Exploration of Blending Teaching Mode Based on BOPPPS

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Abstract. Aiming at the problems existing in teaching practice, this paper proposes a blending teaching model based on BOPPPS. Taking the course "Web Security Technology" as an example, modern educational information technology be reasonably utilized to allocate the teaching practice activities of the course online and offline. This model enhances students' interest in the course, cultivates their experimental skills and innovative abilities. At last, it provides students with a sound theoretical basis for later study.

Keywords: BOPPPS; blended teaching; participatory.

1. Introduction

The BOPPPS teaching model is an interactive teaching model originating from the University of British Columbia in Canada[1]. The teaching objectives and students are the main focus of this model. It mainly focuses on attracting students' interest in learning. The entire teaching process is designed into six stages: "Bridge in, Objective, Pre-assessment, Participatory learning Post-assessment, and Summary"[2]. The model can fully consider students' learning demands. When this mode is introduced into course teaching, it will be beneficial to improve the teaching effectiveness.

Blended teaching is a new teaching mode that combines the advantages of traditional teaching and online teaching[3]. It can fully utilize online resources to stimulating students' interests and keeping high motivation. At the same time, the classroom teaching process is carried out under the organization and monitoring of teachers, ensuring systematic knowledge transfer and good teaching results.

With the development of internet informatization, web applications have been rapidly developed, and web security issues have become increasingly prominent[4][5]. "Web Security Technology "is a course which is one of the important courses in information security related majors, with strong operability and practicality. It is a necessary knowledge foundation for students to learn other professional courses in the future. Learning this course well plays a very important role in cultivating network security talents.

From the perspective of an ordinary professional teacher, this paper takes the course "Web Security Technology" as a case study. While analyzing and summarizing practical experience and effects in actual teaching, we utilize modern smart classroom teaching platforms[6][7] to provide diverse interactive methods and real-time evaluation and feedback mechanisms. Transforming teaching from a rough "experience driven" approach to a precise "data driven" approach provides effective methods to address the challenges of traditional teaching, such as difficulty in grasping learning outcomes, lack of interaction and communication between teachers and students, and lagging evaluation feedback. This article aims to improve teaching level and ensure teaching quality by focusing on teaching design, teaching forms, teaching methods, and assessment and evaluation systems.

2. The current teaching situation

The current teaching is generally dominated by traditional teaching methods[8][9], with relatively dull and abstract teaching content. From the perspective of teaching implementation process, on one hand, students' learning goals are not clear enough and lack motivation. On the
other hand, they passively accept knowledge without actively exploring to discover it. The lack of genuine interaction and communication between teachers and students leads to a poor classroom atmosphere, poor teaching effectiveness. There is no effective way to cultivate students' high-level thinking ability and innovative spirit.

At the same time, there are still problems with ordinary blended learning, such as insufficient student motivation, low participation, unreasonable allocation of online learning time, and assessment of learning effectiveness. Overall, there are several shortcomings in the teaching:

1. Insufficient innovating in the teaching models;
2. Insufficient integration of theory and practice;
3. Relatively Unreasonable Curriculum Assessment.

2.1 Insufficient innovating in the teaching models.

Teachers' teaching methods are not flexible enough, often focusing on knowledge output. And the cultivation of students' abilities such as innovation, reasoning, and communication is lacking. Teaching is vague and uninteresting, unable to attract students' attention. Many students may play with their phones, read idle books, doze off, and so on. This leads to students not being able to fully participate in learning, communication, and interaction.

2.2 Insufficient integration of theory and practice.

The theoretical foundation content is mainly based on teaching material, which are relatively outdated and somewhat disconnected from the cutting-edge technology in the industry. Teaching content is complex and contains a lot of knowledge points. In the limited teaching time, most teachers use traditional teaching methods. They often stay at the mindset of "theoretical teaching as the main approach and practical teaching as the auxiliary". They do not fully understand the true meaning of theory and practice. For newly enrolled sophomore students, their computer literacy is not strong enough. Some students lack necessary guidance and practical opportunities, resulting in a decrease in their interest and motivation for this course.

2.3 Relatively Unreasonable Curriculum Assessment.

The evaluation indicators are too simple and single. It is often mainly based on homework after class and exams at the end of the semester. Due to the lack of consideration for individual differences among students, a unified evaluation of all students based on specific standards cannot effectively reflect their comprehensive abilities.

Based on the above issues, the BOPPPS six step teaching model is introduced. By using a smart teaching platform, optimizing and improving teaching process management, restructuring the course teaching system, and improving teaching activity design, a blended teaching model based on BOPPPS is constructed.

3. Blended Teaching Design Based on BOPPPS

The BOPPPS teaching model are teacher-directed and student-centered. Therefore, the key to the successful implementation of the BOPPPS teaching model is to inspire students' enthusiasm and whether they truly become the masters of classroom teaching. According to the steps of the BOPPPS teaching mode, the six stages are integrated into the pre class, in class, and post class. The comparison of student and teacher activities is shown in Table 1.

<table>
<thead>
<tr>
<th>Role</th>
<th>Pre class (B+O)</th>
<th>In class (P+P+S)</th>
<th>Post class (P+S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>Preview</td>
<td>Independent learning</td>
<td>Discussion and exchange</td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
<td>Group discussion</td>
<td>Review</td>
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<tr>
<td>Teacher</td>
<td>Preview tasks</td>
<td>Teach</td>
<td>Homework</td>
</tr>
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</table>

Table 1 Student and Teacher Activities
3.1 Bridge in

In order to enhance the effectiveness of class teaching and promote teaching quality, Class introduction takes attracting students' attention and learning interest as the starting point. The implementation subject of classroom introduction is the teacher, who should carefully design the introduction points to attract students' attention, so that they can participate in class learning. When designing leading-in, teachers should fully consider the teaching aims of the course, as well as how to capture students' learning interests. Teachers need to study how to subtly penetrate the learning objectives of the curriculum into their classmates through various methods.

The method can be through online hot topics, project cases related to teaching content, or a portion of cases. Teachers should divide the leading-in into pre-class and in-class. The former utilizes a smart teaching platform, integrates preview tasks, and posts them on the platform for students to understand and learn. The latter is the introduction of teacher classroom teaching.

3.2 Objective.

Objective is the standard for measuring students' learning outcomes. Teachers should clarify the teaching objectives and the learning outcomes that students need to achieve before teaching. Encourage students to learn and think with a purpose from the beginning. The teaching objective is the most crucial link in the BOPPPS and also the most crucial basis for teachers' teaching. The other five steps are designed around achieving class teaching objectives. Teachers should carefully formulate reasonable cognitive and skill goals, help students establish a complete, logical, and comprehensive curriculum knowledge cognitive system. So that the knowledge they learn covers a wide range, a strong professionalism, a fully functional. In addition, it is very necessary to integrate emotional goals, achieve mutual penetration between preaching and moral education, so that students unconsciously cultivate the world views and establish the correct value orientation. In the pre-class, teachers infiltrate classroom goals through tasks and discussions. In the post class, students compare and reflect to establish a complete knowledge structure.

3.3 Pre-assessment.

The purpose of classroom Pre-assessment is to understand students' interests and abilities. Through it, teachers can help themselves adjust the depth and progress of course content setting in a timely manner. In addition, it helps teachers recognize the interrelationships between problems and knowledge, guiding students to establish problem spaces.

The section not only examines students' mastery of relevant knowledge points in the pilot course, but also helps to understand their preparation and reserve of knowledge for this class. In the pre-class stage, set test questions for basic knowledge reserve. During the in-class stage, set test questions for students' preview situations.

3.4 Participatory learning.

Participatory learning has achieved a shift from teacher centered to student centered teaching philosophy. It plays a very important role in improving students' participation in classroom teaching and reflecting personalized learning. Teachers can fully utilize students' enthusiasm for participating in teaching and maximize their participation in teaching activities by adopting methods such as task driven, problem oriented, and group discussion. It is divided into four stages in the class.

3.4.1 Teacher present

Firstly, teacher present. According to the requirements for knowledge points and the pre-assessment results, teachers sort out the degree of difficulty or order of knowledge points, and set a number of questions.
3.4.2 Self-learning

Secondly, self-learning. Students start self-learning specific knowledge points, attempting to solve several problems raised by the teacher. And summarizing the problems encountered in their learning. After summarizing the problems thoroughly, effective discussions and analysis can be conducted in the classroom. This can strengthen students' self-study ability. In addition, sufficient time between classroom lectures and problem discussions that is crucial for students' personalized and independent learning, which is also in line with the development concept of psychology.

3.4.3 Group discussion

Thirdly, group discussion. It solves the problems that exist in personal learning and several issues set by teachers. Students will form a discussion group of 3-5 people, with one group leader in charge of the discussion work, which mainly responsible for coordinating the participation of group members in problem discussions.

During the discussion process, the teacher should follow up and control the entire process. If necessary, they can attend group discussions or participate in discussions, and guide students to think about problems. When appropriate, they should provide opinions and suggestions to help students improve their ability to discover and solve problems.

3.4.4 Q&A

Fourth, Q&A. After the group discussion, the teacher can set a certain time to organize a summary. The group leader or representative of each group will give a summary speech, while other group members can make supplementary speeches. During this process, teachers timely introduce new questions based on the answers, triggering deeper thinking among students. The time of interaction and communication is greatly increased between students. The classroom has truly returned the students. Students maximize their knowledge construction in an active atmosphere.

3.5 Post-assessment.

It is a tracking of students' learning outcomes. At this stage, the focus is on the students' mastery of knowledge. In the specific teaching implementation process, it is divided into class post testing and out of class post testing. In class, it uses methods such as operation demonstration, answering questions, and quizzes. Post-assessment is mainly implemented through online teaching methods. The main forms include project case design, special assignments, etc. Based on the testing results, the teacher identifies the problems that exist in classroom teaching.

3.6 Summary

Summary is divided into in-class summary and after-class summary. Teachers can summarize the knowledge structure and system of the teaching content based on the results of the classroom testing and the knowledge points, and learning objectives. During this process, you can first ask the group to summarize. If the representative's summary is not complete, other students can supplement it. Teachers should guide while listening. By elaborating on the key and difficult points of the course content, students can focus their thinking and their speeches, which will result in better summary results. After the summary is completed, teachers should promptly assign homework, which can strengthen learning, and consolidate students' learning content. After-class summary is a self-summary, which can be a mind map for learning or a shared experience, etc.

4. Pluralized dynamic assessment

In classroom teaching, BOPPPS emphasizes participatory teaching, aiming to encourage students to fully showcase themselves and think independently. The purpose of assessment is not only to test students' mastery of knowledge, but also to reflect their creative thinking in learning, as well as their comprehensive abilities to discover and solve problems. So, the assessment methods should be
diversified. For the course “Web Security Technology”, in terms of knowledge, it is not only necessary to assess and evaluate students' mastery of theoretical learning, but also to assess their ability to actually complete practical tasks. Theory and practice are indispensable evaluation contents.

In terms of comprehensive ability development, the BOPPPS involves participatory learning. Teachers divide students into discussion groups of 3-5 people, using collaborative learning and teacher questioning. Cultivate students' ability to discover and solve problems. In the teaching process, attention should be paid to the cultivation of abilities and qualities. Therefore, in the assessment, students' progress should not be assessed solely based on their level of knowledge mastery. Students' classroom performance, such as actively cooperating with teachers, teambuilding, communication and expression, and problem-solving abilities, should be included as evaluation elements in the assessment. For example, groups or individuals who actively identify and solve problems can be given extra points. Students who speak creatively and creatively in the classroom can also be given extra points. Students who help teachers provide suggestions can also be given extra points. These diverse factors can reflect the true learning situation of students.

When formulating assessment standards, it is necessary to break the traditional single assessment method. Through diversified assessment and evaluation methods, students will seriously engage in the class learning during the pre-assessment, participatory learning, and post-assessment stages. Evaluation can not only further test students' mastery of knowledge, but also cultivate their ability to objectively and fairly evaluate others. AT the same time, it can promote mutual supervision and common progress among classmates. Utilizing a smart classroom teaching platform, adopting a diversified evaluation system, focusing on the collection of information throughout the teaching process, making student grades and learning outcomes measurable and measurable.

5. Conclusion

Teaching is not only about imparting knowledge, but also about cultivating students' abilities and improving their comprehensive qualities. Blended teaching based on BOPPPS has the following advantages:

Firstly, on the one hand, it stimulates students' vitality in self-directed learning, and on the other hand, it enhances their ability to discover problems and solve problems. In the process of students' learning, it has changed the dilemma of students passively accepting knowledge, actively realizing the transformation from passive learning to active learning, comprehensively reflecting the cultivation of students' high-level thinking ability and core practical ability. It truly realizes self-directed learning, a student-centered teaching philosophy, highlighting a strong atmosphere of personalized learning for students, which is in line with the current concept of cultivating innovative talents. At the same time, the teaching concept of student-centered in line with the current concept of cultivating innovative talents.

The second is to promote the transformation of roles between teachers and students. In the classroom, teachers often play the roles of guides, organizers, and evaluators compared to imparting knowledge. For students, what they need more is an organizer to organize them to learn more ways and methods to discover and solve problems in the classroom. The goal of teachers is to cultivate students who learn independently and actively, as well as how to broaden their thinking. This is very different from the traditional teaching mode.

The third is diversified dynamic assessment and evaluation. Traditional course evaluation places more emphasis on results, and the final assessment results account for a large proportion of the course. Students who rush through the learning test site may master the knowledge in a short period of time, but it is not conducive to the cultivation of students' comprehensive qualities and abilities. And the paper combines process evaluation and outcome evaluation, highlighting students' daily performance, discussion group daily practice, achieving a comprehensive evaluation system of
process and results. It is conducive to achieving the educational, knowledge, and ability goals of the curriculum, so students need to study and treat them seriously both in and out of class.

However, there are also some problems and difficulties in applying teaching models to curriculum practice. Firstly, this model has higher teaching skills for teachers. It not only requires a solid theoretical foundation, but also focuses on analyzing the learning situation, studying the key and difficult points of the course, and carefully preparing lessons. Secondly, teachers should have the ability to manage the classroom and effectively organize student discussions, exchanges, and evaluations, which requires them to have profound professional knowledge and skills. Finally, although participatory learning provides students with a certain self-learning space, there are still poor learning outcomes. During group discussions, it is possible to only list and summarize viewpoints and issues without deep thinking. Some students have an improper attitude, which leads them to skate by. The blended teaching model based on BOPPPS still needs continuous practice, exploration, and improvement.

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References


