

Research on classroom teaching innovation based on "BOPPPS+Chaoxing On-line Learning Platform"-Take "Linux operating system" as an example

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Abstract. The purpose of this paper is to explore the application and effect of classroom teaching innovation based on "BOPPPS+ChaoXing on-line Plant" in the course of "Linux Operating System". By introducing the BOPPPS teaching mode and using the "Chaoxing On-line Learning Platform" platform, this paper aims to improve students' learning effect, enhance classroom interaction and promote the improvement of teaching quality. This paper first introduces the basic concepts of BOPPPS teaching mode and "Chaoxing On-line Learning Platform", and then expounds in detail the process of implementing this teaching innovation in the course of "Linux Operating System", and evaluates the effect of the innovation through practical cases and data analysis. Finally, this paper summarizes the effect of teaching innovation and puts forward the further improvement direction.

Keywords: BOPPPS, ChaoXing on-line Plant, Linux operating system, Classroom teaching innovation.

1 Introduction

With the continuous development of information technology, the traditional teaching mode can no longer meet the needs of modern education. In order to improve teaching effect and cultivate students' comprehensive quality, classroom teaching innovation is particularly important. As new teaching concepts and tools, BOPPPS teaching mode and "Chaoxing On-line Learning Platform" provide new ideas and methods for classroom teaching innovation. At present, there are some problems in the teaching process of "Linux operating system", which have a direct impact on students' learning effect.

(1) The teaching methods and means are single. "Linux Operating System" mainly teaches the basic principles and related commands of "Linux operating system". Teachers often teach PPT, and students learn knowledge passively in the teaching process, which can not arouse their enthusiasm and creativity, thus failing to achieve ideal teaching results.

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(2) Lack of cultivation of students' ability to find and solve problems. In classroom teaching, teachers often pay attention to the rigor of teaching structure. For a certain question, teachers often give an answer directly, which is bound to keep students in a passive state, leaving no room for students to analyze the problem. In the long run, some students have lost the habit of asking questions and thinking about how to apply basic theoretical knowledge to solve practical problems.

(3) It is difficult to mobilize the initiative of the teaching subject. "Linux Operating System" is a professional course for the third year of undergraduate course. Most students have lost their enthusiasm for learning professional knowledge when they first entered the school, and it is common that they study only to get credits. Therefore, if the teaching form lacks classroom interaction and the classroom is not bidirectional and interesting, it will be difficult for students to mobilize their initiative in learning.

2 BOPPPS teaching mode and “Chaoxing On-line Learning Platform”.

2.1 BOPPPS teaching mode

BOPPPS teaching mode is a teaching mode that emphasizes students' participation and interaction. Its core idea is to guide students to actively participate in the learning process through a series of carefully designed teaching links, so as to improve the teaching effect. This model divides the teaching process into six stages, namely, Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment and Summary. In the Bridge-in stage, teachers will use various methods (such as questions, discussions, cases, etc.) to attract students' attention, stimulate their interest in learning, and at the same time establish the connection between old and new knowledge to pave the way for subsequent learning. Objective, the teacher will clearly inform the students of the learning objectives of this lesson, so that students can have a clear understanding of the learning content and expected results, so as to carry out targeted learning. Through Pre-assessment, teachers can know students' mastery of what they are about to learn, so as to adjust teaching strategies and better meet students' learning needs. The forms of pre-test can be varied, such as questions and quizzes. Participatory Learning is the core link of BOPPPS teaching mode. Teachers will design various interactive learning activities to guide students to actively participate, actively explore and cooperate. Participatory learning can include group discussion, role-playing, case analysis, etc., aiming at cultivating students' critical thinking, innovative ability and teamwork ability. In the post-test stage, teachers will evaluate students' learning achievements to test whether the teaching objectives have been achieved. The form of post-test can be similar to that of pre-test, but the difficulty and depth should be improved to reflect the progress of students in participatory learning. In the final Summary, the teacher will summarize the learning content of this lesson, emphasize the key points and difficulties, and guide the students to reflect and expand what they have learned. Summarization is helpful to consolidate students' memory and improve learning effect.

Generally speaking, BOPPPS teaching mode has formed a complete and systematic teaching process through the organic combination of six links: introduction, goal, pre-test, participatory learning, post-test and summary. This model pays attention to students' subjectivity and participation, which is helpful to stimulate students' interest and enthusiasm in learning and improve teaching effect. At the same time, it also provides a clear and operable teaching framework for teachers, which is helpful for teachers to better organize and implement teaching activities.

2.2 Chaoxing On-line Learning Platform

“Chaoxing On-line Learning Platform” is a platform for course learning, knowledge dissemination and management sharing based on micro-service architecture. It makes full use of Chaoxing's massive resources, including books, periodicals, newspapers, videos and original content, and integrates knowledge management, course learning, thematic creation and office application, providing users with a one-stop learning and working environment.

As a teaching platform, Chaoxing On-line Learning Platform has many functions. First of all, it is combined with the school's network teaching platform to realize the functions of professional course construction, uploading and sharing of teaching materials, PPT wireless screen projection class and so on. Secondly, the platform also provides a full range of teaching processes, such as class sign-in, selecting candidates to answer questions, homework assignment and comment, and quizzes, which meet the needs of modern teaching. In addition, the functions of group chat and topic discussion make real-time communication between teachers and students possible, and the problems that students encounter in preview and review can be posted on the platform in real time, and students can discuss them and teachers can reply in time, which greatly improves the problem of poor communication between teachers and students in traditional classrooms.

On the learning platform, students can register and log in through mobile phones or computers, and view and study courses. The platform also has a statistical function, which can make statistics on students' classroom reports, learning situation and their usual learning situation, which is helpful to change the single course assessment method in traditional teaching and pay more attention to the evaluation of learning process. In addition, the voting and questionnaire functions enable students to effectively evaluate the teaching effect of teachers and provide a feedback mechanism for teaching.

3 Teaching mode innovation based on “BOPPPS+Chaoxing On-line Learning Platform”

The teaching innovation model based on “BOPPPS+Chaoxing On-line Learning Platform” mainly includes three parts: teaching preparation stage, flexible teaching activity design stage and teaching evaluation stage. This teaching model integrates the “student-centered” teaching concept into the classroom teaching process, is supported by the “Chaoxing On-line Learning Platform”, is driven by the new generation of information technology, aims at cultivating students' autonomous learning, cooperative inquiry and innovative ability, combines online and offline teaching methods, and adopts real-time monitoring and multiple evaluation methods, so that teachers and students can flexibly switch teaching and learning forms in face-to-face teaching, online and offline mixed teaching or complete online teaching, and realize the optimization of flexible teaching.

The preparatory stage is the premise and foundation for the smooth development of the whole teaching activity. The preparatory stage of this study includes three parts: analysis of teaching object, analysis of teaching content and analysis of teaching environment. Through the analysis of various elements of teaching activities, it is helpful to provide basis for the design stage and teaching evaluation stage of flexible teaching activities in colleges and universities in the post-epidemic era based on BOPPPS.

In the teaching design stage, online and offline teaching methods are adopted. According to learners' learning characteristics, the six stages of BOPPPS model are reconstructed, and the teaching activities are designed in three links: giving learning tasks before class, pushing online learning resources, giving homework after class, and guiding students' individual needs. Before class, teachers push relevant learning materials through the intelligent platform to help learners learn independently, and flexibly arrange the Pre-

Assessment stage and Objective stage in BOPPPS model online, which is beneficial for teachers and learners to prepare for in-depth teaching and learning in the classroom; In class, according to emergencies or actual teaching needs, teachers can carry out the Bridge stage, Participatory Learning stage, Post-assessment stage and Summary stage in BOPPPS model in a completely online, offline or online-offline mixed way, so as to gradually guide learners to understand, learn and apply relevant important knowledge. After class, teachers push extended homework to learners through the intelligent platform, give timely learning feedback and provide personalized counseling to help each learner check for missing information and deepen their understanding of knowledge content. The teaching innovation mode based on “BOPPPS+Chaoxing On-line Learning Platform” gives full play to the characteristics and advantages of each link, and carries out flexible and diversified teaching according to the teaching content and students' characteristics. Through student-student interaction, teacher-student interaction and human-computer interaction, it promotes the change from "teacher-oriented" to "student-oriented" teaching method, effectively stimulating learners' learning motivation.

Teaching evaluation and teaching activities are advancing synchronously. Teachers adjust and motivate learners' learning in time through evaluation feedback, and learners can know and improve their learning status in time through evaluation feedback. The teaching evaluation system based on “BOPPPS+Chaoxing On-line Learning Platform” has the characteristics of diversity, flexibility and integrity. It focuses on learners' development, effectively evaluates learners' learning situation from three aspects: evaluation subject, evaluation method and evaluation function, and pays attention to the pertinence and timeliness of evaluation, so as to better stimulate and maintain learners' initiative to participate in teaching activities.

4 Teaching innovation practice of “Linux operating system” course

4.1 Course design of “Linux Operating System” based on “BOPPPS+Chaoxing On-line Learning Platform”

In the course of “Linux Operating System”, we have carried out the classroom teaching innovation by combining the “BOPPPS+Chaoxing On-line Learning Platform”. The specific implementation process is shown in Figure 1.

From the lead-in stage, teachers use “Chaoxing On-line Learning Platform” to publish course introduction and learning objectives, and stimulate students' interest in learning through practical cases. In the target stage, teachers make clear the course learning objectives and guide students to complete the preview task. In the pre-test stage, teachers use “Chaoxing On-line Learning Platform” to conduct online tests to understand students' learning foundation. In the participatory learning stage, teachers organize students to have group discussions and practical operations, and at the same time, use “Chaoxing On-line Learning Platform” for real-time guidance and feedback. In the post-test stage, teachers conduct online tests again to test students' learning effect. Finally, in the summary stage, teachers summarize and review the course, and release homework and expand resources. Through this platform, teachers can easily publish course information, upload teaching resources, assign homework and conduct online tests. Students can log on to the platform anytime and anywhere to study, participate in discussions and complete homework. “Chaoxing On-line Learning Platform” provides a convenient online teaching environment for teachers and students, which strongly supports the implementation of teaching innovation.

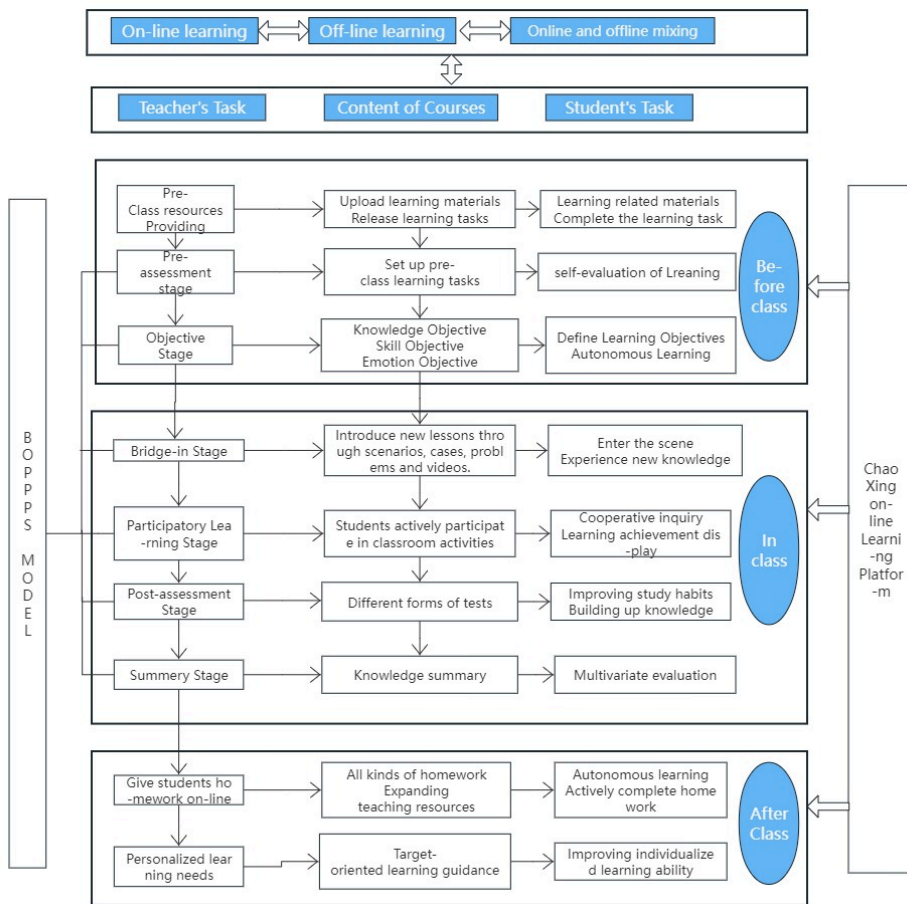


Fig. 1. Course Design of "Linux Operating System" Based on "BOPPPS+Chaoxing On-line Learning Platform".

4.2 Evaluation of innovation effect

After two semesters' practice, we evaluated the effect of teaching innovation by means of questionnaire survey and grade comparison, and the teaching effect was obvious. (1) build a classroom teaching mode of "BOPPPS+Chaoxing On-line Learning Platform" learning. By effectively combining the advantages of BOPPPS, "Chaoxing On-line Learning Platform" and Flip Classroom, the flip classroom teaching mode based on "BOPPPS+Chaoxing On-line Learning Platform" is constructed, and the teaching mode of "BOPPPS+Chaoxing On-line Learning Platform+Flip Classroom" is finally established. (2) Stimulate classroom vitality and improve the quality of personnel training. In the process of teaching "Linux Operating System", the mixed teaching mode of "BOPPPS+Chaoxing On-line Learning Platform+Flip Classroom" is adopted, relying on the "Chaoxing On-line Learning Platform" network teaching platform to realize the sharing of high-quality online teaching resources. The offline teaching fully embodies the characteristics of "education-oriented, student-centered", highlights students' all-round participatory learning, pays attention to students' behavior, and makes timely feedback and adjustment, so as to stimulate classroom vitality and improve the quality of personnel training. (3) Diversified evaluation forms to

improve the objectivity and scientificity of curriculum assessment. The teaching evaluation system based on “BOPPPS+Chaoxing On-line Learning Platform” has the characteristics of diversity, flexibility and integrity. It takes learners' development as the center, makes full use of the intelligent evaluation system supported by intelligent technology, and makes an elastic evaluation of learners' learning situation from three aspects: evaluation subject, evaluation method and evaluation function, and pays attention to the pertinence and timeliness of feedback, so as to better stimulate and maintain learners' initiative in participating in teaching activities.

5 Conclusion and prospect

The teaching mode of “BOPPPS+Chaoxing On-line Learning Platform” is applied to the teaching of “Linux Operating System”, which promotes teachers' flexible use of information technology to teach, enriches the construction of course resource database of “Chaoxing On-line Learning Platform” continuously improves teachers' teaching ability, develops students' habit of active thinking and autonomous learning, activates students' thinking, enables more students to participate in classroom communication and discussion, and cultivates students' ability to find and solve problems. Teachers and students can adjust teaching strategies and study in time through after-class resumption. However, teaching innovation is a continuous process, and we still need to explore and improve it. In the future, we will further optimize the application strategy of online and offline mixed teaching mode of BOPPPS, and continuously improve the teaching effect.

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