

Construction of Vocational Education Model of Construction Engineering

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Abstract: Vocational education is an important way in the current talent training. It shoulders the heavy responsibility of transporting talents for the society. With the acceleration of urbanization construction and the development of industrial technology, the demand for High Tech Talents in construction projects is constantly increasing. It is necessary to strengthen the improvement of vocational education in construction engineering. This paper mainly analyzes the mode of vocational education in construction engineering.

Keywords: *construction engineering; vocational education model*

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0 Introduction

The teaching of architectural engineering is an important way to transport construction talents to the society. Therefore, in the process of teaching, it is necessary to formulate scientific talent training objectives and innovative talent training models. With the development of construction engineering technology, the demand for construction engineering professionals will gradually increase. It is necessary to strengthen the reform and innovation of the content and form of the curriculum, and optimize the mode of talent training. However, from the current teaching of architectural engineering, due to the shackles of traditional education, the current theory of teaching and practice is out of touch, affecting the cultivation of talents in the architectural engineering profession.

Therefore, it is necessary to find a corresponding solution strategy for the problems existing therein.

1 The significance of the optimization of the training mode of construction engineering professionals

Construction professional vocational colleges are vital places and ways to transport talents in the construction industry to the society. With the development of the construction industry and the acceleration of national construction, the quality and ability of construction engineering talents also need to be updated, and traditional construction professionals should be trained. Emphasis on theoretical teaching, ignoring the role of practical teaching leads to the disconnection between theory and practice, affecting the development of students' practical ability^[1]. Through the comparison of the training mode of high-skilled talents at home and abroad, it can be found that whether it is cooperative teaching, dual-system teaching or work-study alternate teaching mode is a mode that combines theoretical knowledge teaching with practical teaching. Therefore, it is also necessary to cultivate professional talents in China. We should establish a teaching model combining engineering and learning, school-enterprise cooperation, and achieve both theoretical knowledge and practice in the teaching process, and realize dual teacher coaching and dual sports people.

The construction engineering major must meet the following characteristics in the training of high-skilled and high-quality talents. First of all, talents must have a high sense of responsibility and good professional ethics, and be able to abide by laws and regulations in work and life, and have service awareness and excellent

quality of hard work; second, talents must be able to master professional knowledge and technology, and have strong practical problem-solving ability^[2]. In terms of professional technology, it is also necessary to master the capabilities including design, construction, and technological innovation. At the same time, it should have the quality, environment, safety, and collaboration awareness of modern construction engineering. In addition, senior engineers in construction engineering must obtain corresponding certificates including technician certificates and senior technician certificates. Finally, in a rapidly developing modern society, talents also need to be able to have good career mobility. These requirements for modern talents and architectural professionals make the model of vocational education in construction engineering be reformed and innovated to better meet the needs of social construction professionals^[3].

2 The problems in the vocational education mode of construction engineering

2.1 The course content is too old

Due to the influence of the traditional education mode, the course content of the architectural engineering vocational education is too old and rigid, and the teaching content is updated slowly. Many equipment or technologies that are no longer used in the construction industry still appear in the teaching materials, and the students are not only in the process of learning which is not only conducive to the future development of work but also a waste of learning time^[4]. However, some new and advanced technical methods are not covered, which makes it impossible for students to realize the connection between school knowledge and specific engineering projects after graduation, which affects the employment competitiveness of students.

2.2 Single teaching method

The traditional vocational education method is mainly based on theoretical knowledge. Teachers only use textbooks as a reference for teaching. The practical curriculum is very few. Even some students have no experience in actually making engineering projects, which is not only productive to improve students' learning interest but also will play a certain role in the development of students' professional and technical skills^[5]. In addition, the teacher's teaching method lacks innovation and does not apply to modern science and

technology, which leads to the boring whole classroom, and some incomprehensible and relatively abstract problems are difficult for students to accurately grasp.

2.3 The construction of the training and teaching base is imperfect

The construction engineering profession itself is a professional with strong practicality and operability. Therefore, it is necessary to pay attention to the significant role of practical teaching. However, from the current practice teaching situation in most vocational colleges, the conditions of practical teaching are worrying^[6]. Due to insufficient funds, venue restrictions, and other aspects, students will have less mobility in participating in practical teaching, which is not helpful to the improvement of practical teaching effects. Therefore, it is necessary to strengthen the construction of practical teaching environment.

3 The countermeasures for the cultivation of professional talents in construction engineering

3.1 Improve the teaching content

First, adopt the method of school-enterprise cooperation to develop course content. This kind of teaching content is determined through the investigation of construction enterprises, the requirements of talents in various positions in the construction profession, and the relevant qualifications required to be acquired. Then, through the discussion with the school leaders and enterprise experts, the duties and skills of each position and related knowledge points (as in Table 1) for the preparation of teaching materials are summarized. Second, the content of the textbook is compiled based on the work process. The teaching content can be integrated according to the specific requirements and conditions of the work process so that the students can know how to complete the task. In the process of compiling teaching content, it is necessary to integrate the theoretical and practical knowledge based on the whole work process, and based on the requirements of the industry and enterprises and the future development needs, rationally design teaching tasks so that students can better adapt to the actual job position situation^[7]. This kind of teaching content design is more in line with the students' cognitive and growth rules and can gradually show transition from simple to complex in the process of learning, with the continuous deepening of teaching objectives and content. At the same time,

Table 1. Summary of the responsibilities, skills, and professional knowledge points of each job

Position	Responsibilities (items)	Professional skills (items)	Expertise points (items)
Construction worker	15	12	14
Quality officer	14	11	14
Security officer	14	12	15
Standards	14	15	15
Materialist	12	09	14

Table 2. Teaching and engineering process compliance table

Quota pricing method	Scenario 1 design basic engineering	1	2	3	4	5
		Column item	Calculating engineering quantity	Project pricing	Construction measures cost	Quota pricing summary
	Scenario 2 design structural work	1	2	3	4	5
		Column item	Calculating engineering quantity	Project pricing	Construction measures cost	Quota pricing summary
	Scenario 3 design renovation	1	2	3	4	5
		Column item	Calculating engineering quantity	Project pricing	Construction measures cost	Quota pricing summary

Table 3. Teaching links and teacher role-playing tables at various stages

Teaching stage	Work link	Role of teacher
Teaching preparation	Clarify learning tasks and develop learning plans	Instructor
Teaching implementation	Implementing a learning plan to control the entire process	Organizer, guide, and interpreter
Teaching evaluation	Feedback for learning	Guide and evaluator

through the typical work tasks, students are helped to establish a good sense of safety and law abiding. In addition, the carrier of demand-based teaching needs to be consistent with the design of the work process [Table 2].

3.2 Reasonable choice of teaching methods

First, the choice of teaching methods needs to meet the integrated development of teaching, learning, and doing. Teachers need to match the specific application of knowledge in the process of teaching knowledge. From the traditional theoretical teaching thinking to the ability of teaching thinking, the form of knowledge also needs to gradually transfer the knowledge carrier to the task carrier. The traditional teaching-oriented learning is the core to enhance students' self-learning ability. From the perspective of students' learning, it is also necessary to change from the traditional theoretical knowledge to the practice of self-practice, and the place of study is transferred from the classroom to the training base. In short, according to the purpose of

the teaching, tasks, and requirements, as well as the actual learning level and characteristics of the students, a reasonable choice of teaching methods encourages students' enthusiasm for learning and improves teaching efficiency. In the process of teaching, we must not only meet the requirements of the teaching content but also the application principles that conform to the teaching mode and clarify the teaching links at various stages and the roles that teachers need to play [Table 3].

The more commonly used teaching methods include the teaching method of the project, the role-playing method, and the situational teaching method. However, no matter which method is applied, it needs to be based on school-enterprise cooperation and engineering exchange.

Second, in the process of teaching, it is necessary to adhere to a work-oriented teaching method^[8]. The work process is guided by a teaching method based on work tasks and actions, and insists on taking students as the main body of teaching. It involves the design of teaching objectives, processes, content, evaluation,

and ideas. For the training of high-skilled talents, it must be guided by the work process. The completion of the work tasks needs to be based on certain scenarios and arranged according to specific project tasks. If the learning content and the order of arrangement can serve the work tasks, it is not necessary to be bound by the logical order.

In the course of work-oriented curriculum construction, vocational colleges need to build a double-teacher type team teaching according to the requirements of teaching and at the same time do a good job in school-enterprise cooperation. First of all, professional teachers can be dispatched to conduct internships for enterprises or training bases outside the school. Second, strengthen the continuing education of professional teachers, send teachers to the design and construction units for technical training; finally, the school can be filled by the school's teachers through the introduction of professional and technical personnel, giving students professional practical guidance.

3.3 Improve the practical teaching environment

First of all, the school can build a training base in the actual production environment through cooperation with the enterprise and organize students to integrate into the real construction environment in the training base. All the links, conditions and tasks in the training base and the actual production process are the same, and the school and enterprise are deeply integrated in teaching. In the teaching base of the training base, students need to complete the actual production work and production tasks in small groups. At the same time, they also need to meet the quality requirements of the enterprise in the production of building products, which can produce certain economic value^[9]. In this process, the company's professional technicians and teachers are responsible for the student's guidance and answers to questions. Since each building product needs to be in a specific location, is susceptible to natural influence, and the production method is fluid, the training base also needs to change as the project changes.

Secondly, construct a work-oriented learning scenario in teaching. Create a real work situation to meet the requirements of practical teaching^[10]. Construction projects need to follow the design requirements of the construction unit and are carried out at designated locations, so all construction products are customized products and it is impossible to mass produce. Moreover, the functional requirements of the building

are different, complex, and non-repeatable, and require a large investment and so many teaching processes cannot be practiced in person. Teachers can use advanced science and technology, such as virtual reality technology, to build a simulation practice teaching environment so that students can experience and learn in a simulated environment and strengthen students' practical operation ability.

4 Conclusion

The construction engineering vocational education must innovate the original teaching mode with the development of society and the advancement of technology so that it meets the development requirements of the current construction engineering industry and cultivates more advanced talents to promote the development of the construction industry for the society.

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