

Application of Blended Teaching Method in "Digital Electronic Technology and Application" Course

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Abstract

"Digital Electronic Technology and Application" is an important basic course for electronic information majors. The traditional teaching method of this course has the following problems: the teaching method is relatively simple, the students' interest in learning is not strong, and the examination method is unitary and so on. In order to solve these problems, we have introduced a mixed online and offline teaching method. Based on the analysis of the nature of the course and the current situation of the course teaching, we explored how to carry out the mixed course teaching design in a better way and realize the purpose of optimizing the teaching from the aspects of pre-class knowledge framework design, in-class teaching link design, after-class feedback mechanism design and implementation method of the course assessment. Through the teaching effect, this teaching mode can not only improve the learning effect of students, but also improve the teaching ability of teachers.

Keywords

Digital Electronic Technology, Blended Teaching Method, Teaching Reform.

1. Introduction

"Digital electronic technology and application" is an important professional basic course of electrical and electronic engineering department of wenzhou polythchnic. This course plays an important role in the cultivation of students' theory and analysis method of electrical engineering science, practical skills of electronic technology application and comprehensive ability. Moreover, it is an important part of the knowledge structure system of students majoring in engineering and occupies an important position in the teaching of engineering science majors.

Over the years, teaching team members have made a lot of teaching reforms around this course, such as putting forward the "project-based teaching method"[1]. In this teaching mode, we integrate the knowledge points of the digital electronic technology course, and finally integrate the course content into 6 learning tasks. Through project-based teaching method, students' ability to apply technical knowledge is cultivated, and their professional quality and innovation ability are improved.

2. The Drawbacks of Traditional Teaching Methods

2.1. The Selection of Teaching Content

There are many knowledge points and complex contents in this course[2]. Although knowledge points have been integrated into different projects, the textbook we choose at present is still traditionally compiled according to chapters. At present, for some majors, the course of "Digital electronic Technology and Application" has very few teaching hours[3]. Therefore, we need to reflect on how to make students master the key knowledge points of digital electronic technology more efficiently within the limited time.

2.2. Students Study Situation Analysis

Most vocational college students think that studying theoretical knowledge for a long time makes them feel bored. Comparatively speaking, they prefer to watch online resources[4]. The current project-based teaching method is task-driven, but the classroom is still the main teaching site. In the process of teaching, theoretical teaching and practical teaching are still divided into two lines. In the process of theoretical teaching, it is inevitable that students need to pay attention for a long time and the teaching effect is not so good.

2.3. Evaluation mode

At present, we usually only consider the final paper score and homework score, the assessment method is relatively simple[5]. The lack of consideration in the process assessment ultimately leads to the students' inflexible application of the knowledge they have learned and the inability to truly cultivate students with solid professional knowledge and good learning habits.

3. The implementation of blended teaching method

The teaching purpose of "Digital Electronic Technology and Application" course is to enable students to acquire theoretical knowledge and practical training of digital electronic technology, improve the ability to solve more complex digital system related engineering problems, and promote the deep integration of information technology and course. In the teaching design of the course "Digital Electronic Technology and Application", the author tried the blended teaching mode based on online course, as shown in Figure 1.

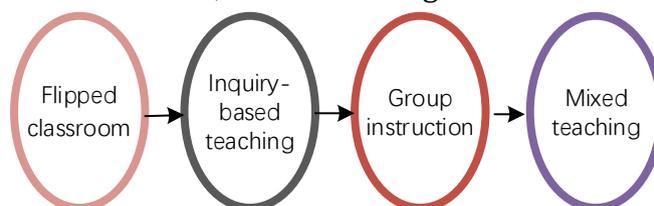


Figure1 Blended teaching model

Taking provincial quality online open course as the main media carrier, we set up videos, courseware, resource database, task release, discussion area and so on. Teachers adopt a combination of online and offline teaching methods to guide students to watch videos, complete unit exercises, participate in online discussions and answer questions through after-school practice. In the online class, besides teaching knowledge, teachers also need to organize students to have group discussions, explain difficult problems and deal with homework, so as to improve the teaching quality and create an efficient teaching class.

4. The Implementation Content of Blended Teaching Method

The course of "Digital Electronic Technology and Application" is based on the provincial quality online open course. It constructs the student-centered teaching mode and realizes the talent training mode of value building, ability training and knowledge teaching. In practice, it includes pre-class learning, in-class intensive learning, after-class feedback mechanism design and assessment methods.

4.1. Pre-class Learning

In terms of teaching methods, in order to realize this blended teaching method, we take provincial online open course as an auxiliary teaching platform to realize the whole process of auxiliary teaching method from before class, during class and after class. The specific implementation method is shown in Figure 2.

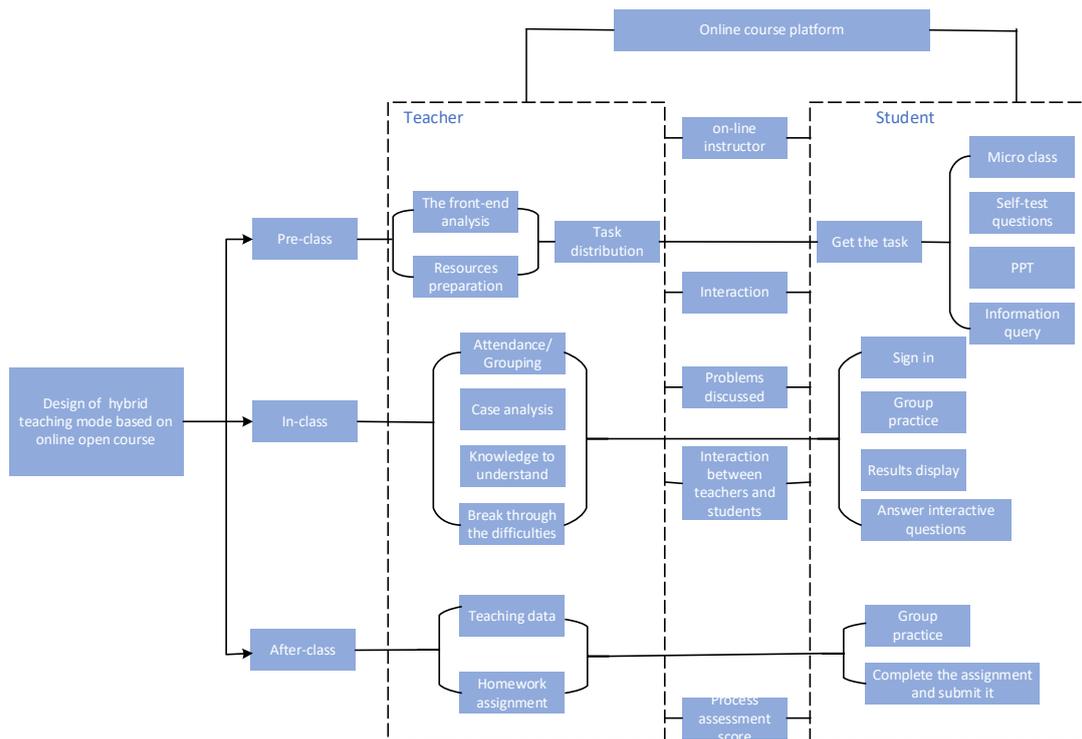


Figure 2 The specific implementation method

Pre-class knowledge is generally learned online, most of which are basic knowledge that is easy to understand, or software operations that students need to spend a lot of time and energy to practice after class. Before class, students need to register an account of online quality course. Teachers in the early stage release tasks or make interactive class topics through online quality open course through front-end analysis, upload courseware and micro-course video and arrange preview courseware at the same time. Students will receive the task and complete the task after class through micro classes, self-test questions, etc. During the process, they can communicate and interact with teachers through the online open course.

4.2. In-class Intensive Learning

In class, students can scan the TWO-DIMENSIONAL code to enter the class and get the attendance data in real time. In this way, hundreds of students can complete the attendance roll call in a very short time, which greatly saves the valuable class time. During the class, teachers show interactive topics, check students' knowledge learning, and then through case analysis, guide students to consolidate their understanding of knowledge and make breakthroughs in the form of groups. In this way, classroom responses can be directly fed back in class, and teachers can keep track of students' knowledge during the teaching process. Through such an implementation mode, it can realize the multi-task and multi-functional learning mode, which is guided by tasks and simultaneously carries out video teaching, in-class testing, homework, various tests, various resources, discussion and Q&A, etc. By assigning tasks after class, teachers let students consolidate and master the knowledge learned in the course to form the process assessment scores.

4.3. After-class Feedback Mechanism Design

Design of problem feedback mechanism: The problem feedback is carried out on the Q&A discussion platform. Students post questions on the platform and teachers solve them periodically. At the same time, teachers can also publish controversial knowledge and let students participate in the discussion so as to know how students master each knowledge point. Homework: There are two kinds of homework. One is a comprehensive homework for each unit, covering most of the knowledge points learned in the unit. The other is fragmented homework

in the teaching process. By learning a small knowledge point or watching a micro-lesson video, students submit their homework immediately, and each homework will be scored according to the learning situation and the response situation.

4.4. Reconstruction of Assessment Method

In the past few years, we have incorporated the process assessment into the assessment, and achieved some results. However, the content contained in the usual scores is relatively simple, which cannot take into account the students' learning attitude and time invested. In this paper, the author mainly adopts the combination of three evaluation methods. The first is diagnostic evaluation, which belongs to qualitative evaluation. This evaluation method can understand students' learning basis, learning habits and learning ability through the data from the pre-teaching survey, and judge whether they have the conditions required to achieve the current teaching goals, so as to provide the basis for the realization of mixed teaching. The second is the process evaluation, which belongs to the quantitative evaluation, including the evaluation of the learning situation before, in class and after class. The evaluation indicators include courseware learning time, number of posts, pre-class test scores, attendance rate, number of interactive discussions, class exercises, class group cooperation results, after-class practical training results, and participation evaluation.

The third is the summative evaluation, which includes the after-class questionnaire results and the final test scores. The former belongs to qualitative evaluation, while the latter belongs to quantitative evaluation. The goal is to avoid "just transferring knowledge from teachers' minds to students' notebooks", and to emphasize students' active exploration of knowledge, active discovery and active construction of the meaning of knowledge, and to encourage students to study autonomously and participate in learning. The implementation of diversified assessment methods is shown in Figure 3.

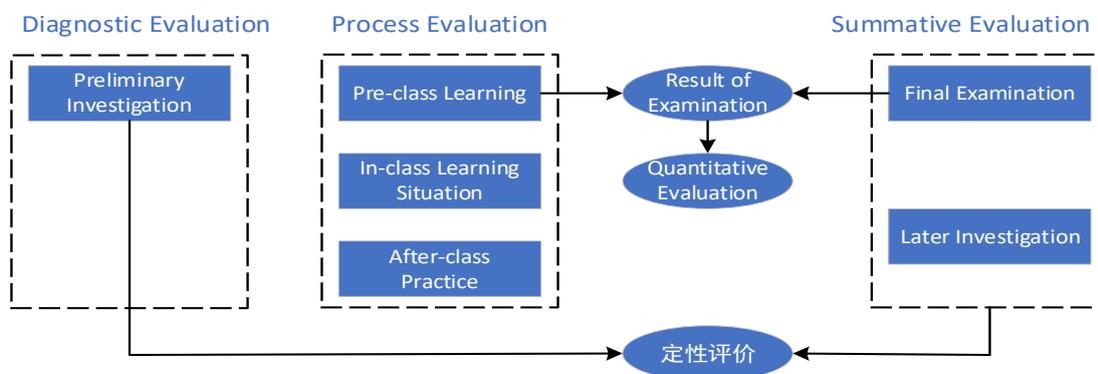


Figure 3 The implementation of diversified assessment methods

5. Conclusion

In the process of blended teaching reform based on online open courses, the teacher team of the author takes the domestic advanced educational concepts as the guidance, actively updates the educational and teaching concepts, pays attention to the innovation of teaching methods and means, and strengthens the practice links. After a semester of practice, the students have made significant progress. The students' initiative, autonomy and flexibility have been improved, and their practicality, openness, willpower, innovation, comprehensiveness and cooperation have been significantly improved. The detailed analysis is as follows.

The course teaching process design is complete and orderly, which not only reflects the knowledge structure, knowledge points, but also highlights the project design and reflects the teaching democracy. It cultivates students' good learning quality, the classroom structure is complete, the density is appropriate.

Under the new teaching mode, teachers adopt the inquiry-type teaching mode in classroom teaching to flip, highlight the key points, analyze thoroughly, and fully interact with teachers and students, which can give full play to the role of students' independent learning and active learning to a large extent.

In the problem-oriented group discussion, not only provides a platform for students to exchange, through mutual discussion and learning also consolidated the professional knowledge, improve the ability of students to analyze and solve problems.

Through the training of practical projects and project design, the students not only cultivate the hands-on ability and the ability to solve practical problems by combining theory with practice, but also expand their thinking and thinking, which reflects the people-oriented and development-oriented education mode.

Through specific exploration and practice, the blended teaching model has achieved good teaching effect. The classroom teaching strategies, content organization structure, online and offline discussion and matters to be noted under the model can be used as a reference for other teachers to carry out teaching reform. At the same time, it also found that some problems (such as students' dishonesty in online testing) need to be further explored and improved.

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