

# Practical Teaching Reform of Airport Construction Engineering Based on Innovative Ability

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**Abstract:** Practical teaching is one of the key links of talent training. Based on the analysis of the current situation of practice teaching in airport engineering, aiming at the existing problems in practice teaching, combined with the needs of airport engineering talents training, the reform of airport engineering practice teaching is discussed. The practical teaching system for training innovative airport engineering professionals is put forward, which provides reference for the revision of airport engineering professional training program, and also provides reference for the reform of innovative airport engineering talents training mode.

**Keywords:** practical teaching; airport construction engineering; innovative ability

## 1. Introduction

Airport construction engineering for the aviation industry and regional economic and social development aims to cultivate all-round development senior personnel with strong engineering practice and innovative ability, as well as a certain international perspective and good professionalism, those can do project planning and bidding, engineering design, construction, supervision and consultation in airport engineering and bridge area. Practicality is the biggest feature of the major <sup>[1]</sup>. How to strengthen the training of students' engineering practice ability, let the students get better opportunities for learning and exercise according to their interests and hobbies, and cultivate the students from "knowledge type" into "ability type" are the goal of training the professional talents of road engineering in various colleges and universities.

## 2. Problems in Professional Practice Teaching

### 2.1. Lack of connection in experimental practice

The course experiment is the practical link of setting up the teaching content of the course. It can be divided into confirmatory, comprehensive and design experiments. The training programs set up a number of experimental projects: mechanical properties test, soil mechanics test, concrete strength test and so on. These experiments lacking the engineering background are basically confirmatory experiments that are very theoretical <sup>[2]</sup>. It makes the students feel that the experiment distance is far from the actual project, and it is difficult to arouse the students' interest in learning.

### 2.2. Lack of initiative in professional practice

Professional practice is an important practical teaching mode of professional theory and practice of the airport construction project. Through field visits to practice bases, construction sites and manufacturing factories, it can strengthen the understanding of professional theoretical knowledge, enhance the ability of integrating theory with practice, and also improve students' professional comprehensive ability <sup>[3]</sup>.

Visiting and studying the airport and road engineering to form a sense of theoretical knowledge. Combined with the course content of the construction technology and organization of the airport and the construction of the underground engineering, students participate in engineering practice at the airport construction site <sup>[4]</sup>. There are many problems in the practice process: in the process of internship students are mainly passive visiting projects, and their active participation is not high; internship content is influenced by project progress and internship time; it is difficult to participate in the main link of the project construction, and lack of systematic and integrity.

### 2.3. Lack of innovation in design practice

Curriculum design is generally set up after the end of the course theory teaching content, it is the use of design techniques to the integration of the content of the course. The airport pavement design course is based on the design of the airport cement concrete pavement structure. The original data of the airport's location, area, terrain, traffic, meteorological data, hydrology, soil geology, building materials and airport usage requirements are given. Students are required to use their knowledge to complete the design of the pavement structure independently. So as to cultivate the students' ability to solve practical problems independently, and to strengthen and

improve the basic skills of design, calculation, drawing and compilation of instructions. In practical operation, there is a problem of the independent development of various courses and no obvious intercourse between the courses [5].

Graduation design, after the end of all courses, is an assessment of the overall knowledge of the major. The time is about 3~4 months. The design proposition is usually given by the teacher, and the student completes the design task under the guidance of the teacher. Usually at the beginning of the graduation design of the airport building, Teachers generally give the original information for the design of several airports, such as Fengxiang airport, Mianyang airport, etc., The students completed the design tasks according to the planning, road surface, terrain, drainage, budget and other stages respectively. Finally, the preliminary design scheme of the airport was formed and the design proposition was given. The students completed the design task under the guidance of the teachers. Most of the topics involved in the curriculum design and graduation design are confirmatory and imitative, less related to engineering practice.

### 3. Design of Innovative Practical Teaching System

Practice teaching system is the guarantee of practice teaching. The practice teaching content is the core in the practice teaching system, and the practical platform is the guarantee for the completion of the practical teaching content and the realization of the ability and quality train-

ing [6]. According to the requirements of the training program for the airport engineering talents, the practical teaching system is planned from two aspects: the content of the practical teaching and the construction of the corresponding platform.

#### 3.1. Planning of practical teaching content planning

The practice teaching of Airport Engineering covers not only the experimental teaching of engineering survey, engineering geology, civil engineering drawing, building materials and other courses, but also the curriculum design of airport planning and design, airport pavement design and so on, with extensive practice contents and various means.

Airport engineering practice teaching includes experimental practice teaching and professional design practice teaching [7]. According to the preliminary understanding, comprehensive training and innovation practice, the three level is to cultivate students' practical and innovative ability. The primary practice mainly refers to the verifying curriculum experiment and the basic curriculum design. Comprehensive design practice mainly refers to students' exploratory experiments and curriculum design based on knowledge and skills, using some knowledge of one course or multiple courses, or designing and implementing them. Innovative practice is the research experiment and design that students use their knowledge and put forward by themselves. Design of innovative practice teaching system is given in Figure 1.

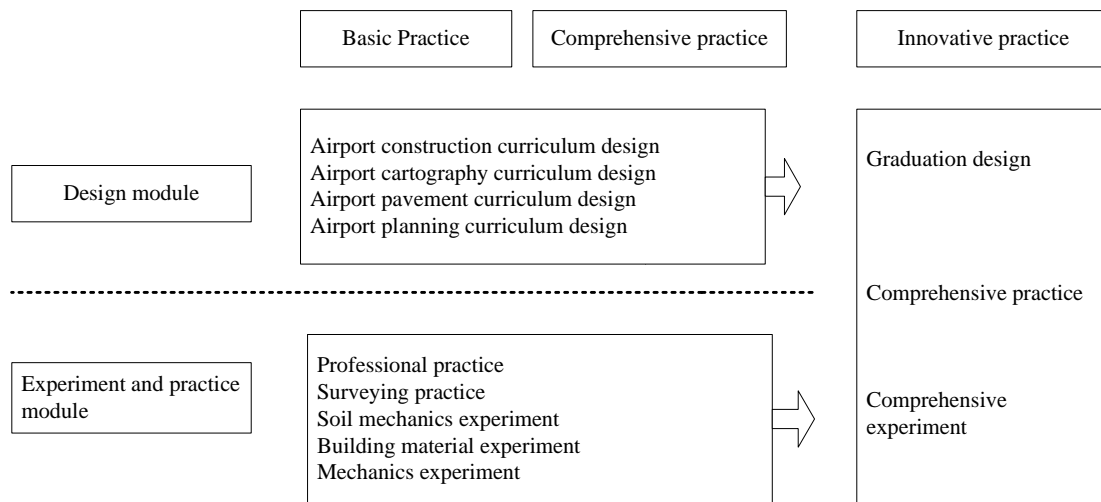


Figure 1 Design of innovative practice teaching system

Through the full investigation, reasonable design for airport construction engineering in all experimental courses and practice courses teaching syllabus and content, independent experimental courses, reform the experimental teaching system, experimental teaching contents to try to

establish regulations as the basis, students were experimental table, the selection of projects, the new experimental teaching system of self complementary experimental content. In the process of experimental teaching, we should increase the comprehensive, designing and inno-

vative experimental projects, and establish an experimental teaching platform, such as open laboratory, graduation project (Thesis) and college students' innovative practice plan, so as to give full play to the role of experimental teaching in talent training.

For the airport construction project seasonal, time span, practice content rich, complex construction technology and production projects cannot be repeated, the establishment of practice base and practical training base combining on-site operation training and virtual simulation experiment combined with practical teaching mode, cultivating innovation consciousness and innovation ability of students<sup>[8]</sup>. Strengthen the practice process management process and the practice examination, changing the status quo in the past only to practice report to student achievement evaluation, so as to effectively prevent the practice report plagiarism phenomenon, formed by "practice - practice base materials for selected - practice mobilization and practice education, computer simulation of virtual practice - site practice - phase composition practice discussion and exchange a reply exchange - Performance Evaluation and other aspects of the complete production practice teaching system.

In graduation design and curriculum design topic selection and content setting, it is necessary to change the past simple imitation training, gradually transition to the change to the research training.

In the curriculum design and the basic requirements of graduation design based on the syllabus, according to the characteristics of personal learning ability of students, to research deeply with the teachers' scientific research projects and related engineering problems and professional issues, thus improve students' curriculum design and graduation design of interest, give full play to their potential and innovation, to create awareness of students. To cultivate students' creative ability to solve practical engineering problems.

### 3.2. Planning of teaching platform system

Combining the practice teaching content system and perfecting the construction of practical teaching platform system in an all-round way. At present, the teaching platform supporting the practice of airport engineering mainly consists of 8 internal school practice platforms and 3 kinds of practice bases outside school<sup>[9]</sup>. In order to ensure the smooth development of practice teaching, and actively expand the innovative experiment project, it is suggested to expand the student independent innovation laboratory, and combine practice teaching team management and laboratory information management, and establish the practical teaching platform system shown in Figure 2.

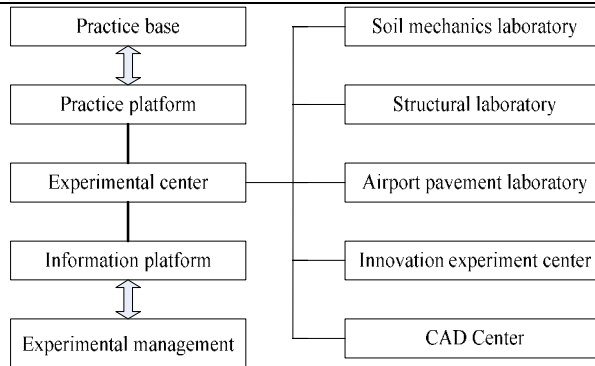


Figure 2 Practical teaching platform system

The purpose of setting up students' science and technology innovation projects is to improve students' awareness of technology participation, scientific and technological practice consciousness, technological competition consciousness, technological innovation consciousness and observation, thinking, hands-on and creativity<sup>[10]</sup>. We should carry out extracurricular scientific and technological activities at various levels and ways, improve students' innovative ability, carry out extracurricular scientific activities extensively, and rapidly improve students' scientific research ability by participating in Teachers' research projects.

Under the guidance of this idea, every year, a number of scientific lectures and academic reports will be held every year, and academic conferences will be held, and colorful and varied technology and cultural activities are being built to create a good campus cultural atmosphere. Through all kinds of scientific and technological activities, we can stimulate students' interest in learning, let students know all kinds of hot topics and frontiers, and encourage students to devote themselves to professional technology innovation, and have achieved good results.

### 3.3. Establishing a stable and practical base for the practice of production, learning and research

Combining the characteristics of the course system of the airport construction engineering and the various links of the production process, the whole process of production practice is established. The interactive virtual experiment is made through computer virtual environment, making it an important supplementary and effective auxiliary means for theory and practice teaching, so as to maximize the comprehensive quality of students<sup>[11]</sup>. The virtual experiment means are integrated into pre-class preview, training in class and practice after class, etc. The construction process is demonstrated by virtual experiment, and the use of construction equipment, construction process and matters needing attention are explained, so as to build a teaching platform for students to practice and interact with each other at any time.

Of course, the process of virtual practice is only an auxiliary means, and it is necessary to strengthen the connection between theoretical knowledge and practical operation with "empty". The key is to improve students' ability to solve practical problems by means of "real". The actual practice base construction process, should give full play to the role of enterprise cooperation, according to the road engineering professional development needs, establish the composition of teacher team related personnel supported by school teachers, design institute and the actual construction and technical personnel, the implementation of multi-channel and multi tutor. Based on the actual engineering situation, the internship base participates in the formulation of the internship plan and determines the content of internship, reflecting the combination of theoretical teaching and production practice, and making the internship more targeted.

#### 4. Conclusions

Based on the analysis of the practical teaching situation of the airport engineering specialty, this paper puts forward the conception of the reform of the practical teaching of the airport engineering specialty. From the aspects of teaching content and platform construction, we have planned the construction of airport engineering practice teaching, hoping to promote the practice teaching reform of airport engineering specialty, and hope to play a reference role for other similar professional practice teaching system construction.

#### References

[1] Yuan Qiwang, She Yuexin, Yu Xiangcheng. The construction of the practical teaching system of "excellent plan" -taking the civil

engineering specialty of the applied local undergraduate college as an example [J]. Higher building teaching, 2013, 22(6): 112-116.

- [2] Deng Miaoyi. Civil engineering in local colleges of science and Engineering (bridge) problems and countermeasures of teaching practice [J]. University education, 2013 (7): 111-113.
- [3] Wang Shaozhen. Research on BIM practice teaching based on design competition mechanism for civil engineering major of applied undergraduate[J]. Information Recording Materials, 2018(1): 140-141.
- [4] Li Haixia, Wu Tao. Research on the quality guarantee system of the practical teaching link of the structure design module of civil engineering specialty [J]. Time Education, 2016(13): 26-27.
- [5] Bai Haifeng, Zhao Lihua, Liu Jun. Research on the operation guarantee mechanism of the practice teaching of the cooperation in the engineering, school and research in the Civil Engineering Department [J]. Journal of Architectural Education in Institutions of Higher Learning, 2016(4): 117-121.
- [6] Zhang Qinling. Discussion on the teaching practice of civil engineering professional bridge direction [J]. Education Teaching Forum, 2016(5): 119-120.
- [7] Xie Jianjun. Practice teaching reform of school enterprise cooperation in civil engineering specialty [J]. Academy, 2017(16): 39+41.
- [8] Liu Zhijun. Reform of practice teaching mode for civil engineering specialty [J]. Journal of Architectural Education in Institutions of Higher Learning, 2017(4): 100-103.
- [9] Liu Guifeng, Chen Zhenfa. Research on problems and countermeasures in practical teaching of civil engineering [J]. Shanxi Architecture, 2016(20): 225-226.
- [10] Zhou Lincong, Qiu Jianhui. Research on the problems and countermeasures of practical teaching in civil engineering [J]. Journal of Architectural Education in Institutions of Higher Learning, 2014(4): 130-132.
- [11] Chen Yuanzhao, Li Zhenxia. Analysis of problems and countermeasures in practical teaching of civil engineering [J]. Education Teaching Forum, 2016(27): 175-176.