Application of Interactive Cloud Class Teaching Platform in "Embedded System" Course

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Abstract: The ministry of education has released the education information 2010-2020 ten-year development plan, striving to promote the construction and application level of informationized teaching in colleges and universities. This paper mainly discusses the application of interactive cloud class teaching platform in "embedded system" course.

Keywords: interactive cloud class; teaching platform; embedded system

1. Introduction

The interactive cloud class teaching platform has strong interactive performance.Students can mark their questions at any time, teachers can also timely understand students' learning status and answer questions, thus effectively improving students' learning efficiency and quality, which has a good role in stimulating students' learning enthusiasm and cultivating students' good learning habits.

2. Implications and Advantages of Interactive Cloud Class Teaching

2.1The meaning of interactive cloud class teaching

Interactive cloud class teaching is an auxiliary teaching mode based on cloud computing. It is mainly a cloud service platform built by teachers using modern network technology for information and personalized course teaching. Interactive cloud class teaching can increase the communication between teachers and students and improve the quality of teaching. With the development of cloud computing technology and the overall information construction of education, it is an inevitable trend to use interactive cloud class teaching platform for teaching in colleges and universities.

2.2The advantages of interactive cloud class teaching

2.2.1Centralized management of teaching resources

There are many problems in the allocation of teaching resources in China, such as low utilization rate of teaching resources, unbalanced allocation of resource construction, and difficulty in sorting out information, etc., for which the interactive cloud class teaching platform can provide effective technical support. The unified management of teaching resources does not require more manpower and is not limited by time and space, so as to improve the problems in the allocation of teaching resources.

2.2.2Changed the traditional way of teaching

The traditional teaching methods in China are mainly cramming and filling. Taking teachers as the subject of teaching but ignoring students' subjective initiative is not conducive to stimulating students' potential.Interactive cloud class teaching has changed this situation and created a student-centered teaching model.

2.2.3Energy saving, environmental protection, low carbon and high efficiency

Interactive cloud class teaching does not have high requirements for the teaching environment. Hardware equipment is a one-time investment without excessive increase in expenditure. Besides, the daily maintenance of the equipment is supported by third-party service providers, which also meets the social requirements of today's low-carbon and sustainable development.

2.2.4Easy interaction, safe and fast

The widespread use of smart phones, tablet computers and other mobile devices provides a very convenient and efficient learning platform for interactive cloud class teaching. Moreover, due to the technical support of cloud computing, data will not be lost even if the device is damaged, thus ensuring the security of the learning platform.

3. Related Theories of Interactive Cloud Class Teaching

3.1Teaching interaction

The main meaning of interaction in modern society is to communicate with other objects on the same platform. In daily life, interaction is mainly achieved through smart phones, computers and other communication tools. Of course, it also exists in face-to-face communication and interaction. Interaction in education is not only the resource exchange between students and teachers, but also the communication and cooperation between students and students, as well as the interaction between teachers, students and knowledge resources. The precise definition of interaction has not been agreed upon in the academic world, but it can be seen that it is generated by communication between two or more participants. Currently, the new curriculum reform is a student-centered teaching model, so teachers should pay special attention to their guidance and assistance in interactive learning.

3.2Blended learning

Hybrid learning is considered as the best way to reflect students' dominant status, which can effectively reduce learning costs and improve learning efficiency. How to better integrate blended learning in interactive cloud class teaching will be one of the research topics in the future.

3.3Collaborative learning

Collaborative learning can strengthen students' spirit of unity and cooperation and improve the efficiency of teamwork. Assigning tasks to teams and encouraging students to learn cooperatively with reward system can improve the learning effect. In the process of collaborative learning, team members unite and help each other for the common goal, which is conducive to promoting the communication and interaction between teachers and students and fostering students' cooperative spirit.

3.4Constructivism

Constructivism plays a very important role in China's education reform. It emphasizes that students should be the focus of teaching, guides students to learn independently in an exploratory way, and focuses on the construction of learning concept, education concept and knowledge concept. The interactive cloud class teaching platform can stimulate students' learning potential to the greatest extent and realize students' all-round and comprehensive development.

## 4. The Function of Interactive Cloud Class Teaching Platform

4.1Structure of platform

The interactive cloud class teaching platform includes database server, file storage server, streaming media player server and network application server. In order to ensure the stability of interactive cloud class teaching platform, Linux and Unix are used. The interactive cloud class teaching platform is based on the data support of cloud computing and the framework of the web. It will not generate specific terminal device dependence, so it can realize multi-screen linkage of

different types of terminals. According to the different requirements of the platform, it is divided into two parts: teacher port and student port.

4.1.1Teacher port

The teacher port is mainly composed of five parts, including course management, cloud resources, test database, interactive classroom platform and course recorded(Figure 1). These five systems set up the corresponding learning system on the interactive cloud class teaching platform, greatly improving the teaching efficiency and optimizing the allocation of resources.
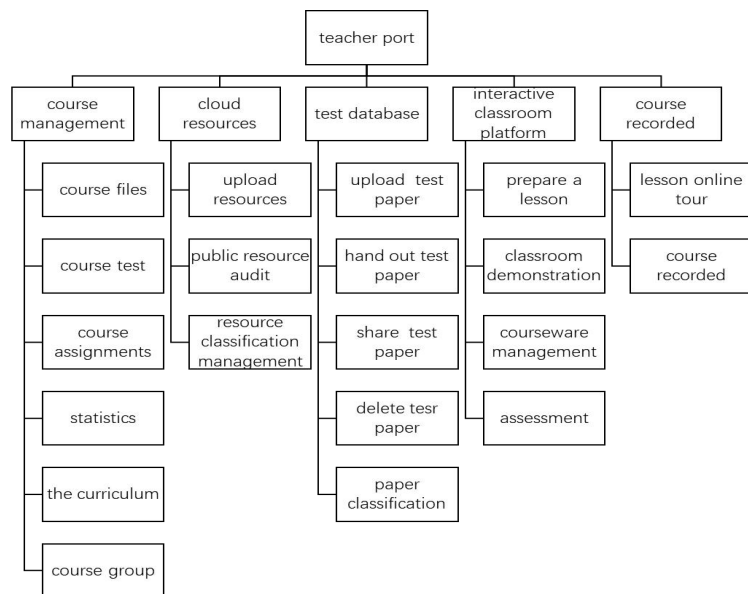
Figure 1. Teacher port

4.1.2Students port

Compared with the teacher port, the student port requires only a few sections, which are mainly divided into three subsystems: course management, classroom interaction and recorded platform. Function classification is shown below(Figure 2). The student port is mainly the course interactive content with teachers and classmates, and does not involve the uploading of database and cloud resources. On the whole, it should be concise and convenient to facilitate students to acquire knowledge efficiently.
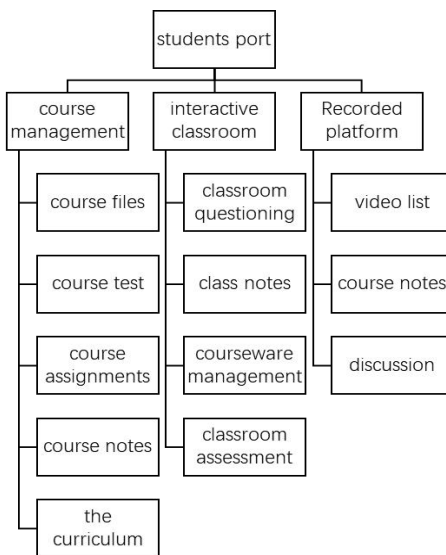
Figure 2. Function classification

4.2Interactive cloud class teaching platform function

The functions of the interactive cloud class teaching platform are various, including the integrated management of teaching resources, the management of teachers' course arrangement and time, the interactive communication and learning between teachers and students, the statistics of students' learning status, the playback of course recording, online question&answer and evaluation.

5. Application Mode of "Embedded System" in Interactive Cloud Class

Interactive cloud class teaching platform is mainly based on smart phones and tablets as a terminal tool, use of modern electronic technology and the network construction of teaching resources platform. The teaching mode with clear steps, i.e., counselling before class learning, interactive learning in class, after class teaching and examination evaluation deeply. This model can be adopted to teach and learn "embedded systems".

5.1Before the course of "embedded systems"

The main purpose of this step is to cultivate students' ability to find problems actively and learn collaboratively with other students.

5.1.1Teachers

Teachers provide effective learning materials for students and set up groups on the cloud class platform, so that each group can get tasks according to relevant audio, video, pictures and text materials. The software module activity library is used to analyze the preview situation of each group, so as to facilitate the adjustment of the follow-up teaching pace and content.

5.1.2Students

Students watch relevant materials provided by the teacher, get a preliminary understanding of the key points and difficulties in the course, conduct online discussion with group members, find out the problems found in the preview, and feedback the problems to the teacher through the discussion section of answering questions.

5.2In the course of "embedded systems"

5.2.1The first step is mainly to cultivate students' divergent thinking ability and ability to summarize. The teacher will send the PPT courseware with relevant experimental procedures and presentation materials to the students, and ask questions: please design and submit the UART scheme inside S3C2410 processor. Students should carefully read and analyze the contents in the PPT, and then upload the UART design scheme inside the S3C2410 processor in the brainstorming function.

5.2.2Guide students to carry out case study. The teacher should screen the design scheme, introduce UART-related cases into the teaching, and continue to ask the question: how to calculate the divisor of baud rate?How to set UART to manipulate registers?How to implement pin configuration?Students are encouraged to engage in group discussion with question-and-answer guidance. The students will conduct group discussions and feedback the answers to the teacher through the module.

5.2.3Mutual communication between teachers and students. Teachers learn about students' learning through the interactive cloud class teaching platform, and provide answers and supplements to students' questions and inadequacies in their answers. Students should keep a record of what they have learned, check for gaps, and upload the final answers to the questions.

5.2.4This step is mainly to cultivate students' cooperative learning, to strengthen students' ability to cooperate in the group. Teachers should make a good summary, link the pre-learning content with the curriculum knowledge, and put forward the serial interface related knowledge and concepts. Students should also summarize the knowledge points and select speakers to speak in the group discussion.

5.2.5This step is mainly to consolidate the classroom content. Teachers upload relevant knowledge points and topics related to serial interface through interactive cloud class teaching platform. Students answer the questions and upload the answers in the corresponding module of the interactive cloud class teaching platform.

5.3After the course of "embedded systems"

Teachers approve assignments, summarize lessons and reflect. Students should complete and hand in their homework in time and should also summarize the learning content after teachers give feedback.

5.4Assessment and evaluation of "embedded systems"

Teachers evaluate students mainly through three links: before class, after class and after class. Evaluation content can be generated automatically through interactive cloud class teaching platform. Teachers should communicate with students in time and encourage outstanding students to enhance students' interest in interactive cloud class.

6. Conclusions

In this paper, the teaching of "embedded systems" is taken as an example to highlight the ways and methods of interactive cloud class teaching platform in practical application, and analyze its advantages and application scope. With the development of science and technology in China, interactive cloud class teaching platform will become a necessary teaching method in the new era, which should be given enough attention and promotion in various colleges and universities.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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