

Research and Practice of "Double Creation" Talents Training for Civil Engineering Specialty

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Abstract—At present, the construction of innovative countries requires double-creation civil engineering talents. The rapid development of social transformation and science and technology requires “double-creation” civil engineering talents. Comprehensively reforming and practicing the training mode, course system, teaching content and teaching methods for civil engineering majors, and it’ cultivate the “double-creation type” civil engineering major that meets the needs of China’s modernization construction in the new century with innovative spirit, entrepreneurial spirit, and practical ability. But at present the education and teaching reform of civil engineering is also facing the urgent task of employment and personnel training. Therefore, this paper takes the training of students' innovation and entrepreneurship and engineering practice as the core, conducts research on the reform and practice of practical teaching systems for civil engineering majors, and proposes the concept of “double-creation” talents training for civil engineering majors, and builds innovative ability. It aims to build the knowledge quality structure and the teaching quality assurance system of the curriculum system.

Keywords—Double Creation, Talent Cultivation, Civil Engineering

I. INTRODUCTION

As the most active and most active factor in innovation activities, talent plays an important role in innovation and entrepreneurial activities. The key to the successful implementation of the country’s innovation and entrepreneurship plan lies in whether it is possible to cultivate “double-creation” talents with innovative spirit and entrepreneurial ability. Colleges and universities are both important bases for the training of high-level innovative and pioneering talents, as well as important sources of high-level scientific research and high-quality innovation results. They should play an important role in supporting and leading "mass entrepreneurship and innovation". Civil engineering major, as a practical professional engineering major, has always had the problem of disconnection between theory and practice in the education of colleges and universities. Students' knowledge in the classroom cannot be effectively linked to practical work, and it is difficult to quickly assume the responsibility of serving the society after graduation. In this way, it is difficult to shoulder the heavy responsibility of technological innovation and entrepreneurship development. The cultivation of “double-creation” talents requires the transformation of higher education and the development of talent training models, active teaching reforms, and the establishment of a new-type education system that will enable graduates to become both scientific and professional technical and technical, as well as innovative and entrepreneurial. "Double-creation" talents.

II. THE NECESSITY OF CULTIVATING INNOVATIVE AND ENTREPRENEURIAL TALENTS

The educational policy of the Party and the country requires that institutions of higher learning must regard the cultivation of talents for innovation and entrepreneurship as their main goals and tasks, consciously realize that education must serve the socialist modernization drive, must be combined with production labor, and cultivate the builders of the socialist cause. successor. The 21st century is a century of priority for the development of higher education in China. China’s higher education has evolved from elite education to popular education. Diversified features have emerged in terms of school specifications, schooling levels, types of education, and the personality and characteristics of schools.

The cultivation of new innovation and entrepreneurship colleges and innovation and entrepreneurial talent conforms to this trend of higher education. As a concept of education, innovation and entrepreneurship education has not been proposed for a long time. The background of its social development is determined by the development trend of the national economy. The development of innovation and entrepreneurship education is not only a requirement of social economy and science and technology development, but also a requirement for the development of education, which is conducive to a more rational adjustment of the structure of higher education.

III. PROBLEMS IN THE CULTIVATION OF TRADITIONAL TALENTS

From the information fed back by society and employers, the main problem for graduates is the lack of corresponding engineering quality education, lack of necessary understanding of the scope, composition, and completion conditions of engineering projects, as well as their respective functions and mutual relations. They often do not know where to start when project problems come. Graduates have narrow professional qualifications and poor adaptability. They lack sufficient

understanding of new technologies, new techniques, and new methods in majors and disciplines. The root cause of this phenomenon is the insufficiency of the traditional personnel training mechanism, which is mainly reflected in the following aspect.

A. Teaching is Too Theoretical

The traditional training of innovative and entrepreneurial talents in civil engineering is generally based on subject areas. The emphasis is on "a broad theoretical basis and a wide range of professional calibers." It tends to focus on the transfer of basic knowledge and theory, ignoring the cultivation of applied abilities. Higher education emphasizes the systematization and integrity of the knowledge system. The architecture of the curriculum system pays great attention to continuity and continuity. Specialized courses that are partial to application tend to stand at the top of the pyramid of basic theories. The loss of basic theoretical knowledge is very likely to result in students not being able to fully grasp and Use professional knowledge correctly. It is also because of the extreme importance of the theoretical basis that higher education has always been dominated by theoretical education. However, civil engineering professional engineering practice skills and theoretical knowledge are of equal importance. Cultivating students' practical application ability is one of the most important tasks for training civil engineering professionals. At present, the personnel training mechanism based on theoretical basic education follows the teaching methods of traditional academic education. The curriculum construction is also academic-oriented. It places too much emphasis on the cultivation of students' cognitive abilities and is unable to meet the needs of the training of civil engineering professionals. Industry development requirements.

B. Teaching Content is Out of Touch with Industry Development

In recent years, with the development of society and the advancement of science and technology, new technologies, processes, and methods in the field of construction have emerged in an endless stream. Architectural design concepts, structural forms, and application software continue to be innovated, and norms and standards in the civil engineering industry are constantly being revised and improved. However, due to various conditions, curriculum settings and teaching materials have not been followed up in a timely manner. For example, construction methods, application software, and engineering technology that have been widely used in the industry are not reflected in education and teaching. Although some classic textbooks are reprinted, the norms and standards quoted are still old versions, and they are brought to readers. It was a great deal of trouble; the cases in some of the textbooks were slightly outdated and failed to reflect the latest research and engineering applications. In a word, the content of the teaching lags behind the development of the industry. On this basis, the students' knowledge structure cannot meet the requirements of the current engineering practice. After students go to work, they often need to undergo further training to meet the employer's requirements.

C. Practice Courses Are in Form

Practical courses are an important part of the framework of civil engineering courses. They are designed for students to consolidate their theoretical knowledge and improve their hands-on skills, including curriculum design and practice sessions. Civil engineering specialty courses mainly include housing architecture curriculum design, concrete structure curriculum design, masonry structure curriculum design, steel structure curriculum design, foundation-based curriculum design, and construction organization curriculum design.

At present, the prevailing practice of colleges and universities is that teachers need to provide dummy topics and design parameters according to the syllabus and calculation requirements, and require students to complete the design calculation of related content.

However, due to the similarities in curriculum design problems in different schools, students can often deal with the problems by referring to the targeted curriculum design guidelines and applying the fixed design calculation model. The calculation process does not actually establish an intuitive connection with the actual project, which weakens the curriculum design. The effectiveness of the internship is also not optimistic. Civil engineering majors include internships, practice of construction production, and graduation practice. Civil engineering industry projects have many characteristics such as many types of industries, long construction period, unfixed project locations, complex design and construction procedures, and non-repeating products. Site work sites and various types of machinery intertwined and mixed, with certain risks.

IV. CIVIL ENGINEERING "DOUBLE-CREATION" TALENT CULTIVATION MECHANISM

Talent training can't be separated from the perfect training mechanism, the establishment of a scientific and scientific training mechanism can ensure the smooth implementation of the training program, so as to ensure the effective achievement of training objectives. Scientifically formulate educational training programs and construct operational mechanisms to ensure that innovative education can cover all students and meet the needs of different development-oriented students. This is a problem that needs to be solved.

A. Operating Mechanism

For first-year students in the basic education and general education stage, professional teachers are hired as class tutors to take charge of the student's academic planning and guidance, so that students can have a clear understanding and orientation of professional learning at the beginning of the university; Students who have already contacted professional courses in the third

grade will implement two-way selection to determine their tutors. The students will perform innovation and research training under the guidance of their tutors. For seniors, they will rely mainly on on-campus laboratories and off-campus practice bases to achieve professional training and training. In addition, based on the knowledge structure of students at different stages of learning, they set reasonable innovation practice links and guide students to apply book theory knowledge to practice innovation.

B. Drive Mechanism

A reasonable driving mechanism can guide teachers and students to actively invest in innovation and entrepreneurship education. For teachers, in the form of institutions, they are required to train students in their ability to innovate in teaching, making innovative education an integral part of their daily work. For example, in the form of work assignments, each teacher is required to arrange an academic report on the frontier of the subject for each semester, and students in each grade will be recruited to enter their own research group to participate in research or engineering practice. In the process of designing and quantifying teachers' performance appraisal indicators, they fully embody the importance of innovative education, so that teachers are willing to spend more energy in innovative education.

C. Evaluation Mechanism

The evaluation mechanism research includes two aspects. Firstly, the effect evaluation mechanism, that is to design a reasonable mechanism to evaluate the effectiveness of innovation education; Secondly, the feedback correction mechanism, that is, according to the evaluation results feedback to get the problems in the innovation education system. The problem is corrected so that the entire mechanism tends to be perfect.

V. CIVIL ENGINEERING "DOUBLE-CREATION" TALENT TRAINING EDUCATION REFORM

The innovation and entrepreneurship education is particularly critical for the improvement of students' ability. As the core carrier for the implementation of the personnel training program, the curriculum is the basis for improving student abilities. This requires the cultivation of innovation and entrepreneurship awareness in the curriculum system, and the original teaching methods for the curriculum. And content reforms.

A. Improve Traditional Teaching Methods

Traditional teaching methods are mainly taught by teachers. Students can only acquire knowledge passively. Students' autonomous thinking is in a stagnant state. This is contrary to the active learning and active thinking of students required for innovative education. Therefore, traditional teaching methods must be reformed. The reform aims to change the traditional duck-feeding teaching model, improve students' position in teaching activities, and stimulate their enthusiasm for independent learning and thinking. The specific ideas of reform are: Teachers try to use heuristic teaching methods in their teaching and interact with students.

B. Introducing Virtual Experiment Teaching

The discipline of civil engineering is an experimental discipline. All the theoretical derivation and numerical simulation results need to be tested by experiments. Therefore, experimental teaching is indispensable. Due to the actual conditions of the professional conditions of civil engineering, it is not possible to set up teaching experiments for each professional course at present, so that students can observe or personally operate. In this case, virtual experimental teaching may be considered to maximize the effectiveness of experimental teaching.

C. Strengthening on-Site Teaching

The discipline of civil engineering is a discipline with strong practicality. Both academic research and practical application must be combined with practical projects. To cultivate students' innovative ability to solve engineering problems, it is necessary to accumulate experience in the project field and to recognize new types of projects. Therefore, teaching to the project site is an effective way. On the one hand, the teacher combines the courses he teaches, selects the points of common knowledge needed for on-site teaching, determines the appropriate on-site instructional projects, and formulates on-site instructional content and programs to normalize on-site teaching; on the other hand, the teacher selects the courses involved in the project New areas, combining with conditions for running schools, organize students to visit new types of projects and learn about cutting-edge engineering development.

VI. CONCLUSION

After the higher education entered the popularization stage from the elite, the education quality, that is, the quality of talent training has become the focus of attention of the society and educators. Higher education shoulders the important mission of cultivating tens of millions of highly qualified professionals and a large number of top-notch "innovative" talents. Raising the quality of higher education is not only the need for the development of higher education itself, but also the need for higher education to improve the employability of students and the ability to innovate and innovate in order to satisfy the people. It is also the need to build an innovative country and build a harmonious socialist society. Through the reform of the "double-creation" talent training mode of civil engineering, it is expected that the graduates will make the following progress: The

overall quality will be significantly improved and will be more socially adaptable; the practical teaching will be strengthened and will have more active learning ability and engineering design ability; the close integration of production, education, and research will be more practical; the internationalized training environment will be even more forward-looking.

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