

# Research on "Rain Classroom" Teaching Mode under the Background of Professional Certification of Engineering Education

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## Abstract

"Student centered", "output oriented" and "continuous improvement" are the core concepts of the professional certification standard system of engineering education. According to the concepts, this paper puts forward the "rain classroom" teaching mode integrating teaching, learning and doing. In the teaching process, the intelligent tools of rain classroom is used to effectively combine all links such as preview before class, interaction in class and consolidation after class. Practice has proved that this teaching mode can comprehensively improve the teaching effect and cultivation quality.

## Keywords

Engineering education; Professional certification; Rain classroom; Integrated teaching mode.

## 1. Introduction

In 1989, the United States, Canada, Britain, Singapore, Ireland and Australia signed the Washington Agreement. This Agreement means that the engineering undergraduate qualifications of different countries in the world can be mutually recognized. In 2006, China officially began the professional certification of engineering education. It is not only an important guarantee to improve the teaching quality of Higher Engineering Education in China, but also an important measure to build monitoring system of teaching quality [1-2].

Professional certification is the main component of our country's quality assurance system of engineering undergraduate education in the new era. It uses the minimum standards that all engineering graduates should meet to evaluate the professional construction. It promotes colleges and universities to constantly and continuously carry out the reform of teaching mode and the optimal allocation of teaching resources, so as to push forward the connotative development of higher education [3-4] and improve the quality of education.

## 2. Connotation of the Core Concepts of Professional Certification

The core concepts of professional certification are to "take students as the center, build an output oriented talent training system and make continuous improvement".

Taking students as the center means that the educational objectives closely centre on the development of students. The teaching content should focus on the cultivation of students' ability. Teachers and educational resources should meet the students' learning requirements. The Key points of evaluation is to evaluate the students' learning effect. In terms of a course, the teacher should clarify the orientation and teaching objectives of the course according to the needs of students, carefully design the teaching strategies and plans and implement them in the teaching process, make full use of teaching conditions and resources to ensure the smooth

progress of classroom teaching, and timely and accurately obtain the teaching output data and evaluate the learning effect of students.

Output oriented means that the starting point of teaching is not what teachers want to teach, but what is needed to achieve the final result. Through the reverse design and forward implementation of the training and evaluation of professional talents, the traditional education mode will be changed. We can establish the training objectives guided by the needs of industry, and put forward the graduation requirements for students according to the training objectives, then ensure the achievement of graduation requirements according to the curriculum system, which involves teaching contents, teaching methods and teaching resources etc.

Continuous improvement means that the evaluation mechanism of the whole process needs to be established, and the evaluation results should be used for improvement. A perfect continuous improvement mechanism should have the characteristics of "123", that is, one goal, two main lines and three improvement measures. We should aim to continuously improve the quality of education, take the compliance and achievement of training objectives and graduation requirements as the main lines, and continuously improve the training objectives, graduation requirements and teaching activities.

### **3. Intelligent Teaching Mode of Rain Classroom under the Background of Professional Certification**

Classroom teaching is the key to realize the student-centered teaching mode. To break through the stubborn "fortress" of classroom teaching reform, we should push on five changes. That is to change from cramming classroom to dialogue classroom, from closed classroom to open classroom, from knowledge classroom to ability classroom, from emphasizing learning and neglecting thinking to combining learning and thinking, from emphasizing knowledge and neglecting action to the integration of knowledge and action. Based on these five changes, this paper proposes to adopt the intelligent teaching mode of rain classroom integrating teaching, learning and doing [5].

#### **3.1. Dialogue Mode of Classroom Teaching**

In the process of teaching, teachers and students are not independent individuals, but an interactive community. Through dialogue teaching, the main role of students and the leading role of teachers can be brought into full play. Using the wisdom tool of rain classroom in the courseware, the interaction of teaching and learning between teachers and students can be realized before, during and after class.

(1) Dialogue before class: Before class, teachers make teaching design according to the teaching objectives and the situation of students, collect and integrate various resources to make rich and colorful multimedia courseware, which includes teaching contents, videos, voice, tests and expanded materials, etc. Then the courseware is uploaded to the platform. Students can use mobile wechat to open the courseware and complete the preview task before class. In the process of preview, students have many ways of interactive communication, for example, they can leave messages in the message area or discuss through chat groups. Teachers should reply in time, and browses the preview records of all students in real time such as the number of students and the preview situation of each student, so as to grasp the preview effect of each student to a certain extent and teach students in accordance with their aptitude.

(2) dialogue in class: Teachers carefully construct and implement the processes of classroom teaching - interaction of teachers and students - students' practice - extension application - online test and so on. First, teachers explain the doubts, difficulties and key points of the course content. The functions of random roll call, barrage message and sending red envelope of wisdom tool can be used to communicate and dialogue with students and improve students'

classroom participation. Secondly, teachers design problems from different perspectives, and students think and discuss problems comprehensively and deeply. Through communication and discussion between teachers and students, students can complete the cognitive process and promote the transfer and internalization of knowledge. On this basis, teachers guide students to carry out practical operation, so that students can achieve the learning effect of "I do, I remember". During operation, students will encounter new problems. Teachers should let them solve by themselves, and encourage them to try to extend the application, so as to improve their ability to find and solve problems. Finally, for the more important knowledge points, teachers can grasp the learning effect of students in real time through the online test of the wisdom tools of rain classroom, reflect on the shortcomings and problems existing in the process of classroom teaching, and correct and improve them in time.

(3) dialogue after class: After class, in the light of the content explained in class, teachers use the wisdom tools to give assignments. Students are divided into groups. Each group can choose the task freely. The group members cooperate with each other to complete the task together, then the results of each group are displayed. In the next class, each group will share results to achieve the learning and expansion of knowledge. At the same time, Students' teamwork ability and exploration ability can be improved.

### **3.2. Open Mode of Classroom Teaching**

The certification standard of engineering education requires that students should not only have good communication skills and international vision, but also have autonomous learning ability and innovation consciousness. Therefore, we should make students give full play to their personality, pay attention to the cultivation of students' innovative ability, provide various resources for students to improve their innovative ability. As teachers, we should abandon the sense of self authority and change from the current situation of emphasizing teaching over learning to the classroom teaching of students' autonomous learning. In addition to the content of teaching materials, the latest technology and development status of the industry should also be combined with.

The integrated teaching mode of teaching, learning and doing is adopted. Firstly, a comprehensive system suitable for integrated teaching is built, which includes teaching content, teaching resources, teaching methods and means, teaching design and so on. Secondly, the teaching place is moved from the classroom to the laboratory. It can provide a novel and open environment for students, and more opportunities for communication, expression and innovative thinking. Finally, students' learning effect and practical ability is improved through learning while doing and guiding while practicing.

### **3.3. Quality and Ability Teaching Mode**

The certification standard of engineering education puts forward requirements for graduates: through the use of various modern information tools, they can study and solve complex engineering problems, and constantly improve their humanistic qualities and sense of social responsibility. Therefore, we should pay attention to the cultivation of students' comprehensive quality and ability.

## **4. Conclusion**

On the basis of accurately grasping connotation of professional certification, this paper analyzes the problems existing in the traditional teaching mode, carries out targeted reform and puts forward the intelligent teaching mode of integrating teaching, learning and doing, which comprehensively improve students' quality, knowledge and ability. Students' learning enthusiasm has been significantly improved. They can grasp classroom knowledge more firmly, and their comprehensive quality and ability have been greatly improved.

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