

# Research on the Examination of College Physics Experiment Teaching Under the New Situation

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**Abstract:** When the offline and online courses are rich in content and the online teaching methods are mature, especially under the influence of the epidemic, online teaching also highlights its advantages and importance compared with pure offline teaching. In this new situation, how to change the current teaching method, how to better use the advantages of online teaching to integrate into offline teaching, and what reflects this achievement is the corresponding assessment method, how to combine it well, so that students can learn more knowledge in a limited time, and the assessment is also more reasonable, which is an urgent problem to be solved.

**Keywords:** Online Teaching; Offline Teaching; New Situation; Assessment Method

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## 1. Current examination methods of college physics experiments

The physics experiment course is different from the theoretical course. Taking Sanya University as an example, the teaching links of physics experiment mainly include three parts: experiment preparation, experiment operation and data processing. There is no experiment examination, so the performance assessment mainly includes attendance, operation and experiment report. In the experiment preview, because the course content is mainly in the form of textbooks and PPT, many students have not completed the preview part, and it happens that new technical means can be used to solve this problem, which will be explained later.

The emphasis of the experiment course is on operation, so the examination content should reflect this feature of the course, while taking into account the experiment preparation, data processing, and highlighting the importance of the ordinary experiment. Based on this principle, the examination of college physics experiment results is mainly divided into two parts: the usual results and the experimental results. The experimental results account for 70% and the ordinary results account for 30%. The experimental results include two parts, namely attendance and experimental operation, in which the operation results account for 50% and attendance accounts for 20%. The usual results are the results of the experimental report, which corresponds to the data processing of the teaching link, that is, the experimental report accounts for 30%. In the examination of college physics experiments, the average score of eight ordinary experiments is the total score of students in this course.

## 2. New models brought about by the epidemic

The pandemic has affected people's lives for more than three years, and in three years, the way people live, think and work, most notably the way schools are taught. During the epidemic, in order to avoid the spread of the epidemic, and at the same time can not delay the normal education and teaching work, from primary schools and even universities have opened the online teaching mode, in the past, in addition to a small number of universities have online and offline mixed teaching methods, primary school to high school teaching methods are offline face-to-face teaching, the emergence of the epidemic has broken the traditional teaching mode, thrown out new challenges, but also provided educators with new teaching ideas. Compared with offline teaching, the advantages of online courses are mainly as follows:

- (1) Online courses are rich in resources and students' knowledge is expanded;

(2) As far as physical experiments are concerned, the experimental operation during the epidemic is mainly operated on the virtual simulation platform, and students can view the operation demonstration in advance, familiarize themselves with the operation part in advance, and repeat the operation without being limited by time and space;

(3) Different schools have different teaching levels and quality, involving different heights, different acceptance abilities of students in the same school, and it is difficult for teachers to teach at different levels in the classroom.

Compared with offline teaching, online teaching also has shortcomings:

(1) When conducting online teaching, because it is not a face-to-face teaching method, many students have little interest in the explanation of the course, and the teaching effect is greatly reduced;

(2) In online teaching, students open the video voluntarily, teachers cannot pay attention to the student's listening status, can not really understand the student's mastery of knowledge, even if the student is willing to open the video, the teacher cannot view the video avatar while teaching, and cannot understand the actual listening situation of the student;

(3) From the perspective of three years of online teaching experience, the pure online teaching effect is obviously not as good as the offline face-to-face teaching method, the learning atmosphere is poor, and most students are in the state of "playing soy sauce".

Obviously, the simple offline teaching method obviously cannot keep up with the requirements of the times and cannot meet the current new situation, and the teaching effect of the pure online teaching method is even more daunting. Only the ingenious combination of online and offline can make the university physics experiment teaching achieve the desired effect.

### 3. Combining information technology to change teaching methods

The traditional offline teaching mode can no longer meet the requirements of the development of the new era, the intervention of information technology has changed the original teaching method, how to use information technology to make the offline teaching content more substantial, the teaching effect optimization, is the focus and difficulty of teaching reform<sup>[1]</sup>. Use information technology to solve the following problems:

(1) Transfer part of the classroom teaching content outside the classroom, such as the content that needs to be understood in advance for students to see in advance, and how to let students take the initiative to preview relevant content in advance, it is necessary to make changes in this regard; And some of the content that needs to be consolidated is put after class for students to complete;

(2) Due to the limited time in class, 90% of students can only complete the operation of the experimental content on time, and the principles may not be well understood, and the operation may not be proficient.

### 4. Assessment methods under the new situation

In teaching, a variety of means can be used to optimize teaching, students can expand their horizons through online courses, improve their interest in physical experiments, and at the same time maximize the use of classroom time, and the corresponding learning results can not be ignored, for teaching, the embodiment of learning results is mainly teaching assessment, if you can not reasonably carry out a full range of assessment of students this course, the links of course setting can not be taken into account, It is related to whether it can truly measure students' actual course learning ability and hands-on ability, and if it cannot be reasonably assessed, it will also discourage students' enthusiasm, make students complain, and cause bad impact.

Therefore, effective assessment of all aspects of the course is a crucial part of university physics experiment teaching. The reformed course mainly consists of three links, and the assessment is refined according to the specific content of the three links, as shown in Table 1.

Table 1 University Physics Experiment Assessment

University Physics Experiment Assessment (100 points)		
Pre-lesson Preparation (10 points)	Classroom Performance (60 points)	Consolidation after class (30 points)

Watch the short video	Attendance	Answer questions	Experiment operation	Online operation results	Lab report Thinking	Question answer
10 points	10 points	5 points	45 points	5 points	20 points	5 points

In the university physics experiment assessment, the focus is still on the experimental operation in the classroom, attendance has the right of "one veto", more than two unexcused absences, the grade is 60 and below, three unexcused absences are regarded as failing. In the experiment, the calculation and analysis of after-class data is also extremely important, only do the experiment without summarizing and summarizing, analysis, equivalent to only completing the "cause", not completing the "effect", some students in the experimental operation of the hands-on ability is outstanding, and the experimental report is hastily completed, did not summarize the experimental data, analysis data error, data analysis is the soul of the experiment, the ultimate purpose of the experiment is to draw relevant conclusions from the data, to achieve the purpose that the experimenter wants to achieve.

## 5. Summary

Under the development of the times, the way of education is also undergoing great changes, teaching methods and methods are also changing, and the corresponding assessment system of the curriculum must also echo it. The implementation of teaching assessment also encountered some obstacles:

(1) Using a combination of online and offline, teachers need to spend huge time and effort on video shooting, editing, searching for online high-quality courses, and pushing videos before class, etc., how to reflect the workload of this part, how to reasonably calculate into the actual class hours, need the full support of relevant departments of the school<sup>[2]</sup>;

(2) Students' pre-class preparation and online operation cannot be completely supervised, mainly relying on students' consciousness, resulting in some students' grades in these two parts may be "mixed with moisture" and lose the fairness of assessment.

While information technology changes the assessment method, it also changes the experimental course itself, but for the experimental course, online course learning is only a powerful supplement to offline experiments, and cannot replace offline teaching altogether<sup>[3]</sup>.

Hybrid online and offline teaching requires multiple considerations and school-related support to optimize the teaching effect and truly benefit students in this mode.

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Project Source: Sanya College Curriculum Assessment Reform Pilot Project (Project Number:SYJGKH2022117)