

# Exploration of Innovative Educational Models of Sino-foreign Cooperative Education in Civil Engineering

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## Abstract

*Based on the education reform of the content, teaching methods, assessment methods, and innovative ability training of the geotechnical engineering course, the paper study on a model of sino-foreign cooperative education. Introduced by Australian high-quality education resources and advanced concepts, we have set up a new concept of advanced sino-foreign cooperative education. It promotes the teaching reform of majored in civil engineering, and that is a big step towards cultivating innovative talents oriented to internationalization.*

**Keywords:** Higher education, Sino-foreign cooperative education, Teaching mode, Innovation ability

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## 1 Introduction

Sino-foreign cooperative education usually refers to foreign educational institutions co-organized with Chinese institutions that enroll students from China. Sino-foreign cooperation in running universities rose in the last century. After more than thirty years of development, the Sino-foreign cooperative education institutions or projects amount to thousands in China, and almost every province has at least one Sino-foreign cooperative education project.

With the development of internationalization and modernization of higher education, Sino-foreign cooperation in running universities is gradually becoming a new form of foreign exchange and cooperation in the Chinese education system and is one of the important strategic goals of China's higher education reform and development in the 21st

century.

## 2 Problems encountered in the process of Sino-foreign cooperative education in civil engineering

In the process of Sino-foreign cooperation in running universities, some problems in teaching practice were also presented. For example, in terms of teaching content, some universities pay more attention to professionalism and systematicness in the curriculum system and educational content, but it is not closely related to reality. There are a few courses that can exercise students' hands-on ability and cultivate students' creative thinking ability. Another problem is teaching methods. Under the traditional teaching mode, most students are accustomed to the passive acceptance learning method of taking notes in getting out of class and memorizing notes after class, and the lack of communication and interaction between teachers and students during the learning process. The simplification of classroom practice teaching will inevitably lead to students cannot be effectively exercised and improved regarding multiple thinking ability and problem-solving ability.

Given the above reasons, the universities must conduct in-depth research on the curriculum system, teaching mode, teaching management, etc., carefully absorb the advanced experience at home and abroad, and update the teaching content based on the professional advantages and subject characteristics of civil engineering. Explore a new teaching mechanism suitable for Sino-foreign cooperation in running university, further clarify the implementation of a comprehensive quality education talent training model, and explore and practice the quality teaching model of Sino-foreign cooperative education.

## 3 Reform of the teaching model of Geotechnical Engineering Course

Aiming at the teaching and management problems encountered in our school's cooperative education, based on earnestly absorbing advanced domestic and foreign experience, the "geotechnical engineering" course is the research object, based on our school's professional advantages and subject characteristics, Focus on the research work of professional teaching and reform under the mode of Sino-foreign cooperative education from the following aspects:

### a. Establish an interactive heuristic teaching model of teacher as the leading and student as the main body.

The traditional teaching model is teachers speak, students listen, that is, teachers teach materials and students learn materials. The new talent training goal of Sino-foreign cooperation in running university requires the formation of a teaching model with the teacher as the leading role and students as the main body. Teaching materials are in a subordinate position in teaching. Teachers are not limited to teaching materials to arrange teaching content in the classroom, but use a variety of teaching methods to introduce students to the subject of the classroom. Students can study the textbooks outside of class and digest them independently to deepen their understanding of classroom content. In the teaching process, we must change the past full-class teaching, and actively adapt teaching methods such as heuristic, questioning, lecture, discussion, and set an example. It is necessary to actively achieve the three interactions: listening to each other, discussing with each other, and evaluating each other. The classroom should be student-centered, and appropriate questions should be taken, which will help focus the students' attention on the classroom and increase the listening effect. The Australian teaching method is mainly through discussion and research, emphasizing inquiry learning. Focus on the process of students reviewing knowledge, discovering new content, and solving new problems, and the process of transitioning from knowledge transfer to knowledge discovery and knowledge re-innovation. This Australian teaching philosophy can better cultivate students' self-learning ability, practical ability, innovation ability, communication ability, etc.

**b. Form a progressive teaching method of large lectures + small tutorials + small experiments.**

University teachers are not only knowledge imparters, but also knowledge guides. Teachers from both China and Australia can pass on the framework and connotation of existing knowledge to students through flexible and diverse theoretical lessons, while the specific content and form of knowledge require students to learn, think and understand independently. Compared with the theory teaching of large classes, tutoring classes in small classes, or groups are particularly important. The instructor can give specific guidance to each student, teach students by their aptitude, guide students to ask questions and think independently, or group discussions to solve problems, and promote students' knowledge Understanding and assimilation. With a rational understanding, coupled with sub-group experimental operations or comprehensive design, the confusion and confusion of students can be solved. Students can digest and absorb knowledge while creatively sublimating the knowledge they have learned.

**c. Pay attention to practical teaching and cultivate students' independent innovation ability.**

Practical teaching is an important part of cultivating students to integrate theory with practice, make full use of the theoretical knowledge they have learned, and solve practical problems. The effectiveness of practical teaching plays a vital role in improving teaching quality and achieving training goals. Civil engineering, especially geotechnical engineering is a discipline with strong practicality, and more attention should be paid to cultivating students' independent innovation ability. Australian universities pay special attention to practical teaching links, such as course design and graduation design are based on actual engineering

And completed the design in the relevant internship unit, most of the topics are real engineering topics, and the graduates are also very popular with employers. In the cooperative school, we try to arrange or design many wide-caliber "problems" or design questions every academic year, so that students can use their talents and creativity to solve one after another designed by the teacher. "Questions" or design questions, which not only deepen students' understanding of theoretical knowledge but also stimulate students' practical and innovative abilities.

**d. Establish flexible and diverse evaluation methods to promote learning.**

To stimulate students' talents and innovative abilities, it is very important to conduct objective and comprehensive evaluations. Examination results cannot be used as the only yardstick to evaluate students' abilities and learning achievements. A diversified evaluation mechanism should be established. In the course of geotechnical engineering course teaching, students' usual grades, including their usual learning attitude, learning enthusiasm, classroom practice, in-class tests, homework, etc., should be included in the evaluation system, and the weight should be greater than the final written test score. The content of the exam is not limited to the content taught in the classroom. The knowledge learned and used by the students throughout the semester should be used as the content of the exam, that is, the "high-level exam", which further stimulates the students' enthusiasm for independent learning. Also, we must pay attention to the diversification of evaluation forms and establish a comprehensive evaluation mechanism. In addition to evaluation and testing, it can also supplement the comprehensive interview response and evaluation link. The diversified evaluation mechanism not only avoids students' rote memorization and the bad atmosphere of coping with exams, reduces students with high scores and low energy, but also greatly guides students to establish a correct outlook on learning and encourages students to learn.

#### 4 Conclusion

All in all, the teaching model of Sino-foreign cooperative education in civil engineering. During the development process, we must fully respect applied talents in civil engineering projects. The goal of training, the effective implementation of a better-coordinated teaching mechanism, and take cooperation in running schools as the key to improve the interaction between students and teachers. It also lays a foundation for the sharing of teaching resources and the optimization of teaching levels.

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