

# ***The Construction of High-Quality Courses Promotes the Improvement of Teaching Quality and the Cultivation of Practical Ability in Application-Oriented Colleges and Universities—Taking the Course "Water Resources Planning and Utilization" as an example***

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**Abstract:** The construction of high-quality courses is an important part of the teaching construction and teaching reform in colleges and universities. At present, reforming the old curriculum system and constructing and developing new subject curriculum systems have become the mainstream calls for the construction of various disciplines. Curriculum construction is an important part of teaching construction, and the basic role of curriculum construction in professional and discipline construction must be highlighted. Taking the course "Water Resources Planning and Utilization" as an example, this paper discusses in detail how the construction of excellent courses promotes the improvement of teaching quality and the cultivation of practical ability in application-oriented colleges and universities. Research provides reference.

As one of the basic factors determining the quality of teaching, curriculum design is an important part of the professional construction of colleges and universities. In order to improve the quality of teaching and deepen the reform of the education system, the Ministry of Education has formulated the Action Plan for Teaching Quality and Teaching Reform in Higher Education Institutions. One of the key factors is the establishment of a high-quality curriculum system, that is, the construction of excellent courses. According to the documents of the Ministry of Education, the selection criteria for excellent courses are exemplary courses that need to combine excellent teachers, first-class course content, teaching methods and resources, first-class teaching materials and first-class teaching management methods.

## 1. The Meaning and Current Situation of the Construction of High-Quality Courses

### 1.1. The Meaning of Excellent Course Construction

The purpose of establishing a quality curriculum system is to gather high-quality educational resources, improve teaching quality, and provide students with the highest quality education possible. In this environment, teachers can also use them in a wider context to improve their own teaching ability. Excellent courses integrate the advantages of various educational reforms, improve the level of curriculum informatization, and strengthen the close connection between scientific research and teaching. Its purpose is to train highly qualified professionals to meet national and local development needs. High-quality curriculum construction is an important part of teaching reform and improving teaching quality in higher education institutions. A modern human-centered approach to education [1].

On April 8, 2003, the Ministry of Education mentioned in the "Notice on Starting the Construction of Excellent Courses of Teaching Quality and Teaching Reform Project in Colleges and Universities" that a three-level excellent course system should be established in colleges and universities, provinces and cities, and the country. In 2003, the Ministry of Education launched a national program to improve curriculum quality, including courses on curriculum planning, personnel development, curriculum content and system, teaching methods and resources, writing teaching materials, and building practical teaching bases. In 2010, a total of 3,910 high-quality courses were completed, opening up a large number of high-quality teaching resources for colleges and the society. In 2011, the Ministry of Education began to formulate national high-quality open courses, including courses for improving video quality and high-quality courses for sharing resources. In 2016, 992 high-quality video courses and 2,886 high-quality resource sharing courses were provided. The high-quality curriculum resources intersect the ordinary curriculum system is more systematic and comprehensive, and it is an update of the original curriculum. The goal of quality curriculum construction is to use modern information technology to jointly build and share high-quality teaching materials, promote the opening of higher education to the society, and jointly improve the quality of teaching. The establishment of national quality courses has greatly promoted the reform of higher education and university courses, improved the quality of teaching, and made up for the relative shortage of teaching resources in mass education to a certain extent [2].

### 1.2. Current Situation of Quality Course Construction

From 2003 to 2010, the Ministry of Education introduced high-quality programs in the course evaluation process for eight consecutive years, and selected 3,910 national-level high-quality courses from different higher education institutions. From 2012 to 2015, a total of 781 high-quality video open courses and 3,922 high-quality resource sharing courses were selected nationwide. Among them, there are 2450 undergraduate courses, 1112 junior college courses, 160 online courses, and 200 teacher training courses (see Table 1) [3].

*Table 1: Batch and quantity of national high-quality video open courses (2012~2015)*

batch	1	2	3	4	5	6	7	total
Approved time	201204	201212	201305	201311	201404	201410	201504	/
Approved quantity	43	62	139	121	121	137	158	781

At present, colleges and universities are market-oriented, take the road of combining school and enterprise, and scientific research, and have cultivated a large number of high-quality talents

welcomed by the society. However, there is still a large gap between the quality of school work and social needs. Judging from the current situation of curriculum development in the vocational training office, there are many problems at present. It is urgent to strengthen curriculum design and improve the quality of education. In the vocational education system, teachers mainly carry out content elaboration, and students follow the classroom content for theoretical learning, and the curriculum model that allows students to lead the classroom and strengthen students' practical ability is rarely substituted into the curriculum system. A considerable number of teaching staff in higher education institutions join higher education institutions immediately after graduation, and they lack practical experience [4]. Sometimes proficiency instruction is not available, although they expect students to do more. Through the high-quality development of the curriculum, teachers not only have extensive theoretical knowledge, but also actively improve practical teaching methods in various subjects. Teachers must master new technologies, methods, and techniques that are required by current businesses. In order to increase the proportion of high-quality teachers, improve the structure of teachers in colleges and universities, and adapt to the current trend, theoretical and practical teachers should be combined and help each other [5].

## **2. Current Situation of Course Development of "Water Resources Planning and Utilization"**

### **2.1. Course Teaching Content**

With the rapid development of water resources management and higher education and the strengthening of education and teaching reform, my country's water resources management field has also been significantly expanded and improved. In order to meet the requirements of the new curriculum for water resources planning and overall economic development, the National University Water Resources Management Steering Committee was established to train water resources planning engineers.

It is a breakthrough attempt to convert the course "Water Resources and Water Energy Planning" to "Water Resources Planning and Utilization". expansion. This course is designed to provide students with the theoretical foundations of engineering and the fundamentals of water resources planning, development and utilization based on an understanding of the hydrological foundations of different professional fields. Main training directions: comprehensive planning of water resources, assessment of water resources, urban water supply, analysis and rational allocation of water resources, comprehensive utilization planning of reservoirs and management of technical benefits, planning of flood control and disaster reduction, and hydropower planning. River water resources utilization and comprehensive utilization planning, reservoir construction scale and water resources management system, engineering infrastructure calibration and analysis, mastered the basic analysis methods and basic training courses of water resources leveling calculation, planning and management in advance. The training focuses on cultivating trainees' technical ability and basic skills in applying knowledge and technology in complex technical issues such as water resource planning, development and utilization, and training trainees' innovative ability. Adapt to the development of teaching practice.

### **2.2. Course Teaching Objectives**

The content of "Water Resources Planning and Utilization" is very broad, and through reasonable teaching methods, it can achieve a balance between theory and practice. This course focuses on laying a good foundation for students' subsequent practical training. At the end of the

course, students must meet the following basic requirements: (1) Ability to manage integrated water resources and coordinate conflicts between departments. (2) The planning, management and utilization of water resources have comprehensive basic theories and knowledge, including the main characteristics and characteristics of different water supply sectors, main technical construction activities, promotion and profit control, and basic principles of flood control. (3) Possess basic analytical and problem-solving skills. The main content is to select parameters and reservoirs and hydropower stations that determine the type of urban natural resource planning. It includes the basic concepts and principles of comprehensive utilization of water resources, the balance of water supply and demand, the analysis of water resources characteristics and storage capacity, and the rational selection of hydropower capacity.

### 2.3. Current Situation of Course Teaching

#### (1) Course content to be updated

The computational methods in the "Water Resources Planning and Utilization" course have not been replaced by new software modules and are widely used, some of which are out of touch with current engineering practice. Some of the latest water statistics from 2000 do not match the rules for water development. The update of course content is lagging behind, and students are not active enough in learning. Practical courses can no longer meet the needs of industrial development in the new environment. From the perspective of course content, the course structure is outdated, the class time is short, the course content is not updated in time, and the teaching process lacks the time to fully grasp and master practical knowledge. Students lack an understanding of practice and an understanding of current industry developments. Practical courses are designed to give students the opportunity to become familiar with practical issues and professional development. However, the existing scheme can no longer meet the needs of industrial development in the new environment, and the practice is too old. At the same time, the learning and training time is short, and the practical knowledge is easy to lack and lag, which is not conducive to the rapid integration of high-quality hydrological experts in the new situation [6].

#### (2) Teaching methods and teaching methods are single

In the classroom, teachers often use cramming teaching methods to let students passively accept the classroom content, especially basic theories and examples, ignoring students' ability to learn independently, which is not conducive to students' learning motivation and motivation, and is not conducive to students' positive thinking, is not conducive to the combination of theory and practice. At the same time, the teaching process mainly uses slides, pictures and other materials, ignoring the application of the network information platform, resulting in a single teaching method, which is not conducive to the communication and discussion between teachers and students.

#### (3) Talent training goals are not clear

The planning and use of water resources is based on actual water conservation projects, both in the planning phase and in the operational phase. Students lack opportunities to participate in engineering practice, lack of understanding of water conservancy engineering, students have difficulty in learning, poor understanding ability, and limited opportunities to flexibly apply knowledge. The planning and use of water resources have no clear human resource development goals and are separated from social needs. Especially since the 1990s, with the development of social economy, the problems of water shortage, flooding, natural disasters and environmental pollution have become increasingly serious. It has become one of the key factors restricting the social and economic development of our country. However, because the original content of the

course "Water Resources Planning and Utilization" is still based on traditional engineering hydrology, students' knowledge structure and comprehensive ability can no longer meet the needs of modern social development. The training courses for water resources planning and utilization lack innovation, and the training content for students is relatively simple [7].

### **3. The Construction of High-Quality Courses Promotes the Development of the Course Teaching of "Water Resources Planning and Utilization"**

The link between theory and practice is the basis for professionalization in the workplace. If students want to master a specific knowledge point, they should first understand why they want to learn the knowledge point and how to advance the knowledge point, and then further explore how to apply theory to solve practical problems. In this way, students can understand why they want to study and what they want to master and use theoretical knowledge for. The course "Water Resources Planning and Utilization" is mainly aimed at reservoirs and hydropower stations. It changes the traditional language-centered teaching method in teaching methods and enriches the teaching content by using multimedia materials.

During the teaching process of engineering, students can improve their understanding of real projects through engineering images or animations. Taking the Three Gorges Project, the North-South Project, and the dammed lake project as examples, the laws of runoff heterogeneity can be explained in combination with images and related data. In the teaching process, flood prevention images and videos can be combined to deepen students' impression of the importance of subject learning, learn to overcome risks, improve efficiency, and mobilize learning motivation. Before entering this course, students must have some understanding of hydroelectric power plants and reservoirs. Therefore, in teaching practice, it is necessary to build a bridge to have a general understanding of hydropower stations [8].

#### **3.1. The Construction of High-Quality Courses Promotes the Improvement of the Teaching Quality of the course "Water Resources Planning and Utilization"**

Excellent courses require the arrangement of teaching links according to the main teaching objectives of the course, and according to the particularity of the course content, the effect of the course must be considered in the course implementation process, so that students can fully understand the main content of the course. Induction, induction and comparative analysis can be used in the teaching process. The introductory course combines technical examples to introduce the basic elements, teaching knowledge base and research content of hydraulic engineering, and give full play to the advantages of hydraulic engineering. By introducing the content of measures such as flood control, growth promotion, and power generation, the calculation principles and methods of different factors are compared and analyzed, and the similarities and differences of each part are found out. Fundamentals and fundamentals are then combined into a comprehensive body of knowledge that makes it easier to accept and understand. The use of multimedia materials makes it easy to access information. Through multimedia, students can master the latest scientific research results, fill the gaps in students' practice, and facilitate theoretical interpretation and mastery. In the classroom, teachers should pay attention to the combination of blackboard writing and multimedia, and use the blackboard to write complex and important theoretical conclusions and calculation results, so that students can analyze, understand and record. It is also necessary to strengthen the communication between teachers and students. Teachers should review their homework and answer students' questions in a timely manner after class. Answer frequently asked questions from students

to deepen their impressions. At the same time, it expands communication with students through recess, understands students' learning environment, and continuously improves students' teaching methods and motivates students' learning motivation according to students' feedback.

### **3.2. The Construction of Excellent Courses Promotes the Development of Students' Practical Ability in the Course "Water Resources Planning and Utilization"**

Under the high-quality curriculum system, colleges and universities actively seek out more high-quality resources to enrich their curriculum system. Through the analysis and study of the "Water Resources Planning and Utilization" course of European universities, it is not difficult to find that universities in Europe will use water resources. The issues of integrated resource management are divided into two categories: natural science and social development. The model emphasizes that water resources development is an integral part of nature and society. In the training course, students understand and analyze water resource management issues, with specific teaching methods and little time spent. Therefore, in the teaching process, there are many interactions between teachers and students. Students often ask strange questions, and although some seem simple, teachers are willing to study and discuss with students for a long time, focusing on inspiring students to discover and analyze problems. Integrate knowledge and experience during discovery and analysis, and find solutions to problems through own research and discussion. In the field of water resource management, domestic universities can use relevant experience to allow students to correctly calculate, analyze and evaluate existing problems [9].

### **3.3. The path to Promote the Teaching Development of "Water Resources Planning and Utilization" by the Construction of Excellent Courses**

#### **(1) Strengthen the construction of high-quality course teachers**

The quality of a high-quality course depends to a large extent on the quality of the work of the teaching team. Due to the problems in the development of high-quality curriculum, each school can form a teaching staff. As an important member of the teaching team centered on the core members of the school, the school has established a curriculum design team to be responsible for the implementation of the project and fully mobilize the enthusiasm of the collectives to build the school. Therefore, with the cooperation of colleges and universities, the increase of high-quality course resources is regarded as an educational science activity, starting from the compilation of teaching materials, the formulation and reform of teaching methods, etc., to give full play to the advantages of colleges and universities, and obtain more. Play a leading role in the construction of internal communication equipment in colleges and universities, and play a demonstration and leading role in skill courses [10].

#### **(2) Improve the practical curriculum system**

In order to cooperate with the comprehensive science and engineering research and training plan based on experimental design and curriculum development, it stipulates the requirements for cooperation between colleges and training institutions in professional practice before graduation, and establishes a set of cognitive and active phased implementation of institutional training. Students' creativity and practical ability. Training courses, comprehensive courses and engineering technology courses are the modules of advanced courses. The training plan matches the basic professional courses, canceling the theoretical and experimental forms of the original basic courses, and the comprehensive training plan matches the small system design. Engineering courses are offered as sponsors of architectural programs, who can be viewed as mentors or "dual-qualified"

teachers; reform graduate and graduate school design teaching practices, optimize design, and encourage students to consider technical issues arising in practice as graduate school. The subject of the design, changing the form, enables graduates to conduct publicity, mentoring and mid-term review of the design, oral defense arguments and other relations are left to the company to complete. When formulating the practical curriculum system, on the one hand, it is necessary to strengthen the interaction and cooperation with professional schools, enterprises and governments in the formulation of curriculum content and standards; and intellectual resources, establish a talent development model based on students' professional skills, and ensure the supply and demand relationship of talent education.

### (3) Combined with the supporting reform of the teaching management system

From the very beginning, the construction of high-quality courses has been inextricably linked with the Honor Award. The state encourages outstanding university teachers to participate in the development of excellent courses by selecting courses and conferring honorary titles. For example, in the national training program for effective resource sharing, the Ministry of Education selected, defined and designated the title of "National Excellent Resource Sharing Course" based on the evaluation of network resources and the social response of professionals, which is valid for 5 years and gives financial subsidies [11].

The construction of quality courses has been associated with honorable mentions from the very beginning. The state encourages outstanding teachers of institutions of higher learning to participate in the construction of excellent courses by selecting excellent courses and conferring honorary titles. For example, for the national excellent resource sharing course, the Ministry of Education selects, determines and grants the title of "National Excellent Resource Sharing Course" based on the evaluation of network resources and the social response of experts, which is valid for 5 years and provides financial subsidies. At the same time, universities are encouraged to develop incentive policies to assist teachers to actively participate in teaching and training, and to develop programs to share quality resources. The effectiveness of high-quality curriculum design is one of the indicators for the evaluation of related disciplines. Therefore, most colleges and universities attach great importance to the establishment of state-funded selection programs, and formulate corresponding management measures for the construction of selection programs. The honorary titles at the provincial and national levels are used as incentive policies for teachers to award titles, which can stimulate teachers' motivation to develop high-quality classroom teaching.

## 4. Conclusion

On the whole, the concept of resource-based quality curriculum construction promotes the transformation of ordinary classrooms from closed ordinary quality courses to student-centered high-quality courses, which reflects the gradual enrichment and strengthening of the course "Water Resources Planning and Utilization". Changes in students' practice content. From the application of information technology to the improvement of teaching, to the integration of information technology into the teaching process, this is not only the result of the development of information technology, but also the result of the transformation of teaching concepts. The essence of education is to follow the laws of education, advocate student-centered, analyze students' characteristics, make rational use of technology, and provide students with more effective learning resources and development conditions.» The course not only improves the teaching quality of teachers, but also enhances the practice level of students.

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## References

- [1] Liu Huahua, Xu Ying. *Practice and research on the construction of online high-quality open courses for vocational education*. *Science and Technology and Innovation*, 2022(06): 129-131+138.
- [2] Zhang Xuehui. *Construction and research of PLC control technology quality courses*. *Electronic Testing*, 2021(14):113-115.
- [3] Fang Guohua, Huang Xianfeng. *Teaching Reform and Practice of the Course "Water Resources Planning and Utilization"*. *Green Science and Technology*, 2020(23):196-198.
- [4] Lu Xiaoyan. *Research on the construction of teaching teams for high-quality courses in colleges and universities*. Henan University, 2020.
- [5] Huang Cao, Long Yuannan, He Sichong. *Thinking and Exploration of Course Ideology and Politics in the Teaching of Engineering Majors in the New Period: Taking "Water Resources Planning and Utilization" as an Example*. *Chinese Journal of Multimedia and Network Teaching (Early Issue)*, 2020(04):210-211.
- [6] Zeng Qingfan. *Utilization and Significance of Water Resources Planning and Management*. *Science and Technology Innovation*, 2019(18):131-132.
- [7] Dai Liyuan, Zhang Cheng. *Research on the application of OBE teaching mode in the course "Water Resources Planning and Utilization"*. *Shandong Industrial Technology*, 2019(10): 217.
- [8] Liang Xiaofang. *Investigation and Research on the Construction and Application Status of National Quality Courses in Higher Vocational Education*. *Research on Electronic Education*, 2016,37(05):87-91.
- [9] Zhang Jing, He Junshi. *Teaching reform and thinking of the course "Water Resources Planning and Utilization"*. *Science and Technology Innovation Herald*, 2015,12(03):128+130.
- [10] Wang Juan, Liu Mingzhuo, Zhu Zhiting. *Investigation on the application of high-quality courses in colleges and universities and its enlightenment to the construction of high-quality resource sharing courses*. *China Electrochemical Education*, 2013(12): 40-46.
- [11] Pan Aizhen, Shen Yushun. *Review and inspection of national quality curriculum construction*. *Higher Engineering Education Research*, 2012(03):141-145.