

Study of blended teaching model based on programming class

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Abstract

Programming courses focus on cultivating computer science students' programming ability and improving students' ability to analyze and solve practical problems independently. In view of the practical problems such as the complex concepts and syntax rules involved in programming courses and the large number of knowledge points, this paper proposes a talent training model based on the hybrid teaching of programming courses, which proves the effectiveness of this teaching and training model from theory and practice and achieves a better teaching effect.

Keywords

Programming courses; blended teaching mode; teaching reform.

1. The current situation of teaching programming courses

Java, PHP, Python, C and other programming language courses, using programming languages as a platform to teach programming ideas and methods, aiming to cultivate good programming literacy and habits among students.

The "knowledge structure-driven" teaching method is the traditional teaching method commonly used by our teachers as the teaching mode of programming courses. This teaching method is based on the following steps: the teacher teaches in a step-by-step manner with reference to the textbook, although the book also sets up code cases for a specific problem, but these cases are often unconnected and isolated[1-3].. This kind of classroom teaching focuses too much on the explanation of language knowledge points on, which leads to students' inability to develop specific projects using the programming language[4]. In response to the above problems, this paper proposes a blended teaching mode based on programming courses, which adopts the teaching method of "online independent learning + classroom lectures". By implementing this hybrid teaching model, it helps teachers to achieve the teaching goal of developing students' ability to solve practical problems.

2. Design of a hybrid teaching program based on programming classes

We adopted the hybrid teaching method of "online independent learning + classroom lecture" to teach the programming course, and designed the course from the following three perspectives[3-7].

(1) Construction of online teaching support platform

With the advantages of the platform itself, we build a multi-dimensional online teaching support platform based on Ding Talk + Tencent QQ + Super Star Learning, and the features of the 3 platforms are shown in Table 1. Use Ding Talk meeting to live broadcast courses, interact with students in class and carry out teaching. Tencent QQ is used for one-on-one Q&A and discussion, etc. Teachers can publish syllabus, lesson plan, lesson PPT and other course materials, class tests, post-class tests, sign-in, course assignments, etc. on Super Star Learning Platform, and get each student's grades and attendance through the statistical function of Super

Star Learning Platform to understand students' course learning. See how students are learning in real time and make timely adjustments.

Table 1 Online teaching support platform

Serial number	Online Teaching Platform	Features
1	Ding Talk	Live course and teaching interaction; DING function
2	Tencent QQ	Real-time chat tool; multi-person communication; resource sharing; remote assistance
3	Super Star Learning Pass	Course learning based on microservice architecture; free courses, books, journals, lectures and other kinds of resources; rich book and journal resources

By using these platforms in an integrated manner, it is easy for students to view course resources at any time and ensure the stable operation of online teaching.

(2) Integrated design of teaching organization

The teaching process is divided into 3 parts: before, during and after the class, which are organized and designed as shown in Table 2.

Table 2 Teaching organization design table

Serial number	Teaching process	Teaching activities (teaching platform)
1	Before Class	Students watch the video and pre-test on their own. (Super Star Learning Connect platform)
2	During the lesson	In the offline classroom, the unit knowledge is the main line, using the "task-driven + case study" hybrid method to teach the knowledge points, and students practice. Sign-in, classroom questions (Super Star Learning Platform) Live online classroom, real-time interaction between teachers and students (Ding Talk platform)
3	After School	Answer questions, discuss (QQ platform) Assignments, tests (Super Star Learning Platform)

Among the teaching methods used are discussion method, practice method, live teaching method, recorded teaching method, and independent learning method.

The online teaching platform releases teaching resources and supervises students' independent learning. After the online and offline teaching, videos are recorded for key and difficult points and uploaded to the online platform for secondary explanation, and online Q&A solves students' confusion effectively; by assigning design assignments and cooperating with other students to complete the design assignments, the teacher cloud supervises the design results, which helps to improve students' solidarity and cooperation ability. Through the questionnaire results, we found that the hybrid teaching method can effectively stimulate students' interest in learning and make them become comprehensive talents with excellent grades and rich technical skills.

(3) Hybrid design of evaluation methods

Process evaluation is the immediate and dynamic interpretation of all kinds of information about students' learning in teaching activities, and it is always accompanied by the teaching process, which is embedded in the teaching process. Diversified teaching evaluation is the

standard for the implementation of hybrid teaching activities. The programming course adopts a process-oriented and diversified evaluation system, as shown in Table 3. The pre-course prep, attendance, class performance, accompanying tests, post-course homework, quizzes and experiments are included in the assessment, and the weight of final exam results is reduced to 30%. Teachers can easily get the teaching process evaluation of this course by using the online teaching platform to export the statistical report of students' learning and combining it with offline classroom teaching.

Table 3 Design of evaluation system of programming class

Serial number	Teaching process assessment stage	Assessment content	Percentage
1	Before Class	Pre-learning situation	5%
2	During the lesson	Attendance Classroom Performance Classroom tests	10% 15% 10%
3	After School	Assignments Testing	15% 15%
4	End of term	Examinations	30%

3. Summary

This paper discusses the teaching concept, teaching design, and course evaluation of blended teaching for programming courses, and explores a feasible teaching path that effectively improves the teaching effectiveness of programming courses and can cultivate students' innovative consciousness, logical thinking, practical ability and professional skills.

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