

# Research on water conservancy practice teaching reform

Qianlong Li, Wenli Zhang\*

Yunnan Vocational College of Water Resources and Hydropower, Kunming, Yunnan 650000

**Abstract:** the construction of modern society is inseparable from the support of water conservancy projects, and the social ecological environment also needs the sound protection of water conservancy projects. It can be said that the construction of water conservancy projects is closely related to the national economic development and ecological security. Under the background of the new situation, the state pays more and more attention to the construction of water conservancy projects, and puts forward higher requirements for talents related to water conservancy projects. They should not only have the relevant skills and knowledge of water conservancy project construction and operation management, but also have the skills required to meet the development of water conservancy projects. As an important place to deliver talents to the society, vocational colleges should clarify the development trend of the times, constantly improve the practical teaching system of water conservancy engineering, change the previous indoctrination teaching concept, actively adjust the teaching mode of the integration of theory and practice, continue to strengthen the reform of practical teaching, and promote students to move forward to practical higher technology applied talents, Cultivate professional water conservancy technical talents for social development, and ensure that students can have the business abilities required by future career requirements and development needs. Based on this, this paper analyzes the implementation strategies of practical teaching reform for water conservancy majors.

**Key words:** water conservancy; Practical teaching; Reform research

Introduction: practice is the essence of water conservancy project, and practical teaching is an important part of the teaching of water conservancy specialty. It can not only cultivate students' engineering practice ability and subject quality, but also help to strengthen students' cultural quality and physical and mental quality, and strengthen the reform of practical teaching can also help to exercise students' innovation ability. Water conservancy majors mainly study the theoretical courses of drawing, building structure, construction technology and other aspects required for the construction of water conservancy and hydropower projects, as well as the practical courses of engineering design methods, construction management methods and so on, and master the corresponding basic abilities of water conservancy and hydropower project survey, planning, construction management and so on through systematic learning. For students majoring in water conservancy, the participation of engineering practice training can help students form engineering thinking and accumulate engineering experience. However, practical teaching has been ignored by students and teachers for a long time, which is difficult to give full play to its due value, leading to the lack of students' application and innovation ability, and making students at a market disadvantage in the process of graduation and employment. Therefore, it is necessary for teachers in vocational colleges to clarify the school running orientation and talent training mode, reflect on the shortcomings of the teaching process in time, and adopt the teaching reform of combining theoretical teaching with practical teaching.

## 1. Deficiencies in practical teaching of water conservancy specialty

Practical teaching is a relatively weak part of the current education system in most higher vocational colleges. There are some problems in the actual implementation, such as unclear objectives, single teaching methods, and less practical opportunities. The water conservancy specialty is a professional discipline with strong practicality, which focuses on the cultivation and test of students' practical ability. The practical training can be divided into on campus practice and off campus practice. The former includes related curriculum design, scientific research practice, graduation design and so on; The latter includes professional cognition practice, post following (post) practice, etc. However, due to the influence of traditional teaching mode and other factors, it is difficult to effectively carry out practical teaching in the major of water conservancy and hydropower engineering. The main problems are as follows:

### 1.1 Limited opportunities to participate in internships

Water conservancy majors have limited opportunities to participate in practice, and few units and venues can participate in practice. In the off campus practice training, the main places where higher vocational colleges organize students to carry out the practice of water conservancy engineering are the reservoirs and irrigation areas in the region, and the graduation practice sites are mainly contacted and arranged according to the development of large and medium-sized water conservancy projects implemented in the region every year. However, it is becoming more and more difficult to carry out practical activities outside the school, which has seriously hindered the promotion of practical training. The main reasons for this situation are: on the one hand, under the current teaching fund management system, the practice funds of water conservancy specialty are insufficient, and with the development of social economy and the overall rise of price level, the input of practice funds does not increase, The internship arrangement is limited to the local relevant water conservancy project construction site. Under the background of continuous development and utilization of water resources, the number of large and medium-sized water conservancy projects that can be constructed is gradually decreasing, and the opportunities to participate in the training base are also gradually decreasing. On the other hand, because the professional internship can not directly participate in the actual work of the production unit and contribute to the internship unit, it is difficult for students majoring in water conservancy to find a suitable internship unit, and the internship unit is not willing to accept interns. And the cost awareness and safety awareness of internship units are constantly improving. It is not only necessary to avoid the impact of interns on the normal production order, but also to avoid the occurrence of safety

accidents in the process of internship, which will lead to the increase of management costs, and then reduce the enthusiasm of cooperation with schools and students.

### 1.2 Insufficient attention to practical teaching

The lack of attention paid by all parties to practical teaching is first reflected in the school. The school is limited by funds, and the investment in the practice of water conservancy specialty is insufficient. With the overall rise of the price level, the lack of funds is not only reflected in the investment in the practice of water conservancy specialty, but also seriously restricts the degree and effect of off campus implementation. The reform of practice teaching includes not only the reform of practice and practice methods, but also the reform of the assessment form of practice activities. However, most colleges and universities lack practical reform plans and implementation strategies. Secondly, it is reflected in the students' aspect. Due to the particularity of the professional practice, the environment of many practice places is high-quality, and many students' attitude towards the practice activities is with the element of playing. The degree of participation in the practice activities is insufficient, which is difficult to effectively achieve the teaching goal of practice teaching. Due to the lack of attention paid by schools and students to practice, it is difficult for practice teaching to play its due educational value and effect.

### 1.3 It is difficult for students to go deep into the actual production process

Water conservancy major has certain particularity, and its actual production process requires high professional skills, so it is difficult for students to go deep into the actual production process in limited time. Water conservancy projects often have a long construction period, most of which are based on years, but most of the students' internships take two weeks, so it is difficult to go deep into the real engineering practice in a short time. In addition, the construction site of the project is relatively complex, and there are many and complex large-scale machinery and equipment, so their practical experience is relatively shallow. There are many potential dangers for students who lack professional skills. Considering these factors, internship units and schools are not sure to let students directly participate in the practical production process. This leads to the fact that although the off campus internship activities organize students to visit and understand, they are affected by many factors, most of which are in the form of surface participation, which is difficult to form an effective training of professional practical skills. In addition, there are also some deficiencies in the construction of teaching staff. From the internal analysis, most teachers directly enter the university after graduation, and their time and energy are used in the participation of various scientific research projects. There are few opportunities to go deep into the field practice, that is, entering the internship site is difficult to guide the purpose and role of internship. Their engineering practice background and practical experience are relatively lacking, let alone teaching students practical skills and knowledge that can be directly applied to the job. From the external analysis, the higher threshold for teachers' access in Vocational Colleges makes it difficult for industry leaders with rich practical experience to enter the school to teach, which makes it difficult for professional teachers to effectively meet the practical needs of students, while high-quality personnel with practical experience in the industry do not have the teaching ability and are difficult to impart their own practical experience to students.

## 2. Implementation strategy of practice teaching reform in water conservancy specialty

### 2.1 Constructing practical teaching mode to promote the integration of knowledge and skills

Correctly solving the relationship between practical teaching and theoretical teaching and strengthening the mutual penetration of practice and theory are important conditions to improve the teaching effect. In the actual teaching process, teachers should pay attention to the effective integration of theoretical knowledge and practical skills training, strengthen the practical training in the theoretical teaching, and realize the practice while explaining, so as to realize the mutual integration and penetration of the two kinds of courses. For theoretical courses, in addition to strengthening the explanation of the corresponding part of practice, a single skill training part should be set up to promote the effective integration of the two kinds of courses. For practical courses, including construction technology, engineering survey, building materials and other courses, it is carried out in the form of mutual integration of explanation and practice, and integrated training courses such as production practice and simulation training are set according to the teaching schedule. Strengthening the integration of theory and practice will help students to effectively master and flexibly apply professional knowledge, and then achieve gradually increasing teaching effect. Therefore, in the overall curriculum arrangement, teachers should combine the specific connotation and knowledge structure of each course, and reasonably set up the practical teaching process according to the principle of progressive level by level, and divide it into four ability levels to carry out teaching: the first is the basic ability level. This level is mainly carried out by course experiments and individual exercises, which not only solves various professional training problems, but also lays a good foundation for students' training activities in the future. In terms of curriculum setting, in addition to basic experimental training courses and individual comprehensive training, it also needs to set up special technical courses, including building materials, computer applications and other courses, It is carried out in the form of combination of speaking and practicing. The second is the level of professional skills. This level focuses on the cultivation of basic skills and professional foundation required by students in the process of hands-on operation. Teaching is carried out through the school training base and professional training classroom. In addition to classroom teaching, students are encouraged to take the corresponding level certificate according to their own level. The third is the level of comprehensive ability. This level focuses on the cultivation and test of students' comprehensive ability, mainly through the school simulation training room, water conservancy project situation, field practice and other forms, so that students can make full use of their professional knowledge in participation, strengthen students' comprehensive ability in water conservancy project construction and quality inspection, and then improve students' employment competitive advantage. The fourth is the practical ability level. This level pays attention to the transformation of students' different identities, allows students to undertake a water conservancy project as a producer or manager in the activity participation, and strengthens

the accumulation of students' practical experience and management experience in water conservancy projects, which plays a key role in the development of students in their future positions.

### 2.2 Updating practical teaching methods to improve students' comprehensive ability

In the actual teaching, teachers should update the practical teaching methods in time to improve students' comprehensive ability, and first of all, realize the modernization of practical technology. Strengthen the construction of experimental training environment and teaching conditions, introduce modern and advanced teaching technology into practical activities, so that students can master professional knowledge and develop students' innovation ability under the conditions of modern technology. Secondly, we should improve the openness of practical teaching. Combining with the development of the times and innovating the talent training mechanism, we should not only focus on building an open reservation practice mode with the help of network information technology, but also promote students to go out of the laboratory and carry out practical activities in off campus practice base and actual water conservancy projects. Then we should realize the diversification of experimental means. With the continuous development of science and technology, more and more advanced technologies have been introduced into the teaching classroom. Teachers can make full use of multimedia technology, simulation experiments, practical experiments and other forms to carry out practical teaching.

### 2.3 Improve students' practical understanding and enrich the types of practice base

It is mentioned in the above content that at present, schools and students do not pay enough attention to practical teaching. In order to improve this phenomenon and enhance the correct understanding of the importance of engineering practice teaching among schools, teachers and students, we should actively make changes. First of all, starting from the school assessment system, the practical teaching content should be included in the teacher teaching assessment system, and the importance of the work of the internship instructor should be correctly understood to stimulate the enthusiasm of the instructor. Secondly, starting from the teaching content, mobilize students' correct understanding and attention to practice. Before the practice, students should be clearly informed of the reasons, fundamental purpose and importance of carrying out water conservancy engineering training, so that students can do their own practice and learning work on the basis of clarifying the specific content of the practice, so as to improve students' practice attitude and practice effect.

## Conclusion:

To sum up, under the background of the new era, the society puts forward higher requirements for water conservancy engineering professionals in the process of development. As an important place for transporting highly skilled professionals to the society, higher vocational colleges should strengthen the reform of practical teaching of water conservancy engineering. In this regard, vocational colleges should innovate the practice teaching mode, promote the integration of knowledge teaching and skill training, promote the improvement of students' comprehensive ability, strengthen the enrichment of the types of practice base, improve students' practical understanding, increase the introduction of modern technology and virtual simulation technology, and let students strengthen the improvement of comprehensive ability in the virtual environment, Promote the improvement of students' creative ability and learning enthusiasm, realize the effective integration of on campus resources and off campus teaching resources, and provide comprehensive skilled talents for the development of water conservancy engineering industry.

## References:

- [1] Qingyun Zhou,Nana Han,Yan Li,Songmin Li A preliminary study on the reform of Ideological and political teaching in the course of water conservancy engineering -- Taking the course of "water conservancy engineering" as an example [j]Journal of Tianjin Agricultural University, 2020,27 (04): 102-104
- [2] Yu Niu Exploration on the teaching reform of "1 + X" combination of education and training in Higher Vocational Colleges -- Taking the Yellow River Water Conservancy Vocational and Technical College as an example [j]Vocational and technical education, 2020,41 (35): 46-49
- [3] Yu Zeng,Jian Shen Analysis of the flipped hierarchical teaching mode of "large class teaching, small class discussion" -- Taking the course of hydraulic engineering cost in Higher Vocational Colleges as an example [j]Journal of Zhejiang University of water resources and hydropower, 2019,31 (02): 79-82
- [4] Rui Zhang,Yanting Gao,Jinghai Wang,Yindi Wang,Xia Zhao Practice teaching system and platform construction of "four levels and seven modules" -- Taking Agricultural Water Conservancy Engineering Major of Gansu Agricultural University as an example [j]Modern educational technology, 2017,27 (05): 115-121
- [5] Cui ping Kuang,Shuguang Liu,Guihui Zhong,Subin Cheng Experimental teaching reform and cultivation of students' Innovative Ability -- a case study of Department of hydraulic engineering, School of civil engineering, Tongji University [j]Laboratory research and exploration, 2012,31 (09): 86-88
- [6] Xinyu Zhang Practical analysis of teaching reform of water conservancy engineering drawing course [j]Educational Research (2630-4686), 2020(34): 2
- [7] Yunyan Chang Research on practical teaching reform of hydraulic engineering surveying [j]Shandong industrial technology, 2015 (5): 2
- [8] Ming Huang Research on practical teaching and performance evaluation methods of water conservancy and Hydropower Engineering [j]China Electric Power Education: China, 2014 (6): 3
- [9] Song Wei,Hui Wang, et al Discussion on practice teaching reform of water conservancy and Hydropower Engineering [c] / theory and practice of civil architecture education reform Wuhan University of technology, 2010
- [10] Liqun Luo,Jinchun He,Jian Liu, et al Discussion on teaching reform and practice of hydraulic reinforced concrete structure [j]Higher architecture education, 2017, 26 (2): 5
- [11] Tianliang Peng,Wenqun Tan,Hongfeng He Exploration and practice of teaching reform of water conservancy information and communication technology course [j]Theoretical research and practice of innovation and entrepreneurship, 2020 (2): 3

# Research on teaching reform of Higher Vocational machinery manufacturing major under modern manufacturing

Chengfeng Zhu

Guangdong Vocational and Technical College of Hotel Management, Dongguan, Guangdong 523962

**Abstract:** with the proposal of the “made in China 2025” strategy, the pace of transformation and upgrading of the national manufacturing industry continues to be rapid, and the industry has strengthened the demand for machinery manufacturing talents. This market situation has brought new opportunities and challenges to the teaching of machinery manufacturing major in higher vocational colleges. Modern manufacturing has led the transformation and upgrading of the manufacturing industry. As a place to deliver innovative and compound mechanical talents to the society, higher vocational colleges should pay attention to actively adjusting teaching according to the development of the times, building a new teaching mode, innovating teaching methods of professional courses, improving the curriculum system of Mechanical manufacturing, cultivating students’ high-quality professionalism and promoting students’ all-round development. Based on this, this paper analyzes the teaching reform strategy of Higher Vocational machinery manufacturing major under the background of modern manufacturing, in order to provide reference for educators.

**Key words:** modern manufacturing; Higher vocational education; Major in mechanical manufacturing; Teaching reform

Introduction: in “made in China 2025”, it is clearly stated that “the main line is to accelerate the deep integration of new generation information technology and manufacturing industry, and the main direction is to promote intelligent manufacturing”. In the context of modern manufacturing, the speed of technology upgrading in the machinery manufacturing industry has accelerated, providing key technical support for the technical equipment and devices required by various industries. Machinery manufacturing enterprises need compound and innovative professionals. In this regard, higher vocational colleges should adjust the teaching plan according to the requirements of the industry, integrate cutting-edge technology and advanced teaching concepts into the teaching, use micro class, hybrid teaching and other methods to carry out teaching, improve students’ professional skills such as mechanical drawing, and exercise students’ comprehensive ability.

## 1. Characteristics and key trends of modern manufacturing

### 1.1 Characteristics of modern manufacturing

Modern intelligent manufacturing technology is a cutting-edge industrial technology to promote the transformation and upgrading of the industrial system, which is conducive to improving the scientific research level of China’s complex products. The workflow of manufacturing industry includes product planning, product design, batch production and other links. The introduction of modern technology can effectively improve the efficiency of manufacturing production and help the development of manufacturing industry. Modern manufacturing endows the traditional manufacturing with intelligent characteristics, prompting the traditional manual link to be gradually set with computer intelligent link, so as to promote the intelligent development of manufacturing production, effectively solve the complex management problems in traditional manufacturing work, promote the innovation of decision-making mode and production mode of manufacturing enterprises, and promote technological innovation through the application of Internet of things, cloud computing and other technologies, Promote business model innovation by providing intelligent products and services, and promote production model innovation by building intelligent equipment and workshops.

[12] Zhongkuan Liu Discussion on practical teaching reform of water conservancy specialty courses [j]Huazhang, 2014, 000 (006): 215-215

[13] Xinyong Xu Investigation and Research on teaching reform practice methods of hydropower station course construction [j]Journal of science and education, 2012(43): 56

[14] Haijun Xu,Rongqin Zhao,Hui Li Exploration and practice of Ideological and political teaching reform of Surveying Course in Colleges and Universities under the new situation [j]Henan Education (University Edition), 2021, 000 (008): 72-74

[15] ILijun Cui Research on the reform of hybrid teaching mode for graduation design of water conservancy specialty [j]Radio and TV University of science and technology, 2020(67): 45

**About the first author:** Li Qianlong, November 1989, male, Shangqiu, Henan, master, lecturer, water conservancy engineering

**About the corresponding author:** zhangwenli, November, 1988, female, Shangqiu, Henan, master, environmental science