

Exploration and Evaluation of High School Physics Experiment Teaching Mode Under the New Curriculum Reform

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Abstract: With pressure increasing due to the heavy tasks and college entrance exam, students are struggling to figure out a way to succeed in their schoolwork. It is vital for teachers to come up with new methods to help students' alleviate their pressure and help them get a good result in the exam which might decide their future to a great extent. The content of physics knowledge itself is very logical, and the learning process of students is difficult. If teachers cannot adopt reasonable and effective teaching methods, it will be difficult for students to make progress. In this way, experiments are the best way to simplify physical knowledge. Experimental teaching in high school physics classrooms is an important part of it. Under the background of the new curriculum reform, students are required to have strong theoretical and practical abilities. Therefore, in the new development situation, we must innovate the teaching mode, by integrating high school physics experiments, in order to effectively improve students' comprehensive qualities and comprehensive abilities.

Keywords: New curriculum reform; High school physics experiment teaching mode; Exploration; Evaluation

In the current high school teaching process, many teachers and students do not pay attention to physical experiments, which seriously restricts the improvement of students' physical literacy. Unfortunately, under the development of the new curriculum reform, there is only one innovative teaching mode. By strengthening the innovation of the experimental teaching mode, students can get the fun of physical experiments, find problems, analyze problems, and solve problems in experiments, which might eventually stimulate their creative thinking and logic. Only in this way can we further master the knowledge of physics and reflect the interest and exploration of high school physics classes. China has made continuous reforms and innovations in the development of talents, especially since the implementation of the new curriculum reform, which has brought about a lot of changes in compulsory education. What is more prominent is that in the teaching of high school physics experiments, more emphasis has been placed on students' innovative ability. and practical ability, as well as allowing students to actively participate in and experience the fun of experiments, and cultivate their innovative consciousness.

1. Problems existing in the teaching mode of high school physics experiments

1.1 Ignore the main body position of students

Most of the teachers in high school physics classrooms are unable to explain and select the course topics according to the students' specific learning situation and actual learning ability in the actual teaching work. Teachers instill knowledge into students according to the "demonstrative" method, and explain it repeatedly, which also makes it difficult for students to really understand the content. In desperation, most students choose to memorize physics knowledge by rote and remembering the results. As for the process and methods to get the result, it becomes a brushstroke and will eventually leads to the fact that students lose their interests in learning physics as well as spirit of questioning and discussion.

1.2 Lack of innovation in experimental teaching methods

The purpose of the experimental course is to get the results of abstract knowledge through practical operations, so that students

can understand the knowledge they need to learn visually, and can also feel the charm of physical knowledge through experiments and improve their interest in learning. However, at present, many physics teachers in high school campuses in China use the same method to conduct experiments during the course development process. There is not much innovation in the whole course, and little novel content is integrated into it. If things go on like this, students might feel boring and pale easily, and there will be the crisis of giving up learning among teenagers.

1.3 Too many special experiments and little coherence

Most of the time, basically each chapter will have some experimental arrangements, which are said to improve the operability to the extreme. However, such experiments are all special experiments because they are aimed at a certain knowledge point or the content of a certain chapter. On the whole, there is a lack of comprehensive experiments that can condense many knowledge points together, which can only work on special abilities in many cases, but it is difficult to improve the overall abilities in solving problems.

2. Exploration of high school physics experiment teaching mode under the new curriculum reform

2.1 Cultivating students' inquiry ability

First of all, in the experimental teaching, teachers need to follow the main training goal of students' active participation, exploration and thinking. Meanwhile, we also need to improve their abilities of observing, thinking, and exploring in the process of experimentation. In view of the current social development situation, in order to gain a better foothold in society, students need to have a strong independent learning ability. Secondly, in the experimental teaching of high school, there is a more important method --- the verification experiment, which is conducted mainly through the verification experiment method and the process of verifying the knowledge learned. Since this kind of experiment does not have a good effect on students' innovative ability, it is necessary for teachers to change the demonstration experiment into an exploratory one, so that a good teaching effect can be achieved. For example, in "Friction", teachers can use exploratory experiments to carry out teaching process. During this experiment, students can also be guided to answer questions like: First, what factors are related to the exploration of sliding friction? The variable control method can be used for research ^[1]. Second, in the experimental stage, coordinators can lead students ask questions through observation to see if it is related to the size and roughness of the contact surface, the pressure, the temperature, the sliding speed and other factors. Third, how to judge the direction of friction? This should be tangent to the contact surface and opposite to the direction of relative motion of the object. In this way of asking questions, students can be motivated to actively explore and continue to learn. Therefore, in order to better improve their inquiry ability, it is necessary for teachers to reserve sufficient space for them to study and practice ^[2]. In the case of instructing students to learn Newton's third law, in order to make students realize that force is the fundamental reason for changing the motion state of objects, teachers will combine various problems existing in students' independent experiments and let students push the wall hard. By perceiving the reaction of the walls in person, many students will be impressed by this knowledge point. This kind of demonstrative experiment helps reduce the pressure of understanding for students. Under the guidance of teachers, students can freely diverge and imagine boldly as well as have a new understanding of intuitive and vivid experiments.

2.2 Pay attention to the combination of theory and practice

The new curriculum reform requires high school experimental courses to be combined with real life to carry out teaching, as well as practical activities. Then teachers should improve the teaching plan in time and infiltrate theoretical knowledge into practical activities reasonably. General knowledge points are relatively abstract, and teachers can appropriately create situational teaching, which is conducive to mobilizing students' enthusiasm and enhancing their interest in learning. Therefore, only the combination of theoretical knowledge and practice can better stimulate their creative potential ^[3]. According to the content of the textbook, teachers put forward some questions related to real life, so that students can personally participate in the experiment and discuss the phenomenon of physical innovation in life, so as to achieve the purpose of cultivating their innovation ability through physical experiments. For example: In "Utilization and Protection of Static Electricity", teachers can ask students to talk about how they feel when they are exposed to static electricity in their lives? And what are the dangers of stillness? So how to prevent the occurrence of static electricity? There is also how to turn harmful into beneficial, better use of static electricity? With these questions, students are able to understand and deepen relevant knowledge points in life, and discover the mystery of applying physical knowledge to real life. For example, laser printing is achieved by electrostatic printing, as well as air purifiers, dust removal, Spraying can use the principle of electrostatics to apply to life. Therefore, actively linking theoretical teaching with practical life can help students master the teaching goals more effectively.

2.3 Carry out interesting experiments

In the process of carrying out physical experiments, we must strengthen the comprehensive analysis and comprehensive discussion among experimental phenomena, experimental steps and experimental results. Under the new curriculum reform, it is necessary to further enhance the fun of the experiment and encourage students to actively participate in the physics experiment, so as to improve their learning effect. Students can develop their potential through interesting experiments in the physics experiment classroom, and cultivate their learning ability through the spirit of inquiry. Teachers can demonstrate some interesting experiments for students based on the teaching content to attract students into the classroom. For example, in the process of learning the lesson "Electromagnetic Induction", teachers can conduct physical experiments through small groups, according to the instruments and equipment, and guide students to conduct experiments independently to understand the specific phenomenon of electromagnetic induction^[4]. Students can understand the generation process of physical knowledge and physical concepts through independent experiments, and explore the principle of electromagnetic induction. Group experiments can stimulate their interest in learning as well as make them interested in the process of communication and exploration. Before learning, students can learn about the concept of electromagnetic induction by previewing in advance. After having the experiment, they will be more eager want to know how electromagnetic induction is formed, so that teachers can achieve twice effect of the result with half the effort when explaining, and improve students Enthusiasm for learning and enhance students' enthusiasm for learning.

3. Epilogue

To sum up, with the continuous deepening of the teaching concept of the new course, the traditional teaching mode and concept are no longer applicable to the development of the current era, not only the subjects other than language and mathematics, but also to the physics and physics experiment courses. Therefore, in order to improve the quality of teaching and the all-round development of students, physics teachers need to make necessary adjustments to the high school physics experimental teaching mode, and actively keep up with the pace of the times. High school physics teachers need to base their experimental teaching on reform and innovation and use flexible creative experimental teaching mode to give students more opportunities to show themselves. To consolidate students' learning foundation, teachers really need to make students realize the value of the subject in real life and mobilize their learning initiative in order to help them become more active and benefit from the learning process.

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