is true recognition of our teaching reform [3].

III. TEACHING REFORM AND PRACTICE

The twenty-one century is a rapid development age. The science and technology is a key factor of sustained and rapid development for the developing countries like china which the knowledge of laborers is relatively scarce. The technology application is an important process of transforming science and technology into productive forces, and the application effect depends largely on the first-line technical personnel quality. At present, the professional quality of the first-line skilled personnel in China is generally low. It is a barrier for the application and development of science and technology. In China, the requirement for technical personnel has been raised for joining in WTO and economic globalization trend. Due to the gap between training goal, training mode and students' skills of the Thermal Energy and Power Engineering characteristic specialty, and the social demand of the national electricity, refrigeration and air-conditioning industry, the following shortcomings of the knowledge and ability structure of the first-line technical staff and the graduate in recent years have been existing. The skill is not prominent. The graduate students who recently graduated from schools seem to know something, or could do something, but it is not sure for the graduate whether it is correct. Especially it is difficult for them to

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complete some comprehensive operation independently. The skill is not enough. The graduate may be competent of some work, but it is difficult to meet the demand of the employing unit for the multi-skill and compound talent. For example, engineering builder could be better to complete construction management, but the project budget or the engineering design has been completed by others. The self-study skill is scarce. It needs a long process to obtain new knowledge and technology, and the depth is not enough. The self-development ability of the graduate is often inadequate. The teaching reform of the Thermal Energy and Power Engineering characteristic specialty becomes necessary for the talent demand of the refrigeration and air conditioning industry and the current situation of higher education, and it is also the basis and power of the teaching reform of the Thermal Energy and Power Engineering characteristic specialty.

IV. FEATURES OF THE SPECIALTY

With the direction of the national energy development need, Thermal Energy and Power Engineering specialty derived a number of new professional and academic orientations, and will continue to strengthen the content, expanding extension, to meet national electricity and refrigeration industry for energy needs.

A. Specialty and Industry Characteristics

Thermal Energy and Power Engineering specialty has a distinct "Thermal Energy and Power Engineering" specialty characteristics and the "the power and refrigeration industry" features. The graduates' once employment rate is more than 98%; graduates for "style of solid, hands-on ability, stronger enterprising spirit" access to the energy power industry and other employer's praise [10].

B. Supporting Large Power System

In 1985, the Thermal Energy and Power Engineering specialty did research around the direction of "thermal power plant pollution control processing", and derived environmental engineering profession. In order to meet the demand of national and international strategies in the energy sector, Thermal Energy and Power Engineering specialty support and derived building environment and equipment engineering, water conservancy and hydropower project, wind energy and power engineering, nuclear technology and other professional direction, and make the school's discipline system from a thermal power as the core, extended to the set of thermal power, hydropower, nuclear and wind power. Therefore, supporting and forming Large Power System, which further enhance the school services in national energy capacity and level [11].

V.UNDERGRADUATE TRAINING SCHEME

A. Program Objective

Thermal energy and power engineering specialized student should master elementary knowledge about energy and power science and engineering, such as thermal power machinery and equipment, refrigeration and air conditioning equipment and so on. The graduates for this major should have the abilities of scientific

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research, technical development, equipment design, and management in different areas as power, refrigeration, chemical, medicines, light industry, environmental protection and machinery.

B. Program Requirement

The students should learn the thermal energy and power engineering elementary knowledge, master the basic theory and technology of energy conversion and utilization, power engineering and engineering, dynamic mechanical and thermal equipment design. The graduates should obtain some knowledge and abilities as follows:

 Master the basic theory and basic skill of thermal energy and power engineering;

 Have the design ability of thermal energy and power engineering, fluid engineering, chemical engineering equipment and control technology;

 With the preliminary ability of research and development, innovative design, project cost evaluation and investment decision-making of heat and power plant;

 Have the basic knowledge and skill of heat and power plant design, research and development, environmental protection and fire safety and other aspects of the guidelines, policies and regulations;

 Master the method of literature searching and information query, have the abilities of scientific research, scientific paper writing and practical work;

 Master one foreign language, and have the abilities of listening, speaking, reading and writing;

 Have the ability of innovation and new knowledge obtaining.

VI. MASTER TRAINING SCHEME

A. Masters of Engineering

 Goals

The department aims to train professionals with a strong foundation of fundamental theory, professional knowledge, and the ability to independently implement scientific research, teaching and engineering project management.

 Program Length

The Master's program requires 2-3 years.

 Subject Areas

The primary master's programs are in Thermal Engineering and Engineering Thermo-physics, the first category, Engineering, Coding as 080700. The branches including thermo-physics, thermal engineering, power mechanics and engineering, and fluid power machinery.

 Training

All master's candidates have major professors that mentor the students as they take courses and complete an independent research project that culminates in the writing of their master's thesis.

The master' s degree candidate must complete no less than 23 credits of courses (with at least 19 credits in courses that require examinations) including 5 credits of general compulsory courses and no less than 16 credits of major courses and 2 credits of literature.

VII.CONCLUSION

In this paper, aimed at training students' innovation ability and comprehensive ability of the Thermal Energy and Power

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Engineering characteristic specialty, the reform and practice from professional training objectives, curriculum system setting, graduate specification, practice teaching base construction, teaching faculty construction, and the reformation of teaching method and means have been carried out. The specialty cultivation objective has been adjusted. Combined with the actual situation of students training, curriculum system has been made a major adjustment. The construction of practice base has been strengthened. The practice base in campus and the off-campus practice base have been constructed. The teaching means of adopting multimedia and projector have been promoted. The heuristic teaching has been adopted, and the teaching methods have also been enriched. Through our unremitting efforts, we firmly believe that Thermal Energy and Power Engineering characteristic specialty will have the international influence in the thermal dynamic field, and training more energy and power field talents for the country.

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