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Research on the Training Approach and Practical Ability of Master of Civil Engineering and Water Conservancy in China

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Abstract: Chinese colleges and universities cultivate masters in civil engineering and water conservancy to meet the needs of the social construction industry for high-quality talents. Therefore, this paper expounds the current problems faced by colleges and universities in cultivating civil and water conservancy masters: weak independent learning ability of students, lack of improvement in the cultivation system of colleges and universities, weak teaching staff in colleges and universities, and single assessment methods for students, and then analyzes the lack of practical ability of civil and water conservancy masters. The factors are influenced by external factors and internal factors. Finally, the measures to improve the training methods and practical ability of civil and water conservancy masters include: strengthening the systematic practical ability training of colleges and universities, deepening school-enterprise training cooperation, and increasing the introduction of high-quality talents. Construct a multi-level training system and form cooperative teaching among different universities. In order to provide a reference for the cultivation of the practical ability of the master's degree in civil engineering and water conservancy in colleges and universities.

Keywords: Civil engineering and water conservancy; Professional master's degree; Training path; Practical ability.

1. Introduction

At present, with the continuous development of the construction industry, higher requirements are placed on the quality of construction talents. China has increased the training of construction professionals, and cultivated talents through the establishment of engineering master's degree programs in domestic universities, and trained high-level engineering professionals [1] to meet China's current demand for high-level talents in the construction industry. In addition, China is currently participating in the construction of basic projects in countries along the route through the "Belt and Road Initiative". Chinese companies can also take this opportunity to go abroad and participate in the competition for international project construction. Therefore, it is also necessary to be familiar with international affairs and international construction. Standard high-quality talents are used as the support, so all colleges and universities are trying to explore new ways to train masters of civil engineering in China, and strengthen the practical ability of masters of civil engineering, in order to improve the quality of masters of civil engineering and water conservancy, and meet the high-level requirements of the construction industry. Talent needs.

2. Problems facing China's colleges and universities in cultivating masters of civil engineering and water conservancy

2.1. Students have weak independent learning ability and insufficient professional knowledge

At present, China's colleges and universities generally recruit students based on test scores, undergraduate colleges and interview results. Among the master's students waiting to be admitted, there are many candidates with high scores in exam-oriented education, and there are uneven educational levels before admission. The majors are different [2], and their self-learning ability is not strong. In addition, during the undergraduate education, many students majoring in civil engineering did not acquire theoretical knowledge combined with practical operations for teaching, which made students stay in the theoretical teaching of books forever when learning civil engineering knowledge. Little do they know that the publication time of many civil engineering textbooks often stays within a few days. In the understanding of the construction industry ten years ago, with the development of the construction industry, relying on textbooks to guide and manage modern construction projects has not adapted to the development trend of the industry, and cannot keep abreast of the latest developments in engineering development. The lack of emphasis on teaching makes civil engineering undergraduates fail to master too much professional knowledge when they receive professional knowledge education. When civil engineering undergraduates become postgraduates to receive higher education after graduation, because they have not yet laid a solid foundation of knowledge and theory, they have not cultivated their independent learning ability, which in turn affects the educational career of postgraduates.

2.2. The cultivation system of colleges and universities needs to be improved, and the management system lacks innovation

In order to cultivate a full range of high-quality master's talents in civil engineering and water conservancy, colleges and universities must start to improve the training system and innovate management methods, that is, to build a master's training system that combines theoretical knowledge and practical operations, and then cultivate the civil and water conservancy needed by the society. Master talent. Since

engineering master education focuses on constantly innovating the educational mechanism in practice[3], colleges and universities are required to combine engineering, law, management, ideological education and other courses to create a knowledge system for cultivating masters of civil engineering and water conservancy and improve students' knowledge level , the overall quality; secondly, promote the practical teaching of the master of civil engineering and water conservancy, cultivate students' practical ability, and truly apply what they have learned. However, at present, many colleges and universities specializing in civil engineering and water conservancy majors in China still adopt a theoretical teaching system, and practical teaching does not even exist. I feel that I have not mastered comprehensive engineering professional knowledge, which makes me face the problem of lack of self-confidence when I am employed. I have a certain lack of self-confidence in the major of civil engineering and water conservancy, which further weakens the competitiveness of masters in civil and hydraulic engineering.

2.3. The faculty in colleges and universities is weak and the practical experience is insufficient

At present, Chinese colleges and universities mainly introduce highly educated research talents, so the current civil and water conservancy teachers in colleges and universities are mostly research talents, and college teachers lack practical experience and are not good at mastering engineering principles [4]. In addition, colleges and universities have different strategies for talent introduction, and many colleges and universities do not have sufficient budget to introduce talents, which makes the faculty of colleges and universities weak and unable to meet the all-round training of students. In addition, the existing research-oriented talent teachers are affected by various factors when assessing students, and generally can only assess the knowledge and theoretical level of students, which greatly limits the practical ability of students majoring in civil engineering and water conservancy, which is not conducive to students. comprehensive development.

2.4. The assessment method for students is single and the evaluation system is not perfect

The construction of current social engineering projects requires high-quality and high-quality engineering professionals. Therefore, the master of civil and water conservancy needs to meet the needs of the society, improve the practical ability and innovation ability of students majoring in civil and water conservancy, and take it as one of the methods of student assessment. However, at present, the practice teaching in China's civil engineering and water conservancy colleges and universities has not been popularized, and various systems have not been perfected. It cannot form an assessment system integrating theory with practice, and forms a single assessment method. In addition, the evaluation of students majoring in civil engineering and water conservancy is still limited to the quality of the assignments. The knowledge level test after the course is easy to form an exam-oriented education, resulting in an imperfect evaluation system. The professional characteristics of the curriculum are not enough, and the teaching content lacks practicality[5]. For example, colleges and universities carry out work internships before graduating from the master's degree in civil engineering and water conservancy, but some students do not actually carry out internships. It is difficult to meet the high-quality engineering talent standards required by the society.

3. Analysis of the Factors of Insufficient Practical Ability of Masters in Civil Engineering and Water Conservancy

3.1. External factors

In terms of practical ability training, the most important thing is to allow students to have immersive operations. Therefore, when setting up practical teaching courses, engineering experiments need to be carried out with the help of experimental equipment. However, many colleges and universities in China have insufficient investment in experimental equipment, so that they either do not offer practical teaching courses, or even if they offer practical teaching courses, they are used for theoretical teaching, which cannot meet students' requirements for practical equipment, affects the cultivation of students' practical ability, and thus loses the significance of setting up practical teaching courses. In addition, as research-oriented talents, teachers are better at teaching theoretical knowledge, and theoretical teaching involves a large amount of complex theoretical knowledge such as applied mathematical statistics, engineering mechanics, elastic-plastic mechanics, and finite element analysis. In addition, under the "theory + guidance" mode, students' main position cannot be fully utilized to form a good academic discussion atmosphere, which reduces the enthusiasm of students to participate in class discussions, which is not conducive to the development of students' practical ability. cultivation. Therefore, colleges and universities need to increase investment in experimental equipment, increase the hours and credits of the practice link, and ensure the smooth development of the practice link[6], so that the theoretical teaching can be combined with engineering practice. In addition, the classroom model should be reformed and innovated to give full play to Students lead the role of teacher guidance, improve classroom teaching efficiency, and better cultivate students' practical ability.

3.2. Internal factors

Students majoring in civil engineering and water conservancy do not have a strong practical awareness, which is one of the key factors for the lack of practical ability. The cultivation of practical ability means the need to visit engineering construction projects and participate in engineering construction. On the one hand, due to the harsh geographical environment of the construction project, rest time cannot be guaranteed, and overtime work has become the norm. All these factors together have become the real reason why students do not want to go to the construction site for practice. On the other hand, students need to complete their own graduation design and graduation thesis. They need to read a lot of materials and take notes every day. There may be unbalanced time allocation in the construction site practice, and they cannot complete the graduation thesis on time, quality and quantity. work, which prevented me from graduating smoothly. In addition, many students want to directly enter colleges and universities to work with a master's

degree. Colleges and universities do not value practical ability when recruiting talents, but only value factors such as academic qualifications, quality of published papers, and professional titles, which further weakens the enthusiasm of students majoring in civil engineering and water conservancy. The lack of practical ability of students.

4. Measures for Improving the Training Approach and Practical Ability of Master of Civil Engineering and Water Conservancy

4.1. Strengthening the Training of Systematic Practical Ability in Colleges and Universities

In the modern training system of civil and water conservancy majors, the course education is usually only one year, and the rest of the time is mainly to complete the graduation thesis and professional practice. Therefore, the concept of solving practical engineering problems should be highlighted in the setting of the curriculum system. It is necessary to set up engineering technology courses, pay attention to the rationality of the curriculum setting, improve the matching degree between course knowledge and practical knowledge [7], and ensure that the courses are extensive. , advanced and cutting-edge, reflecting the most cutting-edge development trends and application of technology in engineering construction projects; it is also necessary to set up engineering management courses to ensure that management courses include innovative, systematic, practical and other characteristics to help students better Learn about technological innovation and engineering developments through the course. In addition, schools should encourage students to take advantage of the opportunity to go to qualified enterprises to implement the one-year off-duty learning method of engineering master students in colleges and universities[8], and refuse to spend the rest of their time on campus, even if they are doing projects and completing thesis with their tutors, without real Participating in engineering construction cannot cultivate one's own practical ability. Only use the knowledge you have learned in engineering projects, enhance your own practical experience, and stimulate students' innovative ability. Through the actual practice operation in the project, it can help students majoring in civil engineering and water conservancy to understand the status of the frontier of engineering development and the problems faced by the project, based on the needs of the society for talents, constantly expand their own capabilities, form their own competitive advantages, and then better carry out employment.

4.2. Deepen school-enterprise training cooperation

The training of civil and water conservancy students in colleges and universities is inseparable from cooperation with construction companies. The school-enterprise joint training model focuses on the cultivation of students' comprehensive abilities[9], and colleges and universities need to pass on practical engineering experience and technology through companies. , to understand the cutting-edge developments of engineering construction, the company hopes to introduce high-quality fresh graduates every year, and cultivate them as the management reserve talents of the company to enhance the core competitiveness of the company. , reached a consensus on cultivation, and cooperation in the cultivation of students majoring in civil engineering and water conservancy can achieve a win-win situation. Coupled with the fact that construction companies are clear about the requirements and standards for talents, colleges and universities cooperate with companies to help colleges and universities formulate training programs for civil engineering and water conservancy professionals, deepen classroom teaching reform, and invite companies to carry out joint talent training. Colleges and universities sign long-term cooperation agreements with construction companies, establish long-term cooperative training relationships, train talents needed by target companies, encourage students to practice in target companies after course learning, and understand the project status of target companies in advance. The contracted target enterprises have accumulated rich practical experience. The school-enterprise cooperation training not only makes up for the long-term lack of a large number of high-quality talents in enterprises, but also solves the employment difficulties faced by students when they graduate, improves the overall employment rate of colleges and universities, and broadens the training channels for students majoring in civil engineering and water conservancy.

4.3. Increase the introduction of high-quality talents and build a multi-level training system

Under the circumstances that the modern construction industry has higher and higher requirements for engineering talents, colleges and universities increase the introduction of high-quality talents with rich engineering practice, let the newly introduced talents offer engineering practice courses, and let students experience civil engineering theory and practice in person. At the same time, integrate the educational resources inside and outside the school, build a platform for sharing engineering experience inside and outside the school, create a strong learning atmosphere, and share experience according to the interests and hobbies of different students, and carry out online and offline multi-channel teaching at the same time Ways to fully mobilize the enthusiasm of students. Secondly, the existing teachers are required to improve the teaching methods, give full play to the subjective initiative of the students, change the teaching mode of the classroom into a student-centered one, explore the frontier and progress of engineering, and arrange engineering practice assignments at the same time, complete in groups, and focus on training graduate students Engineering project planning and knowledge application ability[10], cultivate students' teamwork spirit. Constructing a multi-level training system can fully take into account the differences in students' mastery of professional knowledge, promote the all-round development of students, and provide teaching support for the promotion of masters in civil engineering and water conservancy.

4.4. Collaborative teaching between different colleges and universities

Universities can integrate each other's teaching resources and carry out teaching cooperation, which can break the barriers between different universities, promote the cross-integration of different disciplines, and realize the complementary advantages of educational resources.

Colleges and universities can establish a joint teaching platform and use VR virtual simulation laboratory to enable students to deeply understand the whole process of engineering projects through virtual simulation. At the same time, they can establish online churches and teach through engineering experts from different universities to explain the construction of famous Chinese projects. The project experience realizes the integration of high-quality teachers among colleges and universities, fully realizes multi-party linkage through the network teaching platform, and enables students to obtain high-quality teaching. In addition, students are encouraged to participate in academic lectures or academic conferences across schools, exchange civil engineering knowledge with students from other universities, broaden their own horizons, accumulate experience, and lay a good foundation for future employment.

5. Summary

Improving the practical ability of masters in civil engineering and water conservancy in Chinese universities is an inevitable trend in the development of the construction industry and a guarantee for the completion of high-quality engineering projects. Therefore, it is necessary for colleges and universities to provide the necessary experimental equipment and reform the curriculum. At the same time, students should actively participate in the practice of engineering projects, improve their practical ability, and accumulate project experience in order to better meet the requirements of enterprises for talents. Ultimately To achieve a win-win situation between students, colleges and enterprises, that is, students improve their practical ability, colleges and universities solve the problem of difficult employment of graduates, and enterprises recruit talents urgently needed for engineering projects, further promoting the healthy and stable development of the construction industry.

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