

Research on Teaching Reform Mode of Water Supply and Drainage Science and Engineering Major

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Abstract: This paper first puts forward an overview of water supply and drainage science and engineering (training objectives, courses, employment destination); secondly, the water supply and drainage science and engineering professional education is investigated; finally, according to the results of the investigation, the water supply and drainage science and engineering professional teaching reform measures are proposed for reference.

Keywords: Water supply and drainage science and engineering major; Teaching reform; Measures

Introduction

At present, there is a phenomenon of “total credits” and “total hours” in colleges and universities in my country. This requires colleges and universities to further deepen teaching reforms, focus on the fundamental tasks of Lide, and strengthen the path of teaching material construction to improve water supply and drainage. The teaching effect of science and engineering education ensures that high-quality and high-skilled professionals can be delivered to the country.

1. Overview of Water Supply and Drainage Science and Engineering Major

1.1 Training objectives

This major cultivates talents with comprehensive development of morality, intelligence, physical, beauty, and labor, and has a good foundation in humanities and natural sciences; has strong basic theoretical knowledge of water supply science and engineering, and strong engineering application skills; it can be solved The practical ability of urban water engineering problems can rationally use water supply knowledge to discover, analyze and solve related water engineering problems.

1.2 Major courses

The professional education and teaching courses mainly include water quality analysis, aquatic biological treatment, engineering mechanics, hydrogeological survey (engineering), pumps and pumping stations, water resources utilization and protection, water supply system, building water supply engineering, water process equipment maintenance and repair, Water supply instrument control, etc.

1.3 Employment destination

Graduates can carry out planning and design in the fields of urban construction, construction, environment, water resources, real estate, etc., or engage in technical management work such as supervision and construction, as well as education, teaching, scientific research and development. Graduates of this major work in design and research institutes, environmental engineering companies, construction supervision companies, water supply plants, sewage treatment plants, municipal engineering and other enterprises. In recent years, the supply of student employment has exceeded demand, and the social response has been good.

2. The water supply and drainage science and engineering professional education research

According to the work plan of the “Water Supply Science and Engineering Professional Steering Committee” (hereinafter referred to as the “Education Steering Committee”) of the Ministry of Education in 2018-2022, in the process of further promoting the education and teaching reform of this major, it is necessary to understand the water supply and drainage science of various universities

in my country Only after the basic situation and education situation of engineering majors can targeted education reform practical measures be carried out. For this reason, the basic conditions and teaching conditions of colleges and universities are investigated.

2.1 Basic Conditions for Running Schools

2.1.1 The situation of the teaching staff

(1) Number of teachers. According to the survey on the construction of teaching staff in various universities, it is found that the number of teaching staff in various universities varies greatly, with 25 universities with 5 or less, 64 universities with 11-20 people, 28 universities with 21-30 people, and 8 universities with more than 31 people.

(2) Age distribution of teachers. In the teaching staff, the age of 24% teachers is less than 35 years old, the 47% is 36-45 years old, the 27% is 46-60 years old, 2% is 60-60 years old, the backbone is 36-45 years old teachers, the age structure of the teaching staff is reasonable.

(3) The distribution of teachers' academic qualifications and professional background. In all colleges and universities across the country, teachers with postgraduate and doctoral degrees account for 89%, of which doctors account for 56% and graduate degrees account for 33%. The overall teacher education level is relatively high and the structure is balanced. From the statistical results, independent colleges and local colleges and universities, especially the lack of professional teachers, have a great impact on the quality of teaching in schools.

2.1.2 Conditions of Practice

From the laboratory scale, the number of experiments, signed practice base and other aspects, we can see the practice conditions of this major. According to relevant data, it covers an area of 500-10,000 square meters, with a minimum of 60 square meters. Most of the experimental projects are 20-30, with a minimum of 6. Most practice bases range from 5 to 30. Although there are differences in the understanding of statistical caliber and laboratory area among universities, in terms of the construction of experimental bases and the relative situation of experimental conditions, poor universities also meet the minimum requirements for experiments and practices proposed by Chinese standards.

2.2 Basic Situation of Teaching

In education and teaching, the credit requirements for major colleges and universities are between 170-175, with the lowest being 150 and the highest being 203. The core curriculum of each university basically conforms to the knowledge points in the "national standard". Textbooks for key discipline selection plan account for 90% ~ 100%; The ratio of graduation design/graduation thesis in most colleges and universities exceeds 90%, and the lowest is 40%. On the whole, the basic teaching conditions of this major in our country's colleges and universities have reached the requirements of "national standards".

Through analysis, it is found that according to the orientation and characteristics of the school, each university has clear credits and hours in the teaching plan, and its calculation methods are also different ^[1].

In terms of graduation design (thesis), some universities have a small number of graduation designs/thesis, which is related to the relatively weak professional teaching staff. Although the content of water supply science engineering has been extended to the field of science, but this major as a traditional engineering major, this paper suggests that colleges and universities should require undergraduates to complete the graduation design, in order to cultivate their practical ability, so that they can achieve the basic ability of engineers. At the same time, in order to increase the proportion of graduation design/thesis, the training of young teachers should be strengthened to cultivate the practical working ability of young teachers. Through the training of young teachers in design institutes and operating enterprises, they can actively participate in the actual engineering design, so as to continuously improve their practical engineering operation ability ^[2].

3. Teaching Reform Mode of Water Supply and Drainage Science and Engineering Major

3.1 The fundamental task of establishing morality and cultivating people and promoting the standardization of professional education

First of all, teachers need to clarify the fundamental task of Lide Shuren, with students as the core, cases as the main line, and ideological and political as the soul to complete the teaching design of this major. Here, teachers also need to combine domestic and international professional development trends, choose engineering examples with warning significance and appeal, and use positive and negative selection methods to describe and analyze examples in actual projects, and reveal specific ethical and moral dilemmas. problem.

For example, teachers can use MOOC resources to select representative and time-sensitive engineering examples, based on

supporting important knowledge points in the project, and broadcast them in the form of video tapes, and guide students to think carefully in a logical form. Stimulate students' initiative, improve their thinking ability, and improve the credibility of their teaching. Secondly, this major has the characteristics of large investment, many participating units, high level of science and technology, complex technology, and high risk in practical engineering. For this reason, teachers should make students of this major realize that becoming a qualified engineer requires a huge responsibility. Social and environmental protection responsibilities, and engineering ethics is the "good start" of this major, and it is also a key lesson for students to shape engineering value and ethical awareness. Then help students to establish a correct world outlook, outlook on life, values, enhance their sense of responsibility, reduce the cost and risk of career, so that college students from one day to become a qualified engineer, to make a positive contribution to the society.

Finally, in the process of education reform, teachers can teach the basic theories of engineering ethics in accordance with the requirements of the 2018 Academic Degrees Office of the Ministry of Education, and guide students to take the safety, health and well-being of the public as the first priority, and implement green and sustainable engineering ideas. In this way, under the adherence and focus on the concept of comprehensive education, we can truly promote the standardization of professional education.

3.2 Continue to carry out the construction of high-quality teaching materials to help improve the quality of teaching

First of all, the connotation of water supply and drainage science and engineering is increasingly rich, and its scope is also expanding. Its research object has also expanded from municipal infrastructure to the social cycle of water. Therefore, in view of the educational reform measures of this major, colleges and universities need to continue to carry out the construction of high-quality teaching materials. According to the main tasks faced by my country's water conservancy and hydropower engineering majors, the content of the teaching materials will be changed from "based on water quantity" to "equal emphasis on quality and water quantity, and centered on quality. Secondly, while continuing to promote the construction of high-quality teaching materials, colleges and universities should transform basic courses in mechanics, biology, hydraulics and other majors into modern biological engineering, chemical engineering, material engineering, etc., and gradually develop the latest research results to high-tech To ensure that it can form its own discipline theory system and engineering technology system.

Conclusion

The above discussion puts forward the direction of water supply and drainage professional education reform from the aspects of curriculum professional construction and reform ideas. With the continuous improvement of professional construction, the employment situation of students will be more clear. It not only broadens the professional caliber, but also provides students with a multidisciplinary interface, and truly achieves the educational reform goal of building a national-level first-class undergraduate major.

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