

# The Current Situation Analysis and Organization Methods of Teaching of High School Physics Experiment

Weiguo Xu

Jiangsu Xishan Senior High School,214174

---

**Abstract:** Physics is a science based on experiment.Senior high school is the enlightenment stage for students to learn physics,and it is also the first stage for students to contact physical knowledge.Physics experiment teaching lays a good groundwork for this stage.It not only allows students to understand scientific knowledge,but also exercises students'practical ability,thinking ability and innovative spirit.There are many problems in the traditional physics experiment teaching in senior high schools,which make many students have resistance in their hearts to physics learning,which is not conducive to the mastery and application of physical knowledge.Therefore,teachers should improve and optimize these problems in order to promote the healthy development of high school physics experiment teaching.This paper mainly analyzes the current situation of physics experiment teaching in senior high schools,and puts forward the corresponding solutions to provide reference for physics experiment teaching of senior high schools.

**Keywords:** Senior high school;Physics;Experiment teaching

---

## 1. Analysis of the Current Status of Physics Experiment Teaching in Senior High Schools

Obsolete experimental equipment leads to low teaching efficiency.Because it is a very complicated process to carry out high school physics experiment teaching,which needs to spend a lot of time and energy.However,most of the current high school physics experiment equipment is equipped in the 1960s and 1970s,which limits the development of physics experiment teaching to a certain extent.Because some novel and interesting physics experiments cannot be carried out,it is difficult to stimulate students'interest in learning.At the same time,due to the obsolete and aging experimental equipment,some advanced instruments cannot be used,which leads to many students can only watch the teacher's demonstration,and cannot personally experience them,which makes students lose interest in physics experiment teaching.

Physics teachers do not pay enough attention to experiment teaching.In the traditional physics class of senior high schools,teachers usually explain knowledge according to the content of the textbook,so that students can only fully grasp the knowledge learned in the textbook and apply them,which makes students lack of independent learning and innovative spirit,and makes it difficult for students to actively participate in classroom teaching.Moreover,in the teaching process,teachers often explain the experiment content designed in the textbook,and do not carry out the experiment teaching according to the actual situation of students.In this way,students cannot be exercised and improved in the practice process,which is not conducive to the development of their comprehensive ability.

Some teachers do not know enough about experiment teaching.At present,many teachers will take experiment teaching as a key point to explain,but do not pay attention to the relevant content of experiment teaching.In this way,most teachers have a misunderstanding of experiment teaching,and think that it is enough to master the knowledge learned in physics textbooks.

## 2. The Effective Strategies to Improve the Quality of Physics Experiment Teaching

In view of the problems existing in high school physics experiment teaching,teachers should adopt effective strategies to solve them and improve the quality of experiment teaching.1.Carrying out hierarchical and differentiated experimental teaching according to students'cognitive rules and learning characteristics.Before carrying out physics experiment teaching,teachers should stratify

students and design corresponding experiments according to their different learning levels and cognitive characteristics to improve students' participation and enthusiasm. At the same time, teachers should design experiments with different levels and difficulties according to the teaching objectives to meet the needs of students at different levels. 2. Innovating teaching methods and means to stimulate students' interest in physics experiments. When carrying out physics experiment teaching, teachers should adopt novel and interesting teaching methods and means. For example, teachers can use multimedia and smartphone APPs to carry out physics experiment teaching to create a good experiment atmosphere for students. When explaining "Ohm's law", teachers can introduce smartphone APPs or multimedia courseware into the classroom, so that students can learn Ohm's law while watching videos, which can not only deepen students' understanding of Ohm's law, but also improve students' interest in physics experiments. 3. Adopting open and inquiry-based physics experiment teaching mode. The traditional teaching mode of high school physics experiment is closed and "duck feeding" teaching mode, which is not conducive to the cultivation of students' autonomous learning ability and practical ability. Therefore, teachers should actively innovate the physics experiment teaching mode, and improve students' physical practice ability and innovative spirit through open and inquiry teaching. Teachers should change the traditional "teacher-centered" thought to "student-centered" thought and let students take the initiative to participate in the experiment. When carrying out physics experiment teaching, teachers should provide students with enough exploration opportunities and space, and enable every student to achieve experimental goals in cooperation.

### **3. Optimizing Experiment Teaching Methods**

In high school physics experiment teaching, teachers should optimize the teaching methods reasonably to enable students to have a deeper understanding of physical knowledge. Firstly, teachers should design experiment teaching content according to students' learning foundation and knowledge reserve. When designing the experiment content, teachers should take students as the center, start from the actual needs of students, and explain the physical knowledge pertinently. In the experiment teaching, teachers can add some physics experiments that are simple and easy to understand by combining textbooks with real life. For example, teachers can choose some common objects in life for experiments, such as making a lamp from plasticine, making a telescope from glass sheets, etc. Secondly, teachers should adopt group teaching method and let students complete the experiment independently. Group teaching method refers to grouping students reasonably according to their knowledge level, thinking ability and practical ability, and arranging fixed experimental tasks for them. This teaching method can not only mobilize students' enthusiasm and initiative to participate in physics experiment teaching, but also cultivate students' ability to learn and explore independently. For example, in the section "Exploring the horizontal projectile motion", teachers can divide students into several groups, and each group studies the movement of objects in the horizontal projectile motion. In this process, teachers can let students give full play to their imagination and creativity, explore problems from different angles and solve problems. Finally, teachers should innovate teaching methods, so that students can learn in cooperation and exchange. When carrying out physics experiment teaching, teachers should cultivate the spirit of unity and cooperation among students.

### **4. Using Multimedia for Experiment Teaching**

With the development of information technology, multimedia teaching has been widely used in teaching. In high school physics experiment teaching, teachers can also use multimedia to carry out experiment teaching, and show the experiment process and results to students through multimedia, which can not only increase students' understanding of physical knowledge, but also cultivate students' learning interest. For example, in the teaching of "the Particle", the teacher can first make a 3D animated video to show the particle's motion trajectory and speed changes, then play the particle's motion at different speeds in class, and then ask students to observe the particle's motion in the video. Finally, let the students think: if the particle is replaced by other objects, what will happen? It will help students understand the laws of particle's movement. Multimedia technology can not only stimulate students' interest in learning, but also enable students to better grasp physical knowledge.

In short, with the continuous development and popularization of modern educational technology, high school physics experiment teaching has also made great progress. Teachers should make full use of many media technologies to stimulate students' interest in learning physics through multimedia demonstration of the experiment process, results and the application of physics knowledge. In addition, teachers can also improve students' ability to understand and explore physics experiments through multimedia teaching.

### **5. Guiding Students to Explore Independently during the Experiment**

In the process of physics experiment teaching in senior high schools, teachers should be good at guiding students to explore independently, rather than directly telling students the results of the experiment. For example, when teaching the

section“Equilibrium Condition of Lever”,the teacher can first allow students to conduct experiments on their own and feel the meaning of the Equilibrium Condition of Lever by themselves,and then let the students themselves to discover the problem,think about the problem,solve the problem,and finally draw a conclusion.In this process,teachers should actively guide students to explore independently,let students find problems,think about problems,and solve problems independently,rather than directly tell students the answer.In this way,not only can it effectively improve students’practical ability and thinking ability,but it can also enhance their confidence and autonomy,and deepen their understanding of knowledge.In addition,it can also promote students’interest in physics and make them enjoy the subject more.Therefore,teachers should be good at guiding students to explore independently.

## 6. Conclusion

This paper systematically reviews the current status of physics experiment teaching in senior high schools in China,and reveals the problems and deficiencies in hardware facilities,teaching methods,course design and the cultivation of students’independent inquisition ability.At the same time,we put forward a series of effective strategies to improve the quality of physics experiment teaching,including optimizing experiment content and structure,improving teaching methods and means,and especially emphasizing the importance of using multimedia technology for experiment teaching,and how to scientifically guide students to carry out independent exploration during the experiment process,so as to comprehensively improve students’practical ability and innovation ability.In short,the future high school physics experiment teaching will focus on comprehensively promoting the cultivation of students’core literacy,constructing a new teaching system that is full of vitality,challenges,and conducive to innovation,providing strong support for the country and society to cultivate talents with solid physics foundations and excellent practical innovation abilities.

## References:

- [1]Jiajun Zou.Investigation and Research on the Teaching Status of“Students Must Do Experiments”in High School Physics[D].Guangzhou University,2023.
- [2]Erfeng Xu.The Application of Information Technology in High School Physics Experiment Teaching[J].Learning Weekly,2023,(22):P75-77.
- [3]Qiang Zhang.The Current Situation Analysis and Organization Methods of Physics Experiment Teaching in Senior High Schools[J].Shu Li Tian Di(Senior High School Edition),2023,(20):P69-71.