

# Application of BOPPPS (Bridge-in, Objective, Pre-Assessment, Participatory Learning, Post-Assessment, Summary) Teaching Model in Electronic Technology Courses

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## ABSTRACT

Based on the characteristics of the six steps in BOPPPS (Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, Summary) teaching model, this paper analyzes the feasibility of applying BOPPPS teaching model to electronic technology courses, Taking the "differential amplifier circuit" as an example, the classroom teaching design of the BOPPPS teaching model is aimed to stimulate students' interest in learning, and encourages students to actively participate in the entire teaching process, so that the students become the real masters of the electronic technology classroom.

**Keywords:** BOPPPS teaching model, teaching design, learning objectives, active learning

## I. INTRODUCTION

Electronic technology courses are compulsory basic courses for junior college students majoring in communication, laying a solid foundation for the subsequent study of various specialized courses. This series of courses include electronic technology, electronic technology and application, comprehensive training, etc. The general feature is that the course content is abstract and boring, but practical. At present, although the course has been reorganized and split according to the course characteristics and the professional and non-commissioned student's job requirements, there still exist problems such as students' lack of study interest, initiative and enthusiasm. The BOPPPS teaching model is a teaching model admired by colleges and universities in North America. It is an efficient classroom teaching design model, emphasizing the full participation of students in learning rather than the traditional teaching mode of "teachers speak, and students listen". This teaching mode allows teachers to obtain the feedback information of the students in time and adjust the follow-up classroom teaching activities in time. Applying the BOPPPS teaching model to the electronic technology courses and fully embodying the 6 steps of the BOPPPS teaching model in the teaching design have achieved certain results.

## II. THE EXISTING TEACHING MODE OF ELECTRONIC TECHNOLOGY COURSE

Through the investigation of relevant professional departments and troops, the content of the cultivation of professional basic abilities of communication noncommissioned officers is studied, and the existing teaching content, such as circuit basics, analog circuits and digital circuits, should be integrated and optimized for the professional basic knowledge required by communication noncommissioned officers. At the same time, inspect the content of professional basic ability training in the vocational technical education of communication noncommissioned officers, and increase the relevant teaching content of application skills training according to the needs, such as basic knowledge of electrical engineering, digital communication principles, sensors, single-chip applications, etc. The way of group training is guided by the actual work of the army, and it has been transformed from plan guidance to demand traction. However, there are still problems. For example, they are not closely connected with the actual needs of the troops, the students' learning motivation is not strong, and the learning interest is not strong. Therefore, the BOPPPS teaching model is integrated into the original teaching model, and the typical military case is introduced as the BOPPPS teaching model. Achieve better teaching goals. The BOPPPS teaching model divides the teaching process into introduction (Bridge-in), objective (Objective), pre-assessment (Pre-

assessment), participation in learning (Participatory Learning), post-assessment (Post-assessment) and summary (Summary). This part is called BOPPPS for short. In the teaching process of the electronic technology series courses, according to the specific teaching content, each link of the BOPPPS teaching model is flexibly and appropriately adjusted to achieve the teaching goal and improve the teaching effect.

### III. THE SPECIFIC IMPLEMENTATION PLAN OF THE BOPPPS TEACHING MODEL IN THE ELECTRONIC TECHNOLOGY COURSE

Based on the teaching concept of BOPPPS, the electronic technology course was reorganized before the class preparation. According to the BOPPPS teaching model, organize the offline teaching of the electronic technology series courses. According to the characteristics of the non-commissioned vocational and technical education students and the analysis of job requirements, the typical military case is introduced into the teaching process. Make clear the teaching objectives, improve the interactive activities, and design reasonable pre- and post-class tests and post-class summaries. Let's take the differential amplifier circuit as an example to introduce the teaching design scheme based on the BOPPPS model.

#### A. Bridge-in

Through a typical military case, simulate the laser engagement system in a relatively harsh environment in the wild, and introduce a new lesson by using the suspicious method, which connects the theme of this lesson with the daily military training of the students, attracts the students' attention, and stimulates the students' interest.

Non-vocational and technical education students are generally interested in knowledge related to military informationized warfare, such as weapons and equipment in modern informationized warfare.

Through typical military cases, the laser simulated engagement system works mostly in the harsh environment in the field and introduces the new lesson with the method of doubt, which links the theme of this lesson with the daily military training of the students, attracting their attention and stimulating their interest.

#### B. Learning objective/outcome

In the electronic technology courses, select the suitable teaching objectives according to the characteristics and actual situation of the students of non-sergeant vocational and technical education. Teaching objectives are the navigation of teaching activities and the starting point and ending point of teaching activities. They are playing a leading role in teaching implementation. They are the basis for

teachers to organize classroom teaching content and classroom teaching design, the standard for evaluating students' learning effect, and the most important link in BOPPPS teaching model. In the BOPPPS teaching model, it is emphasized that the teaching objectives must be described in a specific and explicit way, including who is the teaching object, how to learn and what to learn. For the cadets of the vocational and technical education, it is necessary to "put more emphasis on practice instead of calculation". The key point of differential amplifier teaching is to master the working principle of differential amplifier and explain the difference model and common model of differential amplifier through analyzing the experimental data, so that the cadet can understand and accept it more easily.

#### C. Pre-assessment

Distribute preamplifier tests of differential amplifier circuits through the Rain Classroom to understand the students' mastery of relevant knowledge and help the instructors better understand the students' actual mastery of the teaching content. Through the test, the students can clarify the teaching content and the difficulties. The instructors are targeted, so that the instructors can design the teaching starting point according to the actual situation of the students, so that the difficulty of the teaching content and the form of group training match the actual situation of most students.

#### D. Participatory learning

Fully embody the students' initiative in the whole teaching process. Through group discussion and practice operation, let students actively participate in the whole teaching process. In the process of teaching let the students analyze the experimental data and set the actual circuit of differential amplifier circuit model and common model and make them the real master of class. Teacher is responsible to lead the class and stimulate students' learning potential.

#### E. Post-assessment

Through group discussions, project task layout, and after-school test questions issued by Rain Classroom and Tencent Classroom, etc., detect the actual learning effect of students and check whether they have reached the teaching goals. The teaching content and the actual content of the post-test can be further arranged implementation plan.

#### F. Summary

In the process of summary, enable students form a clear main line for the key and difficult points of teaching through group summary, student feedback, and the teachers' summary of teaching contents and difficulties, consolidate the knowledge that they've

already mastered fatherly. For example: the key in the summary of the differential amplifier circuit is to summarize the differences and common models of the differential amplifier circuit in this lesson, emphasizing the idea and dynamic display using ppt, and emphasizing how to use the differential amplifier circuit to solve the analog combat system due to the harsh environment.

#### IV. CONCLUSION

The adoption of BOPPPS teaching model in electronic technology courses is in accordance with the pyramid of students' cognitive level. The introduction and learning goals will stimulate the students' interest in learning; the pre-assessment can help the instructor better grasp the actual learning situation of the student; the participatory learning can make the student become the real master of the classroom; the post-assessment helps the instructor guide and arrange the review content after the class; and the summary can make students have a clear main line on the key and difficult teaching points. The results of practical teaching evaluation show that the application of the BOPPPS teaching model in electronic technology courses is in accordance with the pyramid of students' cognition, which can improve students' self-efficacy, change passive learning into active learning, and improve the timeliness of students' learning of electronic technology courses.

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