

# Research on practical teaching system reform of municipal engineering technology major in higher vocational colleges

Wenjing Zhang\*

Guangzhou City Polytechnic, Guangzhou, China

\*Corresponding author

**Abstract:** Practice teaching is an important part of teaching in higher vocational colleges. The proportion of practice teaching courses aiming at cultivating students' engineering ability has been greatly increased. The practice teaching requests the curriculum to be more abundant, the content is more comprehensive. In this paper, the municipal engineering and technology major in higher vocational colleges as the starting point, the practical teaching curriculum system of engineering practice ability training is studied, and the main methods of the municipal engineering and technology major students in ability training are sorted out, to explore the practical teaching curriculum system that meets the quality requirements of personnel training.

**Keywords:** practice teaching system, school-enterprise teachers, jointly training, professional competition

## 1. Introduction

Practice teaching is an important part of the teaching system in colleges and universities. It plays an irreplaceable role in cultivating students' ability to combine theory with practice, practice and innovation. Practical teaching plays a very important role in the education of Training Plan, which is to train students' practical operation skills, the important link of problem-solving ability and innovation ability, its function and function can not be replaced by theory teaching. The aim of practical teaching is to improve students' professional quality and cultivate their ability to solve practical engineering problems by comprehensive application of professional knowledge, it is an important way to train and bring up high-quality talents with innovative consciousness and innovative ability.

To carry out practical teaching of municipal engineering and technology specialty in colleges and universities, ensure the quality of practical teaching, and enable the graduates of municipal engineering and technology major to have the basic ability to engage in the design, construction and management of municipal engineering structure, it is an important content of the training mechanism of municipal engineering technology specialty. But at present, the practice teaching of municipal engineering technology specialty still has some disadvantages, such as emphasizing theory, neglecting practice, being out of touch with actual project, insufficient investment and obsolete content. In view of the target requirements of higher education of municipal engineering and technology specialty in colleges and universities, in order to train high-quality municipal engineering talents with sound theoretical foundation, broad professional knowledge, strong engineering practice ability and innovation ability, and adapt to the needs of economic and social development, there is an urgent need to reform the existing practical teaching links to make it more conducive to the training of municipal engineering and technology professionals needed by the times[1-2].

## 2. Analysis of the present situation

The practical teaching system generally includes practical training, practice and design, etc.:

(1) In the process of developing broad-ranging and liberal-arts skills, the lack of systematic development of training programmes has led to unclear vocational guidance, a lack of industry convergence and insufficient education in the development of students' vocational skills.

Under the guidance of the teaching thought of "Big Municipal", most of the municipal engineering

and technology schools are set up with a wide range of training programs, the theoretical courses offered cover the theoretical knowledge that engineers of all kinds of municipal engineering and technology majors should master, the practical projects also include municipal engineering material training, construction organization curriculum design, engineering, budget design, graduation design, cognitive practice, measurement practice, production practice and graduation practice. However, while adopting the "Wide-caliber" education model, because many schools did not fully consider the scientific and systematic nature of the development plan, curriculum and curriculum, instead of setting up the inter-relationship between courses and the link with practice according to the characteristics of the major, the system of professional learning is not enough, the teaching goal is not clear and the emphasis is not prominent, as a result, students learn a lot of courses, but they cannot really master the comprehensive use of these knowledge skills.

The major of municipal engineering technology is the cradle of training registered engineers, Structural Engineers, geotechnical engineers, Supervision Engineers, safety engineers and other professional engineers, in order to reach the teaching goal, we must optimize the training plan, allocate teaching resources reasonably and train the excellent municipal engineers systematically according to the requirements of engineering quality of different types of practicing engineers, meet the needs of the enterprise.

(2) Emphasizing theory, neglecting practice, the effect of practice teaching is poor

The practical teaching belongs to all kinds of theory courses. In the course of teaching, teachers often pay more attention to the theory teaching and neglect the practical teaching. The requirement of practical teaching is far less than that of theoretical teaching, which makes students pay less attention to practical teaching. Due to the limitation of teaching time and teaching conditions, the content of practical teaching is often compressed, and the time of study is reduced or even canceled. Some basic practical training which should be operated by students can only be presented in the form of demonstration practical training, and students' practical ability cannot be effectively exercised and improved, most of the assessment based on practice reports, often cannot be strictly in accordance with the Practice Guidance Plan and assessment program, so the understanding of practice and production practice in the form, practice teaching effect is not ideal; Curriculum design is completed according to the form and requirements of teachers, according to the example, it is difficult to train students to solve practical engineering problems, students cannot experience the integration of theory and practice[3-4].

(3) The teaching of basic professional knowledge and the practical teaching are each in its own system, and lack of integration and integration.

Many achievements of municipal engineering are obtained through engineering practice and scientific training. But according to the training plan of municipal engineering technology specialty, most of the courses set up in the early stage are basic courses, and the teaching process emphasizes the imparting of knowledge, there are few interactive teaching methods, and the training method of applying theory to practice is rigid, even if the experimental class is set up, but it is not combined with engineering practice, second, I don't know how to apply the theoretical knowledge to engineering practice. The lack of integration between the teaching of basic professional knowledge and the teaching of practice results in the weak ability of the students to apply the professional theoretical knowledge to engineering practice, it is difficult to train students' ability to find and deal with problems in complex engineering phenomena.

(4) The construction of practice teaching base is weak, and the practice teaching lacks in-depth and practical value.

For a long time, the practice teaching of municipal engineering (especially the field practice) takes a large proportion, including cognitive practice, teaching practice, graduation practice, etc., the enterprise arranges the student to practice the enthusiasm not to be high, mostly is the teacher contacts well the construction unit, by the teacher or the spot technical personnel carries on the explanation to the project outline and the construction technology after the student visits; At the same time, the expansion of enrollment in colleges and universities leads to a surge in the number of interns, and the contradiction of insufficient practice bases is more prominent. In general, municipal engineering construction projects are large in volume, many and complex procedures, and the construction cycle is long. If the short-term practice can only see a certain part of the project or a process, students cannot fully understand the construction process, cannot be familiar with the construction process, cannot master the actual construction technology. And because of time and financial constraints, an internship is unlikely to take place on multiple sites. Students have little opportunity to take part in production practice, which makes students have no deep and comprehensive understanding of the concrete content

of engineering project and construction organization and management.

Engineering practice experience and engineering application ability are very important for municipal engineering practitioners. Therefore, in order to train the applied municipal engineering talents effectively, we must change the traditional concept and method of practical teaching, and study and develop it from the aspects of teaching contents, teaching methods and teaching means, to construct a new practical teaching system of municipal engineering technology to meet the needs of the society.

### 3. Research and practice

(1) To construct a multi-level, multi-module, systematic and scientific combination of strengthening foundation, highlighting design and comprehensive ability, and emphasizing the cultivation of innovation ability, the practical training teaching system consists of basic training, comprehensive training, innovative training and so on. The basic training platform, which consists of a discipline-based training platform, a mechanics training platform and a professional training platform, will train students in addition to their basic skills and qualities, in accordance with the requirements of the standards of the training course, to carry out open and self-designed series of training selectively, to form a comprehensive training platform, and to cultivate students' comprehensive practical ability. For example, the "Municipal engineering materials testing" reform, the implementation of open-ended practice teaching. The contents of the training include the test items, material preparation, material property test, specimen design, fabrication and installation, equipment selection, test point arrangement, data collection and analysis, etc., with the characteristics of design and comprehensiveness, students can design a series of training independently by means of the design and comprehensiveness training contents stipulated in the training outline. That is, students draw up their own training objectives, methods, steps, standards, requirements, propose the required materials, equipment, etc., and apply to the training time, after approval, under the guidance of the training teacher, carry out the training independently and write the training report[5-6].

(2) The production practice adopts the "Open cooperative guidance" practice method, that is, under the guidance of the teaching steering committee, the students contact independently or the teachers recommend to the school-enterprise cooperation practice base or the production-study-research base, under the guidance of part-time teachers in enterprises, practice independently according to the requirements of the practice outline. The school instructs the teachers to go to the practice spot to inspect the inspector. The practice of municipal engineering and technology specialty forms the practice characteristic of "Students' independent practice and teachers' effective supervision and guidance". In the process of implementation, we should pay attention to deal with the relationship between "Release" and "Management", not only to fully reflect the leading role of "Double teachers" in schools and enterprises, but also to create conditions for students to play their own initiative.

(3) To integrate and optimize the contents of curriculum design so as to make the contents of structure, construction and cost become an organic whole, so as to cultivate and improve students' comprehensive quality and integral consciousness. The topics and contents of the course are drawn from the actual project, and the students receive the training and practice of engineering design, construction and management ability through direct participation in the project activities.

(4) "Professional competition" has the promotion and the guidance function to the theoretical teaching and the practical training, the practice and so on curriculum content, is to the municipal engineering technology talented person raise the practice link very good supplement. Competition activities can greatly stimulate students' enthusiasm for learning and interest in practice, students from passive learning into active participation. According to students' knowledge and ability, organize and encourage them to take part in relevant subject competition, such as modeling, map reading, structure competition, etc. Each year, the corresponding training skills contest and the school "Artisan Week" skills contest, select outstanding students to participate in the provincial skills contest. At the same time, students are encouraged to apply for the "University student innovation and Entrepreneurship Project", or to participate in teachers' research projects. In the above-mentioned activities, teachers encourage students to think independently and do it by themselves through side guidance, which effectively cultivate college students' innovative consciousness, cooperative spirit and engineering practice ability.

#### 4. Practical results

Through the reform of practical teaching mode, the students of municipal engineering technology have made remarkable achievements in scientific and technological innovation, professional competition and social practice. The major tries to promote learning by competition, teaching by competition and reform by competition. In the past year, students have achieved outstanding results in academic competitions, including: 12 National Competitions, provincial competitions were awarded 20 people.

Professional team teachers also conducted offline interviews and online questionnaires on graduates and employers. Employers' feedback shows that after the practical teaching reform, students in the municipal engineering design, construction, operation, management and other aspects of a significant improvement, can better adapt to all aspects of the work, by the employer's praise.

#### 5. Conclusion

Through the reform and application of the practical teaching system of municipal engineering technology specialty, this paper clarifies the context of curriculum in the process of personnel training, and perfects the practical teaching system, it provides a reference for students of municipal engineering and technology in the design ability, construction ability and other aspects of training and curriculum system reconstruction.

#### References

- [1] Lijia Yang. Study on the practical teaching system of "Integration of post-course competition and certificate, Education and training competition" [J]. *Joint Journal of Tianjin Vocational Colleges*. 2023(3): 36-41
- [2] Tang Bin, Zhao Neng, Xie Kai, Yiyang Wang. Demand-oriented curriculum system and training scheme construction of intelligent construction specialty [J]. *Technology information*. 2023(5): 177-180
- [3] Xiuyan Zhou, Li Na, Mingsong Wu, Li Xian, Qingwei Li. Exploration and practice of ideological and political education system for environmental engineering [J]. *Modern Chinese educational equipment*. 2023(5): 104-106
- [4] Ruixian Xiu, Yitong Guo. Reconstruction of practical teaching system of engineering specialty in the context of engineering education professional accreditation [J]. *Journal of Changchun Model University*. 2023(4): 172-174
- [5] Yaqin He, Dongming Shao, Zihui Bi. Exploration and practice of practical teaching mode of transport engineering specialty for the construction of "New engineering" [J]. *Logistics Technology* 2023(13): 146-155
- [6] Li Zhen. Exploration and practice of practical teaching curriculum system of mechanical measurement technology [J]. *Lab Science*. 2023(1): 115-117