

# Exploring the Innovative Mode of Engineering Cost Education in the Context of Double High



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**Abstract:** In the current double-high context, the traditional education model cannot meet the needs of the industry and students, so there is a need to explore innovative models. This includes promoting internships, practical training, hands-on teaching, and innovating curriculum and teaching methods. Through these innovative initiatives, engineering cost education can enhance students' practical skills, teamwork, and problem-solving abilities to meet the needs of industry development. At the same time, the introduction of information technology, diversified teaching methods, and personalized teaching can improve teaching effectiveness and students' learning experience. Such innovative exploration can help cultivate high-quality engineering cost talents and promote a close match between education and industry needs.

**Keywords:** engineering cost education; innovative mode; practical teaching

## Introduction:

With the continuous development of society and the economy, there is an increasing demand for high-quality engineering cost talents. However, to meet this demand, the traditional education model needs to be constantly innovated and improved to cultivate engineering cost talents with practical ability, problem-solving ability, and innovation consciousness. Therefore, exploring an innovative education model has become an urgent task for the development of engineering cost education.

## 1. Current situation of engineering cost education

Engineering cost education is an important field for cultivating professional engineering cost talents, aiming at cultivating students to master theoretical knowledge and practical skills of engineering cost and be able to be responsible for budget, cost control, and engineering economic management in construction projects. However, engineering cost education is currently facing some current situations and challenges. First, the teaching content of engineering cost education is relatively traditional,

focusing too much on the inculcation of theoretical knowledge and lacking the introduction of practical and innovative elements. This leads to students' lack of practical experience and problem-solving ability when they face actual work after graduation. Secondly, the teaching methods and means of engineering cost education are relatively traditional and single, mainly based on classroom lectures, lacking an effective combination of interaction and practical links. Such teaching methods are difficult to stimulate students' learning interest and motivation and limit the cultivation of their comprehensive quality and practical ability. In addition, the development of the engineering cost industry has brought new challenges. As the scale and complexity of construction projects have increased, the requirements for engineering cost talents have become higher and higher (Xiong & Xu ,2019). However, the current engineering cost education model can hardly meet the industry's demand for high-quality talents, and the teaching contents and methods need to keep pace with the times and adapt to the latest development trends and technical requirements of the industry. Therefore, to promote

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the development of engineering cost education, it is necessary to reflect on and improve the current situation. Emphasize practical teaching, strengthen cooperation with the industry, and introduce case studies and practical training sessions to enhance students' practical operation and problem-solving abilities. Innovate teaching methods and adopt diversified teaching tools, such as project simulation, fieldwork, and teamwork, to stimulate students' learning interest and innovation ability. At the same time, strengthen the construction of faculty and train teachers with rich practical experience and teaching ability to improve teaching quality and level.

## **2. Exploration of innovative mode**

### **2.1 Application of case study method in engineering cost education**

The application of the case study method in engineering cost education is of great significance to cultivating students' practical application ability and problem-solving abilities. Through case studies, students can understand and analyze various engineering cost management problems in real or simulated project situations, and cultivate their analytical thinking and decision-making abilities. Specifically, the case study method can help students combine abstract theoretical knowledge with practical situations. By studying and analyzing actual cases, students can apply the concepts and principles learned in class to actual engineering projects and deepen their understanding and memory of the knowledge (Xu & Lin, 2020). They will face real challenges and decisions from which they learn how to cope with different situations and solve problems. Second, the case study method develops students' teamwork and communication skills. In the case study process, students usually need to form groups to analyze and solve the problems in the case together. Through cooperative discussions and exchanges, they learn to listen to others' perspectives, negotiate ideas, communicate effectively, and work together to develop solutions. This develops students' teamwork and leadership skills and enhances their ability to work with others in real-world situations. In

addition, the case-based learning approach promotes the development of student's critical thinking and creative skills. By analyzing and evaluating cases, students are required to use critical thinking to ask questions, formulate hypotheses, and find solutions. This development of critical thinking helps students to analyze and evaluate complex problems comprehensively and develop their creative thinking and problem-solving skills. Finally, the case study method can also promote the development of students' professionalism and ethical awareness (Wei,2018). In the process of analyzing cases, students need to consider ethical and legal issues of project management, such as cost control, quality management, and compliance. Through case studies, students can recognize the responsibility and impact of the engineering cost profession and cultivate proper professional ethics and social responsibility.

### **2.2 Importance of engineering cost Simulation practical training**

Engineering cost simulation practical training is important in cultivating students' practical skills and meeting the challenges of actual work. Through simulation training, students can practice and practice in a real engineering project environment, deepen their understanding of engineering cost management processes and techniques, and develop their resilience in the actual work. First of all, engineering cost simulation practical training provides a safe learning platform that allows students to practice in a simulated environment of real engineering projects. They can get familiar with all aspects of project management by performing practical operations such as cost budgeting, risk assessment, and resource management through simulated projects. This practical training enables students to better understand and apply the theoretical knowledge they have learned and reduce mistakes and risks in the real workplace. Secondly, the hands-on engineering cost simulation training provides an opportunity to explore and experiment, allowing students to try out different solutions and decision-making strategies. They can face various practical situations and challenges in a simulated

environment, apply the knowledge and skills they have learned, evaluate the feasibility and effectiveness of various solutions, and make decisions accordingly. This practical training equips students with the ability to respond flexibly to problems and make decisions in real work. In addition, hands-on engineering cost simulation training can improve students' teamwork and communication skills. In simulation projects, students are usually required to form teams to work together to complete tasks and solve problems. Through teamwork, they learn to coordinate and cooperate, divide and conquer tasks, and communicate and negotiate effectively. This develops students' ability to work with others in the real world and enhances teamwork and leadership skills. Finally, engineering cost simulation training also provides students with the opportunity to integrate with the actual work of the industry (Guo & Yan & Zhang, 2014). Through simulation and connection with actual projects, students can better understand the actual operation and industry requirements of engineering cost management. This helps students to make a smooth transition to actual work and to have the required practical skills and professionalism.

### **2.3 Promoting internship, practical training, and hands-on teaching**

Through internship, practical training, and hands-on teaching, students can apply the theoretical knowledge they have learned in a real working environment, develop practical skills, and enhance their professionalism and employment competitiveness. Specifically, an internship is an opportunity to put students in actual work scenarios. Through internships, students can experience first-hand the working environment and requirements of the engineering cost industry and learn about the challenges and opportunities in professional practice. Internships can help students combine classroom learning with practical applications and develop their practical skills, teamwork, and problem-solving abilities (Yan, 2017). Second, practical training is a training activity conducted through simulation and

mock-ups. Through practical training, students can perform various practical operations in a simulated project environment, such as cost estimation, bill of quantities preparation, project control, etc. The practical training activities can help students get familiar with engineering cost management processes, master relevant software tools and techniques, and improve the accuracy and efficiency of practical operations. In addition, practical teaching is a teaching activity that combines theoretical knowledge with actual cases through project practice, site visits, research reports, etc. Practical teaching can help students apply what they have learned to practical problem-solving and develop their analytical thinking and creative ability. Students can understand the requirements and challenges of practical projects and enhance their problem-solving skills and professionalism through practical teaching. By promoting internships, practical training, and hands-on teaching, engineering cost education can better meet the industry's demand for talents and improve students' employability and adaptability. Relevant educational institutions can establish close cooperative relationships with the engineering cost industry to carry out the construction of internship bases and cooperative projects. Teacher teams should strengthen the training of practical teaching methods and the development of teaching resources, and provide more practical opportunities and case studies to stimulate students' learning interest and practical application ability (Sun & Huang, 2017).

### **2.4 Innovative curriculum setting and curriculum system reform**

Innovative curriculum setting and curriculum system reform is an important measures to promote the development of engineering cost education. In the context of double high, it is necessary to deepen and innovate the curriculum in response to the needs of the industry and the development needs of students to improve the teaching quality and students' comprehensive literacy. Specifically, the innovative curriculum needs to focus on the frontiers and hot spots of industry development. The engineering cost industry is constantly evolving and new technologies

and management methods are emerging. Therefore, the curriculum should be combined with the latest industry trends and additional professional courses in related fields, such as digital construction, BIM application, engineering cost software, etc., to train students to meet the needs of industrial development. Second, the curriculum reform should focus on interdisciplinary and comprehensive training. Engineering cost involves many fields, such as engineering management, financial management, legal knowledge, etc. Therefore, it is necessary to increase interdisciplinary and comprehensive courses in the curriculum system to cultivate students' comprehensive quality and problem-solving abilities (Jiang, 2018). For example, courses on project management, risk management, and legal and contract management can be offered to enhance students' professional ability and comprehensive literacy. For example, the engineering cost profession of a university has reformed its curriculum system and added innovative practice-oriented courses. These include courses on the application of building information modeling (BIM) in engineering costing, sustainable construction cost assessment, and project management practices. These courses introduce the latest industry technologies and management methods and encourage students to apply the knowledge and skills they have learned in practice. Through collaboration with industry, students have the opportunity to participate in real-life project simulations and solve real-world problems, developing their practical skills and teamwork abilities. This innovative curriculum and course system reform has greatly enhanced students' practical ability and employment competitiveness, which has been affirmed by the industry and students.

### **2.5 Innovative teaching methods and teaching methods**

Innovative teaching methods and teaching methods are crucial to the development of engineering cost education. Traditional teaching methods can no longer meet students' learning needs and educational goals, so innovative teaching means

and methods need to be explored and applied to improve teaching effectiveness and students' learning experience. First, the introduction of information technology and digital education tools is the key to innovative teaching and learning (Zhang & Zhao, 2017). By using technologies such as virtual reality, augmented reality, and online learning platforms, immersive learning environments can be created that enable students to better understand and apply what they have learned. For example, through virtual reality technology, students can perform practical operations and make decisions in simulated engineering projects, enhancing their practical skills and ability to deal with real-world challenges. Second, exploring diversified teaching methods is an important direction for innovative teaching. The traditional classroom lecture mode can be combined with teaching methods such as case studies, group discussions, and project practice to improve students' participation and initiative. For example, through case studies, students can analyze and solve real engineering cost problems and develop critical thinking and problem-solving skills. Meanwhile, group discussions and project practice can promote the development of students' teamwork and communication skills. In addition, personalized teaching is one of the important trends of innovative teaching. By understanding students' learning characteristics and needs, teachers can differentiate teaching design according to students' differences. Personalized teaching can be achieved through intelligent education platforms, independent learning, and customized teaching resources. Such teaching methods can stimulate students' interest in learning and improve the learning effect and learning motivation. In conclusion, innovative teaching means and teaching methods are important ways to promote the development of engineering cost education. By introducing information technology, exploring diversified teaching methods, and implementing personalized teaching, we can improve teaching effectiveness, stimulate students' learning interest and cultivate their practical application ability.

**Conclusion:**

In summary, engineering cost education is facing the current situation and challenges in the context of double-high education. To meet the needs of the times, it is necessary to promote educational innovation. The exploration of innovative modes includes promoting internship, practical training, practice teaching, and innovating curriculum and teaching methods. By introducing information technology and diversified teaching methods, teaching effectiveness and students' learning experience can be improved. Such innovative exploration can help cultivate high-quality engineering cost talents and promote a close match between education and industry needs. By getting rid of the traditional model, engineering cost education can better meet the needs of industry development, cultivate professionals with practical ability, problem-solving ability, and innovative spirit, and make positive contributions to the progress of the construction industry.

**Conflict of Interest**

The authors declare that they have no conflicts of interest to this work.

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