

Application and research of hybrid teaching mode based on flipped classroom in circuit teaching

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Abstract: with the continuous development of Internet technology, the concept of online and offline Hybrid Teaching Based on the advantages of flipped classroom has been widely concerned by the education sector, and more and more colleges and universities have begun to pay attention to the integration of Internet elements into professional teaching. Taking the circuit course as an example, there are many problems in the traditional teaching mode of the circuit course, such as the single teaching mode and not taking students as the main body. Teachers should be aware of the existence of these problems, excavate the connotation of flipped classroom, and improve it by using hybrid teaching methods, so as to fundamentally improve the teaching quality and promote the improvement of students' professional ability. In specific teaching, teachers should combine online learning, offline learning and face-to-face teaching in the classroom, break through the shackles of traditional teaching with brand-new teaching concepts, give full play to the guiding role of teachers in the teaching process, show the value of professional education, highlight the dominant position of students in teaching, and conduct mixed teaching in a diversified and multi angle flipped classroom, Promote the good development of students.

Key words: flipped classroom; Circuit courses; Blended teaching; Application strategy

In the teaching of Circuit Courses in Colleges and universities, teachers, as the key role of preaching and getting rid of doubts in students' learning career, should always follow the trend of education, change their own teaching ideas in time, constantly improve the teaching mode and teaching methods in combination with the current situation, always take students as the main body of teaching, and take it as their own responsibility to effectively cultivate students' professional ability, Create a high-quality teaching environment for students. At present, under the background of information education, teachers should break through the limitations of traditional teaching, use the hybrid teaching in flipped classroom to improve the teaching quality, and realize the transformation from the concept of imparting knowledge to the concept of cultivating comprehensive ability; Realize the change from the concept of valuing teaching and neglecting learning to the concept of taking teachers as the leading role and students as the main body, make full use of computer technology and internet teaching services, make the course research and enlightening, and promote students' autonomous learning and collaborative learning. Practice has proved that the hybrid teaching method based on flipped classroom can help teachers find students' problems in the learning of circuit course, put the learning of theory and other knowledge online and offline, solve students' confusion in theory learning in classroom teaching, increase time for experimental practice teaching, and enhance students' knowledge application ability.

1 An overview of flipped classroom teaching mode and blended teaching

1. Overview of reverse classroom teaching mode

(1) The origin of flipped classroom teaching mode

In 2007, Jonathan Bergmann and Aaron SAMs used to teach in a high school called "Woodland Park" in the United States. They found a problem in the teaching process, that is, it takes a lot of energy to make up lessons for children who are absent from class, and the teaching effect is not ideal. In order to solve this problem, They recorded their teaching process and uploaded it to the network platform after simple editing, so that those students who were absent from class or needed a second explanation could watch the video for learning. Since then, their students have started watching videos at home, practicing in class and learning life for teachers to solve learning problems. After a period of experiments, the teaching quality has been greatly improved. In 2011, with the establishment of Khan college, the flipped classroom teaching mode came out, which was popular in the education sector.

(2) The essence of flipped classroom teaching mode

Flipped classroom teaching is a breakthrough in the traditional classroom teaching mode. It reverses the way of internalizing knowledge and imparting knowledge, optimizes students' learning environment through active learning and educational technology, and changes students' learning mode from simple "listening" to "seeing and doing". In the flipped classroom teaching mode, students can learn autonomously after class through relevant teaching videos and materials. In class, they can solve the problems encountered in the learning process through the guidance of teachers. This learning method greatly enhances students' autonomous learning ability and independent thinking ability, and is of great help to their personal development, At the same time, it is also beneficial to the growth of their comprehensive ability.

2. Overview of blended teaching mode

Blended teaching is a new teaching mode in the new era of education. It combines the two classes through the integration of online and offline teaching, so as to achieve the purpose of improving students' learning effect. In this teaching mode, students can not only acquire knowledge in classroom teaching, but also carry out autonomous learning through online ways, which can not only improve students' learning initiative, but also broaden students' knowledge breadth.

2 Application of hybrid teaching mode based on flipped classroom in Circuit Teaching

The purpose of flipped classroom is to move the learning of theoretical knowledge from the classroom to extracurricular, and put it in the preview link, and then put the absorption of knowledge, discussion and problem solving in the classroom, so as to improve students' learning efficiency. The implementation of flipped classroom will change the function of teachers in traditional teaching, from knowledge imparter to guide students' learning, and students will also change from passive to active, fully demonstrating the value of education. This teaching mode gives students a lot of freedom in the learning space, and it is convenient for teachers to manage and track students' learning status, which makes up for many shortcomings of traditional teaching and can achieve better teaching effect. Hybrid teaching is to retain the advantages of face-to-face teaching in traditional teaching and integrate with the advantages of online teaching. It can not only enable teachers to play a leading role in teaching, but also reflect the dominant position of students in learning, improve their enthusiasm and obtain the best learning effect.

1. Application of teachers' online teaching module

The implementation process of teachers is very critical to the construction of hybrid teaching mode based on reverse classroom, which has an important impact on the implementation of the whole teaching mode. First, teachers should use the Internet to collect videos related to circuit courses. Nowadays, the teaching resources on the Internet are extremely rich. If teachers independently design circuit course courseware or knowledge explanation video, it will be more difficult and consume more energy. Therefore, teachers can collect relevant teaching resources on the Internet based on teaching materials and knowledge content. In the process of collection, teachers should identify the quality of teaching resources, such as courseware and videos, whether they are suitable for students' listening, whether they are of high difficulty, and whether they can reflect the value of professional knowledge. Secondly, teachers should design corresponding teaching activities according to the actual teaching content. Teachers should dig into the connotation of the circuit course and build an efficient circuit teaching system with the help of the network platform, including the syllabus, teaching calendar, phased teaching objectives, and course introduction, so as to achieve the online and offline mixed teaching function of learning, practice, testing, and evaluation.

2. Application of students' online learning module

Teachers can use the online teaching platform to release relevant learning tasks, such as Netease cloud classroom, Tencent classroom, etc., and students can accept and execute them online. With the resources such as micro class video and teaching courseware uploaded by teachers, students can refer to learning tasks and use teaching resources for autonomous learning.

First, the teacher arranges the knowledge in the circuit course, such as circuit model and circuit law, equivalent transformation of resistance circuit, general analysis of resistance circuit, circuit theorem, resistance circuit with operational amplifier, energy storage element, time domain analysis of first-order circuit and second-order circuit, and integrates these knowledge points into the video recording of micro lecture. It is presented to students in the form of micro lecture and imported into relevant unit micro lecture through the platform. When learning, students can preview circuit related courses in advance through these learning resources, and can also understand the overall structure of the whole circuit course teaching in advance through teaching video. When encountering knowledge points that they do not understand, students can carry out corresponding explanations through network retrieval, find the answers to questions, and independently solve the problems encountered in learning.

Secondly, the circuit course is highly practical, and the theoretical study is ultimately to serve the practice. Therefore, students can watch the teacher's teaching course in advance, understand the experimental content in advance according to the tasks assigned by the teacher, and conduct simulation experiments according to the demonstration operation in the teacher's video, implement the theory in the experiment, and complete the process of knowledge from learning, internalization to output. If students are confused about the experimental steps, they can put forward it in the face-to-face teaching below the line, and the teacher will summarize the students' problems and solve them in the classroom teaching. For some personalized problems, teachers need to use the network platform to carry out one-to-one teaching according to their aptitude, strive to comprehensively solve the difficulties students encounter in learning, and promote the improvement of their personal ability. Thirdly, students can browse the courseware related to the current course, complete the homework and exercises according to the teacher's regulations, and submit them on the platform. Teachers can also answer questions and solve problems for students through online mode, give full play to their guiding role, let students know more about the course content through videos, and complete the tests and experiments of relevant knowledge in advance.

Finally, students can also summarize and summarize the problems encountered in daily online and video learning, and improve their professional ability by solving them online with classmates or asking teachers in class. In addition, high-level students should help students with weak learning ability. According to the teaching task, they can also record relevant knowledge decomposition videos, which are uploaded to the teaching platform after being reviewed by the teacher, to communicate with everyone, build a good learning atmosphere, and give full play to the mixed teaching value of flipped classroom.

3. Application of classroom teaching module

In the online learning process of the circuit course, students have basically mastered the course content. Therefore, when teaching face-to-face in the actual classroom, teachers should appropriately abandon the time of theoretical teaching, and leave room for deeper knowledge explanation and communication. In the limited actual classroom, teachers should effectively improve the teaching quality, and also enhance students' cognitive level of the circuit course.

First of all, teachers conduct tests for students in the actual classroom to test their online learning results, expose the problems in the

process of self-study, and teachers can also solve them pertinently, which is also an important means for teachers to track students' learning status in the hybrid teaching mode of flipped classroom. After the quiz, the teacher should lead the students to a discussion session. In the specific implementation, the teacher divides the students into several groups, and then each group selects a representative. The representative needs to sort out the preview status of autonomous learning in the group and report to the teacher, including the preview status, homework completion and learning experience, and is also responsible for collecting the problems encountered by each student in online learning. The discussion and exchange of problems between teachers and students and between students will be carried out gradually by means of questioning or answering questions.

Secondly, after the previous teaching session, the teacher selects high-frequency questions to answer, and then arranges targeted exercises for students in the classroom, so that students can complete them within the specified time, and carefully review the students' completion after completion, and must solve the existing problems on the spot. At the same time, the key and difficult points of the course are sorted out for students to have a basic understanding of the basic framework of the circuit course system.

Finally, at the end of the actual class, the teacher should summarize the situation of this course and the previous students' autonomous preview, point out some common problems in students' learning, and adjust some imperfect links with students to complete the learning process of the next class with students. In this module, teachers must strengthen the communication with students, and on this basis, according to the specific learning situation of each student, carry out personalized, flexible and diversified teaching design, and timely adjust the order of learning content and key and difficult knowledge.

To sum up, the hybrid teaching mode of circuit course based on flipped classroom fully embodies the teaching concept of "learning and application in one". Using this mode, teachers can guide students to choose online learning content according to their own needs, realize personalized learning, and effectively improve the learning effect. Through the flipped classroom teaching method, teachers can explain and discuss the key and difficult points offline, which is conducive to improving the efficiency of classroom teaching, helping students master the methods and practical skills of circuit analysis and calculation, so as to cultivate more compound innovative talents.

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