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The Exploration of the Quantitative Evaluation of Each Link of the University Physics Experiment

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Abstract: In the university physics experiment course, how to quantify and evaluate the teaching quality in each link is an important problem. As an online teaching platform, Yuclassroom provides a wealth of data and tools that can help teachers and students to conduct effective quantitative evaluation. By analyzing the students' preview completion, classroom participation and other data, the teaching effect can be objectively evaluated to find out the advantages and disadvantages in teaching, so as to make targeted improvements. At the same time, these data can also be used to stimulate students' learning enthusiasm and improve their learning effect.

Keywords: Rain classroom; University physics experiment; Experiment preview; Experiment operation

University physics experiment teaching is a subject based on experiment, and its purpose is to cultivate the practical ability of learning history and the ability to explore problems [1], [2]. A complete experimental process includes students getting familiar with and understanding the experimental equipment, the experimental design principle, the factors affecting the experiment, the experimental process, the experimental results and the summary analysis."Rain Classroom" is an online teaching-only terminal jointly launched by the Online Education Office of Tsinghua University and Xuetang Online. All the functions of the rain classroom are carried out on the basis of PPT and wechat, with simple operation and complete functions of [3-5].

1. Problems existing in the teaching of university physics experiment course

For a complete physical experiment process, there are basically three parts: preview before class, laboratory operation, and after-class data processing. The teacher gives the corresponding scores according to the writing situation of the students' preview report, the correctness of the measurement of the class hours, and the calculation and evaluation of the experimental data after class: usually, the score ratio of each link is, preview accounts for 10%, experimental operation accounts for 40%, and data processing accounts for 50%.

Although the scoring standard of data processing is formulated according to each experimental project, there are still two serious problems in the evaluation of students' preview and experimental operation:

1.1 Preview link evaluation is single

The teacher only makes a simple evaluation of whether the paper version of the student preview report is written and the number of words written, and evaluates the specific situation of the students' independent preview.

1.2 The operation link can not be very timely grasp the progress and the problems encountered by the students

During the experimental operation, the teacher could not grasp the progress of the experiment, the correctness of the connection of the electrical experiment, the correctness of the optical path adjustment in the optical experiment, and the correctness of the data recording of various experimental instruments in the experiment.

2. Use "rain classroom" to try to solve the problem of preview and operation of the two links of evaluation

This paper takes the "electron and field" experiment as an example to elaborate.

2.1 Preparation before class

Through the PowerPoint rain classroom plug-in setting: preview check quiz.

Experimental operation: Combined with the actual operation requirements of this experiment, two subjective questions are set (Figure 1).

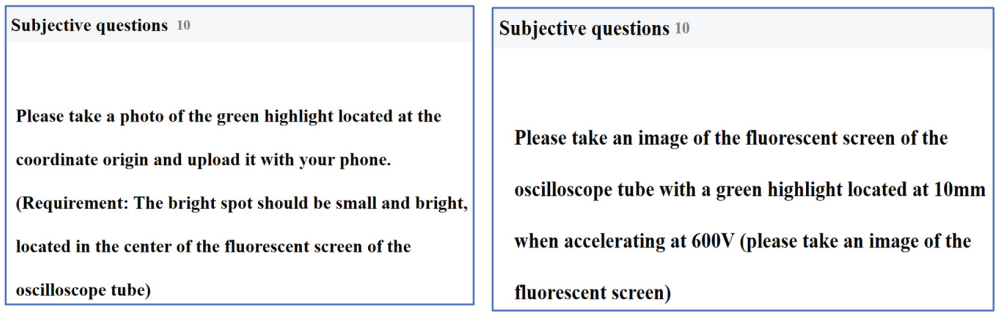

Figure 1 subjective questions

2.2 Teaching practice

According to the time and experimental projects arranged by the school educational administration, into the actual teaching link.

2.2.1 Show the rain class code, and wait for the students to scan and enter the class.

2.2.2 Conduct the preview inspection quiz: show the prepared preview quiz questions, and answer each question within a limited time. Take the answer situation of metal class 2201 as an example. We can see the ranking of students' preview scores, and quantify the preview links that are difficult to quantify.(Figure2)

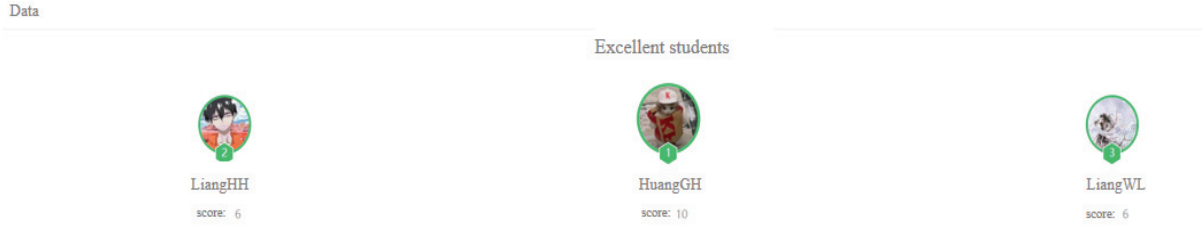

Figure 2 "Rain class" preview quiz score ranking: top three

2.2.3 Teaching process: The preview of metal 2201, you can understand: 'electric deflection','magnetic spiral ", these two problems are difficult. Here are these two points in the lecture(Figure 3).

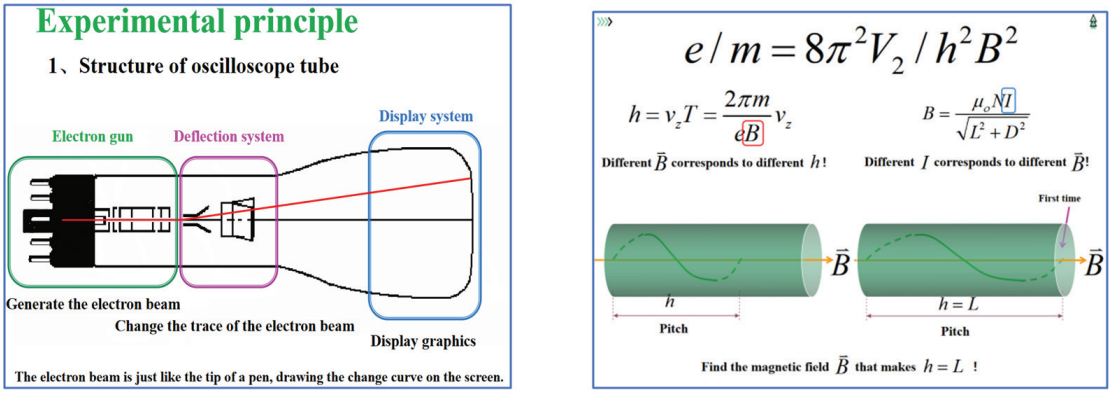

Figure 3 shows the knowledge points explained in preview

After teaching the basic knowledge, demonstrate the basic process of the experimental operation.

2.2.4 students began to experiment operation: "rain" classroom submission can submit quantitative operation problem (subjective), the experiment needs to 'electric deflects and' magnetic focus' surveying and mapping, thus set up five subjective questions, require students according to the complete progress, in turn, to upload photos, can quantify the progress and quality of experimental operation.

2.3 Teaching efficiency; teaching result

University physics experiment is a public basic course for all science and engineering students. In the second semester of 2023 / 2024, the author adopted the experimental exploration based on "rain classroom", carried out teaching practice through "electronic and field" experimental teaching, and made quantitative discussion and attempt on the experimental preview and experimental operation. Compared with the traditional experimental teaching, this teaching mode has been recognized by students, and truly feel the feeling as the subject of learning, which greatly improves students' interest in learning.

3. Peroration

As the only experiment course designated by the Ministry of Education, the importance of university physics experiment course is self-evident. With the help of the excellent and practical learning and teaching tools of "Rain Classroom", the teaching reform of the difficult experimental preview and experimental operation are discussed. And this discussion in the teaching process of teaching practice, achieved good results, the preview and operation to a certain extent was quantified, has also been recognized by students.

References

[1] Gu Yan, Gao Dongliang, Gao Lei. Application of WeChat New Media in Physics Experimental Teaching in University [J]. Industry in Technology Forum, 2019,18 (7): 172-173.

[2] Zhang Bei, Xu Lei. Some thoughts on the teaching method of university physics experiment [J]. Education and Teaching Forum, 2016,15 (23): 186-187.

[3] The Yang C... Xuetang launched intelligent teaching tool-Rain Classroom [EB]. Tsinghua University, 2016.

[4] Lv Qiao, Zhang Zhi. Application of rain classroom in university physics experiment teaching [J]. Information Technology Education in China, 2017 (5): 96-98.

[5] Shen Yang. Research on the teaching of university physics experiment based on "rain classroom" [J]. Think Tank Era, 2019 (15): 225-226.