

# Reform and Practice of the New Participatory Classroom Teaching Mode of Electrical Technology Based on OBOPPPS-RC

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**Abstract.** The quality and effect of education and teaching are directly affected by the class teaching mode. For the electrical technology course, a new participatory teaching mode based on Outcomes-based education-BOPPPS-Rain Classroom (OBOPPPS-RC) has been formed after four years of first-class undergraduate course construction. The OBOPPPS-RC teaching mode is guided by the OBE idea, participatory classroom teaching activities are designed based on BOPPPS teaching mode, the multi-functions of rain classroom platform are used in teaching activities. It can enhance the vitality of classroom teaching and students' participation in the learning process, guide students to study effectively and improve the quality and effect of classroom teaching. New teaching mode based on OBOPPPS-RC has been highly recognized by students and is worthy of further promotion.

**Keywords:** Electrical Technology; Participatory Classroom Teaching Mode; Outcomes Based Education; BOPPPS; Rain Classroom.

## 1. Introduction

In the process of speeding up the construction of a powerful country in education and talents and improving the quality of talents training, colleges and universities shoulder a very important historical mission. Classroom teaching is the main battlefield of college education and teaching. The quality of classroom teaching mode is directly related to and determined the quality and effect of education and teaching. The electrical technology is an important basic course for non-electrical majors in higher engineering colleges, which covers a wide range of theoretical and technical applications. Under the background of emerging engineering construction and innovation and entrepreneurship, the course teaching of electrical technology should keep pace with times, deepen the curriculum reform to meet the requirements of the educational development in the new era. Therefore, taking the first-class curriculum construction as an opportunity, the idea of education and teaching has been continuously updated by the curriculum teaching team, and a new teaching mode of OBOPPPS-RC, namely Outcomes-based education (OBE)-Bridge-in, Objective, Pre-assessment, Participatory learning, Post-assessment and Summary (BOPPPS)-Rain Classroom, has been established after four years of exploration. Participatory teaching, inquiry teaching and personalization classroom teaching has been fully implemented.

## 2. Update the teaching idea

The advanced education and teaching idea is the premise and guarantee of doing well in education and teaching. Under the background of the strategy of building a strong nation with talents and the new requirement of the construction of emerging engineering, we should update and change our idea constantly, a new idea of education and teaching has been gradually established in the construction of the first-class curriculum. Under the guidance of the OBE idea, the traditional "Teacher as the main

body” is transformed into the new “Student as the main body” [1,2]. It pays more attention to students' final learning outcomes, leads students to study with the purpose. This teaching idea has achieved the transform from indoctrination to dialogue classroom, and from knowledge classroom to competence classroom [3].

### **3. Innovate teaching mode**

In order to improve students' learning effect and classroom teaching vitality, qualitative research method is adopted [4]. Based on the idea of OBE, the teaching objectives are revised, the teaching methods and means are innovated, through literature retrieval, interview, observation, teacher-student interaction and feedback, etc. Then, the teaching mode of BOPPPS is deeply explored as a whole, and the new teaching mode of OBOPPPS-RC is established finally.

The BOPPPS teaching mode originates from with the Workshop of the teacher's Instructional Skills Workshop (ISW) in Canada in the 1970s, which has been adopted by universities more than 33 countries worldwide, has been highly respected by more than 100 universities and training institutions worldwide. Based on the theory of constructivism and communicative approach, it emphasizes student-centered teaching process.

Firstly, innovative teaching mode of BOPPPS is adopted to design participating teaching activities around teaching objectives [5]. Secondly, innovative teaching methods and teaching means are developed participatory classroom teaching by making full use of the function of rain classroom platform, for example time-limited testing, calling the roll at random, submitting, showing barrage, checking in, and so on. The data of the rain classroom platform is used to organize and manage the course, and students' learning dynamics and effectiveness are acquired in time. The participatory teaching conforms to the psychological law of the human learning process, emphasizes the students' principal role, and pays attention to construct the platform for the students' participation, which is beneficial to the students' learning and growth in the process of participation, to cultivate the talent having the ability of thinking independently, the spirit of innovation, the ability to solve practical problems [6].

### **4. Design of OBOPPPS-RC teaching mode**

Effective classroom teaching design is the basis of achieving effective teaching, and is the premise of achieving effective classroom teaching. The new participatory teaching mode, namely OBOPPPS-RC, is introduced to design the classroom teaching activities of electrical technology, including six aspects of BOPPPS.

#### **4.1 Design of Bridge-in**

The aim of bridge-in is to attract students' attention, curiosity and interest in learning. The engineering cases, new technology, life phenomena and so on are selected, which are regarded as the entry point to introduce new content of electrical technology. It can not only attract students' attention from the beginning of the class, but also can be a good combination of theoretical knowledge and engineering practice.

#### **4.2 Design of the Objective**

The final objective and the periodic objective of the electrical technology course are designed comprehensively by combining the talent training plan, the teaching program and analysis of the learning situation. The final objective of the curriculum, namely the status and role of the curriculum, are clarified from a macro perspective, which is useful helping students to actively adjust the state of learning according to their own cognitive conditions. And, the periodic objectives are designed for each chapter, which lets students know clearly what they can learn in each chapter, what is the key

and difficult section, what ability can be acquired from learning. Thereby, students can have a plan for targeted learning.

#### **4.3 Design of the Pre-assessment**

Pre-assessment is used to briefly evaluate students' preparatory knowledge and guide teachers in carrying out subsequent teaching arrangements. On the one hand, it reminds the students what they have learned, on the other hand, it helps teachers to master the students' current learning situation and adjust the teaching proportion, depth and teaching schedule in time. Test function of the rain classroom is used to design problems with a definite answer, and the function of submitting and showing barrage are applied to design open-ended questions.

#### **4.4 Design of the Participatory Learning**

In order to guide students to participate actively in the classroom learning activities, a series of participatory learning process, such as video, micro-class, thinking, group discussion, student interpretation, experimental exploration and so on, are designed carefully, which can encourage students to think more, practice more, express more and collaborate more, thereby helping them achieve their expected learning goals. By using the submitting and showing barrage of rain classroom, teacher can investigate the students' thoughts, problem-solving ideas and answer situations, and so on. Based on the action research method and the rain classroom platform data, the students' classroom participation mode is analyzed, evaluated and adjusted.

#### **4.5 Design of the Post-assessment**

Post-assessment is used to assess briefly the student's knowledge level and the achievement of a given goal. To this end, the test questions of electrical technology are designed, which are issued to students to finish in time by the rain classroom. It can help teachers to understand the situation that students grasp the knowledge and achieve the teaching objectives. According to the post-assessment results, the subsequent teaching content is optimized.

#### **4.6 Design of the Summary**

Summary is the essence of a lesson, therefore, there should be some extension except the basic systematization and generality contents. It is a summary of the lecture and an introduction to the next lecture. Teachers can also assign homework or preview content. This can be done in a variety of ways, for example student summary and teacher supplement, teacher guide student summary or teacher summary, etc.

### **5. Evaluation of OBOPPPS-RC teaching mode**

Students have a great say in how the teaching model works. In order to know the practical effect of OBOPPPS-RC, the teaching feedback data were obtained through the student's teaching evaluation and the self-designed questionnaire. According to feedback data, the student's study feeling was obtained to know which links were students like or approved, which links needed to be adjusted or improved, and so on. Participatory teaching mode was developed through the process of practice-feedback-practice.

#### **5.1 Students' evaluation**

The evaluation results show that the teaching of electrical technology courses has been received high praise in the last three years. The score of students' assessment were all A plus, which were ranked in the school's top about 1%. Students gave their comments on electrical technology course, for example, the class is very attractive, there is a lot of interaction in class, there is much to be gained in the classroom, hands-on ability is trained, and so on.

## 5.2 Questionnaire result

A questionnaire was conducted in a class of 60 students. The result shows that 85% of the students thought that participatory teaching was very helpful to understand the content of the course, 78% of the students thought that application of the class platform was very helpful to improve the learning effect, and 95% of the students were satisfied with the overall teaching of the curriculum, which are shown in Table 1.

**Table 1.** Questionnaire result

Content	Very helpful	Helpful	A little helpful	None
Participatory teaching	85%	11.67%	3.33%	0%
The class platform	78.33%	18.33%	3.33%	0%

## 6. Summary

The reform of new teaching mode of OBOPPPS-RC for electrical technology course is in keeping with the development of information education and teaching in the new era. This mode can enable teachers to understand students' learning in real-time and comprehensive, and improve the efficiency of classroom teaching. At the same time, it can improve students' learning initiative, enhance hands-on practice ability and stimulate the spirit of innovation. From the evaluation results, we can find that the new teaching mode has achieved good results in teaching practice. In the future, we will continue to explore and enrich the participatory teaching activities, while also promoting and applying it to the teaching of other courses.

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