

Discussion on the New Teaching Reform Mode of Civil Engineering Specialty Based on Ability Cultivation

Xingyu Ding, Xiangliang Chen, Yu Mao, Lingyong Liu

School of Civil Engineering, Hunan City University, Yiyang 413000, Hunan, China

Abstract: Nowadays, civil engineering has the characteristics of rapid technological innovation, diversified construction process and mechanical modernization. Therefore, the new teaching reform mode of civil engineering major based on the premise of ability cultivation should focus on cultivating students' innovative practical ability and improving students' independent innovation ability. At the same time, students are required to have solid basic theoretical knowledge and the spirit of developing new research, which can provide fresh blood for the country's infrastructure industry. Based on this, this paper expounds the teaching reform strategy of civil engineering major based on the premise of ability cultivation, for reference.

Keywords: Ability cultivation; Major in civil engineering; Teaching reform strategy

Fund Project:

Project supported by Teaching Reform Research Project of Hunan City University, China (Project name: Reform and Practice of Dual Dimension Evaluation for New Engineering Talent Training under the Ideological and Political Background)

1. Introduction

Civil engineering major is an important major in higher education, but also the focus of training our modernization construction talents^[1]. Therefore, civil engineering major based on the premise of ability training to carry out teaching reform, we should carefully study the characteristics of modern civil engineering diversification, function, information, science and technology, improve the training mode of civil engineering professional personnel, improve the degree of specialization of civil engineering students, so as to ensure the quality of personnel, guarantee the quality of engineering.

2. Characteristics of civil engineering specialty

2.1 Knowledge covers a wide range

The course of civil engineering involves a wide range of knowledge. Generally speaking, the course knowledge system of civil engineering involves structural mechanics, material mechanics, building structure, building materials, engineering measurement and other aspects of knowledge. The course knowledge span is large and has strong comprehensiveness. Therefore, students majoring in civil engineering can become excellent engineering talents with strong innovation ability and practical ability only by studying professional knowledge and actively participating in the practice of civil engineering construction management.

2.2 Strong case practicability

The strong case nature of civil engineering professional knowledge means that in many cases, the knowledge points of each chapter are organized in accordance with the sequence of engineering construction, and the knowledge points of each chapter mostly tell the construction technology and construction method of this part in the unit of actual engineering, which makes the chapters independent and almost no contact with each other. Therefore, teachers need to explain engineering cases to help students absorb and understand knowledge points.

2.3 The effect of teaching reform is obvious

Civil engineering as a strong practical specialty, teaching reform brings more obvious effect than theoretical courses. In teaching

reform, schools and teachers should follow the basic principle that perceptual knowledge originates from engineering construction practice, and emphasize the cultivation of students' comprehensive ability, practical ability and innovative ability^[2]. Teaching reform needs to strengthen students' ability to solve practical construction problems of civil engineering, further stimulate students' interest in learning professional knowledge of civil engineering, and obtain better teaching effect.

2.4 Knowledge is updated quickly

The construction technology of civil engineering specialty has strong upgrading, which is mainly reflected in the change of construction technology and the upgrading of construction equipment. Civil engineering major has strong engineering practice and case, so introducing new teaching cases can provide more possibilities for teaching reform. In this process, civil engineering teachers should pay attention to the selection of appropriate teaching methods, better stimulate students to play the subjective initiative, so that they can find problems while solving practical engineering construction problems in a creative way, so that more students become outstanding talents at the same time, as soon as possible qualified for civil engineering work.

3. Significance of Civil Engineering teaching Reform based on ability Cultivation

First of all, the construction of innovative country needs, during the construction of innovative country can not leave the effective support of innovative talents, the basic goal of civil engineering teaching reform is to train more excellent engineering talents with innovative ability, which conforms to the goal of our future construction of innovative country. Secondly, civil engineering teaching reform can cultivate students' innovation ability. Finally, the reform of civil engineering teaching can further enhance the construction quality of our country's construction engineering. As the goal of teaching reform needs to be practical, the result of teaching reform must be to enhance the construction quality of the project.

4. The problems of Civil engineering teaching Reform based on ability Cultivation

4.1 The lack of innovation ability affects the improvement of students' comprehensive quality

The teaching of civil engineering major in some colleges and universities does not adapt to the cultivation of students' innovative ability^[3]. For example, some Chinese universities' civil engineering courses are not designed to transfer civil engineering knowledge and cultivate students' practical ability, but simply to complete teaching tasks and achieve employment targets. As a result, classroom theoretical teaching can not make students master the basic knowledge of comprehensive construction technology and construction organization, can not prepare students for the next link of construction practice, and it is difficult to play a substantial role in promoting the cultivation of students' professional ability and comprehensive quality.

4.2 The practice teaching link is weak, which affects the construction quality of the project

Many civil engineering graduates in colleges and universities do not have enough technical knowledge and practical ability to complete the actual work objectives after occupation, unable to effectively improve the construction quality of the project. Considering the comprehensive civil engineering course is strong and the knowledge span is wide, there are many new engineering construction technology in the course, resulting in students can not distinguish the important and difficult points in learning, It is not surprising that the quality of engineering construction is difficult to be improved when students are unable to take the initiative and study in a targeted way.

5. The teaching reform strategy of Civil engineering Specialty based on ability cultivation

5.1 Optimize teaching methods, change teaching ideas

The training of modern civil engineering talents can not be scripted, should be timely to adjust the teaching content, the introduction of advanced technology and management ideas, design suitable for the needs of social development of teaching courses, teaching methods, so as to cultivate practical civil engineering talents, to help students to understand the theoretical knowledge of civil engineering more deeply, for the future workplace practical application of preparation work. Teachers' teaching and students' learning, as the two main bodies of teaching, should change the teaching idea, take students' independent learning as the main body, guide students to actively learn the relevant knowledge of civil engineering, guide students to think, discover and explore the problems encountered in the study of civil engineering and independently use relevant knowledge to solve the problems. So as to cultivate students' independent learning ability, thinking ability and creative ability.

5.2 Strengthen the management of practice teaching links and enhance students' comprehensive quality

First of all, the combination of theory and practice is emphasized in the course design, and the cooperation between schools and

enterprises is utilized to enable students to learn and test the learning degree of civil engineering professional knowledge in a practical environment on a regular basis, so that students can understand civil engineering professional knowledge more clearly, learn and master the theoretical knowledge of civil engineering, and point out the direction for the teachers in the following teaching. Secondly, it emphasizes the experiment of students themselves. When the relevant hardware and software facilities are available, it encourages and supports students to participate in the investigation and experiment of civil engineering science, arouses students' interest in learning, tests their professional skills and knowledge, exercises their social practice ability, improves their comprehensive quality, and lays a solid foundation for their future career development planning.

5.3 We will strengthen the construction of professional teachers

We should pay attention to the cultivation of "double-qualified" teachers among professional teachers, encourage full-time teachers to take part-time jobs in enterprises, and improve the engineering practice ability and scientific research ability of professional teachers through the joint training of schools and enterprises. Teaching management departments conduct quantitative assessment and evaluation according to professional teachers' implementation of teaching content, practice and practice links, practical training effects, and quality and quantity of scientific research papers in practical teaching links.

6. Conclusion

To sum up, the teaching reform of civil engineering major focuses on the cultivation of students' ability, which can enable more students to have the ability to solve the practical problems of civil engineering construction in their work after graduation, so that college students can achieve the purpose of applying what they learn and serve the engineering construction, and finally achieve the expected effect and practical goal of the teaching reform of civil engineering major.

References:

- [1] CHEN M Q. Application of engineering case teaching in Civil engineering teaching. *Vocational education*, 2017,10(6):116-117.
- [2] SUN H W, WANG T, WANG D J, et al. Discussion on Teaching Reform of High- Rise Building Construction Course for Civil Engineering Specialty. *Journal of Changchun Institute of Technology (Social Science Edition)*, 2021,22(2):133-137.
- [3] ZHANG L, GAO J. Research on Effectiveness of Teaching reform of Civil engineering construction Course. *Sichuan Building Materials*, 2022,48(12):234-235.