The Development and Realization of the Digital Electric Experiment Microlecture Based on WeChat

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Abstract. Experimental teaching is an important part of college teaching process, it can cultivate students' practical ability, innovation ability and practical ability of combining theory with practice. The teaching effect has not been ideal due to the experimental courses are restricted and influenced by many factors. To improve the teaching effect, this paper proposes to reform the experimental courses with the combination of new teaching mode and internet technology. The WeChat Public Account is adopted as the learning platform, and micro class as the main learning resource. So that the students can use flexibly their learning time, understand and learn actively the content and process of the experiment, eliminate the blindness, fear emotions to the experimental class. Based on the construction of The Digital Electric Experiment, this paper briefly introduces the development and application of experimental microlecture using WeChat's Public Account platform.

Introduction

Experimental course is a very important link in colleges and universities, which contains the understanding, application and innovation of knowledge. In the actual teaching process, students focus on the study of theoretical course, and the effect of experimental course is poor. The reasons are as follows:

1) The effect of the students' preparation is almost zero

Before the experimental class, students are required to preview and write the experimental preview report. Most students copy the experimental materials on their Exercise books, without thinking at all and know little about the experiment

2) The efficiency of the teacher's operation demonstration is low

Due to space limitations, when the teacher demonstrates to the students in the laboratory, only the students around the instrument can see the experiment process.

3) The problems in the experiment cannot be solved in time

The students will have various problems in the operation of the experiment, their interest and patience ran out gradually when the teacher is to attend to one another.

To improve the effect of the experiment course, the above problems must be solved. Due to the rapid development of intelligent terminals and mobile Internet, this paper proposes to take micro course as the teaching carrier and use WeChat public account which enables people to exchange information more frequently and conveniently as the teaching medium, to carry out the reform of new teaching mode, enhance students' learning interest and improve the teaching effect of experimental course.

WeChat Public Account's Advantage in Teaching Mode Reform

1) WeChat is now the largest social software in China, and almost all people who use smartphones sign up for WeChat. According to statistics, at the beginning of 2018, the number of WeChat users reached 889 million, and nearly 40% of those who use WeChat for more than 4 hours every day. There are about 10 million new WeChat Public Account platforms.
2) Almost all the students in the collage have smart phones. WeChat is used for making friends, chatting and information acquisition every day. WeChat is used as the communication media for teaching content, which makes students' learning free from time and space and facilitates greatly students' access to knowledge resources.

3) On the one hand, WeChat Public platform makes it easy for teachers to make and publish teaching resources; on the other hand, it also provides conditions for students to study.

**Micro-lecture Development**

Microlecture is a teaching mode popular in recent years, which presents the fragmented learning contents and processes, extends the structured digital resources of the materials by using information technology\(^1\). In China, it is also constantly developing and improving. It takes micro-video as the core to carry out teaching design for a certain knowledge point. It is short and concise, aiming at the key of the problem and solving it. Microlecture can solve the problem in Digital Electricity Experiments.

Micro-lecture has the following characteristics:

1) Short teaching time and small resource capacity;

Micro-lecture generally consists of video of 5 to 10 minutes. Compared to a class of 50 minutes, students are more able to concentrate and raise their interest to watch video content. Video is generally in the format of streaming media, such as RM, WMV, FLV, mp4, etc. It not only can be broadcast online, but also downloaded conveniently to the terminal equipment to realize the teaching form of mobile learning and flipped classroom\(^2\).

2) The teaching content is specific and the theme is outstanding:

Micro-lecture appears the problems in teaching with a concentrated way. It is a theme, which is discussed revolves around the solution of problems. These Micro-lecture contents must be classic and good at by teachers,. In this way, teachers can give play to the advantages of teaching design, express the teaching contents more clearly and interesting, and students can master the key points of learning more easily.

3) Rapid communication and timely feedback.

The students can see the teaching video through the terminal device (mobile phone or computer) to learn as soon as the course is released, without waiting for the class time. Students can also transfer their learning problems and opinions to teachers at any time. Teachers can adjust the courses in timely according to the feedback of students, so as to improve the efficiency of teaching.

The development process of micro-lecture mainly includes topic selection, teaching design, script design, resource preparation, recording of video, editing of video and publishing of video\(^3\). Micro-lecture are generally developed according to the process shown in figure 1:

![figure 1: Development process of microlecture](image)

The topic selection bases on the teaching content of micro courses from a macro perspective, and then conduct the teaching design according to the teaching objectives, including determining the teaching method, video structure, recording method, style and other contents\(^4\). Teaching script design is a detailed and specific design, including the analysis of teaching objects, teaching resources, video lens and other specific design. Resource preparation is to prepare the teaching tools, instruments and other equipment required for shooting in microlecture. The recording of micro video should be selected according to the previous design. After recording, video needs to be edited, the unnecessary parts are cut out, the missing notes, dubbing, subtitles and other contents are
supplemented, and the zoom process is made for the lens that needs to be enlarged, so as to add effects. Finally, the edited micro video is published.

Microlecture Development of Digital Electric Experiment based on WeChat Public Account

The micro lecture of Digital Electric Experiment is developed based on WeChat Public Account, which is composed of the module shown in figure 2. Through the course learning, students can learn about the experimental content in advance, and the experimental effect indeed is improved. Each experiment in the course corresponds to the video resource, which operated standardly and the result is correct. There are hints for the error behavior in the experiment and explanations for the problems that students are likely to have. Teachers and students can communicate online and then solve problems. The teacher may evaluate the student's study situation, the student may also propose the opinion to the teacher and the curriculum.

![Figure 2. The modules of WeChat Public Account of Digital Electric Experiment.](image)

1) The module of curriculum resources

Digital Electric Experiment micro courses consists of many microlectures, which take video resources as the carrier, Project-based teaching thoughts[5]. The time of each video is controlled in 5 minutes to facilitate students to use spare time to study for many times. Experiment contents consist of Gate Circuit function test, analysis of Combinational Logic Circuit Design, Trigger and its Application, Counter and its Application, and Application of 555 Timer, Integrated Circuit Analysis and Design and so on.

2) The module of curriculum learning

The module of curriculum learning enables students to interact with WeChat Public Account platform, WeChat group and friend circle of users. It can record students' learning time and progress. The learning materials can be uploaded and downloaded by using the cloud space of WeChat[6,7].

3) The module of curriculum interaction

The module of curriculum interaction makes use of the group function of WeChat to ensure the timely communication between teachers and students on the problems in the course learning. For some common problems, teachers do not have to answer repeatedly, and use time for individual problems.

4) The module of student achievement

According to the evaluation table, the teacher graded the students' activity in the micro course group, the results of experimental operation and the experimental report, so that the students could know the learning situation in time.

5) The module of curriculum evaluation

Students can evaluate the course acceptability, experimental effect and learning interest, and teachers and managers can adjust them according to the evaluation.

Conclusion

The continuous development and perfection of WeChat Public Account function provides conditions for the digitization and individualization of teaching. More than 90% of the students in the course of the trial held a positive attitude to this kind of teaching method. They think that learning efficiency were improved by using WeChat Public Account of Digital Electric Experiment, and convenient to communicate with the teacher. But there are some of students not studying in the
process in spite of they open courses. So we need to increase the monitoring management functions of WeChat Public Account platform for the students' learning process.

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References