

# Application of Microlecture in College Physics Experiment

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**Keywords:** Microlecture; College Physics Experiment; Teaching Mode.

**Abstract.** College physics experiment is important in cultivating students with comprehensive competence, innovation ability and practical abilities. Based on the problems existing in the current university physics experiment, this paper analyzes the characteristics of the microlecture and puts forward the teaching mode that combines the traditional teaching method with the microlecture teaching and puts it into practice.

## 1. Introduction

College physics experiment is an important basic experimental course for students of engineering colleges to learn soon after entering the colleges. Due to the reduction of credit hours of some basic courses in local undergraduate colleges, the credit hours of college physics experiment are also reduced significantly. How to cultivate students' practical ability and innovative ability during the limited time is the primary problem of the college physics experiment teaching.

As a new type of teaching resource, microlecture uses teaching video as the carrier, and the teaching activities are carried out around a certain knowledge point or teaching link, which can meet the needs of personalized learning with fragment knowledge, fragment time and fragment space. This also solves the problem of less time and poor quality [1]. Therefore, it is necessary for college physics experiment teachers to try to use microlecture to assist teaching.

## 2. Current Problems in College Physics Experiment of Our School

### 2.1 Lack of Preparation for Class

In the process of physics experiment teaching in colleges, students generally do not make preparation for class. When they enter the laboratory, they begin to prepare and muddle through their work. They are carrying out the experiment while reading the textbook, which affects the experimental effect. In fact, the pre-study can familiarize them with the experimental content in advance and make them understand the steps of the experiment. For the problems to be solved in the experiment, the students should know the conclusions and understand the key steps in the experiment.

### 2.2 Unreasonable Allocation of Class Hours

In the experimental teaching, many teachers pay too much attention to the explanation of the theory, and ignore the reasonable allocation of experimental time. For the rest of the time, students should study the experimental principles, familiarize themselves with the experimental procedures, organize the experimental instruments, and finally complete the experiment. The students finish the experiment carelessly in order to be dismissed on time.

With the help of microlecture, the teachers will make the microlecture video of the principle and experiment, and let the students prepare in advance, so that they can control class time better.

### 2.3 Be Slack at Review after Class

After the experiment report is submitted, almost no one reviews it. They only go to the lab to get familiar with the experimental process to cope with the final exam. The teachers explain the experimental knowledge in a general way and simply guide them. Most students don't understand

the experimental principle at all, they just learn the experimental process by rote and lack practical ability.

### **3. Application of Microlecture in College Physics Experiment Teaching of Our School**

Microlecture is a brand-new teaching method and an inevitable outcome of the development of this era. The main advantage of the microlecture is that “the teaching theme is outstanding, the teaching direction is clear, the teaching resources are rich in form, and the essence of knowledge is concentrated and it is easy to use” [2]. Generally, it takes 10-20min, which is consistent with the time for teaching of experiment. The content can be carried by the audio and video and be sent to the students for preview in advance. The content of the microlecture is refined, mainly for a certain knowledge point, and each experiment of college physics is a knowledge point. The microlecture is small in volume and easy to send via computer and network. Students can receive and download it flexibly and easily to achieve mobile learning [3].

#### **3.1 Self-regulated Preparation before Class Motivates the Initiative of Students for Experiments**

Through the rich texts, pictures and videos on the microlecture platform, students can clearly learn the purpose, steps, process and precautions of the experiment. Each student can also read the apprehensive part for a few times according to their own situation. With the help of microlecture, students can study freely in a lively way.

#### **3.2 Self-regulated Review after Class Satisfies Needs for Personalized Learning**

With microlecture, students can review and consolidate the knowledge. If they forget the theoretical knowledge, they can review the principle part, if they forget the use of the instrument, they can focus on the instrument use part. They can review the original microlecture to prepare for the final exam. The teaching of microlecture is more targeted, the purpose of teaching is clear, the theme is outstanding, and students can study selectively according to their own learning level, which is more in line with the learning needs of modern college students.

#### **3.3 Change of Traditional Teaching Mode**

Traditional experimental teaching is generally performed a teacher with dozens of students watching, and the effect is not satisfactory. Through the microlecture, students can pre-study the experimental content, and the teacher reduces the time for explanation in class, which can save more time to communicate with the students and better guide the experiment. Through the microlecture, the ideal “one-on-one” teaching mode becomes a reality, so that students can observe the experimental steps more carefully. In the practice of students, if they have any unclear points, they can watch the contents of the microlecture at any time. So the teacher can guide the experiment for each student on line, thus improving their learning efficiency.

### **4. Application Strategy of the Microlecture in College Physics Experiment Teaching**

#### **4.1 Improve the Quality of Micro-Courses**

Micro-courses can effectively make university physics experiment teaching more entertaining, and motivate students' interest in learning. However, due to the characteristics of micro-courses, such as short running time and less content, the content of a micro-course must be less and precise, and can meet the learning needs of students. Therefore, the application of microlectures in college physics experiment teaching should continuously improve the quality of microlectures. It is necessary to pay attention to not only the streamlining but also the comprehensiveness of microlectures' content. For this reason, teachers can follow the teaching steps of university physics experiment, carrying out micro-course teaching in each experimental session to improve the pertinence of micro-course teaching. Consequently, the use of micro-courses in the process of university physics experiment teaching should constantly improve the quality of micro-courses.

## 4.2 Improve the Quality of Teachers

Teachers play a key role in the process of university physics experiment teaching. Hence, the application of microlecture teaching in the process of university physics experiment teaching should continuously improve the quality of teachers. First of all, the information skills of teachers for university physics experiment should be constantly improved, so that they can skillfully use information technology to produce microlectures with high-quality. To this end, colleges should regularly organize teachers to participate in information technology training so as to improve their information skills; Secondly, universities should try to improve teachers' professional ethics and personal qualities, so that they will pay more attention to students' practical and innovation abilities during the process of experiment teaching, being actively responsible for students, and improve the quality of university physics experiment teaching.

## 5. Summary

In college physics experiment teaching, combining microlecture with traditional lectures can stimulate students' interest in learning, help students to effectively prepare and review the knowledge, reduce basic operation demonstrations and introduction of instrument use, and leave more time for students to do operation and communication. This has greatly improved the students' practical and innovative ability. Therefore, as long as the microlecture is used reasonably and effectively, it will help to promote the quality of college physics experiment teaching to a new level.

## Acknowledgement

This research was financially supported by the National Science Foundation.

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