Reform Ideas for the Teaching Practice of Modern Physics Experiment

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ABSTRACT

Modern physics experiment is an important and basic curriculum. It plays an important role in increasing students' ability to resolve and analyze a problem. In view of the problems existing in the teaching of "modern physics experiment" in our university, we put forward some personal suggestions and concrete measures of reformation on the contents, means and management of experiment teaching.

INTRODUCTION

Modern physics experiment is an important and basic curriculum for all physics subject students in colleges and universities. Through the study of modern physics experiment courses, students can understand the generation, formation and development of modern physics concepts. Moreover, modern physics experiment[1] is an important link to increase students' ability to resolve and analyze a problem, and is a crucial part to cultivate students' research ability and innovation ability. Therefore, modern physics experiment teaching should be taken some improvement in order to come up with the times. In this paper, according to our own actual teaching environment at the university of Jinan, we analyze the present situation of modern physical experiment teaching and discuss the way of reform.

The problems in the modern physics experiment teaching

Physics experiments are despised. Traditionally, most of the colleges and universities focus on the theory teaching of physics seriously, and despise the Physics experiment teaching. This causes utilitarianism in teaching and studying the modern physics experiment. At the same time, the coefficient of experiment teaching is lower

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than the coefficient of theory teaching of physics. Therefore, very few teachers are willing to teach the experimental course. Furthermore, modern physics experiments is more complex, time-consuming and laborious, compared with the common physics experiment[2]. Teachers are not willing to spend more energy to take the modern physics experiment, which seriously affects the modern physics experiment teaching level. Most of modern physics experimental equipment are mostly 20 years ago or more old, can barely be used.

Teaching old-fashioned way. Experiments in modern physics are relatively classic experiments in physics, and even Include famous physics experiments won the Nobel Prize, which involves a deeper knowledge of physics. Higher requirements are then put forward to Physics teachers[3]. This requires the teacher not only have the experiment guidance ability, but also have related knowledge of physics experiment, which can be used to make the experiment principle clear for the students to do the experiment. It can improve students' ability in practical operation and enhance their rigorous and matter-of-fact quality as well. However, there are two problems in the teaching of modern physics experiment: On the one hand, each of our "modern physics experiment" teacher must guide the two different experiments at the same time in each class. This directly leads to the limited teaching time. Teacher only can explain the purpose and procedure of the experiment simply to the students. On the other hand, teachers only emphasize the concrete laboratory procedure and the experimental matters needing attention. This deviates from the original intent of modern physics experiment. it's unable to improve students' understanding level of physics.

Reform Ideas of modern physics experiment

How to reduce and avoid the above problems in the teaching of modern physics experiment, and further improve the teaching effect? We think it can from the following several aspects to reform the experiment teaching of this course.

Elevates teachers' teaching level, strengthen the learning of correlative specialty. The requirement of modern physics experiment is higher than that of general physics experiment for teachers. Besides the proficiency of experimental manipulation, the experimental teachers should have a deep understanding of the subject background knowledge involved in the experiment. In order to make the experiment teachers have enough subject background, the teacher must raise own vocational level unceasingly, and communicate with the teachers of the basic courses. This is an important prerequisite to raise teaching level. We thinks that improve the level of experimental teaching should cover two aspects: Firstly, let the theoretical class teachers participate in the teaching of modern physics experiment. The teachers extend the modern physics experiment to the basic theory course, take the experiment maintained a close connection with the professional knowledge. Secondly, if the theoretical class teachers cannot participate in the experimental teaching directly because of objective reasons. The experimental teachers should attend lectures on the theoretical courses involved in the experiment. This will improve the theories teaching and practical ability of the experimental teachers.

Improve the experimental conditions. For the teaching environment of modern physics experiment, schools should increase the number of experimental equipment tables appropriately, reduce the number of experimental cycles and reduce the workload
of teachers. In the process of experimental teaching, teacher should understand the advantage of multimedia technology well and use it actively so as to improve the teaching efficiency and attract students' interest in physics. At the same time, schools should appropriately increase the number of teachers in modern physics experiments. The increase of experimental teachers can alleviate the embarrassing situation that the current experimental teachers always teach two experiments at the same time. The increase of experimental teachers can also give the teachers sufficient time to explain the experimental principles and knowledge.

Perfecting the management platform of the teaching. The new teaching management mode of modern physics experiment has been carried out. The students can select courses independently. But selection process of the course has its limitations. They can only choose the experimental time, cannot choose the content of the experiment. Some students are unable to select courses due to the crowding of the selective courses system. Teachers cannot effectively collect the experimental reports of the students who have selected courses. These questions should be perfected.

CONCLUSIONS

Based on the actual problems of modern physics experiment in our university, we put forward some personal suggestions and concrete measures of reformation on the contents, means and management of experiment teaching. We hope our suggestions can promote the development of the modern physics experiment course.

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REFERENCES