

# A Practical Case of Education and Teaching Reform of Project-based Research under the Background of Globalization

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**Abstract:** A total of 30 teachers and students of Grade 2021 Engineering Cost Bilingual Class of Xi'an Eurasian University participated in the one-week Hong Kong and Macao Research project in the summer of 2023, and carried out short-term learning and exchange activities in the area, including visits to enterprises and industry associations, exchanges in colleges and universities, visits to museums, historical and cultural districts, etc.

**Keywords:** Teaching reform; Project mode; Globalization

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## 1. Bilingual project talent training objectives and plans

### 1.1 Training objectives

The bilingual course of Engineering cost aims to cultivate all-round development of moral, intellectual, physical and labor, adapt to the sustainable development needs of the international construction industry, master the basic principles and basic knowledge of engineering cost, obtain the basic training of cost engineers, have an international perspective and outstanding English application ability, and be able to work in the fields of housing construction, infrastructure construction, etc. Engaged in construction, management, consulting and the whole process of project cost management and other work, with high comprehensive literacy and competitive advantages of international applied talents.

### 1.2 Training plans

According to the project cost bilingual class talent training program, and in order to enhance students' sense of experience, promote the construction of the college's bilingual curriculum, strengthen cooperation with relevant universities and enterprises, and enhance the internationalization level of the College, the College of Human Settlements College of Engineering cost bilingual project has organized and planned research activities in Hong Kong and Macao, which are carried out in a project-based manner and driven by tasks. The activities during the period are fully combined with the research objectives, and on the basis of satisfying personal experience, students can broaden their horizons and improve their cognitive level, so as to achieve the ideal effect of research activities and give play to the educational value of research activities.

## 2. Research and study activities and project system

### 2.1 Research and study

Research and Study refers to an activity in which new knowledge, skills and experience are acquired through research and learning to solve practical problems or advance academic research. It usually involves delving into a field, collecting and analyzing data, and communicating and collaborating with experts in the field.

In the selection of the content and process of this research, organizers will try their best to combine the professional knowledge of engineering cost learned by students with the expansion of vision and student experience, and strive to achieve the goal of multi-win. For example, in the choice of schools, through the friendship activities with the teachers and students of the University of Hong Kong and the Hong Kong University of Science and Technology, students can not only enjoy the beautiful scenery of world-class

universities, but also be deeply impressed by the sophisticated laboratory machinery and equipment, open and inclusive academic atmosphere, rich and colorful cultural and sports activities, then kindle the passion of students to study hard. In terms of the selection of enterprises and industry associations, visiting Zhuhai Engineering Cost Association gives students the opportunity to communicate with industry leaders and understand the latest development trends of multi-professional integration and intelligence in the industry, so as to better guide their own learning, which is also of great benefit to the teaching and scientific research for teachers participating in these activities.

## **2.2 Project system**

As a teaching method, project-based learning means that students learn by completing projects derived from real life, explore problems, acquire knowledge and skills from them, and develop students' comprehensive ability through the achievement of project goals. By taking project as the main line, teacher as the leading and student as the main body, we construct and learn a new knowledge system in practice. This research activity also tried to adopt the project method, the specific methods are as follows:

First of all, pay attention to the real situation of research and learning. Project-based research emphasizes that students should learn by doing and construct knowledge system in practice. By allowing students to visit the Hong Kong-Zhuhai-Macao Bridge, they will have a deeper understanding of the professional engineering knowledge they have learned, and through the real experience of world-class projects at close range, they will be shocked in the heart, but also have a strong curiosity for advanced science and technology, awe, and pride in the great rejuvenation of the Chinese nation.

Secondly, students are guided by teachers. Many subjects in research, such as experience-oriented, science-oriented, etc., need students to personally experience and constantly explore in order to achieve the research goal. In the preparation process of this research activity, relevant reading materials were prepared for students, including but not limited to papers, journals, and public Twitter posts. Students were encouraged to raise questions during the reading process, and teachers conducted heuristic thinking, and then answered them in the actual research activities, so as to truly "learn" in the "research", which can not only arouse students' interest in reading, but also ensure the realization of the ideal research effect.

Third, highlight teamwork. The completion of the project and the realization of the research objectives require students to complete each project and research theme in a planned and systematic way in the form of group cooperation, through communication, division of labor, cooperation and exploration, so as to cultivate the ability of independent learning, exercise the ability of teamwork and form the consciousness of innovation. Group cooperation mode is one of the features of this research activity. The participating students will be divided into three groups, each group will be organized by a teacher to carry out activities. After the research activity is over, everyone will be organized to discuss and share their daily learning experiences and gains, and record them. At the same time, another advantage of the grouping mode is convenient management, each group of teachers can always grasp the dynamics of each student in the group, and can ideally reduce or even eliminate the security risks in the process of research.

Finally, the implementation process and final evaluation. Based on evaluation, the research effect of project system is feedback, and students to adjust learning methods. Through students' self-evaluation, mutual and teachers' evaluation, the achievement degree of research objectives of different topics is comprehensively and objectively evaluated. After the end of the research study.

## **3. Problem solving and experience summary**

### **3.1 Problem solving**

#### **3.1.1 Lack of real teaching situation**

In teaching activities, in order to let students better understand and apply the knowledge, it is particularly necessary to highlight the truth and reality, especially for engineering majors with high practice requirements. In class, teachers often teach relevant knowledge to students through case analysis or scenario simulation to help students understand and master. However, this method has some defects. On the one hand, this teaching method is not intuitive enough and has high requirements for students' understanding ability. On the other hand, not all knowledge content is suitable for such teaching methods. Project-based research activities can enable students to go out of campus and visit the construction site of the project to learn, combine the theoretical knowledge learned in class, and more intuitively understand the practical application of professional knowledge.

#### **3.1.2 Lack of awareness of engineering development trends**

In teaching activities, due to the constraints of various conditions, teachers and students still have a large room for improvement in understanding and mastering the development trend and dynamics of the engineering industry. Project-based research activities, especially visiting projects and communicating with experts, allow teachers and students to truly feel the changes in the industry, understand the forefront of the industry, and grasp the direction of development. For example, after visiting the Hong Kong-Zhuhai-Macao Bridge

and Macao Science and Technology Museum,the teachers and students will discuss the aspects of digitization and automation of engineering,artificial intelligence and big data,interdisciplinary integration of engineering disciplines,reducing environmental impact in the design,manufacturing and operation process of engineering,promoting green buildings,etc.Have a deeper understanding and knowledge.

### 3.2 Summary of experience

The research and study activities of this project can be divided into three macro stages:preparation,implementation and summary. Through summary,we can get improvement.The following is the experience summary of research and learning activities:

(1)Focus on inquiry:The activities should take inquiry as the main way,encourage students to discover and solve problems through hands-on practice,and improve their practical ability and innovation ability.This research adheres to project management,students are divided into groups to participate,adhere to problem-oriented,students find problems and solve problems.

(2)Guide students to independent learning and teamwork:In these activities,students should be guided to independent learning,-cultivate their ability to think and solve problems independently,and cultivate the spirit of cooperation.Teachers can provide necessary guidance and help,but should avoid excessive intervention.

(3)Provide opportunities for evaluation and reflection:During and after the activities,opportunities for evaluation and reflection should be provided to help students sum up experience,find problems,improve methods,and constantly improve practical ability and innovation ability.After this activity,we will summarize and share the project experience in time.

(4)Reasonable design and arrangement of activities:When organizing the activities,it is necessary to design and arrange them reasonably to ensure that the activities are orderly,efficient and safe.At the same time,the activity plan should be adjusted flexibly according to the actual situation and characteristics of students,so that the activity is more in line with the needs and characteristics of students.

## 4. Student perception

Perception 1:

In Victoria Harbour,you can see the world-class night view,and the lights inside are extremely bright.I went to Mong Kok and had a car noodle.It was very nice.People always say that when you realize your mediocrity,you really grow up,but now I think mediocrity is the starting point,to change it is the end,you should realize that you are mediocre,you should also know that you cannot be mediocre.  
(Qiuyang Li)

Perception 2:

Under the guidance of my teacher,I visited famous universities in Hong Kong and had a deep understanding of their respective characteristics and cultural atmosphere.These universities not only have world-class courses,but also campus design is a style of pursuit of knowledge.I was exposed to a new living environment and a new culture,Immersive experience of learning and lifestyle in Hong Kong universities.(Chenyang Wang)

## 5. Conclusion

In the research study activities,doing is the means and learning is the goal.Teachers should determine comprehensive and practical research themes and activities before the trip,and conduct safety education for students.In the activities,teachers should adopt various teaching methods such as situational,experiential and heuristic based on the actual situation of research to arouse students'enthusiasm.After the trip,teachers should enrich the evaluation content and constantly improve the effectiveness of research study.Promote research activities to play a greater value.

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