Teaching Practice and Reflection on the Course Instance Based on the BOPPPS Model

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Abstract—In order to enhance the teaching skills of educators and improve the effectiveness of instruction, we conducted a teaching practice and reflection using the BOPPPS model in the vocational education curriculum "Telecommunications Switching Technology." First, we elaborated on the fundamental considerations in constructing the BOPPPS model with respect to the overall design of the instruction. Second, we provided a detailed account of the distinctive features of the teaching practice in light of its effectiveness. Finally, we conducted a reflection on the teaching process, analyzing the shortcomings and deficiencies of this teaching experience and contemplating subsequent measures for improvement. This teaching practice not only validated the teaching effectiveness of the BOPPPS model but also facilitated its application through teaching practice, resulting in a continuously improving teaching paradigm.

Keywords- BOPPPS; Teaching practice; reflection;

1. INTRODUCTION

With the reform of the new engineering construction concept and the reform of talent training, education mode was needed to change from the traditional "content oriented" to "student oriented". In order to ensure the effectiveness of teachers' teaching skills and teaching in our country, the BOPPPS model has been introduced and implemented in China in recent years, and has a positive effect on promoting the reform of new engineering and talent cultivation mode in China[1].

The BOPPPS model is a teaching model promoted in the training process of college teachers in North America, which was originally used to apply the skills training of the teaching staff by Instructional Skills Workshop. In the course of training, the practice of teaching practice is adopted to improve the effectiveness of teachers' teaching skills and teaching by focusing on the way of training. The BOPPPS teaching mode modulates the teaching process, and divides the course into six stages, namely, Bridge-in, Objective, pre-assessment, participatory learning, Post-assessment and Summary[2]. As a new teaching model, the teaching concept of "students

oriented " is emphasized, which makes it a specific measurable goal of the classroom, emphasizing the comprehensive participation of students, and focusing on timely obtaining the students' feedback information to adjust the follow-up teaching activities, forming the mechanism for continuous improvement, and thus completing the desired teaching goals.

2. THE RESEARCH STATUS OF BOPPPS AND THR MISSION OF THIS PAPER

The model has been introduced by more than 33 countries around the world, and has been promoted in more than 100 universities and industry around the world, and its application practices suggest that the model is an effective way to promote students' active participation in classroom learning[3-6]. In the introduction of extensive application and practice teaching, the BOPPPS model is applied to various courses teaching design[7-9], such as "basis of computer engineering "," computer network principle", "signal analysis and processing", etc., which has achieved a certain effect and results. For example ,the computer college of the national defense university of defense, North university of China, Wuhan university, which is better done in Using BOPPPS, and other schools have been conducting this research. Since 2015, there have been more than 300 articles on BOPPPS teaching paper in the national scope[10-13]. The following periodic results are obtained: the important value of the BOPPPS teaching model is demonstrated. The practice and practical experience of the BOPPPS teaching model are given, and the BOPPPS teaching mode is evaluated and reflected.

In this paper, take the vocational education course of our school as an example, the content named the simulation user circuit was used to explore the application of the BOPPPS model, and analyze and summarize the results and the problems that practice are obtained.

3. THE IMPLEMENTATION PROCESS OF BOPPPS

The BOPPPS teaching model was adopted to structure the implementation of the course content, as shown in Figure 1. First, the topic of the course is introduced in the context of the scene example - the user circuit, which is a specific measurable knowledge learning target. Secondly, the study of specific content is carried out, which closely related to the learning goals, and the results of the test study are conducted in the class. Finally, proceed the lecture review and summary of the content. By using the BOPPPS teaching mode design, the whole course is systematic, logical, and closely related to the learning goals, and the ring is formed, and a unified whole is formed.
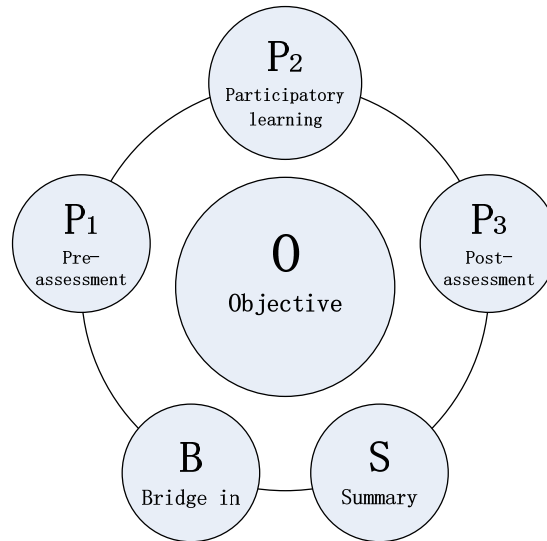
Figure 1 BOPPPS model

3.1 Bridge-in and pre-assessment

Based on the role of communication support personnel, we handle the common tasks of maintenance on duty to handle user fault claims scene example cut, so that students have a sense of picture, can quickly enter the scene. And to carry out pre-test, on the one hand to master the basic process of fault handling, on the other hand, the same test of the core content of the pre-understanding.

3.2   Objective

After introducing the specific learning content, we emphasize the teaching summary, and explain the main content of analog user circuit this lesson.Combined with the learning content, the specific measurable knowledge learning goal is put forward to guide the students to learn the goal orientation.

3.3   participatory learning

First, the participatory learning focuses on the difficult content, thinking unique novel idea. In learning the main functions of analog user circuit as shown in Figure 2, we use the analogy of "Black box", to call the needs of this starting, from the user's point of view and the operation of the equipment from two points of view of demand analysis, from the analysis of demand, matching function, principle decryption of the progressive ideas, constitute a ring linked. According to the requirement of making phone call, the paper analyzes the requirement from the angle of user and equipment operation, and makes a step-by-step thought of analyzing the requirement, matching the function and decrypting the principle. From the perspective of classroom effect, the role of guidance is obvious, students respond positively and participate in a

high degree. In the difficult content of user circuit simulation of the overall structure, we start with the overall structure of the functional block diagram. Based on the closed loop of "Permutation question-supposition transposition-function analysis-authentication orientation", the permutation design sequence among seven function modules is discussed and analyzed. In view of the key and difficult points, group participation testing and analysis are carried out to further strengthen understanding. From the perspective of classroom effect, classroom organization can effectively stimulate students to actively think and discuss, thinking and cognitive depth exercise.
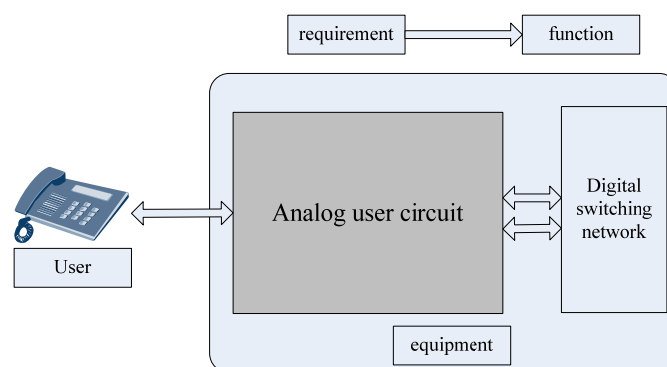
Figure 2 Uncover the secrets of the black box of analog user circuit

Second, in the specific implementation of participatory learning, our teaching methods in various forms, there are some teaching methods, such as example scene, theory teaching, photo display, object display, graphic combination, citing design examples, group discussion and analysis, etc..Such as the introduction of fault declaration scene instance can let students enter the scene and stimulate interest in learning.The basic concept of user circuit is expressed in the form of block diagram, so that students have an intuitive understanding. Various types of telephones and analog user circuit boards are shown with objects and pictures. The close relation between theory and practice is strengthened by using the design example of analog user circuit board.

3.4   Post-assessment

Using rain classroom for in-class testing, we organized two dimensions of classroom testing. One is the memory content test, to verify the students' memory and understanding of the basic content, from the students' performance, the effect is good. The other is to analyze the use of fault-type testing, combined with the difficulty of the post-test and speculative, the students are divided into groups, carry out discussion and analysis, promote the students to think actively to form conclusions. The two kinds of changing teaching strategies fully arouse the students' enthusiasm and initiative, and further enrich the classroom teaching content.

3.5   Summary

The summary is easy to remember. In the final summary of the class, we take the form of mind map to carry out the content framework and key content comb, to show the students the main content of this course and the details of various knowledge points, form a whole to part of the

layered understanding. The students were also encouraged to learn more about the difficult and important points through the use of humorous summaries such as BORSCHT and self-written rhymes.

4. REFLECTION ON TEACHING PRACTICE

4.1 The shortcomings in the process of teaching practice

Firstly, the introduction of classroom content was slightly deliberate, and the effect of stimulating interest was not good.The introduction of user fault reports in this class was somewhat representative and close to the actual duty of the troops. Although it basically achieved the initial effect of attracting attention, generating interest, and stimulating motivation, the introduction was slightly deliberate overall. The direct judgment and positioning of the fault to the user's circuit board was not smooth, and the way of narration was flat.Overall, the introduction was at a general level.

Secondly, there is less time for students to think during the participatory learning process. This class covers three parts, the first part is about the basic concepts of user circuits, which contains less knowledge points. The second part simulates the main functions of user circuits, and learns seven major functions and their implementation principles, which contains more knowledge points and has some white space, but the knowledge points are not difficult to understand, and the overall feedback is good. The third part is about the overall structure, which analyzes and then cites design examples. The content is relatively comprehensive and has certain difficulties. From single knowledge to comprehensive knowledge to application, it reflects high-order thinking. According to the students' response, there is less time for white space, there is a jump in level, and digestion and absorption are not in place.

Thirdly, the achievement of learning objectives is not high. There is insufficient consideration of the differences in the foundation of the students. During the knowledge guidance, interactive communication, and post-test, it can be found that some students are not keeping up and some content feedback is insufficient. This lesson is based on learning objectives, and most of the students can achieve the teaching objectives, but there is not much attention and thinking for students who are "not hungry" and "have indigestion".

4.2 Thoughts and Improvements on the Next Teaching

First, carefully design the introduction link to stimulate the interest and motivation of the students.It is said that the opening remarks are the most challenging part. The introduction should jump out of the low-level level of being forced and uninspiring.Firstly, learn good introduction methods such as story introduction, game introduction, scene introduction, etc., which are easy to stimulate the interest of the students, and form their own reserves.Secondly, pay attention to the logic of the introduction, which should serve the teaching objectives and content.Finally, try to imitate, trial and improvement, and polish to form their own introduction methods, so as to attract attention and stimulate learning interest and motivation.

Secondly, the participatory learning process should be appropriately supplemented with white space to allow students time and space for thinking.Depending on the difficulty of the knowledge points and the level of knowledge application, different white space should be provided. For example, when analyzing the overall structural design relationship of the simulated user circuit in the third section, more white space should be provided. When presenting design examples, white space should also be provided, especially in the second comprehensive question of the post-test.More white space should be provided to allow discussion and analysis time. By providing white space, students are given time and space to think, promoting self-digestion of knowledge and enhancing the depth of independent thinking.

The third is to aim at achieving learning goals and extend the offline participatory learning to online. To play the role of learning-centered and enrich the online and offline organizational forms, it is necessary to tailor teaching to the students' differences. To beigin with, it is necessary to effectively grasp the learning situation, conduct pre-tests, and distribute courseware online before class. Secondly, for students who have "indigestion", it is necessary to provide one-on-one counseling and answer questions offline, and to maintain enthusiasm, patience, and love, encourage and boost their self-confidence. For students who are "not hungry enough", it is necessary to increase their burden, act as a teaching expert for instructors, stimulate their potential, and further their progress. Finally, online knowledge learning materials are pushed to consolidate, and both online and offline Q&A sessions are opened to supplement the key and difficult problems, forming a closed loop.

5 CONCLUSIONS

This article meticulously designs the classroom teaching of the simulated user circuit content in the course "Telecommunications Switching Technology" based on the BOPPPS model. It encompasses the pre-test and introduction of fault scenarios, clarifying learning objectives, engaging in participatory learning, post-tests, and summaries. Overall, each stage is relatively distinct, constructing a comprehensive BOPPPS teaching model.It fully leverages a student-centered, problem-oriented approach, addressing the key difficult points of the course content, effectively achieving teaching objectives, and integrating ideological and political education into the classroom, cultivating correct values.It also earnestly reflects and analyzes the shortcomings and deficiencies in the teaching practice of this course, and provides reflections and improvements for the next step of teaching practice, forming a continuous improvement loop in teaching.

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